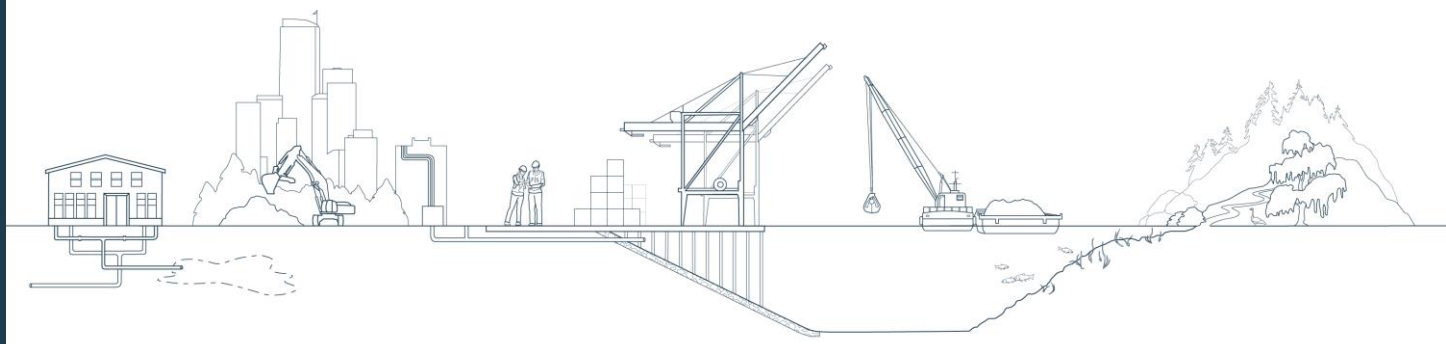
Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Prepared for
Industrial Waste Area Generators Group III

September 2023



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The interpretations and conclusions contained in this report are based in part on site characterization data collected by others and provided by the Industrial Waste Area Generators Group III. Floyd|Snider cannot assure the accuracy of this information.

Zone A Post-Excavation Engineering Design Report

PROFESSIONAL ENGINEER CERTIFICATION

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List of Abbreviations

Abbreviation	Definition
AEC	Anderson Environmental Contracting
AIA	Additional Interim Actions
Anguil	Anguil Environmental Systems, Inc.
AQP	Air Quality Program
ARAR	Applicable or relevant and appropriate requirement
BDI	Basin Disposal, Inc.
bgs	Below ground surface
BGMS	Belowground moisture separators
BMP	Best Management Practice
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CACR	Cleanup Action Completion Report
CAMU	Corrective Action Management Unit
CAP	Cleanup Action Plan – Pasco Landfill NPL Site
Cascade	Cascade Environmental

Abbreviation	Definition
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	Centimeters per second
CMA	Container management area
CMP	Compliance Monitoring Plan
COC	Contaminant of concern
CUL	Cleanup level
cVOC	Chlorinated volatile organic compound
CWM	Chemical Waste Management
design package	Thermal Conduction Heating 30% Design Package
DLO	Diesel locomotive
DRO	Diesel-range organics
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
EO	Enforcement Order No. DE 16899
ERH	Electrical Resistance Heating
FFS	Focused Feasibility Study
FPUD	Franklin County Public Utility District
GMP	Groundwater Monitoring Plan
GPA	Groundwater Protection Area
gpm	Gallons per minute
GRO	Gasoline-range organics
GSR	Green and sustainable remediation
HASP	Health and Safety Plan
HazCat	Hazard categorization
IC	Institutional control
IDW	Investigation-derived waste
IHS	Indicator hazardous substance
ISTR	In situ thermal remediation
IWA	Industrial Waste Area
IWAG	Industrial Waste Area Generators Group III

Abbreviation	Definition
kWh	Kilowatt-hours
LFG	Landfill Group
LGAC	Liquid-phase granular activated carbon
LNAPL	Light non-aqueous phase liquid
LPG	Lower Pasco Gravels
m/m	Meters per meter
mg/kg	Milligrams per kilogram
MSW	Municipal solid waste
MTCA	Model Toxics Control Act
NAPL	Non-aqueous phase liquid
NAVD 88	North American Vertical Datum of 1988
NOC	Notice of Construction
NPL	National Priorities List
O&M	Operation and maintenance
ORO	Oil-range organics
PAH	Polycyclic aromatic hydrocarbon
PBS	PBS Engineering and Environmental Inc.
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PCMP	Performance and Confirmation Monitoring Plan
PCU	Power control unit
PEC	Post-excavation characterization
PID	Photoionization detector
PLP	Potentially liable person
PMP	Pressure monitoring point
POC	Point of compliance
ppm	Parts per million
ppmv	Parts per million by volume
PSLI	Pasco Sanitary Landfill, Inc.
QA/QC	Quality assurance and quality control

Abbreviation	Definition
QAPP	Quality Assurance Project Plan
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
REL	Remediation level
ROI	Radius of influence
RTD	Resistance temperature detector
RTO	Regenerative thermal oxidizer
SAP	Sampling and Analysis Plan
scfh	Standard cubic feet per hour
scfm	Standard cubic feet per minute
Site	Pasco Sanitary Landfill National Priorities List Site
SL	Screening level
SOW	Scope of Work and Schedule
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound
TCE	Trichloroethene
TCH	Thermal Conductance Heating
TMP	Temperature monitoring point
TPH	Total petroleum hydrocarbons
TRS	TRS Group, Inc.
UCL	Upper confidence limit
UPG	Upper Pasco Gravels
USEPA	U.S. Environmental Protection Agency
VGAC	Vapor-phase granular activated carbon
VOC	Volatile organic compound
VR	Vapor Recovery
WAC	Washington Administrative Code
ZARCTM	*Zone A Removal Action Construction Completion Technical Memorandum*

1.0 Introduction

This Zone A Post-Excavation Engineering Design Report (EDR) presents engineering design objectives and criteria for in situ thermal remediation (ISTR) that will be completed to treat residual soil contamination within the Industrial Waste Area referred to as Zone A after the completion of the Zone A Removal Action at the Pasco Sanitary Landfill National Priorities List (NPL) Site (Site). The Site is located to the north of Pasco-Kahlotus Road and U.S. Highway 12, northeast of the City of Pasco, in Franklin County, Washington, as shown on Figure 1.1. The location of Zone A at the Pasco landfill property is shown on Figure 1.2.

1.1 REGULATORY CONTEXT

The Zone A cleanup action is being conducted under Enforcement Order No. DE 16899 (EO) issued by the Washington State Department of Ecology (Ecology) to potentially liable persons (PLPs) who are members of the Industrial Waste Area Generators Group III (IWAG), the Landfill Group (LFG), and other PLPs involved at the Site. The EO was issued to PLPs on November 8, 2019, and includes the *Cleanup Action Plan – Pasco Landfill NPL Site* (CAP) as Exhibit B and the associated Scope of Work and Schedule (SOW) as Exhibit C for the Site (Ecology 2019a, 2019b). The EO, CAP, and SOW describe cleanup actions required for all disposal areas at the Site.

This EDR is required by the EO and CAP and is related specifically to the post-excavation ISTR of residual contamination in Zone A, as presented in Task A.4 in the SOW and Section 6.3 of the CAP. The selected remedy for Zone A presented in the CAP and associated SOW will be protective of human health and the environment, is consistent with the State of Washington's preference for permanent solutions (Revised Code of Washington [RCW] Chapter 70A.305.030(1)(b)), and is based on the Focused Feasibility Study (FFS; Anchor QEA et al. 2017) and other relevant documents in the administrative record for the Site. The selected remedy for Zone A is more specifically described in Section 3.0 of this EDR and was developed to meet the Model Toxics Control Act (MTCA) threshold and other requirements of Washington Administrative Code (WAC) 173-340-400.

1.2 PURPOSE AND OBJECTIVES

The purpose of this EDR is to provide design and planning information for implementation of ISTR to treat residual subsurface organic soil contamination within Zone A after the Zone A Removal Action, as described in the CAP and SOW.

The primary objectives of this EDR include the following:

- Provide ISTR treatment system design details and assumptions that will serve as direction to the ISTR contractor and subcontractors to implement the work in a protective and safe manner in accordance with the CAP and SOW.
- Summarize Zone A post-excavation characterization (PEC) soil results.

- Summarize the thermal treatability bench test results, including expected organic contaminant removal efficiencies.
- Develop remediation levels (RELs) for soil to ensure protection of groundwater at the point of compliance (POC).
- Provide expected ISTR performance goals, including expected contaminant destruction and removal efficiency expectations and performance monitoring details.
- Describe modifications to the existing regenerative thermal oxidizer (RTO) for use in ISTR.
- Describe temporary treatment area cover for ISTR operations.
- Describe ISTR system operation and decommissioning.
- Comply with applicable sections of WAC; MTCA (Chapter 70A.305 RCW); and applicable state, federal, and local requirements.

Task A.4 (Subtask C) of the EO also requires detailed engineering plans and specifications for installation of a low-permeability final cover system over Zone A after ISTR operation and system decommissioning. An overall description of the final cover system is included in this EDR, but final design plans and specifications for the final cover system will be provided to Ecology at a later date in an EDR Addendum.

This EDR meets the WAC 173-340-400(4)(a) requirements.

1.3 GOALS OF ZONE A IN SITU THERMAL REMEDIATION

Per Task A.4 of the SOW, the following are the goals of the Zone A ISTR:

- Treat residual organic compound contamination within Zone A to achieve RELs that will be developed as part of this EDR
- Collect and transfer extracted vapor from ISTR operations to the RTO for destruction
- Broadly treat organic compounds, including indicator hazardous substances (IHSs) whose respective groundwater concentrations measured near Zone A are already at or less than cleanup levels (CULs)
- Reduce overall volatile organic compound (VOC) mass and provide mass reduction for other categories of Zone A organic analytes (i.e., semivolatile organic compounds [SVOCs])
- Avoid the need for a prolonged period of post-ISTR soil vapor extraction (SVE) operation to address any remaining residual VOC and SVOC contamination

1.4 INTERAGENCY COORDINATION

The Pasco landfill is on the NPL. Under an interagency agreement between the U.S. Environmental Protection Agency (USEPA) and Ecology that governs cleanup responsibilities for state-lead NPL sites, USEPA retains its responsibility under the Comprehensive Environmental Response,

Compensation, and Liability Act (CERCLA) to ensure that the final cleanup action is sufficient, while transmitting the day-to-day cleanup oversight role to Ecology. Throughout the Zone A Removal Action, Ecology provided project updates to USEPA in accordance with the interagency agreement. USEPA and Ecology coordination is anticipated to continue throughout the ISTR to support securing USEPA concurrence that the cleanup activities are being conducted in accordance with MTCA and fulfill cleanup requirements under CERCLA for Site closure.

1.5 PUBLIC NOTICE AND PARTICIPATION

The CAP and SOW were issued for public comment, and a responsiveness summary was issued addressing the received comments. The draft CAP and SOW as presented for public comment became final on November 8, 2019, without further changes.

Documentation of the public notice and participation process is maintained by Ecology. In coordination with the IWAG, Ecology will keep the public informed regarding the progress toward completion of the Zone A ISTR. Additionally, the IWAG will provide local stakeholder project updates in coordination with Ecology, similar to the email-based updates and website updates provided during the Zone A Removal Action.

2.0 Zone A Background and Current Conditions

This section provides general information about the Site and the specific industrial waste area (Zone A) that is the focus of this EDR, including an overview of the Site and history, the geological and hydrogeological setting, and an update on current conditions for Zone A. A more comprehensive background summary for Zone A, including an overview of relevant previous investigations and interim actions, was included in Section 3.0 of the Zone A Removal Action EDR (Floyd|Snider and PBS 2020) and is not included herein.

2.1 SITE LOCATION AND SETTING

The Site is located within Franklin County, with a portion within the City of Pasco, north of the intersection of Pasco-Kahlotus Road and U.S. Highway 12 (Figure 1.1). The Pasco landfill property occupies an approximate 200-acre area of gently rolling hills and flat terrain that is situated at about 400 feet in elevation (North American Vertical Datum of 1988 [NAVD 88]). The landfill is closed, and a transfer station and recycling facility operated by Basin Disposal, Inc. (BDI) is located on Dietrich Road at the southern end of the landfill property.

The Site is surrounded by agriculture and light industrial businesses. Residential and commercial areas are located to the south and southwest of the Site; the closest residential-zoned property lies approximately 0.5 miles from the landfill boundary. The off-property areas are zoned light industrial (I 1), residential (RT, R 1, and R 2), and general business (C 3). On-property areas are zoned for light industrial or agricultural production.

The Site is located in an arid region of the Columbia Plateau that is surrounded on the west, north, and northeast by mountain ranges. Annual precipitation in the Pasco Basin ranges from approximately 4 to 13 inches, with mean precipitation of approximately 7.5 inches. Winter snowfall averages approximately 4 inches annually. Windy conditions are common in the vicinity of the Site with average winds less than 10 miles per hour with recorded gusts of more than 70 miles per hour. Winds are typically out of the northwest or southwest.

There are no surface water features in the vicinity of the Site. The Columbia River is located approximately 2.5 miles south of the Site and serves as the primary discharge zone for groundwater that flows generally southward from the Site. The Snake River is located approximately 2.5 miles southeast of the Site and forms a separate hydrologic boundary for the regional alluvial groundwater system.

The depth to groundwater beneath the landfill property varies primarily due to topography and the overall southwesterly groundwater gradient. The water table is typically encountered at depths ranging from approximately 30 to 70 feet below ground surface (bgs). The shallowest depth to groundwater is observed on the north end of the capped Municipal Solid Waste (MSW) Landfill (Figure 1.2), at a depth lower than 20 feet bgs. The water table fluctuates seasonally approximately 1 to 3.5 feet. Groundwater flows generally to the southwest across the property; the flow becomes more southerly in areas south of the property.

2.2 PROPERTY OWNERSHIP

Zone A encompasses several parcels within Franklin County owned by Pasco Sanitary Landfill, Inc. (PSLI) and one parcel owned by Columbia Basin LLC,[1] as shown on Figure 2.1. Parcel 113580091, owned by PSLI, includes the northern two-thirds of Zone A. Parcel 113580037, owned by Columbia Basin, LLC, includes the southern portion of Zone A and the BDI transfer station and recycling facility.

2.3 SITE DESCRIPTION

The Site, as defined by the EO, encompasses where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed or has otherwise come to be located. The Groundwater Protection Area (GPA) that encompasses the historical groundwater plume area was created by the City of Pasco and Franklin County to restrict use of groundwater at and downgradient of the Site. The location of the GPA relative to the Site is presented on Figure 2.2. The GPA will remain in place after implementation of the final cleanup remedy and until post-remedy groundwater performance objectives for the Site have been met, including attainment of groundwater CULs.

The landfill no longer accepts waste and is closed to the public. Current physical institutional controls (ICs), including gates, fencing, and signs, restrict access to the Site. The disposal areas and corresponding waste materials placed at the Site are as follows and are shown on Figure 1.2:

- MSW Landfill Areas (received MSW from 1958 to 1993, and open burning occurred until 1971):
  - MSW Landfill: Contains household and commercial MSW.
  - Balefill and Inert Waste Areas: Contains household waste, tires, and construction debris. Garbage placed into the Balefill Area typically was compacted into bales, stacked, and covered with soil.
  - Burn Trenches BT-1 (two trench areas) and BT-2: Contains MSW that was disposed of and openly burned in the 1950s and 1960s.
- Industrial Waste Areas (received industrial waste from 1972 through early 1975):
  - Zone A: Contained an estimated 35,000 drums and containers that originally contained solvent and paint sludges, cleaners, and a broad variety of hazardous industrial waste.
  - Zone C/D: Contains residues from disposing of approximately 3 million gallons of plywood resin waste, wood treatment and preservative waste, lime sludge, cutting oils, paint and paint solvent waste, and other bulk liquid waste; zones combined in 2002.
  - Zone E: Contains approximately 11,000 tons of chlor-alkali waste, a mercury-enriched barium sludge from paper manufacturing.

[1] In November 2021, parcel 113580037, associated with BDI, which includes the southern third of Zone A, was sold from Leonard and Glenda Dietrich to Columbia Basin LLC, controlled by Darrick Dietrich.

2.4 SOIL AND GROUNDWATER CHARACTERISTICS

The geology and hydrogeology at the Site are well understood and documented in previous reports, including the FFS, the CAP, and the Zone A Removal Action EDR. A summary of soil and groundwater characteristics relevant to Zone A ISTR is included in the following sections.

2.4.1 Vadose Zone Soils and Geology

The Site is located within the Pasco Basin geologic province on the Columbia Plateau and is underlain by a thick sequence of basalts that are covered by a relatively thin sequence of semiconsolidated and unconsolidated sediments. From youngest (top) to oldest (bottom), the primary stratigraphic units beneath the Site include the following:

- Surficial Sand and Silt: imported fill material (0 to 10 feet thick)
- Touchet Beds: interbedded fine sand and silt (15 to 30 feet thick)
- Upper Pasco Gravels (UPG): fine to coarse sand with occasional gravel (15 to 40 feet thick)
- Lower Pasco Gravels (LPG): sand and gravel, gravel increases with depth (10 to 35 feet thick)
- Middle Ringold Formation: sand and gravel, variably cemented (0 to 400 feet thick)
- Lower Ringold Formation: silts and clays with interbedded sand and gravel (0 to 400 feet thick)
- Columbia River Basalt: Yakima Basalt subgroup (>4,000 feet)

The Touchet Beds and UPG are the stratigraphic units of primary interest at the Site. The physical and chemical characteristics of these units influence the fate and transport of contaminants both within the vadose zone (above the groundwater table/capillary fringe) and within the regional groundwater system, which is typically encountered within the LPG beneath Zone A. Remedial actions in the CAP focus largely on the distribution and concentration of various Site contaminants within the Touchet Beds and UPG. Observations of these units during the PEC data collection mobilizations are described in Section 4.2.1.

2.4.2 Groundwater Occurrence, Flow, and Seasonal Water Level Changes

The water table below Zone A is located near the top of the LPG. The water table aquifer extends from the LPG into the Middle Ringold Formation, with the saturated layer at approximately 60 to 70 feet below the post-removal action Zone A ground surface. The Lower Ringold formation may serve locally as an aquitard or perching layer for the water table aquifer that exists throughout the Site. The depth to groundwater beneath the landfill property ranges from 30 to 70 feet bgs and varies primarily due to topography and the overall southwesterly groundwater gradient. The seasonal variation in water levels at the Site varies from less than 1 foot to more than 3.5 feet.

2.5 CONTAMINANTS OF CONCERN

Contaminants of concern (COCs) were identified in soil and groundwater at the Site using data from multiple environmental investigations that began in the 1980s. The Findings of Fact section in the EO contains a timeline of these investigations through 2018.

2.5.1 Contaminants of Concern in Soil

COCs detected in the soil beneath the drummed wasted within Zone A include VOCs, SVOCs, and total petroleum hydrocarbons (TPH) including gasoline-range organics (GRO), diesel-range organics (DRO), oil-range organics (ORO), herbicides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and metals. COC concentrations in the soil within Zone A are greatest immediately above (within the fill zone) and within the Touchet Beds, with substantial decreases in concentrations within the UPG. The lateral extent of COCs in soil beneath Zone A is generally limited to the excavation extent completed during the Zone A Removal Action, shown on Figure 2.3. Refer to Section 4.0 for a detailed summary of PEC soil data collected from within Zone A in 2022 to support ISTR design.

2.5.2 Contaminants of Concern in Groundwater

COCs in groundwater collected from monitoring wells beneath Zone A are largely limited to VOCs currently present at concentrations at or less than Site CULs. Low concentrations of compounds other than VOCs, such as SVOCs and PAHs, have also been detected in groundwater at the Site. Ongoing site-wide groundwater monitoring indicates that concentrations of VOCs in wells at the Site have continued to decrease overall since SVE system upgrades began operation in 2011. The COC concentrations observed in groundwater collected from monitoring wells at the Site are generally less than CULs and are near or less than detection limits throughout the Site.

2.5.3 Indicator Hazardous Substances in Groundwater

Groundwater IHSs are the analytes of primary concern at the Site, as described in Section 4.5 and Table 3 of the CAP. Groundwater IHSs with Site CULs include tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene, *cis*-1,2-dichloroethene, vinyl chloride, 1,1,1-trichloroethane, 1,2-dichloroethane, 1,1-dichloroethane, benzene, methylene chloride, toluene, and total chromium.

2.5.4 NAPL in Source Area Well MW-52S

Light non-aqueous phase liquid (LNAPL) was observed at the groundwater surface between 2017 and 2018 in Zone A monitoring well MW-52S (decommissioned in December 2020). After deployment of a sorbent sock in MW-52S in August 2018, non-aqueous phase liquid (NAPL) was not recorded at a measurable thickness during weekly monitoring with an interface probe. Sampling of NAPL from MW-52S in 2017 and 2018 indicated that it was a mixed product consisting primarily of weathered gasoline and DRO (Stoddard solvent), various chlorinated and non-chlorinated VOCs, SVOCs (naphthalene, methylated naphthalene, and chlorobenzenes), and

PCB Aroclor 1016, which is generally consistent with the contaminant profile in Zone A soils based on available data. NAPL was never observed in MW-53S (downgradient of MW-52S) and has not been observed in any Zone A groundwater monitoring network well. NAPL was not visually observed during the Zone A Removal Action completed between 2021 and 2022 or in the soil matrix in any of the PEC soil borings advanced in 2022 (refer to Section 4.0), including soil boring BH24, which was advanced immediately adjacent to and downgradient of former well MW-52S.

2.6 UPDATE TO CURRENT CONDITIONS

This section provides an update to current conditions for Zone A since the issuance of the CAP and EO/SOW, including a brief summary of ongoing SVE system operation, the completed Zone A Removal Action, and current groundwater quality.

2.6.1 Soil Vapor Extraction System Operation

Installation and operation of an SVE system as an interim action in Zone A began in 1997. SVE system expansion and upgrades have occurred, including the installation of the current RTO system designed by Anguil Environmental Systems, Inc. (Anguil; operating under Approval Order 16AQ E031 dated May 2, 2017) in June 2017. The former and current SVE well locations are shown on Figure 2.3.

Operation and maintenance (O&M) of the SVE system continued throughout the Zone A Removal Action and required replacement of the vertical extraction wells with a pair of two new horizontal extraction wells in September 2020. SVE system O&M will continue in accordance with *Addendum No. 4 Below Grade Moisture Separator Upgrades and Condensate Sampling* (PBS 2019) and the *Soil Vapor Extraction System Operations and Maintenance Manual – 2021 Revision* (PBS 2021) until the ISTR system start-up.[2]

Approximately 1.1 million pounds of VOCs have been removed from Zone A by SVE system operations since 1997. Ongoing site-wide groundwater monitoring indicates that concentrations of VOCs in wells at the Site have continued to decrease overall since SVE system upgrades began operation in 2011.

2.6.2 Removal Action Summary

Ecology approved the Zone A Removal Action EDR in October 2020 (Floyd|Snider and PBS 2020). The primary goal of the Removal Action was to remove drums, drummed waste, pooled free liquids, and readily separable and potentially combustible material for off-site treatment or disposal. Excavation included the removal of approximately 35,000 buried drum carcasses, drum fragments, and containers in various conditions; wastes previously contained in drums and containers; and mixed soil, non-drummed waste, and debris. Pooled free liquids were not observed during the drum removal activities. There was also a substantial amount of MSW that was removed during excavation. Implementation of the Removal Action portion of the Zone A

[2] Vapor extraction will continue as part of the thermal treatment system operation; vapor extraction screens will be collocated with heaters as described further in Section 7.0.

cleanup action is documented in the *Zone A Removal Action Construction Completion Technical Memorandum* (ZARCTM; PBS and Floyd|Snider 2023).

Pre-construction activities for the Zone A Removal Action began in October 2020, with mobilization of the general contractor ENTACT. Preparation of Zone A for construction, including establishing Site controls, building access roads, construction of a container management area (CMA), and erection of a temporary structure and its associated air handling system were completed between October 2020 and April 2021.

Excavation and drum removal activities began in April 2021. Excavation was performed within the temporary structure and was completed in six positions (Positions 1 through 6) as described in the Zone A Removal Action EDR and documented in the ZARCTM. A limited excavation to remove additional drum debris in the K-line grids (K10, K11, K12, K13, and J13) was performed outside the temporary structure but with continued engineering controls, in accordance with Ecology-approved Zone A Removal Action EDR Addendum #1 (Floyd|Snider, ENTACT, and PBS 2022). Excavation and drum removal activities were completed by ENTACT on June 14, 2022. Zone A restoration and contractor demobilization was complete on August 19, 2022. The encountered former drum areas and the final excavation extents are shown on Figure 2.3.

All waste removed from Zone A was sampled and analyzed for characterization by an on-site hazard categorization (HazCat) facility and an off-site third-party laboratory analysis. Waste containers removed from each Zone A grid were assigned a unique ID and tracked using software to record the location, date of generation, screening data, visual observations, photographic documentation, on-site HazCat analysis, and sample IDs for third-party analysis. Using this tracking system, ENTACT developed a detailed record of the number and characterization of waste roll-off containers removed from each grid in Zone A, which is shown on Figure 16 from the ZARCTM, included in Appendix A. The primary contaminant group encountered during the Zone A Removal Action was VOCs with sporadic detections of PCBs and metals. This information was also used to inform the thermal treatment area design as part of this EDR.

2.6.3 Current Groundwater Quality

The Zone A groundwater monitoring network consists of monitoring wells MW-13S, MW-47I, MW-47S, MW-50S, MW-56S, MW-57S, MW-58S, and NVM-01. Source wells MW-52S and MW-53S within Zone A were previously monitored until they were decommissioned in December 2020 prior to the Zone A Removal Action. Active and decommissioned monitoring wells in and around Zone A are shown on Figure 2.3. Prior to the Zone A Removal Action, groundwater sampling at the Zone A groundwater monitoring network occurred on a quarterly schedule (Jan/Apr/Jul/Oct) for VOCs and SVOCs analyses and a semiannual schedule (Apr/Oct) for herbicides and total chromium analyses. During the Zone A Removal Action, supplemental groundwater monitoring was completed (in addition to Zone A quarterly and semiannual monitoring) during active phases of the Removal Action, in accordance with the Zone A Supplemental Groundwater Monitoring Plan (GMP), included as Appendix B.6 of the Zone A Removal Action EDR. This monitoring plan supplemented the *Final Site-Wide Groundwater Compliance Monitoring Plan* (PBS 2020). The scope of the supplemental monitoring included

additional monitoring at the existing Zone A wells, monitoring at three new wells, increased monitoring frequency (Mar/Jun/Sept/Dec) for certain key analytes (VOCs and SVOCs), and additional analytes (herbicides, pesticides, metals, and PCBs) for certain key wells. The implementation of this plan and the results of the supplemental groundwater monitoring program have been reported to Ecology in the Industrial Waste Area (IWA) Monthly Progress Reports and the Semiannual and Annual Groundwater Monitoring Reports. No impacts to groundwater were detected during implementation of the Zone A Removal Action.

Routine and supplemental monitoring data indicated no exceedances of Site groundwater CULs for VOCs at any of the Zone A monitoring wells before, during, or after the Zone A Removal Action. TCE was the primary COC detected (at concentrations less than the CUL) in groundwater collected from wells MW-13S, MW-47S, MW-50S, MW-58S, and NVM-01, and PCE was intermittently detected at concentrations less than the CUL in groundwater collected from well MW-50S. Other VOC detections in groundwater were sporadic. SVOCs (1-methylnaphthalene) were detected in three Zone A wells (MW-53S, MW-56S, and MW-57S) prior to the Zone A Removal Action and one Zone A well (MW-57S) in one sample event (April 2021) during the Zone A Removal Action. SVOCs have not been detected in the Zone A monitoring well network since April 2021. PCBs, herbicides, and pesticides have not been detected at concentrations greater than reporting limits during or after the Zone A Removal Action.

Groundwater VOC and SVOC results for former Zone A source area wells MW-52S and MW-53S for analytes with at least one exceedance of a CUL or, if not applicable, MTCA Method B groundwater criteria in the past 7 years are shown on Table 2.1. Groundwater VOC and SVOC results for the Zone A monitoring network wells (MW-13S, MW-47I, MW-47S, MW-50S, MW-56S, MW-57S, MW-58S, and NVM-01) for analytes with at least one detection in the past 5 years in any Zone A monitoring network well are shown on Table 2.2. All groundwater data for the former Zone A source area wells and Zone A monitoring network wells are documented in the IWA Annual Groundwater Monitoring Reports.

2.6.4 Existing Facility Operations

The ISTR for Zone A will be coordinated with existing Zone A and other Site O&M activities, including the MSW areas. These activities include the site-wide groundwater monitoring program, O&M for the MSW Landfill gas control and treatment system, cover O&M for all waste disposal repository cover systems (MSW Landfill and Zones C/D and E), site-wide ICs for all waste disposal repositories and downgradient properties, and waste management related to these general Site operations. The horizontal SVE wells in Zone A will continue operation until the first phase of ISTR heaters and vapor recovery wells have been installed. Once this is complete, the ISTR system will be connected to the existing underground SVE piping leading to the RTO using a bypass valve to redirect flow from the horizontal SVE wells to the ISTR system. The bypass valve will allow the horizontal SVE piping to be disconnected but remain in operational condition if additional focused vapor recovery is required after thermal treatment. The horizontal SVE wells are below the anticipated vertical limits of the thermal treatment area and will not be impacted by ISTR.

The Balefill Area and Inert Waste Disposal Area, located to the south and east of Zone A, will not be affected during thermal system construction or operation of ISTR in Zone A.

2.7 OVERVIEW OF ZONE A CONCEPTUAL SITE MODEL

As described in Sections 2.1 and 2.4, Zone A is located within the Pasco Basin geologic province in the central portion of the Columbia Plateau and is underlain by a thick sequence of basalts that are covered by a relatively thin sequence of semiconsolidated and unconsolidated sediments. Groundwater flows beneath the Site to the southwest and discharges primarily at the Columbia River, located approximately 2.5 miles south of the Property. Groundwater is typically encountered at depths ranging from approximately 30 to 70 feet bgs with an estimated seepage velocity ranging from 5 to 15 feet per day.

Within the subsurface of Zone A, there were two designated areas where drums were placed for disposal in the 1970s. The first area encompassed the western portion of Zone A and was expected to have randomly placed drums that were placed on top of an area of burned MSW in a natural topographic depression; however, portions of this area also contained stacked drums. During the placement of drums within this area, it is believed drum contents were released into the subsurface soils. The second area is east of the randomly placed drum area and included stacked drums, approximately four drums high, that were placed on top of native soil cover that was placed over waste material. Over the years, liquid waste releases from corroded drums migrated downward through the debris and fill soils and beneath the base of the stacked drums, contaminating the underlying soils within the Touchet Beds and transition soils between the Touchet Beds and UPG. Interbedded silt/cemented sand lenses and high organic material in the Touchet Beds limited the downward migration of liquid-phase waste. The two drum disposal areas were separated by a soil/debris berm that runs north to south in the middle of Zone A.

Under current conditions, the primary potential migration pathway and transport of contaminants within Zone A is vapor-phase mass transport of volatiles from soil gas to dissolved-phase in groundwater. Operation of the SVE system over the past 25 years has removed approximately 1.1 million pounds of VOC mass, and current groundwater quality indicates that SVE system operation has been successful in reducing the VOC mass such that contaminant transport to groundwater is not occurring. PEC soil data collected in Zone A in 2022 (further described in Section 4.0), including at the capillary fringe, confirmed that there are no soil impacts at the water table. During the Zone A Removal Action activities, observations generally confirmed the conceptual site model assumptions.

Final activities associated with the Zone A Removal Action included an interim gravel cover placement over Zone A (refer to Section 6.1 for additional detail). Currently, due to the presence of interim gravel cover, there is no direct exposure to human or terrestrial ecological receptors to contaminated soil, vapor, or groundwater at Zone A. During installation of ISTR technology, an additional cover will be installed as part of the thermal design (refer to Section 7.2.6) with vapor extraction concurrent with heating to eliminate any risk of direct exposure from heated vapors to human or terrestrial ecological receptors at Zone A. A final engineered cover will be designed and installed after ISTR to eliminate the potential for direct contact and the infiltration pathway

3.0 Description of Zone A Cleanup Action

The selected cleanup action for Zone A is described in the CAP, EO, and its associated SOW. The selected remedy for Zone A was a combination of FFS alternatives A6 and A9 with the additions and modifications outlined in the SOW. Ecology selected the Zone A Removal Action, in combination with subsequent ISTR and installation of a final cover, to be protective of human health and the environment and to be consistent with the State of Washington's preference for permanent solutions, as stated in RCW 70A.305.030(1)(b).

3.1 DESCRIPTION OF SELECTED CLEANUP ACTION

The Zone A Removal Action was completed between October 2020 and August 2022 in accordance with the Zone A Removal Action EDR and was one part of the selected cleanup action for Zone A (refer to Section 2.6.2 for additional detail). The purpose of the Zone A Removal Action was to remove drums, drummed waste, pooled free liquids, and readily separable (by mechanical means) and potentially combustible materials from Zone A. Additional goals of the Removal Action were to perform the work safely, protect groundwater, and prepare Zone A for future ISTR. The ISTR of residual contaminated mixed debris (fill) remaining within Zone A after the Removal Action and native soil was the second part of the cleanup action, and the focus of this EDR. After completion of ISTR, as part of the engineered cover, a low-permeability geomembrane cover will be installed over Zone A to control infiltration and limit direct contact with residual contaminants.

3.2 SUMMARY OF REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) were developed for the Site as presented in the CAP as follows:

- Prevent direct exposure to contaminants in waste materials and soil.
- Prevent contaminant releases to the atmosphere.
- Minimize transport of contaminants to subsurface soils and groundwater.
- Prevent ingestion, inhalation or dermal absorption with contaminated groundwater.
- Prevent inhalation of contaminated exhaust air emissions from treatment systems.

RAOs were more specifically defined for Zone A in Table 4.3-1 of the FFS and were consistent with the RAOs presented in the CAP.

To align with the RAOs presented in the CAP, more specific RAOs have been established for the Zone A ISTR to ensure ongoing protection of human health and the environment. These ISTR RAOs include the following:

- Reduce VOC mass remaining in Zone A subsurface vadose zone soils after the Zone A Removal Action.
- Reduce concentrations of organic analytes of potential concern in vadose zone soil to minimize transport of contaminants to subsurface soil and groundwater and to maintain groundwater quality in and downgradient of Zone A.

- Provide treatment of air emissions from the ISTR system to meet air quality discharge permit requirements.
- Reduce concentrations of VOCs in soil to eliminate the need for long-term emission control, including operation of an SVE system after completion of ISTR.

The primary goal of post-Removal Action ISTR as defined in the CAP is to reduce solvent and organic compound source mass within Zone A for long-term protection of human health and the environment.

3.3 CLEANUP STANDARDS

Cleanup standards were established in Section 4 of the CAP. Cleanup standards are defined as a CUL combined with a POC where the CUL applies.

Cleanup standards for soil were not required to be established for the Site in the CAP. Therefore, the MTCA Method B CULs, which are based on protection of groundwater, were used as initial screening levels (SLs) for PEC soil per Ecology's request.

Groundwater CULs were established in Section 4.6 of the CAP for the IHSs, which include PCE, TCE, 1,1-dichloroethene, *cis*-1,2-dichloroethene, vinyl chloride, 1,1,1-trichloroethane, 1,2-dichloroethane, 1,1-dichloroethane, benzene, methylene chloride, toluene, and total chromium. For analytes without a Site groundwater CUL, the MTCA Method B CULs are used as SLs.

Groundwater CULs must be met at the standard POC, which is defined in Section 4.7 in the CAP as "throughout the site from the uppermost level of the saturated zone extending vertically to the lowest depth that potentially could be affected by the site."

3.4 REMEDIATION LEVELS

Per Task A.4 of the EO and Section 4.3.2 of the CAP, RELs were developed for subsurface soils in accordance with WAC 173-340-355 to ensure organic contaminants remaining in Zone A after the Removal Action are treated to levels that are protective of groundwater.

Per Task A.4 of the EO: "Remediation levels shall be developed to ensure all contaminants remaining in Zone A are treated to a level that protects groundwater. The in-situ treatment will be designed to avoid a prolonged period of post-treatment SVE operations to address residual VOC and SVOC contamination. The in-situ treatment process will broadly treat all organic compounds, including IHSs whose respective groundwater concentrations measured near Zone A are already at or below cleanup levels. The in-situ treatment system(s) should be operated and optimized to significantly reduce the overall VOC mass, while also providing a substantive and demonstrable mass reduction for other categories of Zone A organic constituents."

Per Section 4.3.2 of the CAP: "Remediation levels will be established for subsurface soils in the vicinity of Zone A in accordance with WAC 173-340-355. Remediation levels may be developed

and applied at sites where a combination of cleanup action components are used to achieve CULs at the point of compliance, or at sites where the cleanup action will involve a containment remedy as provided under WAC 173-340-740(6)(f). Installing an engineered cover system with a low-permeability geomembrane will be required as a component of the final Zone A cleanup remedy."

Consistent with WAC 173-340-355(1), RELs may be used at sites where a combination of cleanup components are used to achieve CULs or at sites where the cleanup action includes containment of soils. As described in Section 3.1, the cleanup action for Zone A meets both of these criteria. A cleanup action that uses RELs must also comply with cleanup standards, which in this case means that groundwater will meet the CULs for groundwater at the standard POC.

Section 5.1 describes the development of site-specific RELs for ISTR in Zone A.

4.0 Post-Excavation Characterization and Treatability Testing

PEC sampling and analyses were completed concurrent with and immediately after the Zone A Removal Action to provide sufficient data to confirm the lateral and vertical extent of contamination to define the thermal treatment area. The PEC sampling also included collection of representative samples for bench-scale treatability testing, which was conducted to inform the design of ISTR in Zone A. PEC sampling was completed between January and September 2022 in three mobilizations.

4.1 POST-EXCAVATION CHARACTERIZATION FIELD OVERVIEW

Soil borings were advanced at a total of 43 unique locations and 4 additional reoccupied locations throughout three PEC mobilizations as described in the ZARCTM. Initial PEC sampling was completed over two mobilization events. The first mobilization event was completed between January 24 and February 14, 2022, and the second mobilization event was completed between May 31 and June 16, 2022. A third mobilization event was completed between September 22 and September 23, 2022, to collect focused design samples and samples for bench-scale treatability testing from reoccupied PEC locations.

Drilling for the first mobilization was completed by Cascade Environmental (Cascade), and drilling for the second and third mobilizations was completed by Anderson Environmental Contracting (AEC). Soil samples were collected continuously using the rotosonic drilling method at 10-foot intervals using 6-inch-diameter boreholes with a 4-inch-diameter inner core. Recovered soil was transferred to 4-inch sample liner bags for subsequent field screening with a photoionization detector (PID), logging, and sample collection. Borings were advanced to the capillary fringe/water table corresponding to a maximum depth of 70 feet bgs, except for focused design boreholes, which were shallower. Soil boring locations were surveyed by PBS Engineering and Environmental Inc. (PBS) or ENTACT and are shown on Figure 4.1. Boring logs are included in Appendix B.

4.2 POST-EXCAVATION CHARACTERIZATION SUMMARY

The following sections summarize the results of the PEC soil boring events including field observations and the geological conditions of Zone A and soil characterization data for physical and chemical parameters.

4.2.1 Field Observations and Geology

As summarized in Section 2.4.1, the Site is located within the Pasco Basin geologic province on the Columbia Plateau and is underlain by a thick sequence of basalts that are covered by a relatively thin sequence of semiconsolidated and unconsolidated sediments. As part of PEC borehole logging, soil was characterized into four layers, consistent with the *Final Draft Phase I Remedial Investigation, Pasco Landfill* (Burlington 1993): Fill, Touchet Beds, UPG, and LPG. A transition layer was observed at some PEC locations between the Touchet Beds and UPG that was also noted during the Phase II Additional Interim Action (AIA) horizontal soil boring

advancement in Zone A. This transition layer was identified visually in soil boring samples as very dense, tightly packed soils with silt or clay fractions at the contact between the Touchet Beds and the UPG (EPI 2012). For consistency, the contact between the Touchet Beds and UPG was considered to be at the top of this transition zone. These geologic layers within Zone A are generally depicted on Figure 4.2 and included in the boring logs in Appendix B.

Fill: Fill soils that were disturbed and used as backfill during the Zone A Removal Action were typically encountered from the ground surface to 13 to 16 feet bgs based on the depth of drum removal excavation in the grid cell. The deepest measurement of fill soil was 20 feet bgs at location BH12. Fill soil was characterized as fine to medium silty sand and often contained miscellaneous small debris such as glass or plastic fragments. VOCs were generally observed to be low in this disturbed zone based on PID field screening, which was typically less than 100 parts per million by volume (ppmv) near the surface, with elevated PID readings in deeper fill above the Touchet Beds layer in some borings. A bituminous, highly viscous (low mobility) substance was observed at BH39 from approximately 12 to 12.5 feet bgs. This asphalt-like material was similar to material encountered during the K-Line excavation (refer to Section 2.6.2) and was observed to liquify when heated to ambient temperature. There were no observations of NAPL within Fill soils.

Touchet Beds: The top of the Touchet Beds layer was typically encountered between 13 to 16 feet bgs, and the bottom of the Touchet Beds layer was generally observed between 24 to 28 feet bgs with some shallower and deeper variation between borings. The deepest measurement of the Touchet Beds was 40 feet bgs at location BH11. Touchet Beds soils were characterized as very fine to fine-grained sand with silt and some cementation. Layers of thin (typically 3 to 6 inches) cemented silt layers were commonly present within the Touchet Beds, and field screening with the PID showed these silt transition layers were semiconfining layers that appeared to limit downward migration of contamination. The highest concentration/mass of VOCs was observed in the Touchet Beds based on field PID readings (maximum of 15,000 ppmv). Blue-grey staining was observed within the Touchet Beds at locations BH32 (23 feet bgs), BH34 (15 feet bgs), BH39 (24 feet bgs), and BH41 (22 feet bgs). There were no indications of NAPL observed in the Touchet Beds.

Upper Pasco Gravels: The UPG was typically encountered between 24 to 28 feet bgs at the top of the layer and 54 to 60 feet bgs at the bottom of the layer with shallower and deeper variation between borings. The deepest measurement of the UPG layer was 69 feet bgs at BH14. UPG soils were characterized as medium to coarse sand with trace gravel and a “salt and pepper” appearance due to the contrast between quartz and basalt grains. The top 10 to 15 feet of the UPG typically contained mixed or distinct layers of fine siltier soil, and PID readings decreased between the bottom of the Touchet Beds and the top of these silt layers. The mass of VOCs observed in the UPG soils was less than the Touchet Beds with PID readings typically less than 2,000 ppmv at the top of the UPG and less than 100 ppmv 10 to 15 feet below the top of the UPG. Mild staining within a UPG silt lens was observed at BH27 at 24 feet bgs with a PID reading of 5,148 ppmv. PID readings at BH27 decreased to less than 100 ppmv within 3 feet below the stained silt lens. There were no observations of NAPL within the UPG.

Lower Pasco Gravels: The top of the LPG layer was typically encountered between 54 to 60 feet bgs and was characterized as gravelly coarse sand with an increase in gravel and basaltic sand compared to the UPG. PID readings were the lowest in the LPG, typically less than 10 ppmv. LPG soil was typically wet at about 60 feet bgs, and the water table was estimated to be generally between 60 and 65 feet bgs. No NAPL or staining was observed in the LPG layer.

4.2.2 Physical Soil Properties Analyses

Soil samples from BH02, BH03, BH05, BH07, BH10, BH15, BH17, BH24, and BH29 were collected for analysis of physical soil properties (soil moisture and porosity) to assist ISTR design. Samples were collected from multiple depths to understand physical soil characteristics throughout the vertical profile of the potential treatment area. Moisture content and porosity were calculated using a standard proctor compaction by ASTM D698 and calculation method ASTM D2216. Results of the soil physical characteristic sampling are presented in Table 4.1.

Table 4.1
Physical Soil Characteristics

Location	Depth (feet bgs)	Wet Bulk Density (g/cm^3)	Moisture Content	Dry Bulk Density (g/cm^3)	Porosity
BH02	15–18	1.84	8.0%	1.71	35.5%
	63–65	2.09	15.0%	1.82	31.3%
BH03	22	1.80	7.4%	1.68	36.6%
	57	2.03	2.3%	1.99	24.9%
BH05	32	1.86	10.0%	1.69	36.2%
	46	1.92	4.3%	1.84	30.6%
BH07	22	2.00	1.5%	1.97	25.7%
	64	2.07	15.3%	1.80	32.1%
BH10	14	1.93	9.1%	1.77	33.2%
	52	2.28	9.3%	2.09	21.1%
BH15	16	1.77	4.8%	1.69	36.2%
	52	2.07	14.7%	1.81	31.7%
BH17	24	1.9	3.9%	1.83	30.9%
	56	2.02	9.4%	1.85	30.2%
BH24	24–25	1.86	4.5%	1.78	32.8%
	55–57	2.27	8.3%	2.09	21.1%
BH29	33–34	1.89	4.2%	1.81	31.7%
	61–62	1.97	11.4%	1.77	33.2%

Abbreviation:
g/cm^3 Grams per cubic centimeter

Soil moisture content ranged from 1.5% to 15.3% with an average moisture content of 8.0%. Moisture content typically increased in deeper samples and was greater than 10% only in deeper samples near the water table that are not expected to be within the treatment zone due to low frequency of detections and concentrations of contaminants. Porosity ranged from 21.1% to 36.6%, with porosity typically decreasing in deeper samples. Geotechnical laboratory reports were included in Appendix R of the ZARCTM.

4.2.3 Soil Sample Collection and Chemical Analysis

Consistent with the sampling program initially described in the Zone A Removal Action EDR, a minimum of four samples were collected from each initial design borehole as follows: one sample in the fill zone; two samples in the Touchet Beds; and one sample in the UPG. One additional sample was collected in the UPG layer at soil boring locations with indications of contamination in the UPG (BH03, BH05, BH07, BH12, BH13, BH16, BH18, BH19, BH23, BH27, BH29, and BH33). Additional samples were collected and analyzed at the capillary fringe/water table at locations BH01, BH05, BH07, BH08, BH14, BH16, BH18, BH24, BH25, and BH27 to evaluate soil conditions at the water table. Archive samples were also collected at the water table from locations BH02, BH04, BH06, and BH10 in accordance with the PEC First Mobilization Technical Memorandum, but analysis of archived samples was not required based on the shallower and adjacent results (Floyd|Snider and PBS 2022a).

Additional focused design borings (BH33, BH34, and BH36 to BH42) were advanced to a maximum of 40 feet bgs; were sampled at targeted depths based on adjacent boring data or field screening; and were analyzed only for TPH, VOCs, and SVOCs. These additional data were collected to support design, including delineation of the thermal treatment area.

A summary of all boring locations, analysis depths, and analytical schedule are presented in Table 4.2. Soil boring locations and a summary of sample collection and analyses for each location are shown on Figure 4.3.

At a minimum, all samples collected were analyzed for the primary analytes listed as follows:

- VOCs by EPA Method 8260D
- SVOCs including PAHs by EPA Method 8270E
- GRO by NWTPH-Gx
- DRO and ORO by NWTPH-Dx

In addition, samples were collected from select borings for one or more of the following secondary analytes based on predetermined locations, locations informed by evidence of potential contamination from HazCat testing and field screening of removed drums performed during the Zone A Removal Action, or proximity to MW-52S where LNAPL and elevated concentrations of groundwater contaminants were previously documented:

- Resource Conservation and Recovery Act (RCRA) 8 Metals by EPA Method 6020 and mercury by EPA Method 7471
- PCBs by EPA Method 8082

- Pesticides by EPA Method 8081
- Herbicides by EPA Method 8151A

Locations BH01, BH07, BH08, BH11, BH14, BH16, BH18, BH24, and BH31 were sampled for all additional analytes at one or more depths. Samples from BH22, BH26, and BH30 were tested for metals and PCBs. BH12 was sampled for only PCBs, and BH27 was sampled for herbicides and pesticides. The selected sample depth for additional analysis was based on the greatest field evidence of contamination or was located at the capillary fringe/water table interface if evidence of contamination was not observed. NAPL was not observed during any of the three mobilization events and, therefore, did not trigger the requirement for additional analyte sampling at any PEC location.

4.2.4 Data Summary and Evaluation

An initial evaluation of the PEC data compared to SLs was completed to determine the lateral and vertical extent of contamination in Zone A and to develop a method for determining RELs, which is presented in Section 5.0.

Cleanup standards for soil, including CULs, were not established for the Site in the CAP. Therefore, the default MTCA Method B CULs, which are based on protection of groundwater, are used as initial SLs for soil. SLs for individual analytes were adjusted upward as necessary to meet the laboratory reporting limits. SLs for the PEC data for vadose and saturated zone soils are shown on Table 4.3. PEC soil sample results for primary analytes (VOCs, SVOCs, and TPH) compared to the SLs are presented on Table 4.4, and PEC soil sample results for secondary analytes (metals, PCBs, pesticides, and herbicides) compared to the SLs are presented on Table 4.5. Analytical reports and data validation reports were previously included in Appendix R of the ZARCTM and not included with this EDR.

Overall, 72 analyzed organic primary analytes (VOCs, SVOCs, and TPH) were detected in the PEC dataset, and 43 organic analytes were detected at concentrations greater than the SLs. Non-detect exceedances of the SLs, due to raised reporting limits, were also reviewed for completeness. For reference, PEC data were also compared to MTCA Method C industrial criteria for protection of worker direct contact, and the only exceedances of these criteria in all PEC data collected (176 soil samples) was for PCBs.

Frequency of detections and exceedances for vadose zone PEC data for primary analytes are shown on Table 4.6a for detected results and Table 4.6b for non-detect results. Frequency of detections and exceedances for saturated zone PEC data for primary analytes are shown on Table 4.7a for detected results and Table 4.7b for non-detect results.

4.2.4.1 Primary Analyte Results—VOCs, SVOCs, and TPH

The primary analytes were VOCs, SVOCs, and TPH because ISTR will be most effective in mobilizing and extracting these analyte groups and they represent the majority of contaminant mass in Zone A. Exceedances of these analytes were typically commingled and occurred within

and directly adjacent to the drum removal areas. Overall, the results are consistent with previous investigations and the conceptual site model and indicate that the most prevalent contaminant detections and mass are VOCs. SVOCs were detected at a lesser frequency. TPH was detected at a greater frequency than expected. An overview of the results for the primary analytes are shown on Figure 4.4.

VOCs: VOCs that were detected in vadose soil at concentrations greater than the respective SL in more than 10% of PEC data included ethylbenzene, toluene, total xylenes, PCE, and TCE. In addition, benzene, vinyl chloride, 1,1,2,2-tetrachloroethane, 2-hexanone, and methylene chloride had at least 10% non-detect exceedances of the SL and at least one detected exceedance in vadose soil, indicating these analytes may be present at lower concentrations collocated with other analyte exceedances. Exceedances of VOC SLs occurred mainly within the bottom of the Fill and Touchet Beds with some exceedances extending into the UPG. There was only one exceedance of a VOC SL at the groundwater table for methylene chloride at BH01 (60 feet bgs) which had a concentration of 0.0026 milligrams per kilogram (mg/kg) compared to the saturated zone SL of 0.0023 mg/kg. VOCs represent the majority of the contaminant mass that will be volatilized during ISTR. Therefore, cross sections were developed to review the vertical extent of VOCs throughout Zone A. Cross section positions are shown on Figure 4.5, and cross sections are shown on Figures 4.6 through 4.8.

SVOCs: 1-Methylnaphthalene, 2-methylnaphthalene, naphthalene, pentachlorophenol, bis(2-ethylhexyl)phthalate, and isophorone were detected at concentrations greater than the respective SLs in more than 10% of PEC vadose soil data. In addition, 2,4,6-trichlorophenol, 2-chlorophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 4-chloroaniline, pyridine, aniline, azobenzene, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine had more than 10% of non-detect vadose data exceed the SL and at least one detected exceedance. Exceedances of SVOC SLs occurred mainly within the bottom of the Fill and Touchet Beds. There was only one SL exceedance of an SVOC, bis(2-ethylhexyl)phthalate, at the groundwater table at location BH16 at 62 feet bgs, which had a concentration of 0.97 mg/kg compared to the saturated zone SL of 0.67 mg/kg.

TPH: GRO, DRO, and ORO were all detected at concentrations greater than their respective SLs at 24%, 12%, and 15% of PEC vadose soil locations, respectively, mainly within the Fill and Touchet Beds, with some exceedances of DRO extending deeper into the UPG. The maximum concentration of GRO was 25,000 mg/kg at BH12 at 24 feet bgs, the maximum concentration of DRO was 30,000 mg/kg at BH39 at 13 feet bgs, and the maximum concentration of ORO was 12,000 mg/kg at BH16 at 17 feet bgs. There were no GRO, DRO, or ORO exceedances of an SL in saturated soil.

The sample from location BH39 with elevated TPH contained a bituminous, highly viscous (low mobility) substance observed at approximately 11 feet bgs. The resulting DRO concentration (30,000 mg/kg) at this location was substantially greater than any other sample collected within Zone A. The sample collected in the next lower interval at BH39 at 18 feet bgs was non-detect for all TPH analytes, indicating the TPH contamination associated with the asphaltic material is stable

and has not migrated downward. The second greatest concentration of DRO was 9,000 mg/kg at BH16 at 17 feet bgs.

4.2.4.2 Secondary Analyte Results—Metals, PCBs, Pesticides, and Herbicides

The secondary analytes sampled for analysis were metals, PCBs, pesticides, and herbicides because these analytes are less prevalent in Zone A and ISTR will be less effective in mobilizing and extracting these analyte groups. Samples for secondary analytes were collected at a select number of locations to characterize these analytes left in place underneath the final capped surface of Zone A after thermal treatment. Detections of secondary analytes were sporadic and limited to a smaller group of analytes. An overview of the results for these secondary analytes are shown on Figure 4.9.

Metals: Arsenic, barium, cadmium, chromium, mercury, and selenium had at least one detected result exceed the SL. Exceedance factors for metals ranged from 2.8 times the SL to 440 times the SL. The greatest exceedance factor occurred for chromium at BH11 at 12 feet bgs. Metals were detected at concentrations greater than SLs at all four locations (BH01, BH08, BH14, and BH16) where they were sampled for in the saturated zone.

PCBs: Total PCBs were detected at concentrations greater than the SL in 77% of secondary analysis sampling locations (10 out of 13 locations) with a maximum exceedance factor of 2,500 times the SL for total PCB Aroclors at BH22 at 24 feet bgs. Aroclor 1254 and Aroclor 1260 were detected at concentrations greater than their individual SLs. PCBs were detected in one saturated soil sample at BH16 with an exceedance factor of 4.2 times the SL.

Pesticides and Herbicides: Pesticides were not detected in any PEC sample. Two herbicides, 2,4-dichlorophenoxyacetic acid and 2-methyl-4-chlorophenoxyacetic acid (MCBA), were detected in four PEC samples at concentrations greater than their SL with exceedance factors of 4.4 (BH14, 11 feet bgs) and 43 (BH27, 22 feet bgs) times the SL, respectively. Neither of these herbicides were detected in saturated soil.

4.3 BENCH-SCALE TREATABILITY TESTING

The objective of bench-scale treatability testing was primarily to evaluate how efficiently contaminant mass (primarily VOCs, SVOCs, and TPH) is removed in soil samples using two applicable in situ thermal technologies: Electrical Resistance Heating (ERH) and Thermal Conductance Heating (TCH). This objective was achieved by providing selected PEC samples to TRS Group, Inc. (TRS), the thermal vendor, for bench-scale testing.

4.3.1 Soil Sample Collection for Treatability Testing

After data were collected from PEC mobilizations 1 and 2, soil samples were evaluated by the engineering team, TRS, and Ecology for selection of the most representative samples for testing, including soil data with the highest concentrations of VOCs, SVOCs, and/or TPH.

TRS and Floyd|Snider collected ISTR bench test samples from borings collocated with PEC locations BH12 and BH30 during a third PEC mobilization in September 2022. Based on previous PEC data and PID field screening, soil volume was collected from the 22- to 24-foot-bgs depth interval at both locations. VOC readings greater than 5,000 ppmv were measured, which indicated sufficient VOC concentrations prior to bench testing.

4.3.2 Treatability Test Summary and Results

A treatability test was completed by TRS in October 2022, to develop a basis for an ISTR design that evaluated COC removal efficiencies at varying temperatures (i.e., 100, 150, and 200 °C) and to identify a target moisture removal and temperature that will reduce total VOC concentrations to levels protective of groundwater.

Resistivity test results indicated that the tested soils are more electrically conductive than typical sands, which would typically indicate the soil is highly suitable for ERH treatment. However, resistivity testing also showed that the critical moisture percentage (i.e., the moisture percentage "breakpoint" when resistivity of the soil increases substantially the further it is heated) was in the range of 3.5% to 4.5%, which suggests that soil dry-out could limit the effectiveness of ERH with consideration of the already low starting soil moisture values. TRS determined that due to the low moisture content and its proximity in value to the critical moisture percentage, TCH would be the preferred thermal heating technology for Zone A.

Thermal testing results indicated that heating the soil to 100 °C and completely removing the soil moisture, known as desiccation, can remove 93% to 97% of the total analyte mass from the soil and remove between 95% and 99% of TCE and PCE. As soils are heated, soil moisture and volatile components are removed at temperatures less than 100 °C. Elevating temperatures above the boiling point of water during the test improved mass recovery, but this improvement was less pronounced as temperatures continued to increase. The treatability test indicated that desiccation of the soils would provide significant reduction of the more mobile compounds, but the rate of mass removal declined as additional energy was input.

Therefore, heating to a temperature greater than 100 °C is recommended to ensure that all the soil moisture is removed from the soil within the treatment volume but less than 120 °C because significant improvement in removal of COCs was not observed at higher temperatures and the risk of mobilizing heavier compounds is minimized at lower temperatures (i.e., heating at higher temperatures increases the risk of breaking down organic carbon that helps to retard the mobility of heavy molecular weight analytes strongly adsorbed to the soil matrix). TRS recommends a target temperature in the range of 105 to 120 °C for TCH treatment at Zone A. The Thermal Treatability Bench Test Report is included in Appendix C.

4.4 SELECTION OF IN SITU TREATMENT TECHNOLOGY

TCH is the most suitable ISTR technology based on the Zone A soil chemical characteristics and low moisture content of the vadose-zone soil. TCH is a distillation and stream stripping process,

and achieving desiccation in the soil will result in a large decrease in the remaining organic source mass in Zone A.

TCH is an effective and proven technology for treatment of the Site-specific COCs, and the treatability test results show favorable mass removal projections for organic compounds with high vapor pressure and lower boiling points. Additionally, TCH is also expected to substantially reduce concentrations of higher molecular weight organic compounds, such as PCBs or ORO, but with lesser efficiency.

5.0 Remediation Levels and Definition of Treatment Area

The primary goal of post-excavation ISTR, as defined in the CAP and EO, is to reduce solvent and organic compound source mass remaining in Zone A subsurface soils after drum removal to ensure long-term protection of human health and the environment. ISTR will be used to liberate VOCs and other organic analytes through subsurface heating and volatilization. These compounds will be captured by vapor recovery wells and treated with an aboveground thermal destruction process. A reduction in source mass remaining in Zone A will minimize the potential for migration of contaminants from contaminated media to groundwater.

Per Task A.4 (Subtask A) of the SOW: "The in-situ treatment system(s) should be operated and optimized to significantly reduce the overall VOC mass, while also providing a substantive and demonstrable mass reduction for other categories of Zone A organic constituents."

This section describes the development of site-specific RELs for ISTR in Zone A and provides rationale for the delineation of the lateral and vertical extent of the thermal treatment area.

5.1 REMEDIATION LEVELS

Per Task A.4 of the EO SOW and Section 4.3.2 of the CAP, RELs will be developed for subsurface soils in accordance with WAC 173-340-355 to ensure organic contaminants remaining in Zone A are treated to levels that are protective of groundwater. Per WAC 173-340-355(1), RELs may be used at sites where a combination of cleanup components are used to achieve CULs or at sites where the cleanup action includes containment of soils. The cleanup action for Zone A meets both of these criteria. A cleanup action that uses RELs must also comply with cleanup standards, which in this case means that groundwater will continue to meet the CULs[3] at the standard POC.

In accordance with WAC 173-340-200, a REL is "a concentration of a hazardous substance in soil, air, water, or sediment above which a particular cleanup action component will be required as part of a cleanup action at a site." RELs are, by definition, concentrations that exceed cleanup standards (in this case, soil SLs protective of groundwater) and are used when a combination of cleanup action components are necessary to achieve RAOs or where soil containment (i.e., under a cap) is part of the cleanup action alternative.

Per the EO, ISTR will be operated to significantly reduce the overall VOC mass, while also providing mass reduction for other categories of organic analytes in Zone A.

5.1.1 Remediation Level Development Approach

A comprehensive evaluation of Zone A data was performed to support the development of soil RELs, including the most recent and relevant PEC soil data (after drum removal), field

[3] Concurrent with the operation of the existing SVE system, groundwater quality for the Zone A monitoring network has been in compliance with Site CULs since April 2019, including throughout supplemental monitoring during the Zone A drum removal.

observations and field and analytical data collected during the Zone A drum removal from 2021 to 2022, older soil data collected in Zone A in 2011 as part of the Phase II AIA investigation, recent groundwater data (within the past 5 years), and NAPL data collected from former Zone A source area monitoring well MW-52S in 2017 and 2018.

As described in greater detail below, the primary PEC analytes (VOCs, SVOCs, and TPH) were the focus of this evaluation. Secondary analytes sampled at a lesser frequency as part of the PEC were considered relative to overall mass and potential mass removal but are not the focus of ISTR in Zone A and, therefore, were not considered for development of RELs. Secondary analyte groups include RCRA 8 metals including mercury, PCBs, pesticides,[4] and herbicides.

A stepwise approach was used to determine the analytes that are the focus of remediation and, therefore, warranted the development of RELs. The following stepwise evaluation was performed.

- **Step 1**: **Evaluation of PEC soil data,** including a comparison of soil data to relevant criteria, including SLs (MTCA Method B CULs), MTCA Method A CULs for TPH, and MTCA Method C industrial CULs. This evaluation step was described in Section 4.2.4.
- **Step 2**: **Identification of primary analytes for thermal treatment** that were detected at concentrations greater than SLs in at least 10% of PEC soil samples. Based on this review step, the following analytes with greater than 10% detected SL exceedances were identified for further evaluation:
    - VOCs: ethylbenzene, toluene, total xylenes, TCE, and PCE
    - SVOCs: 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, pentachloro-phenol, bis(2-ethylhexyl)phthalate, and isophorone
    - TPH: GRO, DRO, and ORO
- **Step 3**: **Evaluation of Zone A groundwater data,** including data from former Zone A source area wells MW-52S and MW-53S, based on a correlation of analytes present in PEC soil data versus IHSs (refer to Section 2.5.3) detected in groundwater with a focus on representative groundwater quality over the past 5 years (refer to Table 2.1 and Table 2.2).[5] Organic IHSs that have been detected in groundwater within the past 5 years include benzene, toluene, TCE, PCE, 1,2-dichloroethane, *cis*-1,2-dichloroethene, 1,1-dichloroethane, and methylene chloride.
    - Organic IHSs that have exceeded a CUL in groundwater within the past 5 years include benzene, trichloroethene, and tetrachloroethene.
    - Other VOCs detected at concentrations greater than groundwater SLs (MTCA Method B) in at least one sample in the past 7 years within a former Zone A source area well includes 1,3,5-trimethylbenzene, 1,4-dichlorobenzene,

[4] Pesticides were not detected in any PEC soil samples at concentrations greater than their SLs.

[5] Groundwater data in former Zone A source area wells were evaluated over the past 7 years to include MW-52S data prior to decommissioning.

2-hexanone, 4-methyl-2-pentanone, acetone, ethylbenzene, xylenes, methyl isobutyl ketone, and styrene.

- Other SVOCs detected at concentrations greater than groundwater SLs (MTCA Method B) in at least one sample in the past 7 years within a former Zone A source area well include 1-methylnaphthalene, 3-&4-methylphenol, 4-chloroaniliine, benzo(a)pyrene, bis(2-ethylhexyl) phthalate, isophorone, naphthalene, and pyridine.
- There were no other VOCs detected at concentrations greater than groundwater SLs in the past 5 years within a Zone A monitoring network well. Other SVOCs detected at concentrations greater than groundwater SLs in at least one sample in the past 5 years within a Zone A monitoring network well include benzo(a)pyrene and hexachlorobenzene.
- Zone A supplemental groundwater monitoring in wells surrounding Zone A was conducted between 2021 and 2022 with an expanded analyte list and increased frequency (every 6 to 7 weeks). This dataset provided additional insight into current groundwater conditions during and after drum removal, with concurrent SVE operations. Groundwater quality was not adversely affected during implementation of the Zone A Removal Action. Groundwater quality for the Zone A monitoring network has been in compliance with Site CULs since April 2019.

If an analyte was detected in soil greater than the SL in less than 10% of samples and was not an IHS detected in groundwater (over the past 5 years), then it was excluded. Although benzene, methylene chloride, and vinyl chloride had detected SL exceedances in less than 10% of PEC soil samples, these analytes are groundwater IHSs, have been detected in groundwater within the past 5 years, and have had non-detect exceedances in soil, indicating they may be collocated with other organic analytes. Therefore, they were included for further evaluation.

If an analyte was detected in soil greater than the SL in more than 10% of samples but has never been detected in groundwater at a concentration greater than MTCA Method B criteria, then it was excluded (i.e., pentachlorophenol was excluded from further consideration based on this criterion). Additionally, if an IHS analyte was detected in groundwater (over the past 5 years) but was not detected in soil greater than the SL in more than 10% of PEC samples, then it was also excluded. Analytes that were excluded using this criterion include 1,1-dichloroethane, 1,2-dichloroethane, cis-1,2-dichloroethene, and methylene chloride. Of these analytes, 1,1-dichloroethane, 1,2-dichloroethane, and cis-1,2-dichloroethene were not detected greater than the SL in any PEC soil samples. Methylene chloride was detected in PEC soil data greater than the SL in only four samples representing 2.3% of total PEC samples. Additionally, these analytes are not prevalent in Zone A based on review of all available data from all media in Zone A and their presence at low level concentrations in Zone A soil and groundwater at a low frequency is not indicative of a large contaminant mass.

Additional data, such as the NAPL data from former Zone A source area well MW-52S and field and analytical data collected during the Zone A Removal Action were also reviewed for completeness. Where appropriate, older soil data collected from within Zone A (AIA data from 2011) were reviewed for completeness. The AIA soil data were collected 12 years ago and are no longer representative of current conditions due to the operation of the SVE system; VOC concentrations in soil (e.g., benzene) were generally much lower in the recent PEC dataset. However, the AIA data were useful to confirm the most prevalent analytes and to evaluate the secondary (less mobile and volatile) components that may not have been as directly influenced by SVE operations.

- **Step 4: Development of a list of analytes that are of primary concern for ISTR and grouping of like analytes for the development of RELs,** as described in the following section. Additional information reviewed for consideration in development of the RELs included the following:
    - Review of fate and transport characteristics, such as boiling point and vapor pressure, for those remaining analytes to evaluate analyte mobility and likelihood of ISTR effectiveness for treatment.
    - Review of TRS thermal treatability bench test (treatability test) results, including predicted site-specific mass removal efficiencies for organic analytes, to inform the technical achievability of RELs for targeted analyte groups.

5.1.2 Soil Remediation Level Development

Available empirical site data and site-specific conditions were evaluated in the development of soil RELs for Zone A. The PEC soil data indicated that there are certain prevalent organic analytes detected in Zone A at concentrations greater than the soil SLs, which are based on the protection of groundwater. The recent groundwater data were reviewed for the organic analytes that exceeded the soil SLs to determine if they were also analytes of concern in groundwater. The IHS VOCs that have a site-specific groundwater CUL identified in the CAP and that exceeded SLs in soil are the primary focus of treatment for protection of groundwater.

RELs for those analytes were developed as described in the following sections. RELs were developed for the most prevalent VOCs (benzene, toluene, ethylbenzene, and xylenes [BTEX] and select chlorinated volatile organic compounds [cVOCs; TCE, PCE, and vinyl chloride]), SVOCs (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene), and the volatile and semivolatile TPH components (GRO and DRO). These RELs were also reviewed with TRS to confirm that they are technically achievable based on the results of the treatability test.

5.1.2.1 Volatile Organic Compounds

The primary objective of ISTR is to achieve the RAOs through removal of VOC mass for protection of groundwater. The PEC soil data indicated that there are certain prevalent VOCs detected in Zone A at concentrations greater than the SLs. Those VOCs that are present in soil greater than the SLs and are also present in groundwater are the primary focus of ISTR—they include BTEX,

select cVOCs (TCE, PCE, and vinyl chloride), and methylene chloride. The treatability test indicated that ISTR would be effective in reducing concentrations of VOCs (including BTEX and cVOCs) in Zone A.

Other cVOCs that are IHSs in groundwater, including *cis*-1,2-dichloroethene, 1,1,1-trichloroethane, 1,2-dichloroethane, and 1,1-dichloroethane, were not detected in any PEC soil sample greater than soil SLs and, therefore, were not included as part of the cVOC list for REL development.

A REL for methylene chloride was not established because this analyte was always collocated with at least one of the other VOCs listed below (except for one exceedance in saturated soil less than 2 times the SL) and has a low boiling point and high vapor pressure compared to other VOCs; therefore, it is expected to be removed at a rate equal to or greater than the VOCs with RELs.

RELs for BTEX and cVOCs are as follows, along with the rationale supporting the development of the RELs.

BTEX

- **Benzene** was detected and exceeded the SL in only 2.3% of PEC vadose zone soil samples. Although this is less than 10%, there were elevated laboratory reporting limits for benzene in some samples with exceedances of TPH GRO and other BTEX analytes, indicating benzene may be present at a higher frequency and collocated with other petroleum analytes. These detections were generally limited to shallow fill soil in Zone A. Benzene is a Site IHS and was detected in groundwater at concentrations greater than the CUL at MW-52S during multiple events in 2017 and 2018.
- **Toluene** was detected exceeding the SL in 14% of vadose zone PEC soil samples, with a maximum detection of 710 times the SL. There were no detections of toluene in saturated zone PEC soil samples. Toluene is a Site IHS and was detected in groundwater in MW-52S at concentrations greater than the CUL during multiple events in 2017 to 2018.
- **Ethylbenzene** was detected in 14% of vadose zone PEC soil samples greater than the respective SL, with a maximum detection of 120 times the SL. There were no detections of ethylbenzene in saturated zone PEC soil samples. Ethylbenzene was detected in groundwater in MW-52S at concentrations greater than the CUL during multiple events from 2017 to 2018.
- **Total xylenes** were detected exceeding the SL in 18% of vadose zone PEC soil samples, with a maximum detection of 220 times the SL. There were no detections of xylenes in saturated PEC soil. Ortho-xylene was detected in groundwater in MW-52S at concentrations greater than the CUL during multiple events from 2017 to 2018.

cVOCs

- **PCE** was detected exceeding the SL in 15% of vadose zone PEC soil samples, with a maximum detection of 720 times the SL. There were no detections of PCE in saturated zone PEC soil samples; the most elevated PCE detections were typically in shallow

Touchet Beds soil. PCE is an IHS and was detected at concentrations greater than the CUL in groundwater in Zone A source area wells MW-52S and MW-53S during multiple events in 2017 and 2018, and it was detected in groundwater less than the CUL in MW-47S, MW-50S, and NVM-1 during multiple events between 2017 and 2022.

- **TCE** was detected exceeding the SL in 11% of vadose zone PEC soil samples, with a maximum detection of 1,000 times the SL. Elevated TCE detections were typically in shallow Touchet Beds soil and were collocated with PCE exceedances. There were no detections of TCE in saturated zone soil. TCE is an IHS and was detected at concentrations greater than the CUL in groundwater collected from MW-52S and MW-53S during multiple events in 2017 and 2018 and was detected less than the CUL in MW-13S, MW-47S, MW-50S, MW-58S, and NVM-1 during multiple events between 2017 to 2022.
- **Vinyl chloride** had a detected exceedance of the SL in only 1 PEC vadose zone sample (0.57% of all samples collected), collocated with TCE and PCE SL exceedances. However, there were elevated laboratory detection limits for vinyl chloride greater than the SL collocated with several other TCE and PCE SL exceedances. There were no detections of vinyl chloride in saturated zone soil. Vinyl chloride was detected in groundwater in MW-52S during just two events between 2017 and 2018, and only at concentrations less than MTCA Method B criteria; however, it is an IHS with high vapor pressure (highly volatile).

The default MTCA Method B soil CUL for the protection of groundwater (the SL) may be adjusted using site-specific input parameters to the three-phase partitioning model in accordance with WAC 173-340-747(5) using equation 747-1. The following site-specific parameters were evaluated to adjust the three-phase partitioning model for the basis of RELs:

- **Fraction of Organic Carbon:** The MTCA default fraction of organic carbon value is 0.1%. Organic carbon fractions measured in the thermal bench test samples were greater than 0.7% for the control samples. These control samples were collected from locations with elevated concentrations of organic analytes, which may have influenced the fraction of organic carbon measurement. However, the treatability test samples heated to 200 °C, which indicated removal of most organic contaminant mass from the soil matrix, had a measured organic carbon fraction of greater than 0.6%. In addition, total organic carbon measurements from the AIA dataset ranged from 0.033% to 8.85%, with an average value of 0.50%.
- **Dilution Factor:** An engineered cap will be placed over Zone A after ISTR, which will prevent infiltration of water through Zone A and, therefore, significantly increase the dilution factor variable in the model. A site-specific adjusted MTCA Method B value cannot be calculated using an infiltration rate of zero; therefore, an infiltration rate of 0.01 inches per year was used for the purposes of evaluating appropriate site-specific RELs.
- **Hydraulic Conductivity and Gradient:** Site-specific hydraulic conductivity and gradient values were calculated based on testing of Pasco MSW wells for the 1993 RI completed by Burlington Environmental. The hydraulic conductivity for the

unconfined aquifer was estimated to be 0.43 centimeters per second (cm/sec), with a gradient of 0.0037 meters per meter (m/m).

As the final cleanup component for Zone A, the placement of an engineered cap over Zone A will prevent infiltration of water through Zone A. Conservatively, using an infiltration rate estimated to be 0.01 inches per year, which is an overestimate of the permeability rate of a geomembrane liner, the calculated adjusted MTCA Method B values using site-specific hydraulic conductivity and gradient values would be approximately 50 to 100 times the default MTCA Method B values.

Volatilization potential was also considered in development of the RELs, recognizing that the SVE system has been in operation since 1997 and has recovered more than 1.1 million pounds of mass from Zone A. SVE data were reviewed, and there is good correlation between those analytes that continue to be actively removed by the SVE system based on detections in the influent vapor streams and those that are the primary focus of ISTR. Therefore, as a conservative approach and to minimize the future volatilization potential in soils remaining in Zone A and beneath the final engineered cap, the SLs were increased by a factor of 10 for the RELs, with a goal of no active remediation after ISTR in Zone A.

The RELs for VOCs are the sum of the upward-adjusted SLs (10 times) for the analytes in each analyte group, as follows:

- A REL of 250 mg/kg for BTEX (sum of benzene, toluene, ethylbenzene, and xylenes)
- A REL of 1.0 mg/kg for cVOCs (sum of PCE, TCE, and vinyl chloride)

The PEC sample results for BTEX and cVOCs and a comparison of the sums to the RELs are shown on Figures 5.1 and 5.2, respectively.

5.1.2.2 Semivolatile Organic Compounds

SVOCs generally have higher boiling points and lower vapor pressures than VOCs and were generally detected in PEC soil data at a lesser frequency and magnitude than VOCs. Total naphthalenes (sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene) were the most prevalent SVOCs detected in PEC soil data that have also been detected in Zone A groundwater. The treatability test indicated that ISTR would be effective in reducing concentrations of naphthalenes in Zone A.

Isophorone and bis(2-ethylhexyl)phthalate were also detected at concentrations greater than SLs in more than 10% of PEC soil samples and, within the past 7 years, were detected in groundwater greater than their respective SLs (MTCA Method B criteria). RELs for isophorone and bis(2-ethylhexyl)phthalate were not established because these analytes were collocated with at least one of the other VOCs listed above or SVOCs listed below. These analytes have higher boiling points and lower vapor pressures compared to other SVOCs, and their volatilization potential and mobility is low. The treatability test indicated that ISTR would reduce concentrations of isophorone and bis(2-ethylhexyl)phthalate in Zone A, but to a lesser extent than other, lower-boiling-point SVOCs.

RELs for total naphthalenes are described below, along with the rationale supporting the development of the RELs.

Naphthalenes

- **Naphthalene** was detected exceeding the SL in 20% of vadose zone PEC soil samples, with a maximum detected concentration of 24 times the SL. Naphthalene in groundwater exceeded the MTCA Method B groundwater criteria in MW-52S during multiple events in 2017 and 2018 but has not been detected in Zone A groundwater monitoring network wells in the past 5 years.
- **1-Methylnaphthalene** was detected exceeding the SL in 27% of vadose zone PEC soil samples, and the maximum detected value was 200 times the SL. 1-Methylnaphthalene in groundwater exceeded the MTCA Method B groundwater criteria in MW-52S and MW-53S during multiple events in 2017 and 2018 and was detected at concentrations less than the MTCA Method B groundwater criteria in MW-57S during one event in 2021.
- **2-Methylnaphthalene** was detected exceeding the SL in 20% of vadose zone PEC soil samples, and the maximum detected value was 55 times the SL. 2-Methylnaphthalene was detected in groundwater at concentrations less than MTCA Method B groundwater criteria in MW-52S and MW-53S during multiple events in 2017 and 2018.

Consistent with the REL development approach for VOCs described above, the REL for total naphthalenes (sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene) is the sum of the upward-adjusted SLs (10 times) for the individual analytes, which is 65 mg/kg for total naphthalenes. The PEC sample results for total naphthalenes and a comparison of the sum to the REL is shown on Figure 5.3.

5.1.2.3 Total Petroleum Hydrocarbons

More TPH mass was detected in PEC soils at concentrations greater than the MTCA Method A CULs than initially expected. Although TPH is not an analyte of concern in groundwater, TPH was a component of the NAPL previously observed in former Zone A source area well MW-52S. NAPL was never observed in MW-53S (downgradient of MW-52S) and has not been observed in any Zone A groundwater monitoring network well, indicating that the NAPL was localized.

RELs were developed based on residual saturation values for the more volatile components (GRO and DRO) of TPH to eliminate the potential for future NAPL accumulation. A residual saturation value is defined as the concentration at which the petroleum product becomes mobile as a separate phase. Residual saturation values are greater in finer grained soils than in courser grained soils. Selection of residual saturation values as RELs is consistent with WAC 173-340-747(3)(g), which states that soil concentrations left on-site must not result in the accumulation of NAPL in groundwater. Table 15-14 of Ecology's *Concise Explanatory Statement for the Amendments to the Model Toxics Control Act Cleanup Regulation* (Ecology 2001) identifies residual saturation values

for different petroleum products relevant to a variety of soil types. Table 15-14 presents default residual saturation values of 964 mg/kg for gasoline and 2,286 mg/kg for middle distillates (e.g., DRO) based conservatively on coarse gravel (these default residual saturation values were the basis for MTCA Table 747-5).

To be conservative and to ensure that RAOs are met, the TPH RELs for Zone A are based on the most conservative default residual saturation values for coarse gravel. The default residual saturation values for TPH are presented in MTCA Table 747-5 and are 1,000 mg/kg for GRO and 2,000 mg/kg for DRO (this value for DRO is equal to the MTCA Method A CUL). Per WAC 173-340-747(10), residual saturation can be adjusted upward from default values based on site-specific considerations, including an empirical demonstration to show that measured soil concentrations will not result in the accumulation of NAPL on or in groundwater or use of site-specific measurements (i.e., soil grain size/geology).

The PEC sample results for GRO and DRO and a comparison to the RELs are shown on Figures 5.4 and 5.5, respectively. The treatability test indicated that ISTR would be effective in reducing concentrations of TPH in Zone A.

5.1.2.4 Other Organic Compounds

Other categories of Zone A residual organic analytes, including higher boiling point SVOCs, ORO, PCBs, and herbicides will also be treated concurrently, but with less treatment efficiency. Based on review of available soil and groundwater site data, and with consideration of their physical and chemical properties, these analytes generally have low-volatility and low-mobility and are not a concern for groundwater or future emissions/volatilization and, consistent with the target compounds, will also be addressed via placement of an engineered cap over Zone A to control infiltration and prevent direct contact with residual contaminants.

These other organic analytes that have been detected in soil at concentrations greater than the SLs, but at low frequencies, are collocated with the targeted analytes with RELs. Therefore, there will be measurable mass reductions in concentrations of these other organic analytes, and the remedial objectives will be achieved once the RELs for BTEX, cVOCs, naphthalenes, and TPH (GRO and DRO) are achieved.

5.1.3 Soil Remediation Levels

RELs were established for soil, as summarized in Table 5.1, to ensure that ISTR performance is sufficient to meet the RAOs defined in Section 3.2 for the Zone A cleanup action.

Table 5.1
Soil Remediation Levels

Analyte Group	REL	Basis	Notes
Volatile Organic Compounds			
Total BTEX	250 mg/kg	10 times MTCA Method B (1)	Sum of benzene, toluene, ethylbenzene, and xylenes
Total cVOCs	1.0 mg/kg	10 times MTCA Method B (1)	Sum of TCE, PCE, and vinyl chloride
Semivolatile Organic Compounds			
Total Naphthalenes	65 mg/kg	10 times MTCA Method B (1)	Sum of naphthalene, 1-methynaphthanlene, and 2-methynaphthalene
Total Petroleum Hydrocarbons			
GRO	1,000 mg/kg	Default residual saturation (2)	Default residual saturation based on coarse gravel (most conservative)
DRO	2,000 mg/kg	Default residual saturation (2)	Default residual saturation based on coarse gravel (most conservative)

Notes:
1 The REL is based on summing the MTCA Method B criteria for each analyte listed in the specified group and then multiplying the summed value by 10.
2 TPH default residual saturation values obtained from MTCA Table 747-5.

5.2 DEFINITION OF THERMAL TREATMENT AREA

The thermal treatment area (lateral and vertical extents) was defined based on a thorough review of all available and relevant data in Zone A described in Sections 5.1.1 and 5.1.2 and following a stepped approach as described below:

- **Step 1: Comparison of the PEC soil data to the RELs.** An initial thermal treatment area was conservatively defined based on REL exceedances. PEC data compared to the RELs are presented in Table 5.2, and a generalized summary of all PEC data compared to the RELs is shown on Figure 5.6. These PEC data are most representative of current in situ conditions (post-drum removal) and were prioritized for use in delineating the thermal treatment area over other lines of evidence that may not represent current conditions.
- **Step 2: Review supplemental data to support delineation of lateral and vertical extents of treatment,** including the limits of drummed waste and waste characterization data collected as part of the drum removal (Appendix A) and field

screening and geological information from PEC drilling (as presented on the soil boring logs in Appendix B).

- The lateral extent of where drums were found during the Zone A Removal Action was used as an important line of evidence in defining the lateral extent of the thermal treatment area. The thermal treatment area boundary was refined inward or outward based on other lines of evidence including the amount and type of waste observed during drum removal activities, and field observations during PEC soil boring activities.
- Data collected from the fill zone by ENTACT during drum removal to support waste characterization of roll-offs was used to refine the lateral limits of thermal treatment. Characterization data for each grid cell, including how many roll-off containers had soil with a total VOCs concentration greater than 500 mg/kg[6], is depicted on ZARCTM Figure 16 included in Appendix A. This information, which is representative of material that was removed from Zone A during drum removal, was used to support refinement of the lateral thermal treatment boundary. If the grid data collected indicated that elevated VOCs were not detected in individual grid cells during the drum removal action, then it is reasonable to infer that the native soil below the waste would also not contain elevated VOCs. This supplemental information provided additional confidence in the lateral delineation of the thermal treatment boundary.
- Silty or cemented sand lenses were observed in most PEC borings, typically within the Touchet Beds and between the Touchet Beds and UPG layers. PID readings often decreased significantly below these layers, indicating that these lenses likely slowed downward migration of contaminants from the former drummed waste areas. This supplemental information provided additional confidence in the vertical delineation of the thermal treatment boundary.

- **Step 3: Evaluation of isolated TPH REL exceedances** was performed, including an empirical demonstration. A limited number of PEC samples had REL exceedances exclusively for GRO and/or DRO that were driving a potentially larger thermal treatment area footprint. Consistent with WAC 173-340-747(10)(d)(ii), site-specific information for these locations were reviewed and considered, including field observations during PEC drilling and the vertical profile of contamination, to determine if these exclusive TPH exceedances should be included within the thermal treatment area.
  - The TPH contamination in Zone A is present primarily in the shallow vadose zone (imported fill zone and Touchet Beds), which consists primarily of interbedded fine to medium sand and silt. Residual saturation values for gasoline and middle distillates for fine to medium sand presented in Table 15-14 of Ecology's *Concise Explanatory Statement for the Amendments to the Model Toxics Control Act*

[6] During the drum removal, U.S. Ecology Inc.'s Grandview facility Total VOC concentration maximum of 500 parts per million (ppm) applied to wastes that carry D codes and therefore was tracked by the contractor (ENTACT) to inform which facility roll offs were taken to for CAMU disposal.

Cleanup Regulation (Ecology 2001) are 5,625 mg/kg and 13,333 mg/kg, respectively. Additionally, some REL exceedances extended into the top of the UPG, which typically consisted of fine to coarse or medium to coarse sand. Residual saturation values for gasoline and middle distillates for medium to coarse sand presented in Table 15-14 are 3,266 mg/kg and 7,742 mg/kg, respectively. These values are more appropriate for site-specific evaluation of the Touchet Beds soils and UPG, are considerably greater than the default residual saturation values used as the RELs for GRO and DRO (the most conservative values, presented in MTCA Table 747-5, which are based on coarse gravel; refer to Section 5.1.2.3), and provide a strong line of evidence that any residual NAPL associated with concentrations less than these values in the soil matrix is immobile. The site-specific geology and analyte concentrations throughout the entire vertical profile at each location were reviewed to support an empirical demonstration to show that the measured GRO or DRO soil concentrations would not result in the accumulation of NAPL on or in the groundwater.

- TPH was analyzed in saturated soil at 12 PEC locations, and GRO and DRO were not detected in any saturated soil sample. ORO was detected at one location in saturated soil, BH16, with a concentration of 89 mg/kg, well below the SL criterion of 2,000 mg/kg. Non-detect concentrations of GRO and DRO in saturated soil at or near PEC locations were reviewed to support an empirical demonstration that GRO or DRO was not migrating downward into the groundwater table.
- Three locations, BH26, BH38, and BH39, were excluded entirely from the thermal treatment area based on an empirical demonstration that GRO and DRO are isolated in shallow vadose zone soils and not migrating downward to groundwater. This is supported by no detections of GRO and DRO in the saturated soil samples collected as part of the PEC investigation in 2022; this included the collection of 12 soil samples at the water table/capillary fringe throughout Zone A. Additionally, the final engineered cap will cover these soils, prevent stormwater infiltration, and eliminate the soil leaching pathway. The empirical demonstration for exclusion of these locations from the thermal treatment area are discussed below, and data for these locations compared to RELs are shown on Table 5.2.
  - **BH26:** One sample at BH26 at 19 feet bgs within the Touchet Beds exceeded the DRO REL with a concentration of 4,200 mg/kg. This value is less than the residual saturation value of 13,333 mg/kg for fine to medium sand, which indicates that accumulation of NAPL on or in the groundwater, which is more than 40 feet lower than this REL exceedance, from the shallow vadose zone in this location is unlikely. This is further supported by a review of data for deeper samples at 24 and 27 feet bgs, which had detected DRO concentrations of 210 mg/kg and 78 mg/kg, respectively, and saturated soil sample at adjacent location BH25, which had no detections of GRO or DRO.
  - **BH38:** A DRO concentration of 8,000 mg/kg was detected at BH38 at 24 feet bgs in the Touchet Beds, which was the only REL exceedance at BH38. The DRO value is less than the residual saturation value of 13,333 mg/kg for

fine to medium sand, which indicates that accumulation of NAPL is unlikely. There were no detections of any analyte at BH38 at 28 feet bgs in the lower Touchet Beds.

  - **BH39:** GRO, DRO, and BTEX were detected at concentrations greater than the RELs at location BH39 in shallow fill at 13 feet bgs. A bituminous, highly viscous asphalt-like material was observed in the soil core between 12 to 12.5 feet bgs and is presumed to be the source of the elevated TPH results. Similar material was also observed in the field during the Zone A Removal Action K-line excavation and was noted to become less viscous when heated to ambient temperature. The soil sample collected in the Touchet Beds layer at 18 feet bgs was non-detect for TPH, indicating the product was localized to the fill zone and stable with no evidence of downward migration. Therefore, ISTR is not recommended at BH39 to ensure that any remaining solidified bituminous product in the area is not mobilized by heating.

- Using the same empirical demonstration approach as above where GRO and DRO are isolated in vadose zone soils, less than the residual saturation values for the finer grained soils where the petroleum is located, and not migrating downward to groundwater, three borings (BH07, BH16, and BH25) with GRO and/or DRO REL exceedances in deeper samples were excluded vertically from the thermal treatment area.
  - **BH07:** The DRO concentration at BH07 at 30 feet bgs was 3,000 mg/kg, which is less than the residual saturation value of 13,333 mg/kg for fine to medium sand. In addition, DRO concentrations were non-detect in the next sample interval at 34 feet bgs and in saturated soil at 63 feet bgs, indicating DRO is not migrating downward. Therefore, the deeper DRO REL exceedances at 27 and 30 feet bgs were excluded from the treatment area.
  - **BH16:** Location BH16 had a deeper, isolated REL exceedance of DRO (6,500 mg/kg) at 46 feet bgs in the UPG (fine to coarse sand), which is less than the DRO residual saturation value of 7,742 mg/kg for medium to coarse sand in Table 15-14. This deeper DRO REL exceedance at BH16 was correlated with an increase in PID measurements and minor cementation in the soil profile between 43 and 45 feet bgs. A saturated soil sample at BH16 collected at 62 feet bgs was non-detect for DRO, which provides empirical evidence that DRO has not accumulated as NAPL on the water table. The deeper DRO REL exceedance was, therefore, not included in the treatment area.

- **Step 4: Coordination with TRS for final thermal treatment area design considerations.** The final boundary of the thermal treatment area was refined in coordination with TRS based on the technical design considerations, including thermal heater spacing and placement. Additionally, the vertical boundary delineation was supported by site-specific design considerations, including extension of the heaters 5 feet beneath the defined treatment area.

The lateral extent of the thermal treatment area is depicted as the red line on Figure 5.7. This area conservatively includes the majority of the remaining source mass in Zone A. The thermal treatment area was divided into nine subareas based on the varied vertical extents of contamination throughout the treatment area, as described in Section 5.3. The definition of the lateral and vertical extents of the thermal treatment area was a necessary preliminary design component that was previewed with Ecology prior to completion of the ISTR design by the thermal vendor.

5.3 DESCRIPTION OF THERMAL TREATMENT SUBAREAS

The lateral extent of the thermal treatment area and waste characterization information by excavation grid from the Zone A Removal Action used to refine the lateral extent are shown on Figure 5.7. The nine thermal treatment subareas (A1 through A9) and proposed depths of ISTR treatment are shown on Figure 5.8. The basis for the vertical and horizontal extent of each subarea is described below.

- **Subarea A1** includes PEC location BH20 and the vertical extent of treatment is 22 feet bgs.
  - REL exceedances for all analytes at BH20 were detected at 16 feet bgs, and only DRO and GRO exceeded the REL at 22 feet bgs (GRO was a non-detect exceedance). All REL analytes at BH20 were non-detect at 24 feet bgs.
  - Location BH43 north of subarea A1 was sampled at 22 and 25 feet bgs and was non-detect for all analytes. Grid cells I03 and J03 had no roll-offs from drum removal with elevated VOCs. Grid cell H03 had only 1 of 21 roll-offs with elevated VOCs.
- **Subarea A2** includes PEC locations BH22 and BH23 and the vertical extent of treatment is 25 feet bgs.
  - BH22 had REL exceedances for BTEX, cVOCs, GRO, and DRO from 12 to 24 feet bgs and was non-detect for all REL analytes at 28 feet bgs.
  - BH23 had a non-detect REL exceedance (laboratory method detection limit greater than the REL) of GRO at 17 feet bgs and detected REL exceedances of GRO and DRO at 22 feet bgs. BH23 was also non-detect for all analytes with a REL at 28 feet bgs.
  - The UPG layer was observed at 25 feet bgs at both of these locations, and PID readings dropped from 3,200 ppmv to 480 ppmv between 24 to 25 feet bgs at BH22, indicating VOC analytes were being confined to the Touchet Beds.
  - The eastern boundary of subarea A2 is bounded based on no elevated VOCs during drum removal in grid cell K04 and elevated VOCs in only 1 of 23 roll offs from grid cell K05. The western boundary of subarea A2 is based on no elevated VOCs during drum removal in grid cells G04 and G05.
- **Subarea A3** includes PEC location BH05 and the vertical extent of treatment is 20 feet bgs.
  - BH05 had REL exceedances for all analytes at 17 feet bgs (cVOCs was a non-detect exceedance) and no REL exceedances at 23 feet bgs.

  - A cemented sand layer was observed at BH05 at 17 feet bgs, and PID readings within this layer were greater than 15,000 ppmv. Geologic data were not available between 17 and 20 feet bgs, and the PID reading at 20 feet bgs was 317 ppmv.
  - The lateral extents of subarea A3 were defined by no REL exceedances at location BH24 and no elevated drum removal VOC data in surrounding grid cells C05 through C07, D05, and E05 through E06. There was 1 of 19 roll offs with elevated VOCs in cell F06, which includes BH24.
- **Subarea A4** includes PEC location BH07 and the vertical extent of treatment is 27 feet bgs.
  - BH07 had REL exceedances of BTEX, cVOCs, and GRO at 12 feet bgs and REL exceedances of DRO less than 2 times the REL at 15, 27, and 30 feet bgs. All REL analytes were non-detect at 34 feet bgs. These REL exceedances of DRO occurred in the Touchet Beds (silty sand) and top of the UPG (fine to medium sand).
  - An empirical demonstration was applied to exclude a deeper REL exceedance of DRO at BH07 to limit the vertical extent of Subarea A4, refer to Section 5.2.
  - The western lateral extent of subarea A4 is bounded by location BH33.
- **Subarea A5** includes PEC locations BH25, BH27, and BH28 and the vertical extent of treatment is 26 feet bgs.
  - REL exceedances for all analytes were detected at least once in BH25, BH27, or BH28 between 15 to 22 feet bgs within the Touchet Beds or top of UPG. Non-detect cVOCs, GRO, and DRO REL exceedances were also reported in several of the samples in this range.
  - The eastern extent of subarea A5 is bounded by location BH26 in the north, which was excluded from the lateral treatment area extent based on the empirical demonstration requirements for DRO (refer to Section 5.2). The eastern extent of subarea A5 was further defined based on grid cells J06, I07, and I08 not having elevated VOC concentrations during drum removal and the extent of former drums.
- **Subarea A6** includes PEC locations BH29 and BH30 and the vertical extent of treatment is 28 feet bgs.
  - BH29 had REL exceedances of BTEX and cVOCs at 23 feet bgs and non-detect exceedances (laboratory method detection limit greater than the REL) of GRO and DRO at the same depth. Concentrations of all REL analytes were non-detect at 33 feet bgs at BH29.
  - BH30 had REL exceedances of all analytes (DRO was a non-detect exceedance) at 16 and 24 feet bgs. Concentrations of all analytes were less than RELs at 32 feet bgs.
  - REL exceedances at subarea A6 extended into the UPG layer. PID measurements taken at PEC borings BH29 and BH30 were between 700 to 1,800 ppmv through the Touchet Beds and top of UPG but decreased to 330 and 54 ppmv by 28 feet bgs at BH29 and BH30, respectively.
  - The western boundary of subarea A6 is bounded by BH09 and no elevated VOCs in grid cells D09 and D10 during drum removal. The eastern extent of subarea A6

is based on limited VOCs in grid cell I09 (2 of 21 roll-offs) and no elevated VOCs in grid cells I10 and I11.

- **Subarea A7** includes PEC locations BH11 and BH12 and the vertical extent of treatment is 25 feet bgs.
  - REL exceedances for all analytes were detected between 5 to 24 feet bgs in BH11, BH12, or both. The next deepest samples at BH11 and BH12 at 48 and 27 feet bgs, respectively, were less than RELs for all analytes.
  - The Touchet Beds at BH11 extend to 40 feet bgs, which is deeper than other PEC borings, and PID measurements at the base of the Touchet Beds varied between 15,000 ppmv and less than 200 ppmv, which may have been due to interferences with the PID. PID readings in the UPG at BH11 were less than 100 ppmv. PID measurements at BH12 showed a decrease in VOCs between the Touchet Beds and top of UPG at 25 feet bgs.
  - The western boundary of subarea A7 is bounded by grid cells C11, C12, and C13; which had no elevated VOCs during drum removal. The eastern boundary is bounded by grid cells H12 and H13, which had 1 and 0 of 18 roll-offs with elevated VOCs, respectively. Subarea A7 is also bounded to the east by location BH13.
- **Subarea A8** includes PEC locations BH15 and BH16 and the vertical extent of treatment is 28 feet bgs.
  - BH15 had REL exceedances of BTEX, cVOCs, and GRO at 16 and 23 feet bgs and BH16 had REL exceedances of cVOCs, naphthalenes, GRO, and DRO at 17 feet bgs. All analyte concentrations were less than the REL at BH15 and BH16 at 48 feet bgs and 32 feet bgs, respectively.
  - PID measurements at BH15 and BH16 both decreased at about 28 feet bgs. At BH15, this decrease was associated with the observed transition from Touchet Beds to UPG identified at 28 feet bgs. At BH16, PID measurements in the Touchet Beds ranged from a maximum of 2,300 ppmv at 22 feet bgs to 470 ppmv at 28 feet bgs but increased again at the top of the UPG, presumably related to increased DRO concentrations.
  - An empirical demonstration was applied to exclude a deeper REL exceedance of DRO at BH16 to limit the vertical extent of Subarea A8, refer to Section 5.2.
  - The western boundary of subarea A8 is bounded by grid cells C13, C14, and C15, which had 0 of 9 roll-offs, 2 of 8 roll-offs, and 0 of 3 roll-offs, respectively, with elevated VOCs during drum removal. The eastern boundary of subarea A8 is bounded by grid cells H13, G14, and G15, which had no elevated VOCs during drum removal. Subarea A8 is also bounded to the east by location BH17.
- **Subarea A9** includes PEC locations BH18 and BH34 and the vertical extent of treatment is 16 feet bgs.
  - BH18 and BH34 had REL exceedances of BTEX, cVOCs, GRO, and DRO at 17 and 15 feet bgs, respectively. All analytes were less than RELs at BH18 at 22 feet bgs. All analytes were not detected at BH34 at 18 feet bgs.

- Subarea A9 is bounded by locations BH42 to the southwest and BH37 to the east. Grid cells C15 and G15 bounding subarea A9 to the west and east, respectively, had no roll-offs with elevated VOCs during drum removal. The south end of subarea A9 is outside of the drum removal area and is bounded by the sloped topography leading up to the BDI facility to the south of Zone A.

5.4 HAZARDOUS SUBSTANCES TO REMAIN IN PLACE AFTER ISTR

After implementation of ISTR in Zone A, residual soil contamination will remain in place beneath the final engineered cap outside the lateral limits of the ISTR treatment area, beneath the vertical limits of the ISTR treatment area, and within the ISTR treatment area. The final engineered cap will cover Zone A, including portions that are outside the ISTR treatment area, and will prevent direct contact with residual contaminated fill material and soil and will prevent infiltration through residual contamination to prevent migration. The cleanup action relies on containment as part of the final remedy; therefore, consistent with WAC 173-340-380(1)(a)(ix), a summary of residual hazardous substances remaining is included in the following sections. An updated comprehensive assessment of residual soil contamination that will remain in place below the final engineered cap for Zone A will be completed after ISTR is complete and as part of final engineered cap design, which will be submitted to Ecology as a future EDR Addendum.

5.4.1 Fate and Transport of Hazardous Substances to Remain in Place

A summary of fate and transport characteristics for analytes is provided in Table 5.3. General fate and transport characteristics for each analyte group are included below.

- **VOCs:** Chemical and physical properties may allow these organic analytes to readily move between soil-adsorbed, aqueous, and air phases in a subsurface environment. VOCs have high vapor pressures (generally greater than 500 millimeters of mercury at 100 ˚C) and may readily volatilize into the atmosphere or within vadose zone soils. Some VOCs have very high aqueous solubility and readily dissolve in groundwater, and others have lower solubility and do not dissolve as readily in groundwater. VOCs are often microbially degraded over time and can adhere to organic carbon in the soil matrix. VOCs are expected to be effectively treated thermally, because they have relatively low boiling points and high volatility.
- **SVOCs**: Chemical and physical properties may allow some analytes to readily move in water and air phases in a subsurface environment. SVOCs are much less volatile than VOCs and generally have higher boiling points with lower vapor pressures, although there are some exceptions. However, volatilization potential and mobility for detected SVOC analytes at the Site is low, so thermal treatment is expected to effectively treat SVOCs and reduce current site concentrations.
- **TPH:** Chemical and physical properties for TPH analytes are complex, and although hydrocarbons can be mobile in water, they are more likely to sorb to particulate matter and have little mobility. TPH is also subject to some microbial degradation over

time. GRO and DRO, and to a less extent ORO, are expected to be effectively treated thermally, and site concentrations are expected to be reduced through treatment.

- **Pesticides and Herbicides:** Chemical and physical properties readily allow pesticides and herbicides to degrade over time through leaching, photodecomposition, and/or microbial degradation. Analytes have extremely low vapor pressure and can be soluble in water under certain conditions; however, they bind more tightly to particulate matter and are easily absorbed into plant tissue, which removes them from the environment. Both pesticides and herbicides have low volatility and low mobility, and they are not a concern for groundwater or future emissions. Any potential residual contamination will be addressed via placement of an engineered cap.
- **PCBs:** Chemical and physical properties do not readily allow PCBs to degrade, and they can remain in the environment for a long time. PCBs generally have lower vapor pressure and higher boiling points, are not soluble, and have high sorptive potential in particulate matter. PCBs, therefore, have low mobility, so they are not a concern for transporting to groundwater or future emissions. Any potential residual contamination will be addressed via placement of an engineered cap.
- **Metals:** Chemical and physical properties allow metals to mainly sorb to particulate matter and sometimes leach over time depending on soil conditions. Metals tend to have low solubility and extremely low vapor pressure, and they are not expected to be effectively reduced if treated thermally. Any residual contamination will be addressed via placement of an engineered cap.

5.4.2 Outside the Limits of the ISTR Treatment Area

This section provides a preliminary summary of the residual soil contamination that will remain in place in Zone A, outside of the lateral extent of the ISTR treatment area and beneath an engineered cap.[7] All PEC soil samples outside the lateral and vertical extents of the thermal treatment area shown on Figure 5.8 were included in the evaluation of residual analyte concentrations remaining in place. The summary below is conservative because radiating heat during thermal treatment will extend approximately 5 to 8 feet beyond the lateral and vertical extent of the heaters, resulting in a limited reduction of contaminants outside the treatment area, particularly for volatile analytes.

The ISTR treatment area is based on the RELs, and therefore, all detected soil concentrations outside of the treatment area are less than the RELs, except for localized areas around BH26, BH38, and BH39 described in Section 5.2. The evaluation of what will remain within Zone A but outside of the ISTR treatment area was conducted relative to the conservative soil SLs, which are

[7] The extent of the final engineered cap will be updated as part of design and included in an addendum to this EDR. A final evaluation of contaminants outside the ISTR treatment area and beneath the engineered cap will be completed after ISTR treatment and will include confirmation sample data collected outside of the treatment area.

the MTCA Method B CULs. Frequency of detections and exceedances of the SL for PEC data outside the lateral limit of the ISTR treatment area are presented in Table 5.4.[8]

Soil quality outside of the lateral and vertical limits of the ISTR treatment area is either non-detect or meets the SLs for most analytes. There are a few scattered detections that exceed an SL, with generally low-level SL exceedances. For analytes that had detections that were greater than an SL, a statistical evaluation of the data was performed in general accordance with the confidence interval approach for data analysis outlined in WAC 173-340-740(7)(c). A 95% UCL of the mean was calculated using ProUCL version 5.2 and is presented in Table 5.4 with the 95% UCLs compared to the SLs.

Based on the statistical evaluation using a 95% UCL method, most analytes are present at concentrations less than the conservative SLs (based on the protection of groundwater), with the following exceptions:

- GRO (TPH): The 95% UCL for GRO outside the lateral and vertical limits of the ISTR treatment area is 62 mg/kg, which is 2.1 times the SL and less than the REL. GRO was detected in 14 of 144 PEC samples outside the ISTR treatment area.
- 1-Methylnaphthalene (SVOC): The 95% UCL for 1-methylnaphthalene outside the lateral and vertical limits of the ISTR treatment area is 0.80 mg/kg, which is 3.2 times the SL. 1-Methylnaphthalene was detected in 14 of 144 PEC samples outside the ISTR treatment area. Total naphthalenes, which includes 1-methylnaphthalene, was less than the REL outside the ISTR treatment area. 1-Methylnaphthalene was detected once in groundwater in 2021.
- Pentachlorophenol (SVOC): The 95% UCL for pentachlorophenol outside the lateral and vertical limits of the ISTR treatment area is 0.35 mg/kg, which is 1.9 times the SL. Pentachlorophenol was detected in 10 of 144 samples outside the ISTR treatment area. Pentachlorophenol has never been detected in Zone A groundwater monitoring network wells or the former Zone A source wells.
- 4-Chloroaniline (SVOC): The 95% UCL for 4-chloroaniline outside the lateral and vertical limits of the ISTR treatment area is 5.0 mg/kg, which is 7.0 times the SL. 4-Chloroaniline was detected in 2 of 144 samples outside the ISTR treatment area. 4-Chloroaniline has not been detected in Zone A groundwater monitoring network wells or the former Zone A source wells in the past 5 years.
- Pyridine (SVOC): The 95% UCL for pyridine outside the lateral and vertical limits of the ISTR treatment area is 0.22 mg/kg, which is 1.1 times the SL. Pyridine was detected in 2 of 144 samples outside the ISTR treatment area. Pyridine has not been detected in Zone A groundwater monitoring network wells or the former Zone A source wells in the past 5 years.

[8] The data from BH39 at 13 feet bgs was not included in Table 5.4 and the 95% upper confidence limit (UCL) analysis because TPH and petroleum-based VOCs were skewed due to the presence of a bituminous product at 11 feet bgs. Refer to Section 5.2.

- Isophorone (SVOC): The 95% UCL for isophorone outside the lateral and vertical limits of the ISTR treatment area is 3.3 mg/kg, which is 6.8 times the SL. Isophorone was detected in 22 of 144 samples outside the ISTR treatment area. Isophorone has not been detected in Zone A groundwater monitoring network wells or the former Zone A source wells in the past 5 years.
- PCB Aroclor 1254: The 95% UCL for PCB Aroclor 1254 outside the lateral and vertical limits of the ISTR treatment area is 0.43 mg/kg, which is 4.3 times the SL PCB Aroclor 1254 was detected in 2 of 10 samples outside the ISTR treatment area. PCB Aroclor 1254 has not been detected in Zone A groundwater monitoring network wells or the former Zone A source wells in the past 5 years.
- Total PCBs: The 95% UCL for total PCB Aroclors outside the lateral and vertical limits of the ISTR treatment area is 1.9 mg/kg, which is 5.6 times the SL. Total PCB Aroclors had a detected calculation in 5 of 10 samples outside the ISTR treatment area.

The following analytes were detected in only one PEC sample outside the lateral limits of the preliminary ISTR treatment area, and therefore, a 95% UCL could not be calculated. These organic analytes, including four SVOCs, one herbicide, and one PCB Aroclor, all have very low Henry's constants, low vapor pressures, and high boiling points, which means they are very unlikely to volatilize or become mobile. These isolated analyte detections with exceedances of their respective SLs will remain in soil beneath the engineered cap and are not a concern for groundwater, as described below.

- 2,4-Dinitrotoluene and 2,6-Dinitrotoluene (SVOCs): The detected values for these analytes were 1.6 and 1.2 times the SL, respectively. 2,4-Dinitrotoluene has never been detected in Zone A groundwater wells, and 2,6-dinitrotoluene was detected in Zone A groundwater (MW-13S) only during one event in 1995.
- Aniline (SVOC): One detected value in a fill zone sample at 5 feet bgs exceeded the SL by 140 times. Aniline has never been detected in Zone A groundwater monitoring network wells or former Zone A source wells.
- Azobenzene (SVOC): The detected value was 2.0 times the SL. Azobenzene has never been detected in Zone A groundwater monitoring network wells or former Zone A source wells.
- N-Nitrosodimethylamine (SVOC): One detected value in the UPG was 2.4 times the SL. N-Nitrosodimethylamine has not been detected in Zone A groundwater monitoring network wells or former Zone A source wells within the past 5 years.
- 2,4-Dichlorophenoxyacetic acid (herbicides): One detected value in a fill zone sample at 11 feet bgs was 4.4 times the SL. 2,4-Dichlorophenoxyacetic acid has been detected only once in a Zone A groundwater well (MW-52S in 2015).

In addition to the organic analytes summarized above, metals (specifically arsenic and chromium) are also present in soil outside the ISTR preliminary treatment area at concentrations greater

than SLs. Metals would not be affected by ISTR and will remain beneath the engineered cap, which will control infiltration and migration.

5.4.3 Within the ISTR Treatment Area

Documentation of post-ISTR conditions and a summary of what will remain in place within the ISTR treatment area will be assessed through the collection of performance and confirmation samples as described in Section 11.0.

6.0 In Situ Thermal Remediation Preparation Activities

As part of the Zone A Removal Action, both overburden soil and potentially impacted soils were returned to the excavation after the drum removal activities were complete for subsequent ISTR. In addition, after the Removal Action was complete, the Zone A surface was graded and covered with compacted aggregate to provide a stable working surface for ISTR. Lastly, the design team reviewed the performance criteria for the existing RTO to determine if it is suitable for use during ISTR.

6.1 BACKFILL AND GRADING AFTER DRUM REMOVAL EXCAVATION

As described in the ZARCTM, backfill of completed grids was initiated after grid clearance to support safe access to the excavation and avoid conflict with ongoing waste removal within the temporary structure. Potentially contaminated material stockpiled within the temporary structure was generally used first, followed by overburden soil from the stockpile area. Potentially impacted soils (less any drums, drum debris, or material sourced from drums) were placed at the bottom of the excavation prior to placing stockpiled cover material.

After the completion of the drum removal activities, grading of Zone A and stabilization of the surface with compacted aggregate was completed by ENTACT in July and August 2022 to facilitate the future installation of an interim cover for ISTR in accordance with the Ecology-approved Zone A Removal Action EDR Addendum #2 (Floyd|Snider and PBS 2022b). Stormwater management features were also installed concurrent with final grading to facilitate drainage from Zone A and included the installation of a ditch along the west edge of Zone A, adjacent to Dietrich Road, and a stormwater swale north of BDI and south of the Inert Waste Area, as shown on Figure 2.3.

An interim cover for ISTR will be installed to provide a suitable working surface for constructing and operating the in situ treatment system and will act as an insulating barrier to aid in heat retention during treatment and prevent emission of vapors to air. The design details for the ISTR interim cover are included in Section 7 2 6.

6.2 REGENERATIVE THERMAL OXIDIZER EVALUATION

As part of pre-design for ISTR, TRS reviewed the design specifications for the existing RTO (Anguil Model 25 RTO) that is used to control extracted vapor emissions from the Zone A SVE system to determine if it would be suitable for use during ISTR. In addition, TRS also reviewed the emission parameters and operational limitations specified in Ecology's Air Quality Program (AQP) Approval Order No. 16AQ-E031, issued for the RTO in May 2017 (RTO permit).

Based on a review of the design parameters and the AQP parameters and limitations, TRS determined that the existing RTO would be suitable for treatment of extracted vapor during ISTR, and its use and operation parameters and permit discharge limitations were incorporated into the design (refer to Section 7.0). Based on changes in the manner of vapor recovery and the

volume from which vapors will be collected during ISTR, a modification to the existing RTO permit for the RTO was determined to be necessary.

A preliminary meeting was held with the ISTR design team and Ecology (including an AQP representative) on January 11, 2023, to discuss the necessary AQP permitting for ISTR. As part of that meeting, it was determined that a modification to the existing RTO permit would be most appropriate for ISTR.

A Notice of Construction (NOC) application for a modification to the existing RTO permit was submitted via email to AQP on March 31, 2023, and final signature was transmitted on April 4, 2023. A follow-up meeting was held with the ISTR design team and Ecology (including an AQP representative) on April 21, 2023, additional NOC application supporting materials were provided by the IWAG team to the AQP on May 9, 2023, and a draft RTO permit modification (NOC Approval Order, AQPID NO. A0210183) was provided by AQP to the IWAG team for review on July 28, 2023. The final RTO permit modification (Approval Order No. 23AQ-E033) was issued by AQP on September 19, 2023, and a copy of the RTO permit modification is included in Appendix D.

6.3 FRANKLIN COUNTY PUBLIC UTILITY DISTRICT COORDINATION

During the Zone A Removal Action, as part of ENTACT's ongoing coordination with the Franklin County Public Utility District (FPUD), ENTACT initiated coordination for the anticipated electrical service upgrade for the ISTR system. TRS has subsequently coordinated with FPUD regarding specific electrical requirements.

The ISTR system will require an upgrade to the existing site power infrastructure. TRS and Floyd|Snider met with FPUD on January 13, 2023, to discuss the power needs and project timeline. FPUD will be installing new power poles on the east side of Dietrich Road. A temporary transformer will be installed to power the TRS equipment. Informed by the early coordination, TRS submitted an application for upgraded service to FPUD on March 16, 2023.

FPUD design of the power drop installation is still pending. Additional coordination and inspection by the Washington State Department of Labor and Industries will be required once the FPUD design is complete.

7.0 In Situ Thermal Remediation Design

In accordance with WAC 173-340-400, this section includes the design criteria and details for post-excavation ISTR for Zone A. TCH was selected as the most-suitable ISTR technology and the TCH system was designed to comply with the CAP and SOW, meet the ISTR goals described in Section 1.3, and achieve the RAOs defined in Section 3.2. This section of the EDR establishes the design requirements for the Zone A ISTR in accordance with WAC 173-340-400(4)(a) and Task A 4 of the SOW.

7.1 ENGINEERING JUSTIFICATION

WAC 173-340-400(4)(a)(viii) requires engineering justification for design and operation parameters, including the following:

(A) "Design criteria, assumptions and calculations for all components of the cleanup action;

(B) Expected treatment, destruction, immobilization, or containment efficiencies and documentation on how that degree of effectiveness is determined; and

(C) Demonstration that the cleanup action will achieve compliance with cleanup requirements by citing pilot or treatability test data, results from similar operations, or scientific evidence from the literature;"

The following sections discuss the engineering justification.

7.1.1 Design Criteria

The primary goal of this EDR is to provide sufficient detail to implement ISTR safely and efficiently. This EDR includes both a performance-based approach for ISTR and more prescriptive design details and performance objectives to achieve the RAOs. The PEC data evaluation and thermal treatability bench testing described in Section 4.0 provided the basis of the design details for ISTR.

The TCH system design is largely based on proprietary methodologies and technologies. Details of the TCH design assumptions are included in this section and details regarding TCH system installation and operation are described in Sections 9.0 and 10.0, respectively.

7.1.2 Expected Efficiencies and Degree of Effectiveness

ISTR treatment technologies are a proven and effective method of removing volatile contaminants for the subsurface. However, the complex mixture of contaminants in Zone A prompted a bench-scale treatability study (refer to Section 4.3 and Appendix C) to further understand the viability and effectiveness of ISTR specific to the soil matrix and chemical mixtures observed in Zone A. Based on the treatability test results described in Section 4.3, TCH was selected as the most-appropriate ISTR technology. Heating the soil to 100 °C and completely removing the soil moisture (desiccation), can remove approximately 93% to 97% of the total

analyte mass in the thermal treatment area. Elevating temperatures above the boiling point of water improved mass recovery, but this improvement was less pronounced as temperatures continued to increase. It was, therefore, determined that targeting desiccation (i.e., complete removal of water) of the treatment volume with a target temperature in the range of 105 °C to 120 °C would achieve the RAOs and the RELs. The application of ISTR in Zone A will provide significant mass removal, and proper monitoring and operation will prevent short- and long-term impacts to the underlying aquifer.

As described in Section 4.3, heating to desiccation will ensure that the most volatile and mobile compounds contained within the soil matrix are transferred to the gas phase where they can be captured under vacuum and managed through thermal oxidation, captured on liquid-phase carbon, or stored as a NAPL for off-site disposal. Although compounds of lower volatility will be left in place, they will remain relatively immobile after ISTR. To ensure the remaining mass is unable to leach from the soil and migrate downward to the groundwater table, an engineered cover system will be installed after thermal treatment is completed.

7.1.3 Compliance with Cleanup Requirements

The Zone A ISTR operation shall comply with the CAP and SOW to meet the ISTR goals described in Section 1.3 and to achieve cleanup requirements described in Section 3.3 and 3.4. As described in Section 5.1.3, RELs are proposed for soil to ensure that ISTR performance is sufficient to meet the RAOs defined in Section 3.2 for the Zone A cleanup action.

As observed in the treatability test, desiccation will provide the optimal mass reduction. Operation of an ISTR system to achieve desiccation will remove a substantial amount of organic source mass remaining in Zone A after drum removal activities and will eliminate the need for operation of long-term systems installed at Zone A to protect groundwater. The risk of impacts to groundwater will be mitigated after successful ISTR. Multiple lines of evidence including energy input, temperature, and mass recovery rates will be used to monitor the progress of the remediation, and soil performance and confirmation sampling will be used to demonstrate compliance with the RELs.

After completion of ISTR, a final engineered cover will be installed over the Zone A footprint. The engineered cover will include long-term monitoring and maintenance, and groundwater compliance monitoring will also be conducted, as described in Section 12.0.

7.2 THERMAL CONDUCTION HEATING SYSTEM DESIGN

The following sections provide details on individual TCH system components and the assumptions that influence their design. Drawings of the design layout and system components are included in the TRS Thermal Conduction Heating 90% Design Package (design package) in Appendix E.

The TCH system was designed to operate in two separate phases (Phase 1 and Phase 2) to facilitate the use of the existing RTO as described in Section 6.2. Additional detail regarding this phased approach is included in Section 9.0.

7.2.1 Thermal Treatment Areas

The thermal treatment area is approximately 28,700 square feet with treatment depths ranging from 20 to 28 feet bgs, resulting in a treatment volume of approximately 27,000 cubic yards. The lateral and vertical extents of the thermal treatment area were defined as described in Section 5.2. The thermal treatment area was divided into nine subareas (A1 through A9) based on the vertical treatment extent, as described in Section 5.3. The thermal treatment area, including the subareas and volumes of each of the subareas, is shown on Figure 7.1.

The existing RTO has a flow limitation of approximately 1,000 standard cubic feet per minute (scfm). Due to the size of the treatment volume, and the expected flow rates required to remove the heated vapors, the treatment volume will need to be treated in two sequential phases. Areas 6 through 9 are planned for Phase 1 and Areas 1 through 5 are planned for Phase 2.

Heaters will be installed on a 12-foot spacing uniformly across the thermal treatment area to fully cover the lateral extent of each subarea, as shown on Sheet Y-1 of the design package (Appendix E). A halo of heat is expected to radiate outward approximately 5 to 8 feet from the thermal treatment area perimeter (as shown on Figure 7.1), resulting in some volatilization of contaminants around the lateral boundary of the thermal treatment area.

Each heater will extend 5 feet deeper than the defined vertical thermal treatment extent for each subarea or transition zone in which it is located (refer to design package Sheet Y-3 in Appendix E). Heater transition zones are included as needed between subareas to stairstep the heater depths and ensure adequate heating in deeper zones. Similar to the lateral extent of heating, a halo of radiant heat is expected to extend approximately 5 to 8 feet below the design vertical extent resulting in some volatilization of contaminants. The vertical extent of the thermal treatment area is shown on cross sections in Figures 7.2 through 7.4. The positioning of these cross sections is shown on Figure 4.5.

7.2.2 Thermal Modeling Approach

TRS uses a proprietary HeatWave® modeling service to calculate the heating rate and treatment time frame required to achieve project goals. The model performs energy balance calculations to determine how much energy is required to successfully heat up and strip contaminants from the subsurface while accounting for surrounding heat losses. The model has been refined and calibrated based on research and development and empirical data collected over 20 years from more than 160 ISTR projects.

Applying TRS's proprietary HeatWave® computer modeling services, TRS calculated the power and energy required to heat the Zone A treatment area to desiccation (greater than 100 °C) to achieve RAOs. This model provides calculations for heat input and heat loss to ensure an optimal

application of the technology. Utilizing the energy predictions of the model is one way to track overall project progress and can be used to predict when performance soil sampling should occur. Because the target is to remove all soil moisture and reach desiccation, the starting water content in the target treatment volume is a key parameter. The water content was estimated at 7% based on PEC soil data. In addition to the soil moisture content, the TRS model incorporates other Site-specific information including soil density, porosity, heated-volume surface area, total organic carbon content, soil RELs, elevation, local rainfall, and depth to groundwater. These parameters are combined and compared to empirical information to estimate the total energy needed to meet project goals as well as the rate at which that energy can best be applied.

As Zone A is heated, TCH will transfer some of the applied energy to soils adjacent to the treatment volume and convection will transfer some of the heat to the ground surface above the treatment volume. Approximately 30% of the energy input will be lost. To minimize heat loss, the design includes an insulating barrier overlying the treatment area surface (described in Section 7.2.6). The TRS model also minimized the rate of heat loss by selecting an optimal heater spacing. Tighter heater spacing requires more material and equipment for installation and operations, increases installation time, and generates more soil waste, but lowers operating time and heat loss. The TRS model resulted in a recommended spacing of 12 feet between heaters. This spacing is a balance between consideration of infrastructure costs and achieving sufficient heating while accounting for heat loss.

Once heater spacing was selected, the model evaluated the equipment sizing required to capture and treat the heated vapors. Based on the Site-specific soil parameters, the model estimated a vapor capture radius of influence (ROI) of approximately 35 feet. The design includes collocated vapor recovery screens with each heater. Given the 12-foot spacing of the heaters, the vapor recovery design includes significant ROI overlap for vapor recovery. The recovered vapor will be conveyed to a condensing unit before being conveyed to the RTO. The condensing unit includes two 100-ton cooling towers. The TRS model selected the 200-ton (700-kilowatt) cooling capacity to ensure sufficient cooling is available to condense recovered steam. This steam removal will reduce energy needs and improve the performance of the RTO.

To confirm that operational subsurface conditions are as modeled during operations, a series of subsurface monitoring points will be installed, including 29 temperature monitoring points (TMPs) and pressure monitoring points (PMPs) as shown on Sheets M-17 through M-30 in Appendix E. These locations, shown on Sheet Y-1 in Appendix E, will primarily be adjacent to the soil performance sample locations so that soil results can be correlated with performance operation data. The 29 monitoring locations provide a monitoring point for every 1,000 square feet of treatment area, with at least 2 monitoring locations in each treatment subarea. In addition to the TMP/PMP locations, one in four heater borings will include a temperature sensor casing that will be used to measure temperatures adjacent to the heaters. Heater performance is generally uniform across heaters with similar depths so measurement at a focused number of locations provides sufficient information for operational performance evaluation.

7.2.3 System Layout and Components Overview

The thermal treatment system can be pictured as two integrated systems: the first is the subsurface heating system, and the second is the vapor recovery and treatment system. All system components are controlled through a power control unit (PCU). The PCU is used to provide power to the heaters and to monitor and control the vapor capture and treatment systems. Connected to the PCU are the heater breaker panels. These panels are used as control and isolation points for the heater circuits that are used to raise subsurface temperatures. Each heater circuit will contain multiple individual heaters. The number of heaters in each circuit is dependent upon the depth of heating and the voltage applied to the circuit. The applied voltage to each circuit can be adjusted by the PCU to optimize heating based on field conditions including mass recovery, soil moisture, and soil type.

The subsurface heating system will consist of 288 heaters installed throughout the thermal treatment area in two phases (described further in Section 9.0). The heating system will be monitored by a series of TMPs as described in Section 7.2.5. The vapor recovery and treatment system will consist of 288 collocated vapor recovery screens: 272 shallow vapor recovery screens and 16 deep vapor recovery screens as shown on Sheet Y-2 in Appendix E. The vapor recovery system will be monitored using a series of PMPs as described in Section 7.2.5.

Once the temperature of the soil adjacent to and between heaters begins to increase, contaminants and water will begin to volatilize. During this phase change, heated vapor will migrate upward through convection, and therefore, vapor recovery for thermal systems relies on relatively low flow and applied vacuum to provide a preferential pathway for the newly produced soil vapors to the above-grade treatment system. These vapors include the volatile contaminants as well as soil moisture. Each heater boring will include a collocated vapor recovery screen to recover the generated vapors. Screens will be 3 feet long and 1 inch in diameter with 20 slot screens. Most of the screens will be installed starting at approximately 4 feet bgs. However, 16 locations (at least 1 per subarea), as indicated in Sheet Y-2 of the design package (Appendix E), will be located deeper, near the bottom of the treatment interval. These deep screens are intended to improve capture of deeper mass and were positioned toward the inner portion of the treatment area and approximately equal distance from each other. Total air flow is expected to be between 500 and 1,000 scfm based on the model described in Section 7.2.2, with individual screen capture of 3 to 9 scfm. Vacuum applied at each vapor recovery point is expected to be between 20 and 60 inches of water column. Steam production is modeled at an average of 130 to 190 scfm. The 12-foot spacing of the vapor recovery screens will conservatively provide overlapping coverage for capture between heaters. The screens will be connected to above-grade treatment equipment via a piping manifold. This manifold will be kept under vacuum using a 40-horsepower rotary lobe vacuum blower, which will provide sufficient vacuum and flow to ensure vapor capture and an inward pneumatic gradient to the treatment volume. This pneumatic control will be confirmed at a series of PMPs installed throughout the treatment volume. The vapor recovery screens will be connected to vertical risers that will connect to an above-grade piping manifold. Flow velocity within the manifold piping will be maintained between 2,000 and 6,000 feet per minute by increasing the piping diameter downstream as flow

from additional vapor recovery points is combined. Piping will eventually join into an 8-inch-diameter pipe that will convey the recovered vapors from Zone A to the condensing unit. This velocity is designed to entrain any condensate that forms in the vapor recovery piping so that it can be carried to the condenser knock-out tanks.

The vapor recovery and treatment system is presented in the Process Flow Diagram (Sheet P-3 of Appendix E). A TRS-provided condensing unit will be installed between the piping manifold and the 40-horsepower rotary lobe vacuum blower. The condensing unit is designed to condense the steam produced in the subsurface into a liquid. Two 100-ton cooling tower units will be connected to the condenser and utilize potable water as a cooling fluid. By removing the steam from the recovered vapor, the energy cost for the subsequent contaminant destruction by the RTO is significantly reduced. The condensing unit will also condense high-boiling-point compounds volatilized directly adjacent to the heaters before those vapors reach the RTO. Procedures for managing liquid waste from the condenser is discussed in Section 10.5.

Vapors remaining in the condenser discharge will be pulled through the blower and conveyed to the RTO, which will oxidize the organic contaminants with an efficiency of 98% or greater.

Sensors and gauges will be used throughout the system to monitor proper equipment function and provide operational data.

7.2.4 Electrical Service and Energy Requirements

The TRS HeatWave® computer model described in Section 7.2.2 was used to calculate the energy needed to raise subsurface temperatures to the boiling point of water, the energy needed to desiccate the soils, and the energy needed to overcome the heat losses. Energy estimates were also provided for the operation of the treatment equipment. Preliminary total energy estimates are as follows: 5,100,000 kilowatt-hours (kWh) for subsurface heating and 850,000 kWh to operate the treatment equipment. Energy application will be split between the two sequential operational phases proportional to the volumes of the phases. Each phase is expected to operate for between 140 and 186 days. Power will be delivered to the equipment via a new power drop, located on the west side of Zone A. An electrical single line diagram of the power distribution is provided on Sheet E-1 in Appendix E.

7.2.5 Subsurface Infrastructure

A total of 288 heaters with a typical spacing of 12 feet on center are planned. The heater layout is shown on Sheet Y-3 in Appendix E. Each heater is designed to heat from ground surface to the depth of deepest soil contamination and will extend 5 feet deeper than the target treatment depth. The shallow extent of the heater will begin at grade, where a layer of insulation will be added to reduce convective heat loss and provide thermal protection for staff and equipment at ground surface. Six-inch-diameter soil borings will be advanced to the target depth, and three-inch-diameter carbon steel pipe will be installed. A 2.5-inch stainless steel liner will be inserted in the carbon steel casing. A 1-inch-diameter stainless steel vapor recovery screen will be installed adjacent to the heater casing within the soil boring. Approximately 25% of the heater

borings will also include a small-diameter temperature sensor casing in the soil boring that will consist of a single resistance temperature detector (RTD) that can be adjusted within the vertical profile to confirm optimal heater operations and optimization.

An additional 29 TMPs will be installed within separate 4-inch-minimum-diameter boreholes between heaters to monitor subsurface soil temperatures throughout the treatment volume, as shown on Sheet Y-1 in Appendix E. RTDs will be positioned in the TMPs every 5 feet vertically to the bottom of the treatment area in each subarea as shown on Sheets M-17 through M-30 in Appendix E. These 29 TMPs will be located at or near the center point between adjacent heaters such that the location of the TMP will be the furthest location from all adjacent heaters. This will provide a measurement of the coolest soil locations within the treatment area to help ensure desiccation has been achieved throughout the treatment volume.

Each of the 29 TMPs will have a shallow collocated PMP that will include a 1-inch-diameter, 1-foot-long screen positioned at 2 feet bgs, for subsurface pressure monitoring. In addition, 9 of the TMP/PMP borings (one in each subarea) will have a deep collocated PMP positioned 17 feet below the bottom of the treatment volume and a temperature sensor installed at 20 feet below the bottom of the treatment depth. This design depth corresponds to the modeled depth outside the expected area of normal conductive heat transfer. Cross sections of these borings can be found on Sheets M-18, M-20, M-22, M-24, M-26, M-28, and M-30 in Appendix E. Because heat is the driving force for volatilization and mass recovery, the applied vapor recovery flow rate will be high enough to capture vapors volatilized by heating, but not so high as to cool the soils. If positive pressure, not vacuum, is observed at these locations, adjustments to vapor capture and heat input will be made to improve pneumatic control within the treatment volume. A zero pressure or negative pressure measurement at the PMPs indicates sufficient capture is being achieved.

7.2.6 Temporary Insulating Cover

An interim cover will be installed to provide a suitable working surface for constructing and operating the TCH treatment system and will act as an insulating barrier to aid in heat retention during treatment and prevent emission of vapors to air.

The interim cover will be designed as follows:

- The interim cover will consist of a moisture barrier (e.g., high-density polyethylene liner or similar) overlying the current gravel working surface and covered with aerated, cellular concrete ranging from approximately 12 inches (R19 insulation value) to 15 inches thick (R24 insulation value), as shown on Sheet M-31 of Appendix E.
    - The surface will be sloped to facilitate stormwater drainage.
    - The moisture barrier is intended to protect the integrity of the cellular concrete during the initial heating phase, which is expected to produce steam.
    - A 2-inch layer of structural hard concrete will be added to the surface (above the cellular concrete) to facilitate movement and support of drill rigs for performance and confirmation sample collection.

- The lateral extent of the cellular concrete cover will extend approximately 10 feet beyond the treatment zone and will insulate the halo of heat extending 5 to 8 feet beyond the lateral extent of heaters.
- Areas of Zone A that do not require ISTR (i.e., are outside of the thermal treatment area) will remain graded and covered with gravel for surface stabilization until the final Zone A cover is placed after completion of ISTR.

7.2.7 Surface Components

The electrical and fluid conveyance materials will be installed above the insulating layer and connected to the treatment equipment. Steel piping will be used to transfer vapors and condensed liquids to the condensing unit. Outdoor-rated diesel locomotive (DLO) or Type W cable will be used to transmit power to the heaters and to the treatment equipment. Water lines containing pressurized and potentially contaminated water will be housed either within double containment piping or within a secondary containment berm. All tanks containing potentially contaminated fluids will include secondary containment and ventilation. Signal wires will be placed generally parallel with the vapor recovery piping and/or the power cables. Egress routes over or around the piping and cables will be provided to ensure safe movement of works as well as access for the drill rigs used for performance and confirmation sampling.

7.2.8 RTO Modifications and Contingency Planning to Support ISTR

Modifications to the RTO to accommodate the thermal treatment system are minor. The air flow will generally remain the same, with a maximum expected mass loading of only 60% of what was modeled in the most recent RTO permit. Integration with the TRS control system will be required to ensure that a fault in the RTO operations will signal a shutdown of the heating system. These interlocks will prevent continued energy input to the heating system until proper vapor capture and treatment can be confirmed. The RTO will run continuously regardless of whether the thermal system is operational.

Long lead replacement parts for key system components, such as heater components and power distribution cables, will be held on-site or at the TRS warehouse to help ensure minimal interruption of operations.

The oxidation will generally produce carbon dioxide and water, but some compounds that contain chlorine and fluorine will be released into the atmosphere from the RTO. Expected releases from the RTO during the thermal system operation were modeled as part of ISTR design to be less than the releases included in the air dispersion modeling provided by Landau and Associates as part of the original air permit for the RTO (refer to Section 6.2). The Landau model indicated that releases from the RTO will be below threshold values.

To take full advantage of the existing treatment infrastructure, the TCH system blower will discharge into the existing SVE system piping located beneath Dietrich Road, which previously conveyed vapor from the vertical Zone A vapor extraction wells. The downstream vapor and

liquid processing will remain unaltered from the currently operating SVE system other than being interlocked with the operations of the thermal system.

7.2.9 RTO Operation and Maintenance Plan Addendum

The existing RTO O&M Manual (PBS 2017) describes start-up testing procedures, anticipated flow rates during routine operations, periodic flow adjustments and optimization measures, and routine gas/vapor monitoring to assess the ongoing performance of the in situ thermal treatment operations. Influent gas/vapor composition and loading also needs to be monitored and regulated to ensure that RTO emissions would not violate existing air quality permit requirements stipulated in Approval Order 16AQ-E031. The existing RTO O&M Manual was reviewed to ensure it meets the requirements of the amended permit requirements included in the final RTO permit modification (Appendix D). An RTO O&M Manual Addendum was prepared by PBS to reflect minor changes and is included in Appendix G.

7.3 THERMAL CONDUCTIVE HEATING SYSTEM OPERATION PARAMETERS

Operation of the thermal system will be monitored and optimized based on energy input compared to the modeled input, extent of desiccation via temperature monitoring, and mass recovery. Monitoring and analysis of these operation performance metrics is described in Section 5.1 of the Compliance Monitoring Plan (CMP) in Appendix F.

A subarea may be determined to be ready for performance sampling prior to reaching all the targeted operation performance metrics (modeled energy target, complete desiccation, or vapor stream asymptote) if one or more parameters have been met and other indicators including historical data suggest that the criteria might be met.

7.4 GREEN AND SUSTAINABLE REMEDIATION COMPONENTS

Green and sustainable cleanup considerations are increasingly being integrated into cleanup programs, including under MTCA in Washington. *Sustainable Remediation: Climate Change Resiliency and Green Remediation* (Ecology 2023) is a Washington-specific resource to incorporate resiliency into the selected cleanup remedy. In accordance with green and sustainable remediation (GSR) principles, Best Management Practices (BMPs) related to the five core elements of energy, air, water, land/ecosystems, and materials/waste should be considered to reduce the project's net environmental footprint in ways that are consistent with applicable statutes and regulations. Common GSR BMPs that may be incorporated into design of a cleanup action include the reduction of waste generation, optimization of material use or reuse, minimization of impacts to resources, minimization of air pollutants, and positive economic impact to the local community.

The environmental "footprint" associated with ISTR in Zone A has been reduced by incorporating the following GSR BMPs into the design.

- Thermal remediation, although energy intensive, provides a rapid, controlled, and thorough solution to contaminant recovery. Most of the power generated by the local

utility (greater than 90%) is produced by renewable energy sources including hydroelectric, wind, and solar.

- As part of the interim remedy for Zone A, an SVE system has been in operation for more than 2 decades. The RTO associated with this system remains in good working order and offered a viable treatment method for the vapors recovered by the thermal system. To take advantage of the existing RTO system, the thermal treatment volume has been split into two operational phases (refer to Section 9.0) to optimize the mass loading to the existing RTO. By utilizing the equipment already in place, significant savings in material consumption, cost, and time have been achieved.
- Water usage by the project is relatively minor and is related predominantly to the two cooling towers of the condensing unit. By condensing out the water vapor from the recovered vapors, the natural gas consumption of the RTO is significantly reduced. The water usage in the cooling towers is offset by the reduced fuel consumption and greenhouse gas release that would be required to heat the water vapor to temperatures up to 1,650 °F in the RTO.
    - The recovered steam will be condensed above grade, and the project team plans to utilize the treated condensate water on-site for the purposes of dust control and irrigation of on-site vegetation (via discharge to the existing stormwater swale in Zone A).
- The ISTR phased approach (refer to Section 9.0) will allow for reuse of materials and equipment between phases. Smaller treatment equipment sizing reduces mobilization costs. Reuse of vapor recovery piping and some heater materials will also reduce material usage. At the end of the project, the stainless-steel liners, RTDs, and heater components will be removed and either reused or recycled, as will the above-grade metal piping.
- By minimizing the removal and transport of contaminated soil, ISTR reduces the risk of human exposure. The on-site destruction of the volatile contaminant mass in the RTO and the collection of the condensable fraction of recovered vapors for off-site disposal will significantly reduce the volume of contaminated soil that would have been transported via trucking off-site if excavation were conducted. Excavation and removal of the design ISTR treatment volume of 25,900 cubic yards would have required approximately 860 truck trips with 30-cubic-yard roll-off containers.
- Another method employed in the design to reduce the spread of contaminant mass is the installation of the insulative surface barrier. This insulation not only prevents water infiltration during the thermal treatment, but it also significantly reduces convective heat loss at the surface, accelerating the thermal treatment and preventing migration of contaminant mass. As an added benefit, the interim surface cover will remain in place after heating has concluded. By leaving the interim cap in place, off-site waste is reduced, and the functionality of the post-thermal cap will be improved.

8.0 ISTR Planning and Management

The IWAG is responsible for performing the work described in this EDR as required under the EO, including operating and maintaining the Zone A cleanup action. The IWAG has an access agreement with the landowners to access the property and implement the Zone A cleanup action. Specific details regarding the planning and management for ISTR in Zone A are included in this section.

8.1 ROLES AND RESPONSIBILITIES

The IWAG is responsible for performing the work described in this EDR as required under the EO. Ecology will provide regulatory oversight for the cleanup action implementation. The IWAG, IWAG's consultants, the selected ISTR contractor, and Ecology will be involved in the implementation of the project. The IWAG is the contracting party and is ultimately responsible for the performance of the work.

These roles and responsibilities are more specifically described below.

- **IWAG** has overall responsibility for managing the project, including the following:
  - Review of the EDR and design
  - Retaining and managing consultants and the ISTR contractor
  - Liaison with Ecology
  - Participation in project meetings
  - Community relations
  - ISTR performance and financial management
  - Ensure that implementation of the EDR complies with the CAP and SOW
- **Ecology** will provide regulatory oversight and support for cleanup action implementation, including the following:
  - Review and subsequent approval of the EDR and design
  - Provision of written comments for reviewed documents
  - Participation in project meetings
  - Community relations
- **IWAG's Consultants**
  - Project management including performance assessments of the ISTR contractor
  - Liaison with Ecology
  - Project administration and coordination
  - Preparation and review of project documents
  - Facilitate and participate in project meetings

  - Providing ISTR design, construction, and operation oversight and health and safety program compliance
  - Ensure that implementation of the EDR complies with the CAP and SOW
  - Documentation of the work, including review of the ISTR contractor operations and performance
  - Ensuring compliance with ARARs and substantive requirements of permits
  - ISTR performance testing, including soil sample collection, to determine the sufficiency of ISTR operation
  - Community relations in coordination with Ecology
- **ISTR Contractor**
  - ISTR implementation, including system installation, O&M, and monitoring in compliance with the EDR, CAP, and SOW
  - Documentation of work
  - Management of subcontractors
  - Coordination with IWAG's consultants
  - Participate in project meetings
  - Overall health and safety program management and implementation during ISTR
  - Compliance with substantive requirements of permits

TRS has been retained by the IWAG as the ISTR contractor for implementation of ISTR in Zone A, including installation and O&M of the ISTR system. Contractor oversight will be performed by IWAG consultants (Floyd|Snider and PBS) personnel familiar with the Site activities. Installation and operation of the ISTR system will be performed under the oversight of a professional engineer registered in the State of Washington or a qualified technician under the direct supervision of a professional engineer registered in the State of Washington.

8.2 CONTACT INFORMATION DURING ACTIVITIES

The contact information for IWAG, Ecology, IWAG's consultants, and the ISTR contractor for the Zone A ISTR is below.

IWAG
IWAG Group III
c/o Nick Garson, P.G.
Chair, Technical Committee
(425) 269-7866

Ecology
Washington State Department of Ecology Jeremy Schmidt, P.E.
Ecology Site Manager
(509) 724-1164

IWAG's Consultant: Floyd|Snider
Jessi Massingale, P.E.
Project Manager/Coordinator
(206) 292-2078

IWAG's Consultant: PBS
Lance Moen, P.E.
Project Manager
(503) 248-1939

IWAG's ISTR Contractor: TRS
Chad Crownover, P.E.
Managing Principal Engineer
(360) 560-4853

Additional contact information will be provided in the ISTR contractor's Health and Safety Plan (HASP) that will be completed prior to ISTR implementation. The information will include the ISTR contractor's main points of contact and stakeholders such as first responders and local authorities.

8.3 ACCESS AND NOTIFICATIONS

Access to the landfill property, specifically for the Zone A property and extent of ISTR supporting ancillary operations and power service, is granted under the Access and Land Use Agreement between the IWAG and PSLI. Continued access is granted for all remedial activities required by the EO, including the work described in this EDR. Advanced notice will be provided to the landowner prior to initiating ISTR activities described in this EDR, and the landowner will continue to review project updates during ISTR.

8.4 PERMITS AND EXEMPT PERMITS

The post-excavation ISTR portion of the Zone A cleanup action must comply with local, state, and federal laws, identified as applicable or relevant and appropriate requirements (ARARs) for this project in Tables 4.4-1 and 4.4-2 of the FFS and further evaluated as part of this EDR development. Table 8.1 has been updated from the FFS tables and includes the ARARs for Zone A ISTR.

Because implementation of the cleanup action for Zone A is being conducted with Ecology oversight in accordance with MTCA, it is exempt from certain procedural and permitting requirements of select Washington laws and regulations and all local permits (WAC 173-340-710(9)(b)). However, implementation of the cleanup action must comply with the substantive requirements of any otherwise applicable permits. This portion of the cleanup action will comply with the ARARs identified for ISTR and will meet the substantive requirements identified in Table 8.1.

This section identifies applicable permits for the ISTR system installation and operation activities and identifies whether permits will be obtained or if requirements will be met through substantive equivalence. No separate federal approvals or permits are anticipated to be necessary for the implementation of the cleanup actions at the Site.

The following state approval has already been received for this work:

- State Environmental Policy Act Determination of Non-Significance, issued by Ecology on August 27, 2019

The following state approvals or permits will be obtained prior to initiating work:

- Ecology's approval of the EDR.
- The existing RTO operates in accordance with an air discharge permit issued by Ecology's AQP as described in Section 6.2. An NOC for modification to the existing RTO permit for ISTR operation was submitted to Ecology via email on April 4, 2023. The final RTO permit modification issued by AQP in September 2023 is included in Appendix D.
- State-issued electrical permit will be applied for prior to initiating the work, and approval will be received prior to electrical connection.

8.5 UTILITIES

The following coordination with local utilities is anticipated prior to initiating this work.

The thermal system will require a maximum of 1,200 kilowatts to power the heaters and associated vapor and liquid treatment equipment. A preliminary total estimate of 5,100,000 kWh will be needed to heat the subsurface with an additional 850,000 kWh to operate surface equipment.

To reduce the volume of water vapor and other condensable vapors from reaching the RTO, TRS will utilize a heat exchanger. The cooling water for the heat exchanger will be provided by two 100-ton cooling tower units. These units will utilize potable water as a cooling fluid and will require a service capable of at least 5 gallons per minute (gpm) for makeup water to replace evaporated water. The water will be softened on-site prior to use in the cooling towers to reduce mineral buildup within the equipment. An estimated total of 400,000 gallons of makeup water are anticipated as part of system operations.

Condensed steam (anticipated at 1.5 gpm), blowdown water from the cooling towers (anticipated at 0.25 and 0.5 gpm), and brine discharge from the TRS water softener will be developed during operations. The condensed steam will be treated by on-site liquid-phase granular activated carbon (LGAC) prior to discharge, and the blowdown water from the condenser and water softener do not contact the process stream. Because no direct sewer access is available on the property, the water will either be beneficially reused on-site for irrigation and

dust control if water reuse criteria are met or will be transported by tanker to the nearest approved sewer access point.

Natural gas will be used to fuel the RTO. This service is already in place. Usage during startup conditions will be 750 standard cubic feet per hour (scfh), with normal operations at 75 scfh. Total anticipated heat load from the RTO is 668 million British thermal units per year.

No buried utilities are known to exist within the heated volume. Any utilities more than 30 feet outside the treatment volume will not be adversely impacted by the thermal treatment, including the gas line crossing the southwest corner of Zone A. The existing horizontal SVE wells (VEW-06H and VEW-07H) are stainless steel and will not be adversely affected during ISTR. Both wells will remain in place during ISTR but will be disconnected from the subgrade piping crossing Dietrich Road using a bypass valve.

8.6 SITE PREPARATION, SITE CONTROLS, AND SECURITY

Site preparation for ISTR at Zone A is described in detail in Section 9.0 of this EDR. Site controls and security are addressed in the ISTR Contractor HASP described in Section 3.0 of the CMP in Appendix F.

The existing perimeter fence will be used to secure site access. Within that fence, motion sensors and cameras will be used to monitor the site perimeter. Notifications to TRS staff and/or local law enforcement will be provided 24 hours a day in the event of a perimeter breach.

The TRS condensing unit will be positioned within a secondary containment berm, as will any fluid holding tanks. These secondary containment berms will include level sensors to monitor for accumulation of fluids and will be interlocked to send an alarm and cease fluid production/transfer if a high level is detected. The TRS treatment system will be accessible remotely so that system equipment and the site perimeter can be monitored while personnel are not on-site. Notifications of equipment alarm conditions and security breaches will be sent to TRS personnel who will attempt to resolve issues remotely when possible but will travel to the Site as needed to address site needs.

Fire extinguishers and first aid supplies will be in work areas, and an automated external defibrillator will be housed within the TRS equipment compound (specific location within Zone A to be determined). Emergency stop buttons will be located at site entrances and the TRS equipment compound to allow for a quick disconnect of power to the heaters in the event of an emergency.

Site access will require on-site training and a review of the site HASP. Visitors will be logged and signed in on the daily safety tailgate form.

8.7 ENGINEERING OVERSIGHT

Consistent with WAC 173-340-400(6)(b)(i), all aspects of the Zone A ISTR will be performed under the oversight of a professional engineer registered in the State of Washington or a qualified

technician under the direct supervision of a professional engineer registered in the State of Washington.

8.8 CONTINGENCY PLAN AND EMERGENCY RESPONSE COORDINATION

A Contingency Plan that included coordination with local emergency response management and fire department personnel was included as Appendix B.2 of the Zone A Removal Action EDR. The Contingency Plan was updated for ISTR and is discussed in more detail in Section 11.0 and is included in Section 4.0 of the CMP provided in Appendix F.

A thorough review and inspection of equipment and interlocks will occur prior to full operations of the ISTR system. Each piece of equipment will be tested to ensure proper function, and any repair or maintenance will be performed. In addition, each alarm condition and system interlock will be tested to ensure alarm notifications are sent and that the desired equipment interlocks affect the required responses. These tests include flow, temperature, and pressure readings on the air and liquid process equipment, as well as function tests of system float switches and security alarms. Confirmation of sufficient and properly functioning first aid supplies and spill control materials will also occur during system commissioning.

During the system commissioning, TRS will coordinate with local first responder organizations to provide a tour of the site and training on the system. This training will include a description of site hazards as well as the interlocks associated with system components. The emergency stop button locations will be highlighted as well as the main power disconnect switches for the Site and individual pieces of equipment. Contact information will be posted on-site if site access or system support is needed while TRS personnel are not on-site.

In the event of an emergency, personnel will gather at the existing site office trailer on the west side of Dietrich Road.

9.0 ISTR System Installation

ISTR system installation will occur in two overlapping phases (Phase 1 and Phase 2) to optimize equipment and material utilization. Once drilling and installation of the subsurface components for Phase 1 is completed, the Phase 1 insulating cover and components installation will begin as drilling continues in the Phase 2 area to install the heater and temperature sensor casings and vapor recovery screens. Phase 1 operation is expected to include subareas A6 through A9, and Phase 2 operation is anticipated to include subareas A1 through A5 (Figure 7.1). When operation of Phase 1 concludes, materials and infrastructure from Phase 1 will be transferred to the Phase 2 area. Phase 1 decommissioning activities will be completed prior to startup activities in Phase 2. As operations continue in Phase 2, Phase 1 demobilization activities will be completed, and temporary barriers will be used as needed to distinguish work areas.

9.1 SUBSURFACE SYSTEM COMPONENT DETAILS

The subsurface components of the ISTR system described in Section 7.2.5 will consist of heaters with collocated vapor recovery screens, collocated temperature sensor casings at 25% of the heater locations, TMPs with collocated PMPs, and existing subsurface horizontal SVE piping leading to the RTO. Details for the installation of these system components are described in the following sections.

9.1.1 Heater and Vapor Recovery Installation Details

The subsurface heating system will consist of 288 heater locations installed throughout the thermal treatment area that will operate in two sequential phases. When Phase 1 operation is complete, the heaters will be removed from the casings and transferred to the Phase 2 heater locations.

The heaters will be installed within 6-inch-diameter boreholes advanced using rotosonic drilling methods. Borehole depths will range from 20 to 33 feet bgs based on the subarea depth. The bottom 3 feet of annular space around each heater casing will be filled with grout to prevent the risk of downward NAPL migration in the bottom of the boring. The remaining space up to 1 foot bgs will be filled with coarse sand, and the top 1 foot of the borehole will be filled with grout. Approximately 25% of the heater boreholes will include a small-diameter temperature sensor casing. Cross sections of the heaters are provided on Sheets M-1 through M-16 of Appendix E.

In 272 of the heater boreholes, a 3-foot-long slotted stainless steel shallow vapor recovery screen will be installed within the sand interval. Deeper vapor recovery screens will be placed toward the bottom of the treatment interval at 16 heater locations across the thermal treatment area to increase vapor capture in deeper soil layers. The vacuum applied to the vapor recovery screen will allow the sand to act as a vapor capture zone. Additional information on the vapor screens, total flow rates, and system components is provided in Section 7.2.3.

9.1.2 TMP and PMP Installation Details

The TMPs will be installed within 6-inch-diameter boreholes advanced using rotosonic drilling methods. These TMPs will be tremie-grouted for the entire length of the borehole, other than a 5-foot zone from 2 to 7 feet bgs where sand will be backfilled for installation of a PMP. A stainless-steel screen for the PMP will be installed within this sand layer and will be utilized to measure subsurface pressure during TCH system operations. In nine of the TMP/PMP borings (one in each subarea), a deep collocated TMP/PMP will be installed below the bottom of the treatment area. These deep TMP/PMP points will be positioned 20 feet below the designed ISTR radius of influence to verify vapor capture and protection of groundwater beneath the treatment area and will share the same borehole as the shallow TMP/PMPs. Grout will extend from the bottom of the shallow PMP to 5 feet above the bottom of the borehole (15 feet below the treatment depth) and the bottom 5 feet of the borehole would be backfilled with sand. The deep temperature sensor will be installed 20 feet below the bottom of the treatment area and the deep PMP screen will be installed from 17 to 18 feet below the bottom of the treatment volume within the sand interval. Cross sections of the TMPs are provided on Sheets M-17 through M-30 of Appendix E.

9.1.3 Subsurface Existing SVE Piping Reuse

A bypass valve will be installed onto the existing subgrade SVE piping that connects the horizontal extraction wells to the belowground moisture separators (BGMS), and the section of SVE system piping running beneath Dietrich Road from the BGMS (previously used for the vertical extraction wells) will be connected to the thermal system blower discharge to facilitate transport of extracted vapors to the existing RTO. This routing will ensure continued use of the BGMS to collect any condensed liquids. These liquids will be collected and processed on-site as discussed in Section 10.5.

The bypass valve will disconnect the horizontal SVE piping beneath Zone A (VEW-06H and VEW-07H) from the RTO system during thermal system operations but this piping will remain in place until the conclusion of thermal system operations. By leaving the screen and piping in place, combined with the addition of the bypass valve, a potential supplemental vapor capture infrastructure will be preserved that could be utilized either during or after ISTR.

9.2 INTERIM COVER INSTALLATION SEQUENCING

The objective of installing the interim cover for ISTR is to provide a suitable working surface for constructing and operating the TCH system that will act as an insulating barrier to reduce heat loss at the top of the treatment volume. The interim cover will also prevent potential exposure to emissions generated during ISTR. The interim cover will consist of a moisture barrier (e.g., high-density polyethylene liner or similar) overlying the graded working surface and covered with cellular concrete ranging from approximately 12 to 15 inches thick, as shown on Sheet M-31 in Appendix E.

The interim cover installation sequencing is as follows:

- After Ecology's approval of the thermal system design described in this EDR, the in situ thermal wellfield will be installed. Any additional grading that is necessary will be

completed by a TRS subcontractor concurrent with or prior to drilling and installation of the wellfield (note: this will likely be minimal, if necessary).

- Because the cellular concrete design mix includes the entrainment of air to increase its insulation value, it does not have the same strength as standard concrete and is prone to damage from heavy equipment. Therefore, the wellfield installation will be completed by a driller prior to installation of the interim cover. This will allow access for a drill rig, minimize coring of new concrete, and prevent potential damage to the interim cover that would be difficult to repair once the wellfield is installed.
- After the wellfield installation is complete, then the interim cover, which will consist of a moisture barrier and cellular concrete layers and standard-strength concrete surface, will be installed by a TRS subcontractor.
    - The cellular concrete will be sprayed onto the liner surface in a 12- to 15-inch layer. The interim cover is designed to match the slope of the existing grade to facilitate drainage of surface water into the existing stormwater drainage swale to the southeast of Zone A.
    - A 2-inch layer of standard-strength concrete will be installed on the surface of the aerated concrete to facilitate access for the drill rigs used during soil performance sampling.
- Field conditions including weather and subcontractor availability will dictate whether the surface cap is installed separately for Phase 1 and 2 or in one step. If the cover is installed in two phases, then installation in the Phase 1 area will begin while drilling is ongoing in the Phase 2 area.
- After the concrete has cured, the heaters and associated manifold piping will be installed by TRS.

9.3 SURFACE COMPONENTS

Surface components include the vapor recovery manifold, communication and power cables, power distribution equipment, and vapor and liquid treatment equipment. The vapor recovery manifold will be constructed from steel pipes of varying size dependent on the expected flow rate. The piping is designed to maintain a flow velocity sufficient to propel any condensed vapors to a knockout tank in the condensing unit. This flow velocity was estimated to be between 2,000 and 6,000 feet per minute based on modeling. Piping will be elevated as necessary to ensure drainage toward the condensing unit. Electrical cables will be routed adjacent to the piping routes to reduce tripping hazards.

9.4 EQUIPMENT MOBILIZATION

The TRS PCU, condenser, and blower are all skid-mounted units and will be shipped to the Pasco landfill by truck. The equipment will be offloaded by crane or forklift and put into position as shown on Sheet Y-4 in Appendix E. Equipment will be placed on wood cribbing to ensure the equipment is level and raised above potential standing water during storm events. The condenser

will be placed in a secondary containment berm to ensure control of potential spills or leaks. Water in the secondary containment will be monitored with a high-level alarm to alert TRS staff in the event of release.

9.5 WASTE MANAGEMENT

It is expected that investigation-derived waste (IDW) generated as part of drilling for heater and TMP installation will include approximately 200 tons of soil cuttings. Soil will be temporarily stored in roll-off bins prior to off-site transport and disposal at Chemical Waste Management (CWM) in Arlington, Oregon. Existing Corrective Action Management Unit (CAMU) profiles[9] obtained for the Zone A Removal Action will be renewed with CWM for off-site soil and NAPL associated with the condensate generated as part of ISTR.

Both solid and liquid waste will be generated during system operation. Solid waste will include spent personal protective equipment, water filters from the condensing unit, spent LGAC, and potentially vapor-phase granular activated carbon (VGAC). Liquid waste will be generated from steam passing through the condenser and will be pumped into a tank containing a series of weirs to separate NAPL from water. Depending on the volume of NAPL recovered, it will be either drummed or pumped into a tanker truck for off-site disposal at CWM under existing Zone A CAMU profiles. The water passing through the weir will be treated by an LGAC system consisting of two 500-pound vessels in series prior to on-site reuse or off-site disposal (refer to Section 10.5). Spent LGAC or VGAC will be characterized prior to disposal or regeneration off-site. Discharge from the ISTR blower will be routed below grade through the existing BGMS. Condensate recovered in the BGMS will be pumped to the existing SVE system holding tanks for characterization and off-site disposal as is currently occurring with the SVE operations. All liquid transport piping and holding tanks will be provided secondary containment to prevent uncontrolled release.

Performance and confirmation soil sampling will generate additional soil waste. The soil cuttings will be drummed or placed into a roll-off bin for temporary storage prior to transport off-site for disposal under the existing CAMU profiles.

9.6 PROPOSED SCHEDULE FOR CONSTRUCTION AND IMPLEMENTATION

After approval of the EDR, it is expected that up to 2 months will be needed to mobilize materials and for drilling to begin. Subsurface installation is expected to take 2 to 3 months, assuming two drill rigs operating 5 days per week. The surface installation of Phase 1 will likely begin as drilling of Phase 2 is ongoing. Overall surface installation is expected to take 5 to 6 months but will not be successive, as much of the surface installation of Phase 2 will begin after completion of Phase 1 operations. Sequencing for installation of subsurface and surface components in Phase 1 and Phase 2 areas is dependent on field conditions and subcontractor availability. Operations for each

[9] Existing profiles that will be renewed include OR344989: CAMU Waste, OR348553: CAMU & TSCA Waste (PCBs >50 ppm), OR345090: D001 Ignitable liquid/sludge, OR344979: D002 Corrosive liquid/sludge (pH <2), OR344980: D002 Corrosive liquid/sludge (pH >12.5), and OR344981: D003 Reactive for sulfur/cyanide liquid/sludge.

phase are expected to take 5 to 6 months for a total of 12 to 14 months, assuming a gap for start-up of Phase 2 operations. Demobilization is expected to take 2 to 3 months, assuming most of Phase 1 area demobilization can occur concurrently with Phase 2 operations. The overall timeline from EDR approval to final demobilization is expected to be 18 to 22 months.

10.0 Operation, Maintenance, Monitoring, and Reporting

The ISTR system is expected to operate in two phases (Phase 1 and Phase 2) each for 5 to 6 months. A 1- to 2-month gap in heating will occur between Phase 1 and 2; however, vapor capture will continue for at least 2 weeks in the Phase 1 area after heating there has concluded and before start-up of the Phase 2 area heating system. Similarly, vapor capture operations will also continue for at least 2 weeks in the Phase 2 area after heating there has concluded.

A draft ISTR Vapor Recovery (VR) System O&M Manual that describes the updates made to the current SVE system to support ISTR operations will be prepared in accordance with the RTO permit modification Approval Order No. 23AQ-E033 (Appendix D). The draft ISTR VR System O&M Manual will be submitted to Ecology for review and approval and will be finalized prior to ISTR system start-up.

10.1 SYSTEM START-UP AND TESTING

Once system installation is complete for Phase 1, TRS will perform system start-up and testing over 2 weeks. Testing of interlock systems, equipment control function (both local and remote), temperature and pressure sensors, and security systems will be performed prior to system start-up. The vapor recovery blower will be operated prior to turning on the heaters to ensure proper operation and flow rate. The condenser function and interlocks will also be tested prior to applying power to the heaters. A thorough inspection of the RTO and associated liquid-handling equipment will be performed in addition to the routine RTO maintenance activities. Once proper vapor and liquid treatment functionality have been established, heater function will be confirmed through current and grounding surveys. Once all systems are confirmed to be in proper working order, power delivery and unattended operations will begin. This startup testing will be performed again for the Phase 2 system for any newly installed or configured components.

10.2 SYSTEM OPERATION, MAINTENANCE, AND CONTINGENCIES

After the conclusion of startup testing, operations of the vapor recovery and treatment system and heaters will be continuous other than system optimization, routine maintenance, or repair. Vapor and liquid treatment will continue for at least 2 weeks after heating activities in Phase 1 have concluded, which will provide sufficient cooling within the Phase 1 area. During the transition between Phase 1 and 2 operations, there will be a temporary shutdown of the vapor and liquid treatment systems while piping and cables from Phase 1 are moved to the Phase 2 area. During this temporary shutdown, the breathing zone will be monitored, and portions of the Phase 1 vapor recovery system will remain in place in the event vapor mitigation is necessary. Any necessary equipment maintenance (including the RTO) will be performed during this interim shutdown period. Confirmation of system and interlock function will be confirmed prior to start-up of Phase 2 operations. After conclusion of Phase 2 heating, the vapor and liquid treatment systems will continue to operate for at least 2 weeks prior to system shutdown.

During thermal operations, the performance of the RTO will be monitored, including indicators that contingency action may be needed. There will be two VGAC vessels on standby to facilitate short-term vapor capture from Zone A should a temporary shutdown occur. The cellular concrete interim cover will also provide protection of the breathing zone above the treatment volume.

If the RTO shuts down during active subsurface heating, then power input to the heaters would be reduced to zero over a period of a few hours to minimize potential damage to the heaters associated with an immediate shutdown. This reduction in power and eventual heater shutdown will significantly reduce the production of steam, and vapor and mass transport is expected to be minimal. The flow rate would be reduced but still functioning to capture residual vapors. Power to the heaters would remain off until RTO function is restored. There will be two VGAC vessels on standby to facilitate short-term vapor capture from Zone A should a temporary shutdown occur. The cellular concrete interim cover will also provide protection of the breathing zone above the treatment volume.

If there is a longer-term RTO shutdown or catastrophic failure,[10] then TRS will mobilize one of their RTOs with sufficient treatment capacity to the Site. As this scenario would necessitate a full ISTR system shutdown, interim protection measures will be coordinated with Ecology.

If the blower shuts down during active subsurface heating and the RTO remains functional, then one of the two existing Zone A SVE blowers will be used until the ISTR blower function is restored or a replacement blower owned by TRS is mobilized. Bypass valving will be installed to facilitate this shift in operation, which will minimize system downtown.

10.3 VAPOR RECOVERY, MONITORING, AND TREATMENT

Monitoring associated with vapor recovery and treatment will include temperature, flow rate, pressure, and contaminant concentration (measured using a PID). These parameters, which are more specifically described in Section 5.1 of the CMP, will be used to ensure safe and sufficient capture is being maintained.

Temperature measurement before and after the condenser and before and after the blower allow for quantification of proper equipment function, as well as a safeguard against equipment damage. Interlocks associated with temperature will alert operators to conditions outside of expected ranges and will automatically cease equipment operations if temperatures exceed safety thresholds.

Vapor flow rates will be calculated by using differential pressure gauges on pitot tubes after the condenser and after the blower. These readings, along with temperature and pressure measurements, will be used to calculate the flow of vapors within the system. The flow rate and PID readings collected from the ISTR blower discharge will be used to calculate VOC mass

[10] This is an unlikely scenario as the RTO has been performing well and has not had a significant shutdown (no more than 3 days) during its operational lifespan.

recovery and discharge and will also be used to ensure compliance with the RTO permit discharge limits.

By monitoring the concentration of contaminants in the vapor stream, the project team can observe how subsurface temperatures and energy input are impacting the rate of mass recovery. PID readings will be collected at the blower discharge to monitor concentrations, and vapor samples will be collected to monitor treatment progress, the effectiveness of the RTO, and compliance with the RTO permit modification.

A primary mechanism to ensure sufficient capture is to monitor pressure within the vapor recovery piping as well as the subsurface. Subsurface pressure will be monitored at the PMPs. If pressure readings are at zero pressure or at a slight vacuum, sufficient capture is being maintained. If positive pressures are observed, adjustments to the vapor capture system will be made until pneumatic control can be improved. Pressure readings from within the vapor recovery piping manifold will be monitored to ensure a vacuum is observed. If the manifold loses vacuum, the power to the heaters will be lowered until the vacuum is reestablished.

10.4 ELECTRICITY CONSUMPTION

Consumption of electricity will be a primary metric used to measure treatment progress. The PCU will contain an energy meter that will track total energy used for subsurface heating. The local utility will provide utility usage meters that measure energy use of the RTO system as well as the total energy usage of the heaters and other vapor and liquid treatment equipment. The difference between the PCU reading and the utility meter readings will represent the energy used by the vapor and liquid treatment equipment.

10.5 CONDENSATE TREATMENT AND ON-SITE REUSE

It is expected that heating above 100 °C and desiccation of the treatment volume will be necessary to achieve the RAOs. The soil moisture removed as steam will be transported through the vapor recovery system to the condensing unit. A plate and frame heat exchanger will be used to condense the steam. The condensate will be pumped to a gravity weir tank where NAPL will be separated and removed. Condensate production is expected to average approximately 1.5 gpm and is not expected to exceed 5 gpm. The water passing through the weir tank will be routed through an on-site LGAC system for treatment to ensure treated water (effluent) concentrations meet the on-site reuse criteria or off-site discharge requirements. The water treatment system will consist of two 500-pound LGAC vessels plumbed in series that will be staged within a secondary containment area. Refer to Section 5.2 of the CMP (Appendix F) for additional details.

Given the lack of direct sewer access on-site, the goal is to reuse the treated water on-site for the purposes of dust control and irrigation via discharge to the existing stormwater swale in Zone A. If treated water does not meet the on-site reuse criteria, then the treated water will be routed back through the treatment system and retested. If on-site criteria are not met after

retreatment, or there is not sufficient capacity for retreatment, the water will be profiled for off-site disposal at a permitted facility.

10.6 TREATMENT SYSTEM OPTIMIZATION

Heat input is the driving force for contaminant mass removal. Delivery of heat can be optimized by reducing heat losses, which can be achieved by optimizing vapor capture, maximizing heater performance, increasing uptime for equipment, and accelerating performance soil sampling.

Heat loss will be continuous throughout operations as the higher temperature of the treatment volume will create a gradient for heat transfer away from the treatment zone. Heat loss at the surface will be reduced through the installation of the insulating concrete cap over the treatment volume. In addition, heat loss can be controlled by reducing the amount of cool ambient air being pulled through the treatment volume. Individual adjustable valves will be used at each vapor recovery point to ensure sufficient capture (at or less than zero pressure) is maintained without excessive cooling from ambient air, and that capture from specific zones laterally and vertically can be optimized.

The performance of each heater will be optimized through adjustment of the voltage applied to its circuit. Soil conditions adjacent to each heater have different characteristics including soil moisture, pore space, soil density, and contaminant profile. Each of these characteristics play a role in the optimal heating performance, and these characteristics can change over the course of the project. Additionally, monitoring of condensate production, bulk soil and heater temperatures, and mass recovery will allow TRS to ensure the optimal power is applied to the heaters during TCH operation.

Because heat loss is continuous, treatment system downtime extends the time for heat loss. Efficient maintenance of equipment and fast response time to system errors will ensure maximum system operation uptime. Long lead replacement parts for key system components, such as heater components and power distribution cables, will be held on-site or at the TRS warehouse to help ensure minimal interruption of operations.

Another method of optimizing the system is to accelerate performance sampling. The energy modeled to meet the treatment goals is based on currently available site information. However, the duration of heating and scheduling of performance sampling will be based on the actual TCH system performance metrics in each subarea. Utilizing the metrics of temperature, energy, and rate of mass recovery alongside historical characterization data, the project team can select subareas ready for performance soil sampling (refer to Section 10.7). Subareas that have met the performance sampling objectives defined in Section 5.0 of the CMP (Appendix F) can be disconnected from power to cease heating. This allows a focus of electrical energy and treatment on those subareas remaining above the goals. Refer to Section 5.0 of the CMP in Appendix F for additional detail.

In addition to optimization of the heating process, the condensing unit and oxidizer can be optimized to reduce water and fuel usage. The cooling towers and recycle pump on the

condenser all utilize variable frequency drive motors. This allows TRS to adjust the speed of these motors to reduce water evaporation to the rate needed to maintain desired temperatures without overusing cooling water. TRS will also adjust the rate of blowdown from the cooling towers to reduce mineral buildup without purging more water than is necessary.

Water vapor entering the oxidizer must be heated up alongside the contaminant mass. Reducing the moisture content of the vapor stream can offer significant savings in energy cost. Ensuring optimal performance of the condensing unit will help ensure the RTO fuel needs are low. Maintenance of the RTO will also be key to system uptime and fuel efficiency. Currently, the RTO undergoes a routine annual preventative maintenance evaluation in accordance with the existing Approval Order No. 16AQ-E031, and performance testing is required to be conducted once a year. Although final issuance of the Approval Order is pending, it is expected that the performance testing will be completed twice during the approximately 1-year operating time of the thermal system.

10.7 PERFORMANCE STANDARDS

A multiple lines of evidence approach will be used by TRS and the consulting team during ISTR operation to evaluate when the thermal system operation performance metrics have been met and performance sampling can be scheduled. Three specific operation performance indicators will be monitored during heating to help guide when soil performance sampling is likely to show the remedial performance objectives have been met in a subarea. Soil sampling will be scheduled based on a review of the following operation performance indicators:

- Treatment volume temperatures show desiccation has been achieved.
- Vapor recovery concentrations are asymptotic.
- Energy input is in line with modeled projections.

Refer to Section 5.0 of the CMP in Appendix F, which includes additional details regarding system shutdown metrics, performance sampling and remedial performance objectives, and confirmation soil sampling.

As stated in Section 7.1.2, it is expected that the implementation of ISTR in Zone A will attain RELs. However, even after achieving soil desiccation at a target temperature range of 105 to 120 °C, it is possible that a performance soil sampling location may have a contaminant concentration that still exceeds a REL. Because the goal is to achieve RELs rather than CULs (there were not soil CULs established for the Site), and because this cleanup action involves containment of soils that will comply with WAC 173-340-740(6)(f), Ecology has agreed to apply its discretion regarding the need to continue thermal heating in each treatment subarea if performance soil sampling indicates an isolated contaminant concentration that exceeds a REL after achieving target temperatures. Refer to Section 5.5 of the CMP in Appendix F for additional details regarding assessing compliance with the RELs.

10.8 TREATMENT SYSTEM DECOMMISSIONING

Once the remediation performance objectives have been met and heating is discontinued in a subarea, the vapor recovery and treatment system will operate for a minimum of 2 additional weeks to capture residual vapor during the initial cooling of the treatment subarea. Final decommissioning of the thermal treatment system will occur after vapor recovery has ended.

10.8.1 Subsurface Components

During the initial 2-week cooldown period after active heating ceases in a subarea, the heaters and any subsurface monitoring equipment will be removed. Any items that can be reused including sensors, power cables, and heater materials will be collected for future use. Items that cannot be reused will be recycled or disposed of off-site as general refuse. System wells, including heater casings and vapor recovery wells, PMPs, and TMPs, will be decommissioned by pressure grouting in accordance with Washington State Minimum Standards WAC 173-160. Casings will be cut off at grade. A low-permeability final cover system will be installed over Zone A after ISTR system decommissioning, as described in Section 12.2.

10.8.2 Surface Components

Decommissioning of the Phase 1 area will facilitate some of the Phase 2 construction, by reuse of some of the heater, vapor recovery, and process monitoring equipment. Some of the heater components including the power distribution box connected to the top of each heater casing can be reused. In addition, sections of the vapor recovery piping will be flanged so that they can be reused in a new configuration in Phase 2. Field-mounted data collection field boxes for temperature measurement will also be reused in the Phase 2 area. After vapor collection has concluded, all aboveground system components including piping, cabling and equipment will be removed from the Site. Materials will be disposed of as general refuse if reuse or recycling is not an option. The interim vapor cover will remain in place to reduce waste and improve the function of the final cap to be installed after thermal treatment.

10.9 SUPPLEMENTAL ISTR REPORTING

Per EO SOW Task H, progress reports will be submitted to Ecology monthly during active design and construction. Monthly progress reports for ISTR construction and system operation will be submitted to Ecology by or on the 10th of each month for the month prior, consistent with the monthly report submittal frequency agreed upon with Ecology for ongoing monthly status reports and the Zone A Removal Action construction monthly reports.

Consistent with the Zone A Removal Action reporting, weekly email updates and data will additionally be provided to Ecology to provide a brief summary of ISTR system operation status and performance metrics. These weekly email updates will include a notification and summary of supporting data when a subarea or subareas are determined ready for performance sampling. Refer to Section 12.5 for a summary of post-ISTR reporting for Zone A.

11.0 Compliance Monitoring

Compliance monitoring to ensure the protectiveness of the cleanup action will be implemented in accordance with WAC 173-340-410, Compliance Monitoring Requirements. These regulations call out three types of monitoring: protection, performance, and confirmation. Each will be implemented as part of the cleanup actions in Zone A, including ISTR. The objectives of compliance monitoring as stated in WAC 173-340-410 are the following:

- **Protection monitoring** is used to confirm that human health and the environment are adequately protected during implementation of the cleanup action and associated monitoring. Protection monitoring requirements will be described in Site-specific HASPs that address worker activities during remedy construction, implementation, performance monitoring, and post-construction monitoring.
- **Performance monitoring** is used to confirm that the cleanup action has attained performance standards. Performance monitoring will be conducted throughout each phase of ISTR to document that remedial goals are being achieved.
- **Confirmation monitoring** is used to confirm the long-term effectiveness of the cleanup action after completion of the cleanup action. Confirmation monitoring will include soil sample collection to document post-ISTR soil quality and long-term groundwater monitoring to document that groundwater CULs continue to be attained for Zone A.

The necessary compliance monitoring elements for ISTR are detailed in the CMP, included as Appendix F. Consistent with Task A.5 of the EO SOW, the CMP includes the following subplans:

- **HASP,** further described in Section 3.0 of the CMP. The HASP will be prepared by the ISTR contractor to meet WAC 173-340-810 requirements and will include emergency information, waste characteristics, levels of protection, hazard evaluation, and procedures for protecting workers from the identified hazards.
- **Contingency Plan,** included as Section 4.0 of the CMP. The Contingency Plan will be a resource for emergency preparedness and response during the ISTR activities in the event of an accident or emergency during ISTR at the Site.
- **Performance Monitoring Plan,** included as the PCMP in Section 5.0 of the CMP. The PCMP was prepared to satisfy WAC 173-340-410(1)(b) requirements and provides monitoring and assessment metrics to verify the effectiveness of ISTR in Zone A.
- **GMP,** described in Section 6.0 of the CMP. The Zone A Supplemental GMP, which describes supplemental groundwater monitoring both during the Zone A Removal Action and ISTR, was included as Appendix B.6 of the Zone A Removal Action EDR and was previously approved by Ecology on April 22, 2020.
- **Sampling and Analysis Plan (SAP),** included as Section 7.0 of the CMP. The SAP was prepared to satisfy WAC 173-340-410 and 173-340-820 requirements and includes a Quality Assurance Project Plan (QAPP). The SAP/QAPP includes specific sampling

procedures, analytical methods, and associated quality assurance and quality control (QA/QC) requirements for sampling and monitoring activities completed as part of ISTR.

The EO SOW states: "These above-listed plans will present applicable background information, procedures, methods, contingencies, and implementation schedules. Each plan will comply with WAC 173-340-410 and CD Section VI (Work to be Performed). The SAP and QAPP shall meet WAC 173-340-410 and -820 requirements." Additional requirements of the subplans are more specifically described in the CMP included in Appendix F.

12.0 Post-Thermal-Treatment Activities for Zone A

This section provides a summary of the activities and reporting that will occur after excavation (i.e., after ISTR) as detailed in the EO SOW Tasks A.6, A.7, and A.8.

12.1 SHORT-TERM SOIL VAPOR EXTRACTION

The vapor extraction portion of the ISTR system will operate for a minimum of 2 weeks after thermal treatment (i.e., active heating) ceases. This short-term operation will provide collection of residual volatiles during the initial cool-down phase. It is expected that the subsurface soils within and immediately surrounding the thermal treatment area will take at least 6 months (likely more) to reach ambient temperatures. During the 2-week post-heating vapor extraction phase, vapor monitoring will continue to assess whether additional vapor extraction would be warranted beyond the initial 2-week period proposed by TRS.

The existing horizontal SVE wells (VEW-06H and VEW-07H) will remain isolated and in place until after ISTR operations, in the event SVE operation is determined to be necessary for a longer duration (i.e., more than 2 weeks) during the cool down period. If vapor monitoring shows that there are residual VOCs that would warrant continued SVE operations for capture, then reconnection of the horizontal SVE wells could be considered in coordination with Ecology.

12.2 FINAL ENGINEERED COVER SYSTEM INSTALLATION

Task A.4 (Subtask C) of the EO requires detailed engineering plans and specifications for installation of a low-permeability final cover system over Zone A after ISTR operation and system decommissioning. An overall description of the final cover system is included in this EDR, but final design plans and specifications for the final cover system along with a proposed installation schedule will be provided to Ecology at a later date in an EDR Addendum. Per the EO SOW, the EDR Addendum is anticipated to include the following elements as described below; however, because the EO SOW was prepared prior to the design of the thermal interim cover, the final cover elements may be modified to reflect the interim cover and post-drum removal site conditions in coordination with Ecology.

- Cover system design objectives to achieve Zone A cleanup goals
- Subgrade preparation, grading, and material selection
- Cover system design configuration and layout
- Geomembrane material specifications and proposed panel layout
- Drainage layer, topsoil, and cover material specifications
- Construction QA/QC measures

Final restoration, grading, and fencing will be completed concurrent with the installation of the final engineered cap for Zone A.

12.3 GROUNDWATER MONITORING

After completion of ISTR treatment, the groundwater monitoring program for Zone A is anticipated to be re-evaluated in coordination with Ecology with a potential addendum or update to the *Final Site-Wide Groundwater Compliance Monitoring Plan* (PBS 2020).

12.4 DECOMISSIONING OF ZONE A SVE SYSTEM

Per Task A.6 of the EO SOW, the SVE system will be decommissioned with Ecology approval after completion of ISTR and confirmation that RAO and RELs established in this EDR have been met and that short-term SVE operations are not warranted. These activities are anticipated to include decommissioning of the two horizontal SVE wells (VEW-06H and VEW-07H) beneath Zone A and subsurface SVE conveyance piping and removal of the RTO and other aboveground SVE system features.

12.5 REPORTING

Per the EO, the following are reporting requirements for Zone A after the completion of ISTR and all cleanup action components (including placement of the final engineered cap).

- ISTR Performance Assessment Memorandum will be prepared per Task A.6 of the EO SOW to document ISTR performance.
    - The draft ISTR Performance Assessment Memorandum is due 90 days after shutdown of ISTR operations. Shutdown is defined as TRS demobilization from the Site.
- Zone A Cleanup Action Completion Report (CACR) will be prepared in accordance with Task A.7 of the EO SOW to document completion of the Zone A cleanup action and will include final as-builts, surveys, all monitoring and sampling data, laboratory analyses, any deviation from the EDRs, construction documentation, and documentation generated under Task 4 (Zone A Drum/Debris Excavation, Removal, and Off-Site Disposal Construction Completion Technical Memorandum) as an attachment.
    - The draft Zone A CACR is due 120 days after Zone A cleanup construction completion, as defined by the end of physical work (i.e., contractor demobilization associated with the last cleanup action activity).
- Zone A O&M Plan will be prepared per Task A.8 of the EO SOW to address long-term monitoring, maintenance, and repair of the new Zone A cover system.
    - The draft Zone A O&M Plan is due 90 days after Zone A post-excavation construction completion (i.e., after final placement of the Zone A engineered cap).

In addition, monthly status reports and semiannual reports for the Site will continue to be submitted to Ecology in accordance with the EO and will include a summary of any non-routine operations or deviations from Ecology-approved plans. Monthly status reports will include a brief

description of work completed, work planned, and pending deliverables for the Site, including Zone A.

12.6 FINANCIAL ASSURANCE AND INSTITUTIONAL CONTROLS

Financial assurance requirements for the Site including Zone A are incorporated into Section VII of the EO.

Site-wide ICs are described in the *Pasco Landfill Site Updated Institutional Control Plan,* including site access controls, groundwater restrictions, beneficial use surveying, and the GPA (Anchor QEA 2013). An updated IC Plan will be prepared in accordance with the EO after completion of the Zone A cleanup action, which will occur after the placement of the final engineered cap.

Current physical ICs for the Site including Zone A include 6-foot chain-link fencing around the Zone A landfill with barbed wire, locked gates, and signage.

An environmental covenant (Uniform Environmental Covenants Act, Chapter 64.70 RCW) will be developed as part of the Zone A CACR. The covenant will be executed by the property owners on the schedule described in the SOW. In addition, ICs will be identified and implemented as part of the area-specific O&M plans and documented in the Site-Wide Institutional Controls Report (Task F of the SOW).

The GPAs for the City of Pasco and Franklin County restrict domestic consumptive use of groundwater at and downgradient of the Site. The GPAs are anticipated to remain in place after implementation of the final cleanup remedy and until post-remedy groundwater performance objectives for the Site have been met, including attainment of groundwater CULs.

13.0 References

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Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Tables

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-52S					
			Sample Name	PLF-MW52S-0716	PLF-MW52S-1016	PLF-DUP3-1016	PLF-MW52S-0117	PLF-MW52S-0417	PLF-MW52S-0617
			Sample Date	7/21/2016	10/20/2016	10/20/2016	1/24/2017	4/21/2017	6/20/2017
Analyte	**CAS No.**	**Criteria [1]**	**Unit**						
Volatile Organic Compounds									
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	**20**	**30**	**30**
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.46	0.63	0.46
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	**3.3**	**2.5**
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	15	13	16	**790**	**1,200**	**1,400**
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	30	65	82
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.13	0.17	0.25	**16**	**36**	**39**
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	7.1	5.3	6.8	**340**	**500**	**580**
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	4.0	**9.8**	8.0
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	**110**	**370**	**790**
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	9.7	38	23
4-Methyl-2-pentanone	108-10-1	640	µg/L	34	100 U	100 U	**3,700**	**23,000**	**35,000**
Acetone	67-64-1	7,200	µg/L	350	320	300	**7,800**	**64,000**	**70,000**
Benzene	71-43-2	1.2	µg/L	0.17	0.072	0.22	**11**	**14**	**15**
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.5
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	6.2	7.1	6.6
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	3.9	5.1
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.9
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	**22**	**36**	**28**
Ethanol	64-17-5	--	µg/L	710 U	710 U	710 U	5,600	73,000	12,000
Ethylbenzene	100-41-4	800	µg/L	15	10	16	**2,000**	**2,000**	**2,000**
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	82	110	100
m-&p-Xylenes	179601-23-1	1,600	µg/L	**55**	**37**	**53**	**6,600**	**6,600**	**6,400**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	16	100 U	100 U	3,800	**20,000**	**21,000**
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0	**20**	**29**
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	27	50	57
n-Propylbenzene	103-65-1	800	µg/L	2.1	2.0 U	2.3	170	260	270
o-Xylene	95-47-6	1,600	µg/L	23	16	23	**2,500**	**2,900**	**2,800**
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	7.6	30	18
Styrene	100-42-5	1,600	µg/L	9.2	6.6	9.2	1,200	**2,500**	**2,000**
tert-Butyl Alcohol	75-65-0	--	µg/L	13 U	13 U	13 U	150	1,000	1,100
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.2	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.46	0.23	0.30	**30**	**23**	**19**
Toluene	108-88-3	157	µg/L	100	60	85	**14,000**	**11,000**	**11,000**
Trichloroethene	79-01-6	2.5	µg/L	**4.6**	2.4	**4.2**	**580**	**340**	**350**
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.042	0.032 U	0.032 U
Semivolatile Organic Compounds									
1-Methylnaphthalene	90-12-0	1.5	µg/L		0.26	0.29		**5.6**	
2,4-Dimethylphenol	105-67-9	320	µg/L		2.9	2.3		2.0 U	
2-Methylnaphthalene	91-57-6	32	µg/L		0.40	0.46		12	
2-Nitroaniline	88-74-4	160	µg/L		2.0 U	2.0 U		2.0 U	
3-&4-Methylphenol	15831-10-4	800	µg/L		2.0 U	2.0 U		2.0 U	
4-Chloroaniline	106-47-8	0.44	µg/L		*2.0 U*	*2.0 U*		*2.0 U*	
Acenaphthene	83-32-9	480	µg/L		0.020 U	0.020 U		0.12	
Anthracene	120-12-7	2,400	µg/L		0.020 U	0.020 U		0.020 U	
Benzo(a)anthracene	56-55-3	--	µg/L		0.020 U	0.020 U		0.020 U	
Benzo(a)pyrene	50-32-8	0.023	µg/L		*0.029 U*	*0.029 U*		**0.24**	
Benzo(b)fluoranthene	205-99-2	--	µg/L		0.030 U	0.030 U		0.16	
Benzo(g,h,i)perylene	191-24-2	--	µg/L		0.020 U	0.020 U		0.15	
Benzo(k)fluoranthene	207-08-9	--	µg/L		0.021 U	0.021 U		0.22	
Benzoic Acid	65-85-0	64,000	µg/L		10 U	10 U		92	
Benzyl Alcohol	100-51-6	1,600	µg/L		2.0 U	2.0 U		37	
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L		2.0 U	2.0 U		**7.1**	
Chrysene	218-01-9	--	µg/L		0.020 U	0.020 U		0.020 U	
Dibenzo(a,h)anthracene	53-70-3	--	µg/L		0.020 U	0.020 U		0.19	
Fluoranthene	206-44-0	640	µg/L		0.020 U	0.020 U		0.020 U	
Fluorene	86-73-7	320	µg/L		0.020 U	0.020 U		0.046	
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L		0.020 U	0.020 U		0.20	
Isophorone	78-59-1	92	µg/L		2.0 U	2.0 U		2.0 U	
Naphthalene	91-20-3	160	µg/L		3.4	3.9		**220**	
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L		*2.0 U*	*2.0 U*		*2.0 U*	
Phenanthrene	85-01-8	--	µg/L		2.0 U	2.0 U		2.0 U	
Phenol	108-95-2	4,800	µg/L		2.0 U	2.0 U		2.0 U	
Pyrene	129-00-0	240	µg/L		0.020 U	0.020 U		0.020 U	
Pyridine	110-86-1	8	µg/L		5.0 U	5.0 U		5.0 U	

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:
CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:
U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-52S (cont.)							
			Sample Name	PLF-MW52S-0717	PLF-MW52S-1017	PLF-MW52S-1117	PLF-MW52S-1217	PLF-MW52S-0118	PLF-MW52S-0218	PLF-MW52S-0318	PLF-MW52S-0418
			Sample Date	7/19/2017	10/20/2017	11/15/2017	12/12/2017	1/18/2018	2/21/2018	3/21/2018	4/26/2018
Analyte	**CAS No.**	**Criteria [1]**	**Unit**								
Volatile Organic Compounds											
1,1-Dichloroethane	75-34-3	7.7	µg/L	**28**	3.6	2.0 U	2.0 U	2.0 U	2.6	7.7	**14**
1,1-Dichloroethene	75-35-4	400	µg/L	0.33	0.073	0.048	0.032	0.020	0.11	0.17	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.6
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	**2.2**	**2.9**	**2.6**
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	**1,400**	**630**	**1,000**	**1,100**	**900**	**1,300**	**1,500**	**1,100**
1,2-Dichlorobenzene	95-50-1	720	µg/L	67	45	66	63	57	88	120	83
1,2-Dichloroethane	107-06-2	0.38	µg/L	**34**	**4.1**	**0.69**	**0.93**	**0.68**	**2.4**	**6.2**	**8.0**
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	**1,500**	**220**	**350**	**350**	**350**	**550**	**580**	**420**
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	5.8	4.2	6.6	6.2	4.5	7.7	**11**	6.5
2-Hexanone	591-78-6	40	µg/L	**610**	**100**	23	21	20	**210**	**930**	**1,200**
4-Isopropyltoluene	99-87-6	--	µg/L	22	8.1	13	14	16	23	27	19
4-Methyl-2-pentanone	108-10-1	640	µg/L	**30,000**	**3,100**	470	610	**670**	**3,700**	**15,000**	**23,000**
Acetone	67-64-1	7,200	µg/L	**31,000**	**12,000**	2,200	1,700	1,100	**17,000**	**74,000**	**83,000**
Benzene	71-43-2	1.2	µg/L	**16**	**3.8**	**1.3**	0.79	0.51	**4.8**	**12**	**14**
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	7.4	2.5	2.0 U	2.0 U	2.0 U	2.5	5.5	2.6
Chloroethane	75-00-3	--	µg/L	4.1	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.7
Chloromethane	74-87-3	--	µg/L	2.2	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	**28**	10	6.7	4.0	4.3	6.6	**16**	**19**
Ethanol	64-17-5	--	µg/L	13,000	710 U	710 U	710 U	1,500	30,000	170,000	310,000
Ethylbenzene	100-41-4	800	µg/L	**2,200**	**840**	**1,100**	640	420	**880**	**1,300**	720
Isopropylbenzene	98-82-8	800	µg/L	110	44	64	54	67	85	73	53
m-&p-Xylenes	179601-23-1	1,600	µg/L	**7,000**	**2,800**	**3,900**	**3,000**	**2,200**	**3,600**	**4,700**	**2,700**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	**12,000**	2,900	340	410	280	4,000	**31,000**	**30,000**
Methylene Chloride	75-09-2	5.8	µg/L	**18**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**7.5**	**20**
n-Butylbenzene	104-51-8	400	µg/L	47	2.0 U	2.0 U	35	29	45	2.0 U	24
n-Propylbenzene	103-65-1	800	µg/L	240	110	170	150	170	220	210	170
o-Xylene	95-47-6	1,600	µg/L	**3,100**	1,400	**1,800**	1,400	990	1,600	**2,200**	1,400
sec-Butylbenzene	135-98-8	800	µg/L	19	6.4	9.5	9.4	13	17	19	14
Styrene	100-42-5	1,600	µg/L	**2,400**	520	660	390	250	440	680	350
tert-Butyl Alcohol	75-65-0	--	µg/L	360	78	13 U	33	84	310	950	1,600
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	**23**	**12**	**16**	**10**	**9.7**	**15**	**18**	**7.1**
Toluene	108-88-3	157	µg/L	**9,900**	**3,400**	**2,600**	**1,500**	**760**	**2,900**	**4,700**	**3,100**
Trichloroethene	79-01-6	2.5	µg/L	**380**	**120**	**81**	**42**	**21**	**92**	**160**	**110**
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.044	0.032 U
Semivolatile Organic Compounds											
1-Methylnaphthalene	90-12-0	1.5	µg/L		**2.7**			**3.2**			**6.8**
2,4-Dimethylphenol	105-67-9	320	µg/L		3.1			2.0 U			2.0 U
2-Methylnaphthalene	91-57-6	32	µg/L		4.5			5.4			18
2-Nitroaniline	88-74-4	160	µg/L		2.0 U			2.0 U			2.0 U
3-&4-Methylphenol	15831-10-4	800	µg/L		4.0			2.0 U			2.0 U
4-Chloroaniline	106-47-8	0.44	µg/L		*2.0 U*			*2.0 U*			*2.0 U*
Acenaphthene	83-32-9	480	µg/L		0.077			0.071			0.32
Anthracene	120-12-7	2,400	µg/L		0.020 U			0.020 U			0.020 U
Benzo(a)anthracene	56-55-3	--	µg/L		0.020 U			0.020 U			0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L		*0.029 U*			*0.029 U*			*0.029 U*
Benzo(b)fluoranthene	205-99-2	--	µg/L		0.030 U			0.030 U			0.030 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L		0.020 U			0.020 U			0.020 U
Benzo(k)fluoranthene	207-08-9	--	µg/L		0.021 U			0.021 U			0.021 U
Benzoic Acid	65-85-0	64,000	µg/L		10 U			10 U			10 U
Benzyl Alcohol	100-51-6	1,600	µg/L		2.0 U			5.0			2.0 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L		2.0 U			2.0 U			2.0 U
Chrysene	218-01-9	--	µg/L		0.020 U			0.020 U			0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L		0.020 U			0.020 U			0.020 U
Fluoranthene	206-44-0	640	µg/L		0.020 U			0.020 U			0.020 U
Fluorene	86-73-7	320	µg/L		0.030			0.020 U			0.020 U
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L		0.020 U			0.020 U			0.020 U
Isophorone	78-59-1	92	µg/L		8.9			18			**390**
Naphthalene	91-20-3	160	µg/L		61			110			**280**
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L		*2.0 U*			*2.0 U*			*2.0 U*
Phenanthrene	85-01-8	--	µg/L		2.0 U			0.025			2.0 U
Phenol	108-95-2	4,800	µg/L		2.0 U			2.0 U			2.0 U
Pyrene	129-00-0	240	µg/L		0.020 U			0.020 U			0.020 U
Pyridine	110-86-1	8	µg/L		5.0 U			5.0 U			5.0 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.
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1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S						
			Sample Name	PLF-MW53S-0716	PLF-DUP4-0716	PLF-MW53S-1016	PLF-MW53S-0117	PLF-MW53S-0417	PLF-DUP3-0417	PLF-MW53S-0617
			Sample Date	7/21/2016	7/21/2016	10/20/2016	1/24/2017	4/21/2017	4/21/2017	6/20/2017
Analyte	**CAS No.**	**Criteria [1]**	**Unit**							
Volatile Organic Compounds										
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	2.0 U	2.0 U	2.3	23	22	21	6.5
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.021	0.020 U	0.020 U	0.091	0.020 U	0.020 U	0.026
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	2.0 U	2.0 U	2.0 U	10	11	10	3.1
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	25	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone	108-10-1	640	µg/L	10 U	10 U	10 U	91	10 U	10 U	10 U
Acetone	67-64-1	7,200	µg/L	25	25 U	25 U	430	25 U	25 U	25 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.071	0.028 U	0.028 U	0.028 U
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	710 U	710 U	710 U	1,500	710 U	710 U	710 U
Ethylbenzene	100-41-4	800	µg/L	2.2	2.0 U	2.0	16	5.0	4.9	4.5
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**7.8**	**4.7**	**7.3**	**61**	**20**	**20**	**16**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	10 U	10 U	10 U	170	10 U	10 U	10 U
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	2.0 U	2.0 U	2.0 U	3.3	2.5	2.3	2.0 U
o-Xylene	95-47-6	1,600	µg/L	3.2	2.0	3.4	23	10	9.7	6.7
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	13 U	13 U	13 U	13 U	13 U	13 U	13 U
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.20 U	0.20	**0.72**	0.31	0.30	0.35
Toluene	108-88-3	157	µg/L	7.0	4.7	5.8	31	5.9	6.1	9.7
Trichloroethene	79-01-6	2.5	µg/L	0.28	0.20	0.31	1.4	0.31	0.33	0.60
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Semivolatile Organic Compounds										
1-Methylnaphthalene	90-12-0	1.5	µg/L			0.087		**1.8**	**1.7**	
2,4-Dimethylphenol	105-67-9	320	µg/L			2.0 U		2.0 U	2.0 U	
2-Methylnaphthalene	91-57-6	32	µg/L			0.11		3.6	3.5	
2-Nitroaniline	88-74-4	160	µg/L			2.0 U		2.0 U	2.0 U	
3-&4-Methylphenol	15831-10-4	800	µg/L			2.0 U		2.0 U	2.0 U	
4-Chloroaniline	106-47-8	0.44	µg/L			*2.0 U*		*2.0 U*	*2.0 U*	
Acenaphthene	83-32-9	480	µg/L			0.020 U		0.020 U	0.020 U	
Anthracene	120-12-7	2,400	µg/L			0.020 U		0.020 U	0.020 U	
Benzo(a)anthracene	56-55-3	--	µg/L			0.020 U		0.020 U	0.020 U	
Benzo(a)pyrene	50-32-8	0.023	µg/L			*0.029 U*		*0.029 U*	*0.029 U*	
Benzo(b)fluoranthene	205-99-2	--	µg/L			0.030 U		0.030 U	0.030 U	
Benzo(g,h,i)perylene	191-24-2	--	µg/L			0.020 U		0.020 U	0.020 U	
Benzo(k)fluoranthene	207-08-9	--	µg/L			0.021 U		0.021 U	0.021 U	
Benzoic Acid	65-85-0	64,000	µg/L			10 U		10 U	10 U	
Benzyl Alcohol	100-51-6	1,600	µg/L			2.0 U		2.0 U	2.0 U	
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L			2.0 U		2.0 U	2.0 U	
Chrysene	218-01-9	--	µg/L			0.020 U		0.020 U	0.020 U	
Dibenzo(a,h)anthracene	53-70-3	--	µg/L			0.020 U		0.020 U	0.020 U	
Fluoranthene	206-44-0	640	µg/L			0.020 U		0.020 U	0.020 U	
Fluorene	86-73-7	320	µg/L			0.020 U		0.020 U	0.020 U	
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L			0.020 U		0.020 U	0.020 U	
Isophorone	78-59-1	92	µg/L			2.0 U		2.0 U	2.0 U	
Naphthalene	91-20-3	160	µg/L			0.39		17	14	
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L			*2.0 U*		*2.0 U*	*2.0 U*	
Phenanthrene	85-01-8	--	µg/L			2.0 U		2.0 U	2.0 U	
Phenol	108-95-2	4,800	µg/L			2.0 U		2.0 U	2.0 U	
Pyrene	129-00-0	240	µg/L			0.020 U		0.020 U	0.020 U	
Pyridine	110-86-1	8	µg/L			5.0 U		5.0 U	5.0 U	

Notes:

All results are rounded to two significant figures.
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Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

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Abbreviations:
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CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:
U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S (cont.)							
			Sample Name	PLF-MW53S-0717	PLF-DUP2-0717	PLF-MW53S-0817	PLF-DUP1-0817	PLF-MW53S-0917	PLF-DUP1-0917	PLF-MW53S-1017	PLF-DUP3-1017
			Sample Date	7/19/2017	7/19/2017	8/29/2017	8/29/2017	9/19/2017	9/19/2017	10/20/2017	10/20/2017
Analyte	**CAS No.**	**Criteria [1]**	**Unit**								
Volatile Organic Compounds											
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	8.9	13	12	12	10	16	7.5	7.8
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.072	0.067	0.020 U	0.020 U	0.085	0.092	0.020 U	0.020 U
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	4.2	5.9	5.9	5.9	5.0	7.8	4.0	4.2
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone	108-10-1	640	µg/L	100	110	12	14	130	120	10 U	10 U
Acetone	67-64-1	7,200	µg/L	350	380	25 U	25 U	370	340	25 U	25 U
Benzene	71-43-2	1.2	µg/L	0.053	0.066	0.028 U	0.028 U	0.049	0.061	0.028 U	0.028 U
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	1,400	1,400	710 U	710 U	710 U	710 U	710 U	710 U
Ethylbenzene	100-41-4	800	µg/L	5.9	9.8	9.5	9.2	7.8	14	6.3	6.2
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**22**	**35**	**36**	**36**	**32**	**50**	**23**	**23**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	110	110	10 U	10 U	96	94	10 U	10 U
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.3	2.0 U	2.0 U
o-Xylene	95-47-6	1,600	µg/L	10	16	17	16	16	24	10	9.8
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	15	14	13 U	13 U	23	25	13 U	13 U
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	**0.70**	**1.0**	**2.7**	**2.6**	**1.4**	**2.2**	**2.1**	**2.1**
Toluene	108-88-3	157	µg/L	16	23	25	24	27	40	15	14
Trichloroethene	79-01-6	2.5	µg/L	1.2	1.7	2.4	2.3	2.3	**3.3**	1.3	1.2
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Semivolatile Organic Compounds											
1-Methylnaphthalene	90-12-0	1.5	µg/L							0.35	0.14
2,4-Dimethylphenol	105-67-9	320	µg/L							2.0 U	2.0 U
2-Methylnaphthalene	91-57-6	32	µg/L							0.44	0.11
2-Nitroaniline	88-74-4	160	µg/L							2.0 U	2.0 U
3-&4-Methylphenol	15831-10-4	800	µg/L							2.0 U	2.0 U
4-Chloroaniline	106-47-8	0.44	µg/L							*2.0 U*	*2.0 U*
Acenaphthene	83-32-9	480	µg/L							0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L							0.020 U	0.020 U
Benzo(a)anthracene	56-55-3	--	µg/L							0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L							*0.029 U*	*0.029 U*
Benzo(b)fluoranthene	205-99-2	--	µg/L							0.030 U	0.030 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L							0.020 U	0.020 U
Benzo(k)fluoranthene	207-08-9	--	µg/L							0.021 U	0.021 U
Benzoic Acid	65-85-0	64,000	µg/L							10 U	10 U
Benzyl Alcohol	100-51-6	1,600	µg/L							2.0 U	2.0 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L							2.0 U	2.0 U
Chrysene	218-01-9	--	µg/L							0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L							0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L							0.020 U	0.020 U
Fluorene	86-73-7	320	µg/L							0.020 U	0.020 U
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L							0.020 U	0.020 U
Isophorone	78-59-1	92	µg/L							2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L							1.5	0.45
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L							*2.0 U*	*2.0 U*
Phenanthrene	85-01-8	--	µg/L							2.0 U	2.0 U
Phenol	108-95-2	4,800	µg/L							2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L							0.020 U	0.020 U
Pyridine	110-86-1	8	µg/L							5.0 U	5.0 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S (cont.)							
			Sample Name	PLF-MW53S-1117	PLF-DUP1-1117	PLF-MW53S-1217	PLF-DUP1-1217	PLF-MW53S-0118	PLF-DUP2-0118	PLF-MW53S-0218	PLF-DUP1-0218
			Sample Date	11/15/2017	11/15/2017	12/12/2017	12/12/2017	1/18/2018	1/18/2018	2/21/2018	2/21/2018
Analyte	**CAS No.**	**Criteria [1]**	**Unit**								
Volatile Organic Compounds											
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	11	14	13	13	16	13	27	25
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.044	0.050	0.023	0.020	0.033	0.026	0.020 U	0.020 U
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	5.5	6.7	7.5	7.4	7.8	6.5	12	11
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone	108-10-1	640	µg/L	110	130	12	12	10 U	10 U	82	84
Acetone	67-64-1	7,200	µg/L	110	120	25 U	25 U	25 U	25 U	180	180
Benzene	71-43-2	1.2	µg/L	0.034	0.042	0.028 U	0.028 U	0.089	0.075	1.2	1.2
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	710 U	710 U	710 U	710 U	710 U	710 U	710 U	710 U
Ethylbenzene	100-41-4	800	µg/L	12	17	9.3	9.7	17	13	27	27
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**42**	**57**	**35**	**36**	**60**	**49**	**90**	**91**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	37	40	10 U	10 U	10 U	10 U	65	70
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	2.0 U	2.3	2.0 U	2.0 U	2.5	2.0 U	4.2	3.9
o-Xylene	95-47-6	1,600	µg/L	17	23	17	18	26	20	38	37
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	**3.7**	**5.0**	**3.5**	**3.5**	**4.3**	**3.6**	**6.3**	**6.3**
Toluene	108-88-3	157	µg/L	37	51	19	21	28	34	72	75
Trichloroethene	79-01-6	2.5	µg/L	**3.8**	**5.1**	1.7	1.9	**3.7**	**3.0**	**6.0**	**6.3**
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Semivolatile Organic Compounds											
1-Methylnaphthalene	90-12-0	1.5	µg/L					0.78			
2,4-Dimethylphenol	105-67-9	320	µg/L					2.0 U			
2-Methylnaphthalene	91-57-6	32	µg/L					1.2			
2-Nitroaniline	88-74-4	160	µg/L					2.0 U			
3-&4-Methylphenol	15831-10-4	800	µg/L					2.5			
4-Chloroaniline	106-47-8	0.44	µg/L					*2.0 U*			
Acenaphthene	83-32-9	480	µg/L					0.020 U			
Anthracene	120-12-7	2,400	µg/L					0.020 U			
Benzo(a)anthracene	56-55-3	--	µg/L					0.020 U			
Benzo(a)pyrene	50-32-8	0.023	µg/L					*0.029 U*			
Benzo(b)fluoranthene	205-99-2	--	µg/L					0.030 U			
Benzo(g,h,i)perylene	191-24-2	--	µg/L					0.020 U			
Benzo(k)fluoranthene	207-08-9	--	µg/L					0.021 U			
Benzoic Acid	65-85-0	64,000	µg/L					10 U			
Benzyl Alcohol	100-51-6	1,600	µg/L					2.0 U			
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L					2.0 U			
Chrysene	218-01-9	--	µg/L					0.020 U			
Dibenzo(a,h)anthracene	53-70-3	--	µg/L					0.020 U			
Fluoranthene	206-44-0	640	µg/L					0.020 U			
Fluorene	86-73-7	320	µg/L					0.020 U			
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L					0.020 U			
Isophorone	78-59-1	92	µg/L					2.0 U			
Naphthalene	91-20-3	160	µg/L					5.0			
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L					*2.0 U*			
Phenanthrene	85-01-8	--	µg/L					0.020 U			
Phenol	108-95-2	4,800	µg/L					2.0 U			
Pyrene	129-00-0	240	µg/L					0.020 U			
Pyridine	110-86-1	8	µg/L					5.0 U			

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:
CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:
U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S (cont.)							
			Sample Name	PLF-MW53S-0318	PLF-DUP1-0318	PLF-MW53S-0418	PLF-DUP3-0418	PLF-MW53S-0518	PLF-DUP1-0518	PLF-MW53S-0618	PLF-DUP1-0618
			Sample Date	3/21/2018	3/21/2018	4/26/2018	4/26/2018	5/22/2018	5/22/2018	6/20/2018	6/20/2018
Analyte	**CAS No.**	**Criteria [1]**	**Unit**								
Volatile Organic Compounds											
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	30	25	28	31	12	16	8.1	8.1
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.022	0.024	0.057	0.059	0.038	0.041	0.020 U	0.020 U
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	14	11	13	15	6.0	7.7	3.8	3.8
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone	108-10-1	640	µg/L	12	12	28	28	18	18	37	42
Acetone	67-64-1	7,200	µg/L	28	26	100	110	73	63	160	190
Benzene	71-43-2	1.2	µg/L	0.78	0.76	0.92	0.95	0.32	0.41	0.49	0.50
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	710 U	710 U	710 U	710 U	710 U	710 U	710 U	710 U
Ethylbenzene	100-41-4	800	µg/L	27	23	17	18	8.2	12	6.4	6.6
Isopropylbenzene	98-82-8	800	µg/L	2.1	2.0 U	2.0 U	2.1	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**74**	**74**	**55**	**58**	**26**	**36**	**20**	**21**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	11	11	41	43	23	22	59	67
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	4.8	4.0	3.9	4.2	2.0 U	2.3	2.0 U	2.0 U
o-Xylene	95-47-6	1,600	µg/L	32	31	24	25	11	15	8.8	8.9
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	**3.6**	**4.1**	**2.0**	**2.1**	**0.91**	**1.2**	**0.71**	**0.74**
Toluene	108-88-3	157	µg/L	45	67	33	34	14	20	13	14
Trichloroethene	79-01-6	2.5	µg/L	**4.3**	**4.3**	1.8	1.9	0.72	0.99	0.65	0.67
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Semivolatile Organic Compounds											
1-Methylnaphthalene	90-12-0	1.5	µg/L			1.5	1.4				
2,4-Dimethylphenol	105-67-9	320	µg/L			2.0 U	2.0 U				
2-Methylnaphthalene	91-57-6	32	µg/L			2.7	2.7				
2-Nitroaniline	88-74-4	160	µg/L			2.0 U	2.0 U				
3-&4-Methylphenol	15831-10-4	800	µg/L			2.0 U	2.0 U				
4-Chloroaniline	106-47-8	0.44	µg/L			*2.0 U*	*2.0 U*				
Acenaphthene	83-32-9	480	µg/L			0.020 U	0.020 U				
Anthracene	120-12-7	2,400	µg/L			0.020 U	0.020 U				
Benzo(a)anthracene	56-55-3	--	µg/L			0.020 U	0.020 U				
Benzo(a)pyrene	50-32-8	0.023	µg/L			*0.029 U*	*0.029 U*				
Benzo(b)fluoranthene	205-99-2	--	µg/L			0.030 U	0.030 U				
Benzo(g,h,i)perylene	191-24-2	--	µg/L			0.020 U	0.020 U				
Benzo(k)fluoranthene	207-08-9	--	µg/L			0.021 U	0.021 U				
Benzoic Acid	65-85-0	64,000	µg/L			10 U	10 U				
Benzyl Alcohol	100-51-6	1,600	µg/L			2.0 U	2.0 U				
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L			2.0 U	2.0 U				
Chrysene	218-01-9	--	µg/L			0.020 U	0.020 U				
Dibenzo(a,h)anthracene	53-70-3	--	µg/L			0.020 U	0.020 U				
Fluoranthene	206-44-0	640	µg/L			0.020 U	0.020 U				
Fluorene	86-73-7	320	µg/L			0.020 U	0.020 U				
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L			0.020 U	0.020 U				
Isophorone	78-59-1	92	µg/L			2.0 U	2.0 U				
Naphthalene	91-20-3	160	µg/L			9.3	8.8				
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L			*2.0 U*	*2.0 U*				
Phenanthrene	85-01-8	--	µg/L			2.0 U	2.0 U				
Phenol	108-95-2	4,800	µg/L			2.0 U	2.0 U				
Pyrene	129-00-0	240	µg/L			0.020 U	0.020 U				
Pyridine	110-86-1	8	µg/L			5.0 U	5.0 U				

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S (cont.)							
			Sample Name	PLF-MW53S-0718	PLF-DUP1-0718	PLF-MW53S-1018	PLF-DUP3-1018	PLF-MW53S-0119	PLF-DUP1-0119	PLF-MW53S-0419	PLF-DUP3-0419
			Sample Date	7/17/2018	7/17/2018	10/25/2018	10/25/2018	1/23/2019	1/23/2019	4/25/2019	4/25/2019
Analyte	**CAS No.**	**Criteria [1]**	**Unit**								
Volatile Organic Compounds											
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.1
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	**2.1**
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	10	13	19	18	24	34	17	17
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.054	0.037	0.18	0.17	0.11	0.19	0.020 U	0.020 U
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	4.6	5.7	8.4	7.9	10	14	8.8	8.9
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		
4-Methyl-2-pentanone	108-10-1	640	µg/L	14	11	64	65	89	95	10 U	10 U
Acetone	67-64-1	7,200	µg/L	46	34	400	520	270	390	25 U	25 U
Benzene	71-43-2	1.2	µg/L	0.45	0.20	1.0	0.96	0.81	**1.3**	0.96	0.96
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.5	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	710 U	710 U	710 U	710 U	710 U	710 U	710 U	710 U
Ethylbenzene	100-41-4	800	µg/L	10	11	16	16	14	21	8.3	8.1
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**32**	**35**	**54**	**52**	**50**	**79**	**31**	**30**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	16	13	34	39	63	37	10 U	10 U
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	2.0 U	2.2	2.7	2.5	3.0	4.0	2.1	2.1
o-Xylene	95-47-6	1,600	µg/L	14	13	25	24	23	36	14	14
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	13 U	13 U	13 U	13 U	31	62	13 U	13 U
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	**0.95**	**1.2**	**2.5**	**2.4**	**1.3**	**2.1**	**1.2**	**1.2**
Toluene	108-88-3	157	µg/L	20	13	37	37	27	33	18	18
Trichloroethene	79-01-6	2.5	µg/L	1.1	0.70	**2.6**	2.5	1.7	**2.7**	0.89	0.91
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Semivolatile Organic Compounds											
1-Methylnaphthalene	90-12-0	1.5	µg/L	1.3	0.86	1.1	1.2	**3.5**	**2.9**	**1.6**	1.4
2,4-Dimethylphenol	105-67-9	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	5.7	4.8	2.0 U	2.0 U
2-Methylnaphthalene	91-57-6	32	µg/L	2.2	1.5	2.3	2.6	5.8	4.9	2.7	2.4
2-Nitroaniline	88-74-4	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
3-&4-Methylphenol	15831-10-4	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	106-47-8	0.44	µg/L	*2.0 U*	*2.0 U*	**9.0**	**11**	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Acenaphthene	83-32-9	480	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.036
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.031
Benzo(a)pyrene	50-32-8	0.023	µg/L	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.027
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.045
Benzoic Acid	65-85-0	64,000	µg/L	10 U	10 U	10 U	10 U	44	35	10 U	10 U
Benzyl Alcohol	100-51-6	1,600	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	9.3	7.0	2.0 U	2.0 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L	2.0 U	2.4	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.037
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.038
Fluorene	86-73-7	320	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.029
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.024
Isophorone	78-59-1	92	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L	7.7	4.5	7.5	8.5	29	23	8.2	7.2
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	**3.4**	*2.0 U*	*2.0 U*	*2.0 U*
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	0.10	0.079	0.045	0.074
Phenol	108-95-2	4,800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	11	8.9	2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.044
Pyridine	110-86-1	8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	**20**	**15**	5.0 U	5.0 U

Notes:

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Abbreviations:

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.1
Former Zone A Source Wells VOC and SVOC Groundwater Results

			Location Name	MW-53S (cont.)								
			Sample Name	PLF-MW53S-0719	PLF-MW53S-1019	PLF-MW53S-0120	PLF-MW53S-0420	PLF-DUP2-0420	PLF-MW53S-0720	PLF-DUP1-0720	PLF-MW53S-1020	PLF-DUP-1020
			Sample Date	7/23/2019	10/23/2019	1/22/2020	4/21/2020	4/21/2020	7/22/2020	7/22/2020	10/29/2020	10/29/2020
Analyte	**CAS No.**	**Criteria [1]**	**Unit**									
Volatile Organic Compounds												
1,1-Dichloroethane	75-34-3	7.7	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-Dichloroethene	75-35-4	400	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,2,3-Trichlorobenzene	87-61-6	6.4	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	120-82-1	1.5	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
1,2,4-Trimethylbenzene	95-63-6	80	µg/L	8.3	11	11	14	15	10	9.7	10	12
1,2-Dichlorobenzene	95-50-1	720	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.045	0.051	0.036	0.059	0.059	0.063	0.061	0.064	0.079
1,3,5-Trimethylbenzene	108-67-8	80	µg/L	4.6	4.7	4.7	6.1	6.8	4.3	4.1	4.2	4.6
1,4-Dichlorobenzene	106-46-7	8.1	µg/L	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
2-Hexanone	591-78-6	40	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Isopropyltoluene	99-87-6	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone	108-10-1	640	µg/L	28	45	20	26	27	32	30	33	38
Acetone	67-64-1	7,200	µg/L	100	370	190	270	290	190	190	290	310
Benzene	71-43-2	1.2	µg/L	0.57	0.22	0.093	0.10	0.10	0.13	0.12	0.16	0.18
Carbon Disulfide	75-15-0	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	108-90-7	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloroethane	75-00-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloromethane	74-87-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	156-59-2	12	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Ethanol	64-17-5	--	µg/L	710 U	830	710 U	1,200	1,200	710 U	710 U	1,000	1,200
Ethylbenzene	100-41-4	800	µg/L	5.6	5.9	4.7	5.9	6.5	4.6	4.2	4.4	4.9
Isopropylbenzene	98-82-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m-&p-Xylenes	179601-23-1	1,600	µg/L	**16**	**20**	**16**	**21**	**23**	**16**	**14**	**15**	**17**
Methyl Ethyl Ketone	78-93-3	4,800	µg/L	25	68	36	55	61	54	55	47	49
Methylene Chloride	75-09-2	5.8	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	104-51-8	400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Propylbenzene	103-65-1	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
o-Xylene	95-47-6	1,600	µg/L	7.7	10	8.2	11	11	8.3	7.6	8.1	9.4
sec-Butylbenzene	135-98-8	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	100-42-5	1,600	µg/L	1.5 U	1.5 U	1.5 U	1.4 U	1.4 U	1.5 U	1.5 U	1.5 U	1.5 U
tert-Butyl Alcohol	75-65-0	--	µg/L	14	34	15	25	26	22	19	42	49
tert-Butylbenzene	98-06-6	800	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.57	0.41	0.45	0.38	0.40	0.21	0.20 U	0.28	0.30
Toluene	108-88-3	157	µg/L	13	14	8.0	8.3	9.1	8.5	7.6	10	12
Trichloroethene	79-01-6	2.5	µg/L	0.65	0.59	0.40	0.52	0.58	0.49	0.43	0.61	0.69
Vinyl Chloride	75-01-4	0.053	µg/L	0.032 U	0.032 U	0.032 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Semivolatile Organic Compounds												
1-Methylnaphthalene	90-12-0	1.5	µg/L	**1.8**	1.4	**2.3**	**2.0**	**2.1**	**2.3**	**1.8**	**2.7**	**2.4**
2,4-Dimethylphenol	105-67-9	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-Methylnaphthalene	91-57-6	32	µg/L	2.8	2.1	3.4	3.1	3.2	3.8	3.1	3.9	3.5
2-Nitroaniline	88-74-4	160	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10
3-&4-Methylphenol	15831-10-4	800	µg/L	2.0 U	7.1	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	106-47-8	0.44	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Acenaphthene	83-32-9	480	µg/L	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.058	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.026	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L	*0.029 U*	*0.029 U*	*0.029 U*	0.020 U	0.020 U	*0.029 U*	*0.029 U*	*0.029 U*	*0.029 U*
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.030 U	0.030 U	0.030 U	0.020 U	0.020 U	0.030 U	0.038	0.030 U	0.030 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.047	0.020 U	0.020 U
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.043	0.021 U	0.021 U
Benzoic Acid	65-85-0	64,000	µg/L	18	10 U	17	10 U	13	34	17	39	40
Benzyl Alcohol	100-51-6	1,600	µg/L	2.0 U	2.0 U	4.6	4.5	8.5	2.4	2.0 U	3.6	3.3
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.044	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.046	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.022	0.020 U	0.020 U
Fluorene	86-73-7	320	µg/L	0.020 U	0.022	2.0 U	0.023	0.031	0.025	0.022	0.031	0.022
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.042	0.020 U	0.020 U
Isophorone	78-59-1	92	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L	12	6.8	13	9.1	12	11	7.8	13	12
N-Nitrosodimethylamine	62-75-9	0.00023	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Phenol	108-95-2	4,800	µg/L	4.6	3.6	7.2	3.6	6.9	6.0	2.4	2.0 U	2.2
Pyrene	129-00-0	240	µg/L	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.023	0.020 U	0.020 U
Pyridine	110-86-1	8	µg/L	5.0 U	5.0 U	**8.9**	5.0 U	**12**	5.0 U	5.0 U	5.0 U	5.0 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any former Zone A source area well within the past 7 years are shown. All groundwater data collected at former Zone A source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL or SL.

RED/BOLD Result was detected and exceeds the criteria.

1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations:

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
GW Groundwater
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-13S													
			Sample Name	PLF-MW13S-0718	PLF-MW13S-1018	PLF-MW13S-0119	PLF-MW13S-0419	PLF-MW13S-0719	PLF-MW13S-1019	PLF-MW13S-0120	PLF-MW13S-0420	PLF-MW13S-0720	PLF-MW13S-1020	PLF-MW13S-1220	PLF-MW13S-0321	PLF-MW13S-0421	PLF-MW13S-0621
			Sample Date	7/17/2018	10/25/2018	1/23/2019	4/23/2019	7/23/2019	10/22/2019	1/22/2020	4/22/2020	7/22/2020	10/27/2020	12/15/2020	3/3/2021	4/21/2021	6/9/2021
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.032 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	79-01-6	2.5	µg/L	0.062	0.15	0.057	0.053 U	0.065	0.075	0.053 U	0.053 U	0.068	0.065	0.053 U	0.056	0.053 U	0.074
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L														
Anthracene	120-12-7	2,400	µg/L														
Benzo(a)anthracene	56-55-3	--	µg/L														
Benzo(a)pyrene	50-32-8	0.023	µg/L														
Benzo(b)fluoranthene	205-99-2	--	µg/L														
Benzo(g,h,i)perylene	191-24-2	--	µg/L														
Benzo(k)fluoranthene	207-08-9	--	µg/L														
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L														
Chrysene	218-01-9	--	µg/L														
Dibenzo(a,h)anthracene	53-70-3	--	µg/L														
Fluoranthene	206-44-0	640	µg/L														
Fluorene	86-73-7	320	µg/L														
Hexachlorobenzene	118-74-1	0.027	µg/L														
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L														
Phenanthrene	85-01-8	--	µg/L														
Pyrene	129-00-0	240	µg/L														

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL/SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-13S (cont.)							MW-47I							
			Sample Name	PLF-MW13S-0721	PLF-MW13S-0921	PLF-MW13S-1021	PLF-MW13S-1221	PLF-MW13S-0122	PLF-MW13S-0322	PLF-MW13S-0422	PLF-MW47I-1018	PLF-MW47I-0419	PLF-MW47I-1019	PLF-MW47I-0420	PLF-MW47I-1020	PLF-MW47I-1220	PLF-MW47I-0321	PLF-MW47I-0421
			Sample Date	7/20/2021	9/8/2021	10/26/2021	12/7/2021	1/19/2022	3/1/2022	4/19/2022	10/25/2018	4/25/2019	10/23/2019	4/21/2020	10/30/2020	12/15/2020	3/3/2021	4/22/2021
Analyte	**CAS No.**	**Criteria [1]**	**Unit**															
Volatile Organic Compounds																		
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.032 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	*2.0 U*	*2.0 U*	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	79-01-6	2.5	µg/L	0.097	0.11	0.053 U	0.066	0.071	0.062	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U
Semivolatile Organic Compounds																		
1-Methylnaphthalene	90-12-0	1.5	µg/L															
Anthracene	120-12-7	2,400	µg/L															
Benzo(a)anthracene	56-55-3	--	µg/L															
Benzo(a)pyrene	50-32-8	0.023	µg/L															
Benzo(b)fluoranthene	205-99-2	--	µg/L															
Benzo(g,h,i)perylene	191-24-2	--	µg/L															
Benzo(k)fluoranthene	207-08-9	--	µg/L															
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L															
Chrysene	218-01-9	--	µg/L															
Dibenzo(a,h)anthracene	53-70-3	--	µg/L															
Fluoranthene	206-44-0	640	µg/L															
Fluorene	86-73-7	320	µg/L															
Hexachlorobenzene	118-74-1	0.027	µg/L															
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L															
Phenanthrene	85-01-8	--	µg/L															
Pyrene	129-00-0	240	µg/L															

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL/SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations

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CAS Chemical Abstacts Service
CUL Cleanup level
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-47I (cont.)						MW-47S							
			Sample Name	PLF-MW47I-0621	PLF-MW47I-0921	PLF-MW47I-1021	PLF-MW47I-1221	PLF-MW47I-0322	PLF-MW47I-0422	PLF-MW47S-0422	PLF-MW47S-0618	PLF-MW47S-0718	PLF-MW47S-1018	PLF-MW47S-0119	PLF-MW47S-0419	PLF-MW47S-0719	PLF-MW47S-1019
			Sample Date	6/9/2021	9/8/2021	10/26/2021	12/7/2021	3/1/2022	4/18/2022	4/18/2022	6/20/2018	7/17/2018	10/25/2018	1/23/2019	4/25/2019	7/24/2019	10/23/2019
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.032 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.22	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	79-01-6	2.5	µg/L	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.11	0.053 U	0.12	0.098	0.13	0.13	0.10	0.090
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L							0.020 U		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L							2.0 U		0.020 U	0.020 U	0.093	0.020 U	0.020 U	0.020 U
Benzo(a)anthracene	56-55-3	--	µg/L							0.020 U		0.020 U	0.020 U	0.13	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L							0.020 U		*0.029 U*	*0.029 U*	**0.12**	*0.029 U*	*0.029 U*	*0.029 U*
Benzo(b)fluoranthene	205-99-2	--	µg/L							0.020 U		0.030 U	0.030 U	0.13	0.030 U	0.030 U	0.030 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L									0.020 U	0.020 U	0.12	0.020 U	0.020 U	0.020 U
Benzo(k)fluoranthene	207-08-9	--	µg/L							0.021 U		0.021 U	0.021 U	0.13	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L									3.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chrysene	218-01-9	--	µg/L							0.020 U		0.020 U	0.020 U	0.092	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L							0.020 U		0.020 U	0.020 U	0.071	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L							2.0 U		0.020 U	0.020 U	0.14	0.020 U	0.020 U	0.020 U
Fluorene	86-73-7	320	µg/L							2.0 U		0.020 U	0.020 U	0.044	0.020 U	0.020 U	0.020 U
Hexachlorobenzene	118-74-1	0.027	µg/L							*0.050 U*		*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L							0.020 U		0.020 U	0.020 U	0.11	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L							2.0 U		2.0 U	2.0 U	0.092	0.020 U	2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L							2.0 U		0.020 U	0.020 U	0.15	0.020 U	0.020 U	0.020 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL/SL.
RED/BOLD Result was detected and exceeds the criteria.
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Abbreviations

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MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-47S (cont.)													
			Sample Name	PLF-MW47S-0120	PLF-MW47S-0420	PLF-MW47S-0720	PLF-MW47S-1020	PLF-MW47S-1220	PLF-MW47S-0321	PLF-MW47S-0421	PLF-MW47S-0621	PLF-MW47S-0721	PLF-MW47S-0921	PLF-MW47S-1021	PLF-MW47S-1221	PLF-MW47S-0122	PLF-MW47S-0322
			Sample Date	1/22/2020	4/21/2020	7/22/2020	10/29/2020	12/15/2020	3/3/2021	4/22/2021	6/9/2021	7/20/2021	9/8/2021	10/26/2021	12/7/2021	1/19/2022	3/1/2022
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.032	0.020 U	0.020 U	0.025	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	*2.0 U*	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Trichloroethene	79-01-6	2.5	µg/L	0.095	0.093	0.086	0.089	0.11	0.14	0.47	0.17	0.15	0.16	0.13	0.12	0.13	0.12
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L	*0.029 U*	0.020 U	*0.029 U*	*0.029 U*	*0.029 U*	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.030 U	0.020 U	0.030 U	0.030 U	0.030 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U									
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U					
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Fluorene	86-73-7	320	µg/L	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Hexachlorobenzene	118-74-1	0.027	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U					2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

Italic Result was not detected. Associated reporting limit exceeds the CUL/SL.
RED/BOLD Result was detected and exceeds the criteria.
1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations

CAP Cleanup Action Plan
CAS Chemical Abstacts Service
CUL Cleanup level
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-50S													
			Sample Name	PLF-MW50S-0618	PLF-MW50S-0718	PLF-MW50S-1018	PLF-MW50S-0119	PLF-MW50S-0419	PLF-MW50S-0719	PLF-MW50S-1019	PLF-MW50S-0120	PLF-MW50S-0420	PLF-MW50S-0720	PLF-MW50S-1020	PLF-MW50S-1220	PLF-MW50S-0321	PLF-MW50S-0421
			Sample Date	6/20/2018	7/17/2018	10/25/2018	1/23/2019	4/25/2019	7/24/2019	10/23/2019	1/22/2020	4/21/2020	7/21/2020	10/29/2020	12/15/2020	3/3/2021	4/22/2021
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.032 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	1.2	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.21	0.20 U	0.20 U	0.24	0.24	0.20 U	0.23	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20
Trichloroethene	79-01-6	2.5	µg/L	0.053 U	0.25	0.21	0.19	0.32	0.21	0.18	0.25	0.26	0.18	0.16	0.17	0.27	0.26
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L		0.020 U	0.066	0.020 U	0.020 U	0.036	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U
Benzo(a)anthracene	56-55-3	--	µg/L		0.020 U	0.15	0.020 U	0.020 U	0.039	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L		*0.029 U*	**0.12**	*0.029 U*	*0.029 U*	**0.030**	*0.029 U*	*0.029 U*	0.020 U	*0.029 U*	*0.029 U*	*0.029 U*	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	--	µg/L		0.030 U	0.25	0.030 U	0.030 U	0.035	0.030 U	0.030 U	0.020 U	0.030 U	0.030 U	0.030 U	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L		0.020 U	0.20	0.020 U	0.020 U	0.039	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U		
Benzo(k)fluoranthene	207-08-9	--	µg/L		0.021 U	0.23	0.021 U	0.021 U	0.041	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chrysene	218-01-9	--	µg/L		0.020 U	0.21	0.020 U	0.020 U	0.061	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L		0.020 U	0.18	0.020 U	0.020 U	0.039	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L		0.020 U	0.25	0.020 U	0.020 U	0.056	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U
Fluorene	86-73-7	320	µg/L		0.020 U	0.022	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U
Hexachlorobenzene	118-74-1	0.027	µg/L		*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*0.050 U*	*0.050 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L		0.020 U	0.15	0.020 U	0.020 U	0.040	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L		2.0 U	2.0 U	0.020 U	0.020 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		
Pyrene	129-00-0	240	µg/L		0.020 U	0.19	0.020 U	0.020 U	0.052	0.020 U	2.0 U	0.020 U	0.020 U	0.020 U	0.020 U	2.0 U	2.0 U

Notes:

All results are rounded to two significant figures.
Analytes and qualifiers presented as-is from the PBS GW Database.
Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

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CUL Cleanup level
IWA Industrial Waste Area
µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-50S (cont.)								MW-56S					
			Sample Name	PLF-MW50S-0621	PLF-MW50S-0721	PLF-MW50S-0921	PLF-MW50S-1021	PLF-MW50S-1221	PLF-MW50S-0122	PLF-MW50S-0322	PLF-MW50S-0422	PLF-MW56S-0120	PLF-MW56S-0321	PLF-MW56S-0421	PLF-MW56S-0621	PLF-MW56S-0721	PLF-MW56S-0921
			Sample Date	6/9/2021	7/20/2021	9/8/2021	10/26/2021	12/7/2021	1/19/2022	3/1/2022	4/18/2022	1/22/2020	3/3/2021	4/22/2021	6/9/2021	7/20/2021	9/8/2021
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.024	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.3	1.0	1.0 U	*2.0 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.20 U	0.23	0.11 U	0.20	0.29	0.21	0.30	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U
Trichloroethene	79-01-6	2.5	µg/L	0.21	0.18	0.23	0.19	0.25	0.27	0.26	0.26	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	*0.029 U*	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.030 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L														
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.023	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L	2.0 U	2.0 U							2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.021	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Fluorene	86-73-7	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Hexachlorobenzene	118-74-1	0.027	µg/L	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*2.0 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.022	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L			2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						2.0 U
Pyrene	129-00-0	240	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

All results are rounded to two significant figures.
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Only analytes with at least one detection in any Zone A monitoring network well within the past 5 years are shown. All groundwater data collected at former Zone A Source wells are presented in the IWA Annual Groundwater Monitoring Reports.

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1 Criteria based on site-specific CULs consistant with the CAP or, if not applicable, MTCA Method B criteria.

Abbreviations

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CAS Chemical Abstacts Service
CUL Cleanup level
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µg/L Micrograms per liter
MTCA Model Toxics Control Act
PBS PBS Engineering and Environmental Inc.
SL Screening level

Qualifier:

U Analyte was not detected at the associated reporting limit.

Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-56S (cont.)					MW-57S								
			Sample Name	PLF-MW56S-1021	PLF-MW56S-1221	PLF-MW56S-0122	PLF-MW56S-0322	PLF-MW56S-0422	PLF-MW57S-0321	PLF-MW57S-0421	PLF-MW57S-0621	PLF-MW57S-0721	PLF-MW57S-0921	PLF-DUP1-0921	PLF-MW57S-1021	PLF-MW57S-1221	PLF-MW57S-0122
			Sample Date	10/28/2021	12/7/2021	1/19/2022	3/1/2022	4/19/2022	3/3/2021	4/21/2021	6/9/2021	7/20/2021	9/8/2021	9/8/2021	10/28/2021	12/7/2021	1/19/2022
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Trichloroethene	79-01-6	2.5	µg/L	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.034	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.064	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.060**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.053	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L														
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.093	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L						2.0 U	2.0 U	2.0 U	2.0 U					
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.10	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.080	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Fluorene	86-73-7	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Hexachlorobenzene	118-74-1	0.027	µg/L	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	**0.089**	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.092	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U					2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

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SL Screening level

Qualifier:

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Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-57S (cont.)			MW-58S								
			Sample Name	PLF-DUP1-0122	PLF-MW57S-0322	PLF-MW57S-0422	PLF-MW58S-0321	PLF-DUP1-0321	PLF-MW58S-0421	PLF-DUP1-0421	PLF-MW58S-0621	PLF-DUP1-0621	PLF-MW58S-0721	PLF-MW58S-0921	PLF-MW58S-1021
			Sample Date	1/19/2022	3/1/2022	4/19/2022	3/3/2021	3/3/2021	4/21/2021	4/21/2021	6/9/2021	6/9/2021	7/20/2021	9/8/2021	10/28/2021
Analyte	**CAS No.**	**Criteria [1]**	**Unit**												
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.030	0.17	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.11 U	0.11 U	0.11 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U	0.11 U
Trichloroethene	79-01-6	2.5	µg/L	0.053 U	0.053 U	0.053 U	0.077	0.074	0.096	0.087	0.080	0.082	0.094	0.064	0.061
Semivolatile Organic Compounds															
1-Methylnaphthalene	90-12-0	1.5	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Anthracene	120-12-7	2,400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(a)pyrene	50-32-8	0.023	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzo(g,h,i)perylene	191-24-2	--	µg/L												
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L				2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Fluoranthene	206-44-0	640	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Fluorene	86-73-7	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Hexachlorobenzene	118-74-1	0.027	µg/L	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U								2.0 U	2.0 U
Pyrene	129-00-0	240	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

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SL Screening level

Qualifier:

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Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	MW-58S (cont.)								NVM-01					
			Sample Name	PLF-DUP4-1021	PLF-MW58S-1221	PLF-DUP1-1221	PLF-MW58S-0122	PLF-MW58S-0322	PLF-DUP1-0322	PLF-MW58S-0422	PLF-DUP2-0422	PLF-NVM01-0618	PLF-NVM01-0718	PLF-NVM01-1018	PLF-NVM01-0119	PLF-NVM01-0419	PLF-NVM01-0719
			Sample Date	10/28/2021	12/7/2021	12/7/2021	1/19/2022	3/1/2022	3/1/2022	4/19/2022	4/19/2022	6/20/2018	7/17/2018	10/24/2018	1/23/2019	4/25/2019	7/24/2019
Analyte	**CAS No.**	**Criteria [1]**	**Unit**														
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.032 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*	*2.0 U*
Tetrachloroethene	127-18-4	0.69	µg/L	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.38	0.30	0.29	0.32	0.50	0.35
Trichloroethene	79-01-6	2.5	µg/L	0.058	0.097	0.083	0.096	0.11	0.10	0.080	0.083	0.48	0.35	0.24	0.46	0.65	0.26
Semivolatile Organic Compounds																	
1-Methylnaphthalene	90-12-0	1.5	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Anthracene	120-12-7	2,400	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						
Benzo(a)anthracene	56-55-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Benzo(a)pyrene	50-32-8	0.023	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Benzo(b)fluoranthene	205-99-2	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Benzo(g,h,i)perylene	191-24-2	--	µg/L														
Benzo(k)fluoranthene	207-08-9	--	µg/L	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U						
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L														
Chrysene	218-01-9	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Dibenzo(a,h)anthracene	53-70-3	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Fluoranthene	206-44-0	640	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						
Fluorene	86-73-7	320	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						
Hexachlorobenzene	118-74-1	0.027	µg/L	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*	*0.050 U*						
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U						
Phenanthrene	85-01-8	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						
Pyrene	129-00-0	240	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U						

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SL Screening level

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Table 2.2
Zone A Groundwater Monitoring Network Results

			Location Name	NVM-01 (cont.)															
			Sample Name	PLF-NVM01-1019	PLF-NVM01-0120	PLF-NVM01-0420	PLF-NVM01-0720	PLF-NVM01-1020	PLF-NVM01-1220	PLF-NVM01-0321	PLF-NVM01-0421	PLF-NVM01-0621	PLF-NVM01-0721	PLF-NVM01-0921	PLF-NVM01-1021	PLF-NVM01-1221	PLF-NVM01-0122	PLF-NVM01-0322	PLF-NVM01-0422
			Sample Date	10/23/2019	1/22/2020	4/22/2020	7/22/2020	10/27/2020	12/15/2020	3/3/2021	4/22/2021	6/9/2021	7/20/2021	9/8/2021	10/26/2021	12/7/2021	1/19/2022	3/1/2022	4/18/2022
Analyte	**CAS No.**	**Criteria [1]**	**Unit**																
Volatile Organic Compounds																			
1,2-Dichloroethane	107-06-2	0.38	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.021	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Benzene	71-43-2	1.2	µg/L	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Chloroform	67-66-3	1.4	µg/L	*2.0 U*	*2.0 U*	1.0 U	*2.0 U*	*2.0 U*	*2.0 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	127-18-4	0.69	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Trichloroethene	79-01-6	2.5	µg/L	0.22	0.21	0.097	0.094	0.12	0.19	0.12	0.086	0.089	0.096	0.11	0.057	0.082	0.095	0.084	0.084
Semivolatile Organic Compounds																			
1-Methylnaphthalene	90-12-0	1.5	µg/L						0.020 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Anthracene	120-12-7	2,400	µg/L						0.020 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Benzo(a)anthracene	56-55-3	--	µg/L						0.020 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Benzo(a)pyrene	50-32-8	0.023	µg/L						*0.029 U*	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Benzo(b)fluoranthene	205-99-2	--	µg/L						0.030 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Benzo(g,h,i)perylene	191-24-2	--	µg/L						0.020 U										
Benzo(k)fluoranthene	207-08-9	--	µg/L						0.021 U	0.021 U		0.021 U		0.021 U		0.021 U		0.021 U	
bis(2-Ethylhexyl) Phthalate	117-81-7	6.3	µg/L						2.0 U	2.0 U		2.0 U							
Chrysene	218-01-9	--	µg/L						0.020 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Dibenzo(a,h)anthracene	53-70-3	--	µg/L						0.020 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Fluoranthene	206-44-0	640	µg/L						0.020 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Fluorene	86-73-7	320	µg/L						0.020 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Hexachlorobenzene	118-74-1	0.027	µg/L						*2.0 U*	*0.050 U*		*0.050 U*		*0.050 U*		*0.050 U*		*0.050 U*	
Indeno(1,2,3-cd)pyrene	193-39-5	--	µg/L						0.020 U	0.020 U		0.020 U		0.020 U		0.020 U		0.020 U	
Phenanthrene	85-01-8	--	µg/L						2.0 U					2.0 U		2.0 U		2.0 U	
Pyrene	129-00-0	240	µg/L						0.020 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	

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Table 4.2
Analytical Summary

Boring Location	Sample Collection Date	Sample Depth (feet bgs)	Primary Analyses [1]	Additional Analyses [2]				Moisture/ Porosity [3]	Treatability Test
				PCBs	RCRA 8 Metals	Pesticides	Herbicides		
BH01	1/24/2022	10	X						
		14	X						
	1/25/2022	35	X						
		60	X						
		61	X	X	X	X	X		
BH02	1/26/2022	11	X						
		14	X						
		15–18						X	
		22	X						
	1/31/2022	54	X						
		63–65						X	
BH03	2/7/2022	5	X						
		14	X						
		22						X	
		25	X						
		56	X						
		57						X	
BH04	1/31/2022	11	X						
		14	X						
	2/1/2022	25	X						
		38	X						
BH05	2/4/2022	11	X						
		17	X						
		23	X						
		32						X	
		36	X						
		44	X						
		46						X	
		61	X						
BH06	2/1/2022	12	X						
		14	X						
		24	X						
	2/2/2022	44	X						
BH07	2/2/2022	12	X						
		15	X	X	X	X	X		
		22						X	
	2/3/2022	27	X						
		30	X						
		53	X						
		63	X						
		64						X	
BH07a	9/22/2022	34	X						
		41	X						
BH08	2/11/2022	5	X						
		18	X						
		24	X						
	2/12/2022	37	X						
		61	X	X	X	X	X		
BH09	6/6/2022	15	X						
		16	X						
		23	X						
		32	X						
BH10	2/9/2022	3	X						
		12	X						
		14						X	
	2/10/2022	39	X						
		52						X	
		54	X						
BH11	2/7/2022	12	X	X	X	X			
		20	X	X	X	X	X		
	2/8/2022	48	X						
		57	X						
BH12	6/7/2022	5	X						
		21	X						
		24	X	X					
		27	X						
		38	X						

Table 4.2
Analytical Summary

Boring Location	Sample Collection Date	Sample Depth (feet bgs)	Primary Analyses [1]	Additional Analyses [2]				Moisture/ Porosity [3]	Treatability Test
				PCBs	RCRA 8 Metals	Pesticides	Herbicides		
BH12a	9/22/2022	22–24							X
BH13	6/15/2022	4	X						
		18	X						
		23	X						
		33	X						
		55	X						
BH14	2/8/2022	11	X	X	X	X	X		
		15	X						
		29	X						
	2/9/2022	64	X						
		68	X	X	X	X			
BH15	2/10/2022	11	X						
		16	X					X	
	2/11/2022	23	X						
		48	X						
		52						X	
BH16	2/13/2022	12	X						
		17	X						
		32	X	X	X	X	X		
		36	X						
		44	X						
		62	X	X	X	X			
BH16a	9/22/2022	46	X						
		51	X						
BH17	2/12/2022	3	X						
		14	X						
		24						X	
		26	X						
	2/13/2022	51	X						
		56						X	
BH18	2/14/2022	12	X						
		17	X	X	X	X	X		
		22	X						
		39	X						
		45	X						
		60	X						
BH19	5/31/2022	14	X						
		16	X						
		33	X						
		39	X						
		42	X						
BH20	6/2/2022	13	X						
		16	X						
		22	X						
		24	X						
BH21	6/1/2022	13	X						
		15	X						
		25	X						
		31	X						
BH22	6/1/2022	12	X						
		15	X						
		24	X	X	X				
		28	X						
BH23	6/2/2022	14	X						
		17	X						
		22	X						
		28	X						
		31	X						
BH24	6/1/2022	13	X						
		18	X						
		23	X	X	X	X	X		
		24–25						X	
		32	X						
		55–57						X	
		60	X	X					

Table 4.2
Analytical Summary

Boring Location	Sample Collection Date	Sample Depth (feet bgs)	Primary Analyses [1]	Additional Analyses [2]				Moisture/ Porosity [3]	Treatability Test
				PCBs	RCRA 8 Metals	Pesticides	Herbicides		
BH25	6/1/2022	15	X						
		18	X						
		22	X						
		26	X						
		34	X						
		63	X						
BH26	6/2/2022	17	X						
		19	X						
		24	X	X	X				
		27	X						
BH27	6/3/2022	14	X						
		19	X						
		22	X			X	X		
		28	X						
		33	X						
		38	X						
		61	X						
BH28	6/16/2022	4	X						
		17	X						
		24	X						
		29	X						
BH29	6/16/2022	17	X						
		20	X						
		23	X						
		33	X						
		33–34						X	
		44	X						
		61–62						X	
BH30	6/16/2022	3	X						
		16	X	X	X				
		24	X						
		32	X						
BH30a	9/22/2022	22–24							X
BH31	6/15/2022	14	X						
		17	X	X	X	X	X		
		23	X						
		32	X						
BH32	6/15/2022	3	X						
		15	X						
		28	X						
		32	X						
BH33	6/6/2022	15	X						
		20	X						
		28	X						
		33	X						
		37	X						
BH34	6/6/2022	10	X						
		15	X						
		18	X						
BH35	5/31/2022	12	X						
		16	X						
		23	X						
	6/1/2022	33	X						
BH36	6/6/2022	6	X						
		16	X						
		23	X						
BH37	6/15/2022	5	X						
		11	X						
		16	X						
BH38	6/15/2022	15	X						
		24	X						
		28	X						

Table 4.2
Analytical Summary

Boring Location	Sample Collection Date	Sample Depth (feet bgs)	Primary Analyses [1]	Additional Analyses [2]				Moisture/ Porosity [3]	Treatability Test
				PCBs	RCRA 8 Metals	Pesticides	Herbicides		
BH39	6/15/2022	13	X						
		18	X						
		23	X						
		29	X						
BH40	6/15/2022	15	X						
		24	X						
BH41	6/16/2022	13	X						
		17	X						
		22	X						
		32	X						
BH42	6/16/2022	10	X						
BH43	9/22/2022	22	X						
		25	X						

Notes:

1 Primary analyses consisted of VOCs, SVOCs, and TPH.
2 Sample for additional analyses was collected from the depth interval with the greatest field indication of contamination or, if no evidence of contamination, at the water table.
3 Moisture content and porosity calculated using a standard proctor by ASTM D698 and calculation method ASTM D2216.

Abbreviations:

bgs Below ground surface
PCB Polychlorinated biphenyl
RCRA Resource Conservation and Recovery Act
SVOC Semivolatile organic compound
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Analyses:

VOCs by USEPA Method 8260D
SVOCs by USEPA Method 8270E
TPH by Method NWTPH-Gx and NWTPH-Dx
PCBs by USEPA Method 8082
RCRA 8 Metals by USEPA Method 6020
Mecury by USEPA Method 7471
Pesticides by USEPA Method 8081
Herbicides by USEPA Method 8151A

Table 4.3
Screening Level Development

Analyte	CAS No.	Unit	Protection of Direct Contact			Protection of Groundwater Leaching		Adjustment Factors		Proposed Screening Values	
			MTCA Method A Industrial [1]	MTCA Method C Non Cancer	MTCA Method C Cancer	MTCA Method B Protection of Groundwater Vadose [2]	MTCA Method B Protection of Groundwater Saturated [3]	Washington State Natural Background [4]	Practical Quantitation Limit [5]	Proposed Screening Level Vadose [2]	Proposed Screening Level Saturated [3]
Metals											
Arsenic	7440-38-2	mg/kg	--	1,100	88	2.9	0.15	5.1	0.025	5.1	5.1
Barium	7440-39-3	mg/kg	--	700,000	--	1,600	83	--	0.50	1,600	83
Cadmium	7440-43-9	mg/kg	--	3,500	--	0.69	0.035	0.93	0.25	0.93	0.93
Chromium	7440-47-3	mg/kg	--	--	--	--	--	--	0.50	--	--
Lead	7439-92-1	mg/kg	--	--	--	3,000	150	11	0.50	3,000	150
Mercury	7439-97-6	mg/kg	--	--	--	2.1	0.10	0.050	0.020	2.1	0.10
Selenium	7782-49-2	mg/kg	--	18,000	--	5.2	0.26	--	0.50	5.2	0.50
Silver	7440-22-4	mg/kg	--	18,000	--	14	0.69	--	0.50	14	0.69
Total Petroleum Hydrocarbons											
Gasoline-range organics	GRO	mg/kg	30	--	--	--	--	--	25	30	30
Diesel-range organics	DRO	mg/kg	2,000	--	--	--	--	--	50	2,000	2,000
Oil-range organics	ORO	mg/kg	2,000	--	--	--	--	--	50	2,000	2,000
Polychlorinated Biphenyls (PCBs)											
PCB-1016	12674-11-2	mg/kg	--	250	1,900	1.2	0.060	--	0.10	1.2	0.10
PCB-1221	11104-28-2	mg/kg	--	--	--	--	--	--	0.10	--	--
PCB-1232	11141-16-5	mg/kg	--	--	--	--	--	--	0.10	--	--
PCB-1242	53469-21-9	mg/kg	--	--	--	--	--	--	0.10	--	--
PCB-1248	12672-29-6	mg/kg	--	--	--	--	--	--	0.10	--	--
PCB-1254	11097-69-1	mg/kg	--	70	66	0.057	0.0029	--	0.10	0.10	0.10
PCB-1260	11096-82-5	mg/kg	--	--	66	0.36	0.018	--	0.10	0.36	0.10
PCB-1268	11100-14-4	mg/kg	--	--	--	--	--	--	0.10	--	--
Total PCB Aroclors (U=0)	T_PCB (U=0)	mg/kg	--	10	66	0.34	0.017	--	0.10	0.34	0.10
Volatile Organic Compounds											
Benzene	71-43-2	mg/kg	--	14,000	2,400	0.027	0.0017	--	0.0010	0.027	0.0017
Ethylbenzene	100-41-4	mg/kg	--	350,000	--	5.9	0.34	--	0.010	5.9	0.34
Toluene	108-88-3	mg/kg	--	280,000	--	4.5	0.27	--	0.010	4.5	0.27
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	--	700,000	--	13	0.77	--	0.020	13	0.77
Xylene (ortho)	95-47-6	mg/kg	--	700,000	--	14	0.84	--	0.010	14	0.84
Xylene (total)	1330-20-7	mg/kg	--	700,000	--	14	0.83	--	0.010	14	0.83
cis-1,2-Dichloroethene	156-59-2	mg/kg	--	7,000	--	0.079	0.0052	--	0.0010	0.079	0.0052
Tetrachloroethene	127-18-4	mg/kg	--	21,000	63,000	0.050	0.0028	--	0.0010	0.050	0.0028
Trichloroethene	79-01-6	mg/kg	--	1,800	2,900	0.025	0.0015	--	0.0010	0.025	0.0015
Vinyl chloride	75-01-4	mg/kg	--	11,000	88	0.0017	0.000090	--	0.000080	0.0017	0.000090
Chloroethane	75-00-3	mg/kg	--	--	--	--	--	--	0.010	--	--
trans-1,2-Dichloroethene	156-60-5	mg/kg	--	70,000	--	0.52	0.032	--	0.010	0.52	0.032
1,1-Dichloroethane	75-34-3	mg/kg	--	700,000	23,000	0.041	0.0026	--	0.0010	0.041	0.0026
1,1-Dichloroethene	75-35-4	mg/kg	--	180,000	--	0.046	0.0025	--	0.0010	0.046	0.0025
1,1,1-Trichloroethane	71-55-6	mg/kg	--	7,000,000	--	1.5	0.084	--	0.010	1.5	0.084
1,1,2-Trichloroethane	79-00-5	mg/kg	--	14,000	2,300	0.017	0.0011	--	0.0010	0.017	0.0011
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	--	70,000	660	0.0012	0.000080	--	0.00032	0.0012	0.00032
1,2,4-Trichlorobenzene	120-82-1	mg/kg	--	35,000	4,500	0.56	0.029	--	0.010	0.56	0.029
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	--	700	160	0.00091	0.000058	--	0.050	0.050	0.050
1,2-Dibromoethane	106-93-4	mg/kg	--	32,000	66	0.00027	0.000018	--	0.00011	0.00027	0.00011
1,2-Dichlorobenzene	95-50-1	mg/kg	--	320,000	--	7.0	0.40	--	0.00	7.0	0.40
1,2-Dichloroethane	107-06-2	mg/kg	--	21,000	1,400	0.023	0.0016	--	0.0010	0.023	0.0016

Table 4.3
Screening Level Development

Analyte	CAS No.	Unit	Protection of Direct Contact			Protection of Groundwater Leaching		Adjustment Factors		Proposed Screening Values	
			MTCA Method A Industrial [1]	MTCA Method C Non Cancer	MTCA Method C Cancer	MTCA Method B Protection of Groundwater Vadose [2]	MTCA Method B Protection of Groundwater Saturated [3]	Washington State Natural Background [4]	Practical Quantitation Limit [5]	Proposed Screening Level Vadose [2]	Proposed Screening Level Saturated [3]
Volatile Organic Compounds (cont.)											
1,2-Dichloropropane	78-87-5	mg/kg	--	140,000	3,500	0.025	0.0017	--	0.0010	0.025	0.0017
1,3-Dichlorobenzene	541-73-1	mg/kg	--	--	--	--	--	--	0.01	--	--
1,4-Dichlorobenzene	106-46-7	mg/kg	--	250,000	24,000	1.2	0.068	--	0.01	1.2	0.10
2-Hexanone	591-78-6	mg/kg	--	18,000	--	0.17	0.012	--	0.050	0.17	0.050
Acetone	67-64-1	mg/kg	--	3,200,000	--	29	2.1	--	0.050	29	2.1
Bromodichloromethane	75-27-4	mg/kg	--	70,000	2,100	0.033	0.0022	--	0.0010	0.033	0.0022
Bromoform	75-25-2	mg/kg	--	70,000	17,000	0.36	0.023	--	0.010	0.36	0.023
Bromomethane	74-83-9	mg/kg	--	4,900	--	0.051	0.0033	--	0.0010	0.051	0.0033
Carbon disulfide	75-15-0	mg/kg	--	350,000	--	4.1	0.25	--	0.010	4.1	0.25
Carbon tetrachloride	56-23-5	mg/kg	--	14,000	1,900	0.041	0.0022	--	0.0010	0.041	0.0022
Chlorobenzene	108-90-7	mg/kg	--	70,000	--	0.86	0.051	--	0.010	0.86	0.051
Chloroform	67-66-3	mg/kg	--	35,000	4,200	0.074	0.0048	--	0.0010	0.074	0.0048
Chloromethane	74-87-3	mg/kg	--	--	--	--	--	--	0.010	--	--
cis-1,3-Dichloropropene	10061-01-5	mg/kg	--	--	--	--	--	--	0.010	--	--
Dichlorodifluoromethane	75-71-8	mg/kg	--	700,000	--	38	0.53	--	0.010	38	0.53
Isopropylbenzene	98-82-8	mg/kg	--	350,000	--	15	0.79	--	0.010	15	0.79
Methyl ethyl ketone	78-93-3	mg/kg	--	2,100,000	--	20	1.4	--	0.050	20	1.4
Methyl isobutyl ketone	108-10-1	mg/kg	--	280,000	--	2.7	0.19	--	0.050	2.7	0.19
Methylene chloride	75-09-2	mg/kg	--	21,000	66,000	0.022	0.0015	--	0.0023	0.022	0.0023
Methyl-tert-butyl ether	1634-04-4	mg/kg	--	--	73,000	0.10	0.0072	--	0.0010	0.10	0.0072
Styrene	100-42-5	mg/kg	--	700,000	--	2.2	0.12	--	0.010	2.2	0.12
trans-1,3-Dichloropropene	10061-02-6	mg/kg	--	--	--	--	--	--	0.010	--	--
Trichlorofluoromethane	75-69-4	mg/kg	--	1,100,000	--	23	0.79	--	0.010	23	0.79
Semivolatile Organic Compounds											
Benzo(a)anthracene	56-55-3	mg/kg	--	--	--	--	--	--	0.10	--	--
Benzo(a)pyrene	50-32-8	mg/kg	--	1,100	130	3.9	0.19	--	0.10	3.9	0.19
Benzo(b)fluoranthene	205-99-2	mg/kg	--	--	--	--	--	--	0.10	--	--
Benzo(k)fluoranthene	207-08-9	mg/kg	--	--	--	--	--	--	0.10	--	--
Chrysene	218-01-9	mg/kg	--	--	--	--	--	--	0.10	--	--
Dibenzo(a,h)anthracene	53-70-3	mg/kg	--	--	--	--	--	--	0.10	--	--
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	--	--	--	--	--	--	0.10	--	--
1-Methylnaphthalene	90-12-0	mg/kg	--	250,000	4,500	0.082	0.0042	--	0.25	0.25	0.25
2-Methylnaphthalene	91-57-6	mg/kg	--	14,000	--	1.7	0.088	--	0.25	1.7	0.25
Acenaphthene	83-32-9	mg/kg	--	210,000	--	49	2.5	--	0.10	49	2.5
Acenaphthylene	208-96-8	mg/kg	--	--	--	--	--	--	0.10	--	--
Anthracene	120-12-7	mg/kg	--	1,100,000	--	1,100	57	--	0.10	1,100	57
Benzo(g,h,i)perylene	191-24-2	mg/kg	--	--	--	--	--	--	0.10	--	--
Fluoranthene	206-44-0	mg/kg	--	140,000	--	630	32	--	0.10	630	32
Fluorene	86-73-7	mg/kg	--	140,000	--	51	2.6	--	0.10	51	2.6
Naphthalene	91-20-3	mg/kg	--	70,000	--	4.5	0.24	--	0.10	4.5	0.24
Phenanthrene	85-01-8	mg/kg	--	--	--	--	--	--	0.10	--	--
Pyrene	129-00-0	mg/kg	--	110,000		330	16	--	0.10	330	16
2-Chloronaphthalene	91-58-7	mg/kg	--	280,000		34	1.8	--	0.10	34	1.8
Carbazole	86-74-8	mg/kg	--	--	--	--	--	--	0.25	--	--
2,4-Dinitrotoluene	121-14-2	mg/kg	--	7,000	420	0.0044	0.00024	--	0.034	0.034	0.034
2,6-Dinitrotoluene	606-20-2	mg/kg	--	1,100	88	0.00092	0.000051	--	0.046	0.046	0.046

Table 4.3
Screening Level Development

Analyte	CAS No.	Unit	Protection of Direct Contact			Protection of Groundwater Leaching		Adjustment Factors		Proposed Screening Values	
			MTCA Method A Industrial [1]	MTCA Method C Non Cancer	MTCA Method C Cancer	MTCA Method B Protection of Groundwater Vadose [2]	MTCA Method B Protection of Groundwater Saturated [3]	Washington State Natural Background [4]	Practical Quantitation Limit [5]	Proposed Screening Level Vadose [2]	Proposed Screening Level Saturated [3]
Semivolatile Organic Compounds (cont.)											
Nitrobenzene	98-95-3	mg/kg	--	7,000	--	0.10	0.0065	--	0.034	0.10	0.034
Bis(2-chloroethyl)ether	111-44-4	mg/kg	--	--	120	0.00022	0.000014	--	0.12	0.12	0.12
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	--	--	--	--	--	--	0.25	--	--
2-Nitroaniline	88-74-4	mg/kg	--	35,000	--	1.0	0.064	--	0.10	1.0	0.10
3-Nitroaniline	99-09-2	mg/kg	--	--	--	--	--	--	1.0	--	--
3,3'-Dichlorobenzidine	91-94-1	mg/kg	--	--	290	0.013	0.00068	--	0.21	0.21	0.21
4-Chloroaniline	106-47-8	mg/kg	--	14,000	660	0.0027	0.00017	--	0.71	0.71	0.71
4-Bromophenyl phenyl ether	101-55-3	mg/kg	--	--	--	--	--	--	0.10	--	--
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	--	--	--	--	--	--	0.10	--	--
4-Nitroaniline	100-01-6	mg/kg	--	14,000	6,600	0.027	0.0017	--	0.25	0.25	0.25
Hexachloroethane	67-72-1	mg/kg	--	2,500	3,300	0.0088	0.00053	--	0.025	0.025	0.025
Pyridine	110-86-1	mg/kg	--	3,500	--	0.043	0.0029	--	0.20	0.20	0.20
2-Chlorophenol	95-57-8	mg/kg	--	18,000	--	0.47	0.027	--	0.25	0.47	0.25
2-Methylphenol	95-48-7	mg/kg	--	180,000	--	8.1	0.47	--	0.10	8.1	0.47
2-Nitrophenol	88-75-5	mg/kg	--	--	--	--	--	--	0.10	--	--
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	--	110,000	--	4.6	0.27	--	0.10	4.6	0.27
2,4-Dichlorophenol	120-83-2	mg/kg	--	11,000	--	0.33	0.021	--	0.31	0.33	0.31
2,4-Dimethylphenol	105-67-9	mg/kg	--	70,000	--	4.4	0.25	--	0.080	4.4	0.25
2,4-Dinitrophenol	51-28-5	mg/kg	--	7,000	--	0.13	0.0092	--	0.17	0.17	0.17
2,4,5-Trichlorophenol	95-95-4	mg/kg	--	350,000	--	58	3.0	--	0.10	58	3.0
2,4,6-Trichlorophenol	88-06-2	mg/kg	--	3,500	12,000	0.092	0.0053	--	0.049	0.092	0.049
2,6-Dichlorophenol	87-65-0	mg/kg	--	--	--	--	--	--	0.25	--	--
3- & 4-Methylphenol	15831-10-4	mg/kg	--	--	--	--	--	--	0.10	--	--
4-Chloro-3-methylphenol	59-50-7	mg/kg	--	350,000	--	22	1.2	--	0.50	22	1.2
4-Nitrophenol	100-02-7	mg/kg	--	--	--	--	--	--	0.10	--	--
4,6-Dinitro-o-cresol	534-52-1	mg/kg	--	280	--	0.024	0.0013	--	0.10	0.10	0.10
Phenol	108-95-2	mg/kg	--	1,100,000	--	37	2.3	--	0.10	37	2.3
Pentachlorophenol	87-86-5	mg/kg	--	18,000	330	0.016	0.00088	--	0.18	0.18	0.18
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	--	70,000	9,400	13	0.67	--	0.10	13	0.67
Butyl benzyl phthalate	85-68-7	mg/kg	--	700,000	69,000	13	0.65	--	0.10	13	0.65
Di-n-butyl phthalate	84-74-2	mg/kg	--	350,000	--	57	3.0	--	0.10	57	3.0
Di-n-octyl phthalate	117-84-0	mg/kg	--	35,000	--	450	23	--	0.10	450	23
Diethylphthalate	84-66-2	mg/kg	--	2,800,000	--	72	4.7	--	0.10	72	4.7
Dimethyl phthalate	131-11-3	mg/kg	--	--	--	--	--	--	0.10	--	--
Aniline	62-53-3	mg/kg	--	25,000	23,000	0.083	0.0055	--	0.10	0.10	0.10
Azobenzene	103-33-3	mg/kg	--	--	1,200	0.031	0.0016	--	0.10	0.10	0.10
Benzoic acid	65-85-0	mg/kg	--	14,000,000	--	260	18	--	1.0	260	18
Benzyl alcohol	100-51-6	mg/kg	--	350,000	--	7.1	0.49	--	0.10	7.1	0.49
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	--	11,000	--	0.21	0.014	--	0.25	0.25	0.25
Dibenzofuran	132-64-9	mg/kg	--	3,500	--	1.5	0.076	--	0.10	1.5	0.10
Hexachlorobutadiene	87-68-3	mg/kg	--	3,500	1,700	0.012	0.00063	--	0.16	0.16	0.16
Isophorone	78-59-1	mg/kg	--	700,000	140,000	0.49	0.032	--	0.087	0.49	0.087
N-Nitrosodimethylamine	62-75-9	mg/kg	--	28	2.6	0.0000010	0.000000070	--	0.10	0.10	0.10
N-Nitroso-di-n-propylamine	621-64-7	mg/kg	--	--	19	0.00012	0.0000070	--	0.12	0.12	0.12
N-Nitrosodiphenylamine	86-30-6	mg/kg	--	--	27,000	1.0	0.052	--	0.042	1.0	0.052

Table 4.3
Screening Level Development

Analyte	CAS No.	Unit	Protection of Direct Contact			Protection of Groundwater Leaching		Adjustment Factors		Proposed Screening Values	
			MTCA Method A Industrial [1]	MTCA Method C Non Cancer	MTCA Method C Cancer	MTCA Method B Protection of Groundwater Vadose [2]	MTCA Method B Protection of Groundwater Saturated [3]	Washington State Natural Background [4]	Practical Quantitation Limit [5]	Proposed Screening Level Vadose [2]	Proposed Screening Level Saturated [3]
Pesticides											
4,4'-DDD	72-54-8	mg/kg	--	110	550	0.34	0.017	--	0.010	0.34	0.017
4,4'-DDE	72-55-9	mg/kg	--	1,100	390	0.22	0.011	--	0.010	0.22	0.011
4,4'-DDT	50-29-3	mg/kg	--	1,800	390	3.5	0.17	--	0.010	3.5	0.17
Aldrin	309-00-2	mg/kg	--	110	7.7	0.0025	0.00013	--	0.0027	0.0027	0.0027
alpha-BHC	319-84-6	mg/kg	--	28,000	21	0.00055	0.000028	--	0.010	0.010	0.010
alpha-Endosulfan	959-98-8	mg/kg	--	--	--	--	--	--	0.010	--	--
beta-BHC	319-85-7	mg/kg	--	--	73	0.0023	0.00012	--	0.010	0.010	0.010
beta-Endosulfan	33213-65-9	mg/kg	--	--	--	--	--	--	0.010	--	--
Chlordane	57-74-9	mg/kg	--	--	--	--	--	--	0.020	--	--
delta-BHC	319-86-8	mg/kg	--	--	--	--	--	--	0.010	--	--
Dieldrin	60-57-1	mg/kg	--	180	8.2	0.0028	0.00014	--	0.0030	0.0030	0.0030
Endosulfan sulfate	1031-07-8	mg/kg	--	21,000	--	19	0.97	--	0.010	19	0.97
Endrin	72-20-8	mg/kg	--	1,100	--	0.44	0.022	--	0.010	0.44	0.022
Endrin aldehyde	7421-93-4	mg/kg	--	--	--	--	--	--	0.010	--	--
gamma-BHC	58-89-9	mg/kg	--	1,100	120	0.0062	0.00033	--	0.010	0.010	0.010
Heptachlor	76-44-8	mg/kg	--	1,800	29	0.019	0.00095	--	0.0033	0.019	0.0033
Heptachlor epoxide	1024-57-3	mg/kg	--	46	14	0.0099	0.00050	--	0.0030	0.0099	0.00300
Hexachlorobenzene	118-74-1	mg/kg	--	2,800	82	0.44	0.022	--	0.045	0.44	0.045
Hexachlorocyclopentadiene	77-47-4	mg/kg	--	21,000	--	1.5	0.081	--	0.10	1.5	0.10
Methoxychlor	72-43-5	mg/kg	--	18,000	--	64	3.2	--	0.010	64	3.2
Toxaphene	8001-35-2	mg/kg	--	320	120	1.5	0.076	--	0.050	1.5	0.076
Herbicides											
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	mg/kg	--	3,500	--	0.080	0.0054	--	0.01	0.080	0.0054
2,4,5-Trichlorophenoxyacetic acid	93-76-5	mg/kg	--	35,000	--	0.98	0.063	--	0.01	0.98	0.063
2,4-DB	94-82-6	mg/kg	--	110,000	--	5.5	0.32	--	0.01	5.5	0.32
2,4-Dichlorophenoxyacetic acid	94-75-7	mg/kg	--	35,000	--	0.32	0.022	--	0.01	0.32	0.022
Dalapon [6]	75-99-0	mg/kg	--	110,000	--	0.81	0.058	--	--	0.81	0.058
Dicamba	1918-00-9	mg/kg	--	110,000	--	2.2	0.15	--	0.01	2.2	0.15
Dichloroprop	120-36-5	mg/kg	--	--	--	--	--	--	0.01	--	--
Dinoseb	88-85-7	mg/kg	--	3,500	--	0.63	0.032	--	0.01	0.63	0.032
MCPA	94-74-6	mg/kg	--	1,800	--	0.037	0.0025	--	0.01	0.037	0.0025
Silvex	93-72-1	mg/kg	--	28,000	--	0.38	0.023	--	0.01	0.38	0.023

Notes:

All screening levels are rounded to two significant figures.

Screening level adjusted upward based on laboratory PQL or natural background concentrations.

-- Value does not exist.

1 Criteria applied only to TPH. Criteria for other analytes not shown.

2 Criteria applied only to samples in the vadose zone, determined to be 0 to 59 feet bgs.

3 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

4 Based on Yakima Basin values in Washington State Department of Ecology's 1994 publication, "Natural Background Soil Metals Concentrations in Washington State."

5 PQL values, except for pesticides and herbicides, from ALS Environmental. Pesticide and herbicide PQL values from Pacific Agricultural Laboratory.

6 Pacific Agricultural Laboratory does not analyze for Dalapon as part of EPA Method 8151A and, therefore, did not provide a PQL.

Abbreviations:

2,4-DB 4(2,4-Dichlorophenoxy)butyric acid
bgs Below ground surface
BHC Benzene hexachloride
CAS Chemical Abstracts Service
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
MCPA (4-Chloro-2-methylphenoxy)acetic acid
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
PQL Practical quantitation limit
TPH Total petroleum hydrocarbons

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH01					BH02				
				Sample Name		PLF-PEC-BH01-10-012422	PLF-PEC-BH01-14-012422	PLF-PEC-BH01-35-012522	PLF-PEC-BH01-60-012522	PLF-PEC-BH01-61-012522	PLF-PEC-BH02-11-012622	PLF-PEC-BH02-14-012622	PLF-PEC-BH02-22-012622	PLF-PEC-BH02-54-013122	PLF-PEC-DUP1-013122
				Sample Date		1/24/2022	1/24/2022	1/25/2022	1/25/2022	1/25/2022	1/26/2022	1/26/2022	1/26/2022	1/31/2022	1/31/2022
				Sample Depth (feet bgs)		10	14	35	60	61	11	14	22	54	54
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00044 U	0.00044 U	0.00041 U	*0.00034 U*	0.00025 U	0.00048 U	0.0004 U	0.00056 U	0.00046 U	0.00063 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.04	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00015 U	0.00015 U	0.00014 U	0.00011 U	0.000084 U	0.00016 U	0.00013 U	0.00019 U	0.00015 U	0.00021 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH01					BH02				
				Sample Name		PLF-PEC-BH01-10-012422	PLF-PEC-BH01-14-012422	PLF-PEC-BH01-35-012522	PLF-PEC-BH01-60-012522	PLF-PEC-BH01-61-012522	PLF-PEC-BH02-11-012622	PLF-PEC-BH02-14-012622	PLF-PEC-BH02-22-012622	PLF-PEC-BH02-54-013122	PLF-PEC-DUP1-013122
				Sample Date		1/24/2022	1/24/2022	1/25/2022	1/25/2022	1/25/2022	1/26/2022	1/26/2022	1/26/2022	1/31/2022	1/31/2022
				Sample Depth (feet bgs)		10	14	35	60	61	11	14	22	54	54
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0044	0.0031 U	0.0033	0.0026	0.0018 U	0.0039	0.0028 U	0.0039 U	0.0032 U	0.0044 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.044	0.05 U	0.0033	0.0026	0.05 U	0.0039	0.05 U	0.05 U	0.05 U	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.28 J	0.05 UJ	0.24 J	0.24 J	0.05 UJ	0.24 J	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	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	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	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	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	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	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	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	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	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	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	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	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	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	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.12	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
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.12	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.37	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	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	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	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	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.16	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
Pyrene	129-00-0	330	16	110,000	mg/kg	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	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.047 U	0.05 U	0.045 U	0.044 U	*0.051 U*	0.046 U	0.046 U	0.049 U	0.046 U	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.29 U	0.31 U	0.28 U	0.27 U	*0.32 U*	0.29 U	0.29 U	0.3 U	0.29 U	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.077 U	0.08 U	0.073 U	0.071 U	0.083 U	0.075 U	0.075 U	0.079 U	0.074 U	0.073 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	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	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.17 U	0.18 U	0.16 U	0.16 U	*0.19 U*	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	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	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.044 U	0.046 U	0.042 U	0.041 U	*0.048 U*	0.043 U	0.043 U	0.046 U	0.043 U	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH01					BH02				
				Sample Name		PLF-PEC-BH01-10-012422	PLF-PEC-BH01-14-012422	PLF-PEC-BH01-35-012522	PLF-PEC-BH01-60-012522	PLF-PEC-BH01-61-012522	PLF-PEC-BH02-11-012622	PLF-PEC-BH02-14-012622	PLF-PEC-BH02-22-012622	PLF-PEC-BH02-54-013122	PLF-PEC-DUP1-013122
				Sample Date		1/24/2022	1/24/2022	1/25/2022	1/25/2022	1/25/2022	1/26/2022	1/26/2022	1/26/2022	1/31/2022	1/31/2022
				Sample Depth (feet bgs)		10	14	35	60	61	11	14	22	54	54
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.2 U	0.21 U	0.19 U	0.19 U	*0.22 U*	0.2 U	0.2 U	0.21 U	0.2 U	0.2 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.68 U	0.71 U	0.64 U	0.63 U	*0.73 U*	0.66 U	0.66 U	0.7 U	0.66 U	0.65 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.12 U	0.12 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.043 U	0.045 U	0.041 U	0.04 U	*0.046 U*	0.042 U	0.042 U	0.044 U	0.042 U	0.041 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.024 U	*0.026 U*	0.023 U	0.023 U	*0.026 U*	0.024 U	0.024 U	0.025 U	0.024 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.17	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
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	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	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.34	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
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	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	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	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	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	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	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.16 U	0.16 U	0.15 U	0.14 U	*0.17 U*	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.084 U	0.088 U	0.08 U	0.078 U	*0.091 U*	0.082 U	0.082 U	0.087 U	0.082 U	0.08 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	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	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.11 U	0.12 U	0.11 U	0.1 U	0.12 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	1.5	0.043 U	0.039 U	0.038 U	0.044 U	0.04 U	0.04 U	0.042 U	0.039 U	0.039 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	240	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	330	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	570	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	580	50 U	50 U	50 U	50 U	50 U	50 U	50 U	*50 U*	*50 U*

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH03					BH04				BH05	
					Sample Name	PLF-PEC-BH03-05-020722	PLF-PEC-BH03-14-020722	PLF-PEC-DUP2-020722	PLF-PEC-BH03-25-020722	PLF-PEC-BH03-56-020722	PLF-PEC-BH04-11-013122	PLF-PEC-BH04-14-013122	PLF-PEC-BH04-25-020122	PLF-PEC-BH04-38-020122	PLF-PEC-BH05-11-020422	PLF-PEC-BH05-17-020422
					Sample Date	2/7/2022	2/7/2022	2/7/2022	2/7/2022	2/7/2022	1/31/2022	1/31/2022	2/1/2022	2/1/2022	2/4/2022	2/4/2022
					Sample Depth (feet bgs)	5	14	14	25	56	11	14	25	38	11	17
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.22 U*	*1.2 U*
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.3	41
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.7	22
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	7.2	160
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	4.3	58
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	12	220
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	12	220
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	15	280
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	15	280
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.26 U*	*1.4 U*
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.29 U*	*1.5 U*
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.24 U*	*1.3 U*
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.012 U*	*0.062 U*
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.29 U	*1.5 U*
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.29 U	*1.5 U*
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.35 U	1.8 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.42 U	*2.2 U*
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.46 U	*2.4 U*
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00039 U	0.00034 U	0.00033 U	0.0003 U	0.00031 U	0.00068 U	0.00077 U	0.00066 U	0.00062 U	*0.32 U*	*1.7 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.11 U*	*0.59 U*
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.23 U*	*1.2 U*
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011 U	0.001 U	0.001 U	*0.44 U*	*2.3 U*
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.26 U	*1.3 U*
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	*5 U*
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00013 U	0.00011 U	0.00011 U	0.000099 U	0.0001 U	0.00023 U	0.00026 U	0.00022 U	0.00021 U	*0.11 U*	*0.55 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.16 U	5.4
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.13 U*	*0.69 U*
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.14 U*	*0.73 U*
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.15 U	1 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.18 U	1 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.78 U*	*5 U*
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	5 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.14 U*	*0.72 U*
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.16 U	*1 U*
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011 U	0.001 U	0.001 U	*0.47 U*	*2.4 U*
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.31 U	1.6 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.23 U*	*1.2 U*
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.13 U	*1 U*
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.43 U*	*2.2 U*
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.42 U	2.2 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.19 U	1 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.45 U	2.3 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.17 U	7.5
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	5 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH03					BH04				BH05	
				Sample Name		PLF-PEC-BH03-05-020722	PLF-PEC-BH03-14-020722	PLF-PEC-DUP2-020722	PLF-PEC-BH03-25-020722	PLF-PEC-BH03-56-020722	PLF-PEC-BH04-11-013122	PLF-PEC-BH04-14-013122	PLF-PEC-BH04-25-020122	PLF-PEC-BH04-38-020122	PLF-PEC-BH05-11-020422	PLF-PEC-BH05-17-020422
				Sample Date		2/7/2022	2/7/2022	2/7/2022	2/7/2022	2/7/2022	1/31/2022	1/31/2022	2/1/2022	2/1/2022	2/4/2022	2/4/2022
				Sample Depth (feet bgs)		5	14	14	25	56	11	14	25	38	11	17
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.54 U	*5 U*
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0027 U	0.0023 U	0.0023 U	0.0021 U	0.0021 U	0.0047 U	0.0077	0.0046 U	0.0043 U	*2.2 U*	*12 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011 U	0.001 U	0.001 U	*0.46 U*	*2.4 U*
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.18 U	1 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.3 U	1.6 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.29 U	1.5 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0077	0.05 U	0.05 U	15	290
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.25	0.05 U	0.05 U	21	330
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	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	1 U	1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	1 U	1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	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	1 U	1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	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	1 U	1 U
Chrysene	218-01-9	--	--	--	mg/kg	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	1 U	1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	1 U	1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	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	1 U	1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	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	1 U	1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	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	1 U	1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	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	14	99
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	5	17
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	7.5	28
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	27	140
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	27	140
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	1 U	1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	1 U	1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	1 U	1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	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	1 U	1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	1 U	1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	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	1 U	1.7
Pyrene	129-00-0	330	16	110,000	mg/kg	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	1 U	1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	1 U	1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	1 U	1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	1 U	1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.045 U	0.044 U	0.044 U	0.044 U	0.043 U	0.047 U	0.047 U	0.044 U	0.045 U	*0.45 U*	*0.45 U*
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.28 U	0.27 U	0.27 U	0.27 U	0.27 U	0.29 U	0.29 U	0.27 U	0.28 U	*2.8 U*	*2.8 U*
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.072 U	0.07 U	0.071 U	0.07 U	0.069 U	0.076 U	0.076 U	0.071 U	0.073 U	0.73 U	0.72 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	*1.7 U*
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	1 U	1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	1 U	1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	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	1 U	1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	*1 U*	*1 U*
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	1 UJ	1 UJ
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.17 U	0.16 U	0.17 U	*1.6 U*	2.1
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	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	1 U	1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.34 U*
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.042 U	0.041 U	0.041 U	0.041 U	0.04 U	0.044 U	0.044 U	0.041 U	0.042 U	*0.42 U*	*0.42 U*
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.34 U*

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH03					BH04				BH05	
				Sample Name		PLF-PEC-BH03-05-020722	PLF-PEC-BH03-14-020722	PLF-PEC-DUP2-020722	PLF-PEC-BH03-25-020722	PLF-PEC-BH03-56-020722	PLF-PEC-BH04-11-013122	PLF-PEC-BH04-14-013122	PLF-PEC-BH04-25-020122	PLF-PEC-BH04-38-020122	PLF-PEC-BH05-11-020422	PLF-PEC-BH05-17-020422
				Sample Date		2/7/2022	2/7/2022	2/7/2022	2/7/2022	2/7/2022	1/31/2022	1/31/2022	2/1/2022	2/1/2022	2/4/2022	2/4/2022
				Sample Depth (feet bgs)		5	14	14	25	56	11	14	25	38	11	17
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	1 U	1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.2 U	0.19 U	0.19 U	*1.9 U*	*1.9 U*
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	10 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.64 U	0.62 U	0.63 U	0.62 U	0.61 U	0.67 U	0.67 U	0.63 U	0.64 U	*6.4 U*	*6.4 U*
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	1 U	1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	1 U	1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.11 U	0.11 U	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	*1.1 U*	*1.1 U*
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.041 U	0.039 U	0.04 U	0.039 U	0.039 U	0.043 U	0.043 U	0.04 U	0.041 U	0.41 U	0.4 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.023 U	0.022 U	0.023 U	0.022 U	0.022 U	0.024 U	0.024 U	0.023 U	0.023 U	*0.23 U*	*0.23 U*
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	*2 U*
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.55	0.19	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	10	68
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	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	1.2	7.3
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	1 U	1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	7.6
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	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	55	25
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	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	3.3	2.3
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	14 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*1 U*
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*1 U*
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	10 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	1 U	1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	1 U	1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.15 U	0.14 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U	0.14 U	0.15 U	*1.5 U*	*1.5 U*
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	1 UJ	1 UJ
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.079 U	0.077 U	0.078 U	0.077 U	0.076 U	0.083 U	0.083 U	0.078 U	0.08 U	1.7	20
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	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	*1 U*	*1 U*
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	*1.1 U*	*1 U*
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.38	0.037 U	0.038 U	0.037 U	0.037 U	0.04 U	0.04 U	0.038 U	0.039 U	0.39 U	0.38 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	790	4900
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	2,100	6,500
Oil-range organics	ORO	2,000	2,000	--	mg/kg	140	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	3,300	5,900
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	140	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	6,200	17,000
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	180	*50 U*	*50 U*	50 U	50 U	50 U	50 U	50 U	50 U	6,200	17,000

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenze, and xylenes
CAS Chemical Abstracts Service
cPAH Carcinogenic polycyclic aromatic hydrocarbon
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
REL Remediation Level
TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH05 (cont.)				BH06				BH07		
					Sample Name	PLF-PEC-BH05-23-020422	PLF-PEC-BH05-36-020422	PLF-PEC-BH05-44-020422	PLF-PEC-BH05-61-020422	PLF-PEC-BH06-12-020122	PLF-PEC-BH06-14-020122	PLF-PEC-BH06-24-020122	PLF-PEC-BH06-44-020222	PLF-PEC-BH07-12-020222	PLF-PEC-BH07-15-020222	PLF-PEC-BH07-27-020322
					Sample Date	2/4/2022	2/4/2022	2/4/2022	2/4/2022	2/1/2022	2/1/2022	2/1/2022	2/2/2022	2/2/2022	2/2/2022	2/3/2022
					Sample Depth (feet bgs)	23	36	44	61	12	14	24	44	12	15	27
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.41 U*	0.025 U	
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	52	3.5	
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	78	3.7	
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	260	13	
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	84	4.4	
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	340	17	
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	340	17	
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	470	25	
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	470	25	
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.48 U*	0.03 U	
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	18	0.43	
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.1	0.052	
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.1 U*	0.0014 U	
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	19	0.48	
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	19	0.48	
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.64 U	0.04 U	
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*0.77 U*	0.048 U	
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.84 U	0.052 U	
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00027 U	0.00032 U	0.00027 U	0.00028 U	0.00042 U	0.00039 U	0.00041 U	0.00056 U	*0.58 U*	*0.036 U*	
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.21 U*	0.013 U	
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.42 U*	0.026 U	
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.81 U*	*0.05 U*	
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.9	0.11	*1 U*
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	0.05 U	
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.000089 U	0.00011 U	0.000092 U	0.000095 U	0.00014 U	0.00013 U	0.00014 U	0.00019 U	*0.19 U*	*0.012 U*	
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.0033	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1,600	31	4.5
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.24 U*	0.015 U	
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.26 U*	0.016 U	
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	90	3.7	1 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	67	1.8	1 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*1.4 U*	0.089 U	
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.89 U	0.055 U	
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.25 U*	0.016 U	
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.3 U	0.018 U	
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.86 U*	*0.053 U*	
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.57 U	0.036 U	
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.42 U*	0.026 U	
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.23 U	0.014 U	
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.79 U*	0.049 U	
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.76 U	0.047 U	
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.35 U	0.022 U	
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.82 U	0.051 U	
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	6.1	0.23	
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	0.05 U	

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH05 (cont.)				BH06				BH07		
				Sample Name		PLF-PEC-BH05-23-020422	PLF-PEC-BH05-36-020422	PLF-PEC-BH05-44-020422	PLF-PEC-BH05-61-020422	PLF-PEC-BH06-12-020122	PLF-PEC-BH06-14-020122	PLF-PEC-BH06-24-020122	PLF-PEC-BH06-44-020222	PLF-PEC-BH07-12-020222	PLF-PEC-BH07-15-020222	PLF-PEC-BH07-27-020322
				Sample Date		2/4/2022	2/4/2022	2/4/2022	2/4/2022	2/1/2022	2/1/2022	2/1/2022	2/2/2022	2/2/2022	2/2/2022	2/3/2022
				Sample Depth (feet bgs)		23	36	44	61	12	14	24	44	12	15	27
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	55	1.6	
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.003 J	0.0023 U	0.0019 U	0.002 U	0.0029 U	0.0027 U	0.0029 U	0.0039 U	*4.1 U*	*0.25 U*	
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.84 U*	0.052 U	
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.33 U	0.02 U	
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.55 U	0.034 U	
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.53 U	0.033 U	
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.0063 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	2,300	64	
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.24 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	2,300	64	
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.5 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	1 U	1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.5 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	1 U	1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.5 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	1 U	1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.5 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	1 U	1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.5 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	1 U	1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.5 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	1 U	1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.5 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	1 U	1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.5 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	1 U	1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.5 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	1 U	1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	4.7	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1	1 U	6.9
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	2.4	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	3.8	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.41	*2.5 U*	*2.5 U*
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	11	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.5	2.5 U	6.9
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	11	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.6	2.5 U	9.4
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.5 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	1 U	1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.5 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	1 U	1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.5 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	1 U	1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.5 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	1 U	1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12	1 U	1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.5 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	1 U	1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.54	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.32	1 U	1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.5 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	1 U	1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.5 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	1 U	1 U
Carbazole	86-74-8	--	--	--	mg/kg	1.2 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.5 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	1 U	1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.5 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	1 U	1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	*0.21 U*	0.043 U	0.042 U	0.044 U	0.048 U	0.048 U	0.045 U	0.045 U	0.044 U	*0.42 U*	*0.43 U*
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	*1.3 U*	0.27 U	0.26 U	0.27 U	0.29 U	0.3 U	0.28 U	0.28 U	0.27 U	*2.6 U*	*2.6 U*
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.35 U	0.07 U	0.068 U	0.071 U	0.077 U	0.077 U	0.073 U	0.073 U	0.071 U	0.69 U	0.69 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	*0.85 U*	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	*1.7 U*
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	1.2 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	*1.2 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.5 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	1 U	1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.5 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	1 U	1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.5 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	1 U	1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	*0.5 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	*1 U*	*1 U*
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	2.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.5 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	1 UJ	1 UJ
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	*0.78 U*	0.16 U	0.15 U	0.16 U	0.17 U	0.17 U	0.16 U	0.16 U	0.16 U	*1.6 U*	*1.6 U*
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.5 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	1 U	1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	*0.17 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.34 U*
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	*0.2 U*	0.041 U	0.039 U	0.041 U	0.045 U	0.045 U	0.042 U	0.042 U	0.041 U	*0.4 U*	*0.4 U*
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	*0.17 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.34 U*

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH05 (cont.)				BH06				BH07		
				Sample Name		PLF-PEC-BH05-23-020422	PLF-PEC-BH05-36-020422	PLF-PEC-BH05-44-020422	PLF-PEC-BH05-61-020422	PLF-PEC-BH06-12-020122	PLF-PEC-BH06-14-020122	PLF-PEC-BH06-24-020122	PLF-PEC-BH06-44-020222	PLF-PEC-BH07-12-020222	PLF-PEC-BH07-15-020222	PLF-PEC-BH07-27-020322
				Sample Date		2/4/2022	2/4/2022	2/4/2022	2/4/2022	2/1/2022	2/1/2022	2/1/2022	2/2/2022	2/2/2022	2/2/2022	2/3/2022
				Sample Depth (feet bgs)		23	36	44	61	12	14	24	44	12	15	27
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.5 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	1 U	1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	*0.92 U*	0.19 U	0.18 U	0.19 U	0.21 U	0.21 U	0.19 U	0.19 U	0.19 U	*1.8 U*	*1.8 U*
3-Nitroaniline	99-09-2	--	--	--	mg/kg	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	10 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	*3 U*	0.62 U	0.6 U	0.63 U	0.68 U	0.68 U	0.64 U	0.64 U	7.1 J	38	180 J
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.5 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	1 U	1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.5 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	1 U	1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	*1.2 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	*0.52 U*	0.11 U	0.1 U	0.11 U	0.12 U	0.12 U	0.11 U	0.11 U	0.11 U	*1 U*	*1 U*
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	1.2 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.19 U	0.039 U	0.038 U	0.04 U	0.043 U	0.043 U	0.041 U	0.041 U	0.04 U	0.38 U	0.39 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	*0.11 U*	0.022 U	0.022 U	0.023 U	0.025 U	0.025 U	0.023 U	0.023 U	0.023 U	*0.22 U*	*0.22 U*
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	*1 U*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	*2 U*
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	14	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	4	1 U	7.5
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	1.3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1.2
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.5 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	1 U	1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	1.4	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	6.9	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.7	1.7	5.5
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.96	1 U	1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	*0.5 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	*1 U*	*1 U*
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	*0.5 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	*1 U*	*1 U*
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	5.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.4	10 U	10 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.5 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	1 U	1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	*1.2 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.5 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	1 U	1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	*0.7 U*	0.14 U	0.14 U	0.14 U	0.16 U	0.16 U	0.15 U	0.15 U	0.14 U	*1.4 U*	*1.4 U*
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.5 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	1 UJ	1 UJ
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	1.7	0.077 U	0.075 U	0.078 U	0.084 U	0.084 U	0.08 U	0.08 U	0.42	2.2	100
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	*0.5 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	*1 U*	*1 U*
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	*0.5 U*	0.1 U	0.099 U	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.1 U	*1 U*	*1 U*
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.18 U	0.037 U	0.036 U	0.038 U	0.041 U	0.041 U	0.039 U	0.039 U	0.038 U	0.36 U	0.37 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	300	25 U	25 U	25 U	25 U	25 U	25 U	25 U	3,000	40	66
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	1,600	50 U	50 U	50 U	50 U	50 U	50 U	50 U	100 U	3,100	3,300
Oil-range organics	ORO	2,000	2,000	--	mg/kg	1,700	50 U	50 U	50 U	50 U	50 U	50 U	50 U	1,800	1,100	1,200
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	3,600	50 U	50 U	50 U	50 U	50 U	50 U	50 U	4,800	4,200	4,600
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	3,600	50 U	50 U	50 U	50 U	50 U	50 U	50 U	4,900	4,200	4,600

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH07 (cont.)					BH08					
					Sample Name	PLF-PEC-BH07-30-020322	PLF-BH07a-34-092222	PLF-BH07a-41-092222	PLF-PEC-BH07-53-020322	PLF-PEC-BH07-63-020322	PLF-PEC-BH08-05-021122	PLF-PEC-BH08-18-021122	PLF-PEC-BH08-24-021122	PLF-PEC-BH08-37-021222	PLF-PEC-BH08-61-021222	PLF-PEC-DUP5-021222
					Sample Date	2/3/2022	9/22/2022	9/22/2022	2/3/2022	2/3/2022	2/11/2022	2/11/2022	2/11/2022	2/12/2022	2/12/2022	2/12/2022
					Sample Depth (feet bgs)	30	34	41	53	63	5	18	24	37	61	61
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.52	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	4.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	4.4	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	20	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	7.8	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	28	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	28	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	37	0.02 U	0.001	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	37	0.02 U	0.026	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	*0.2 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	*0.22 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	*0.18 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.0032	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	*0.009 U*	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.22 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0062	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.22 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0062	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.26 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.32 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.34 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	*0.24 U*	0.00043 U	0.00038 U	0.0004 U	*0.00037 U*	0.00033 U	0.00039 U	0.00042 U	0.00033 U	*0.00034 U*	*0.00035 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	*0.086 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	*0.17 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	*0.33 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.68	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	*0.08 U*	0.00014 U	0.00013 U	0.00013 U	*0.00012 U*	0.00011 U	0.00013 U	0.00014 U	0.00011 U	0.00011 U	*0.00012 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	140	0.034	0.0097	0.001 U	0.0031	0.001 U	0.001 U	0.001 U	0.001 U	0.0021	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	*0.099 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	*0.11 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	12	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	5.5	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	*0.59 U*	0.05 U	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.5 U	0.05 U	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	*0.1 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.12 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	*0.35 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.24 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	*0.17 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.1 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	*0.32 U*	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.31 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.14 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.34 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.13 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.5 U	0.05 U	0.05	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH07 (cont.)					BH08					
				Sample Name		PLF-PEC-BH07-30-020322	PLF-BH07a-34-092222	PLF-BH07a-41-092222	PLF-PEC-BH07-53-020322	PLF-PEC-BH07-63-020322	PLF-PEC-BH08-05-021122	PLF-PEC-BH08-18-021122	PLF-PEC-BH08-24-021122	PLF-PEC-BH08-37-021222	PLF-PEC-BH08-61-021222	PLF-PEC-DUP5-021222
				Sample Date		2/3/2022	9/22/2022	9/22/2022	2/3/2022	2/3/2022	2/11/2022	2/11/2022	2/11/2022	2/12/2022	2/12/2022	2/12/2022
				Sample Depth (feet bgs)		30	34	41	53	63	5	18	24	37	61	61
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	2.3	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	*1.7 U*	0.003 U	0.0027 U	0.0028 U	*0.0026 U*	0.0023 U	0.0027 U	0.0029 U	0.0023 U	*0.0024 U*	*0.0025 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	*0.35 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.14 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.23 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.22 U	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	200	0.034	0.27	0.05 U	0.0031	0.0062	0.05 U	0.05 U	0.05 U	0.0021	0.05 U
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	200	0.27	0.38	0.05 U	0.24	0.24	0.05 U	0.05 U	0.05 U	0.24	0.05 U
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	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	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	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	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	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	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	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	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	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	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	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	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	6.6	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	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.91	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	1.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	9.1	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	9.1	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	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	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	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	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.34	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	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	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	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.049 U	0.042 U	0.045 U	0.044 U	0.046 U	0.045 U	0.042 U	0.041 U	0.046 U	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.27 U	0.3 U	0.26 U	0.28 U	0.27 U	0.28 U	0.28 U	0.26 U	0.26 U	0.28 U	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.079 U	0.068 U	0.073 U	0.071 U	0.074 U	0.073 U	0.068 U	0.067 U	0.074 U	0.073 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	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	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.34	0.18 U	0.15 U	0.16 U	0.16 U	0.17 U	0.17 U	0.15 U	0.15 U	0.17 U	0.17 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	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	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.046 U	0.04 U	0.042 U	0.041 U	0.043 U	0.042 U	0.039 U	0.039 U	0.043 U	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH07 (cont.)					BH08					
					Sample Name	PLF-PEC-BH07-30-020322	PLF-BH07a-34-092222	PLF-BH07a-41-092222	PLF-PEC-BH07-53-020322	PLF-PEC-BH07-63-020322	PLF-PEC-BH08-05-021122	PLF-PEC-BH08-18-021122	PLF-PEC-BH08-24-021122	PLF-PEC-BH08-37-021222	PLF-PEC-BH08-61-021222	PLF-PEC-DUP5-021222
					Sample Date	2/3/2022	9/22/2022	9/22/2022	2/3/2022	2/3/2022	2/11/2022	2/11/2022	2/11/2022	2/12/2022	2/12/2022	2/12/2022
					Sample Depth (feet bgs)	30	34	41	53	63	5	18	24	37	61	61
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.19 U	0.21 U	0.18 U	0.19 U	0.19 U	0.2 U	0.19 U	0.18 U	0.18 U	0.2 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	33	0.7 U	0.6 U	0.64 U	0.63 U	0.65 U	0.64 U	0.6 U	0.59 U	0.66 U	0.64 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.044 U	0.038 U	0.041 U	0.04 U	0.042 U	0.041 U	0.038 U	0.038 U	0.042 U	0.041 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.025 U	0.022 U	0.023 U	0.023 U	0.024 U	0.023 U	0.022 U	0.021 U	0.024 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	3.6	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	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.7	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	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	2.4	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	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.22	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	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	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	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.16 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	110	0.44	0.075 U	0.29	0.078 U	0.081 U	0.08 U	0.075 U	0.073 U	0.081 U	0.08 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.24	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
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.12 U	0.099 U	0.11 U	0.1 U	0.11 U	0.11 U	0.099 U	0.098 U	0.11 U	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.042 U	0.036 U	0.039 U	0.038 U	0.039 U	0.039 U	0.036 U	0.036 U	0.039 U	0.039 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	660	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	3,000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	870	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	4,500	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	4,500	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	*50 U*	*50 U*

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH09				BH10				BH11		
					Sample Name	PLF-BH09-15-060622	PLF-BH09-16-060622	PLF-BH09-23-060622	PLF-BH09-32-060622	PLF-PEC-BH10-03-020922	PLF-PEC-BH10-12-020922	PLF-PEC-BH10-39-021022	PLF-PEC-BH10-54-021022	PLF-PEC-BH11-12-020722	PLF-PEC-BH11-20-020722	PLF-PEC-DUP3-020722
					Sample Date	6/6/2022	6/6/2022	6/6/2022	6/6/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022	2/7/2022	2/7/2022	2/7/2022
					Sample Depth (feet bgs)	15	16	23	32	3	12	39	54	12	20	20
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.6 U*	0.011 U	*1.3 U*
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	16	0.12	16
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	6.7	0.021	24
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	100	0.58	74
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	50	0.2	30
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	150	0.78	100
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	150	0.78	100
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	170	0.92	140
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	170	0.93	140
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.9 U*	0.012 U	*1.5 U*
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.1 U*	0.014 U	*1.7 U*
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.8 U*	0.012 U	*1.4 U*
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.088 U*	0.00057 U	*0.07 U*
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.1 U*	0.014 U	*1.7 U*
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.1 U*	0.014 U	*1.7 U*
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	2.6 U	0.017 U	2 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*3.1 U*	0.02 U	*2.5 U*
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*3.4 U*	0.022 U	*2.7 U*
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00045 U	0.00052 U	0.0004 U	0.0004 U	0.0003 U	0.00035 U	0.00039 U	0.00029 U	*2.3 U*	0.081	*1.9 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.84 U*	0.0054 U	*0.67 U*
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.7 U*	0.011 U	*1.4 U*
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.2 U*	0.021 U	*2.6 U*
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*1.9 U*	0.012 U	10
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*5 U*	0.05 U	*5 U*
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00015 U	0.00017 U	0.00013 U	0.00013 U	0.0001 U	0.00012 U	0.00013 U	0.000096 U	*0.78 U*	*0.0051 U*	*0.62 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.1 U	0.0073 U	0.91 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.97 U*	0.0063 U	*0.77 U*
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1 U*	0.0067 U	*0.83 U*
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.1 U	0.01 U	1 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*1.3 U*	0.01 U	1 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*5.7 U*	0.12	*5 U*
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	5 U	0.77 J	5 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1 U*	0.0065 U	*0.81 U*
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*1.2 U*	0.01 U	*1 U*
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.5 U*	0.022 U	*2.8 U*
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	2.3 U	0.015 U	1.8 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.7 U*	0.011 U	*1.3 U*
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*1 U*	0.01 U	*1 U*
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.2 U*	0.02 U	*2.5 U*
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	3 U	0.02 U	2.4 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.4 U	0.01 U	1.1 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	3.3 U	0.021 U	2.6 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	5.4	0.042	1 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	5 U	0.37	5 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH09				BH10				BH11		
				Sample Name		PLF-BH09-15-060622	PLF-BH09-16-060622	PLF-BH09-23-060622	PLF-BH09-32-060622	PLF-PEC-BH10-03-020922	PLF-PEC-BH10-12-020922	PLF-PEC-BH10-39-021022	PLF-PEC-BH10-54-021022	PLF-PEC-BH11-12-020722	PLF-PEC-BH11-20-020722	PLF-PEC-DUP3-020722
				Sample Date		6/6/2022	6/6/2022	6/6/2022	6/6/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022	2/7/2022	2/7/2022	2/7/2022
				Sample Depth (feet bgs)		15	16	23	32	3	12	39	54	12	20	20
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*5 U*	0.61	8.4
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0079	0.013	0.0051	0.0073	0.005 U	0.011	0.005 U	0.005 U	*16 U*	*0.11 U*	*13 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.4 U*	0.022 U	*2.7 U*
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.3 U	0.01 U	1.1 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	2.2 U	0.014 U	1.8 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	2.1 U	0.014 U	1.7 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	0.0079	0.013	0.0051	0.0073	0.05 U	0.011	0.05 U	0.05 U	180	2.9 J	160
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	0.25	0.25	0.24	0.25	0.05 U	0.25	0.05 U	0.05 U	230	3.2 J	200
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.057 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.07 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	81	0.1 U	63
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	15	0.25 U	5.2
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	27	0.25 U	10
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	120	0.25 U	78
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	120	0.25 U	78
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.6	0.1 U	1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.066 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	2.5 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.044 U	0.04 U	0.042 U	0.042 U	0.04 U	0.051 U	0.043 U	*0.43 U*	0.041 U	*0.43 U*
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.27 U	0.25 U	0.26 U	0.26 U	0.25 U	0.32 U	0.27 U	*2.6 U*	0.26 U	*2.7 U*
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.072 U	0.065 U	0.069 U	0.068 U	0.065 U	0.083 U	0.07 U	5.4	0.067 U	0.7 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	0.17 U	*1.7 U*
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	2.5 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	*2.5 U*
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	*1 U*
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	1 UJ	0.1 UJ	1 UJ
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.23	0.16 U	0.15 U	0.16 U	0.16 U	0.15 U	*0.19 U*	0.16 U	5.5	0.15 U	*1.6 U*
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	17	0.1 U	1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.055	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	*0.34 U*
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.055	0.041 U	0.038 U	0.04 U	0.04 U	0.038 U	*0.048 U*	0.041 U	*0.4 U*	0.039 U	*0.4 U*
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	*0.34 U*

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH09				BH10				BH11		
					Sample Name	PLF-BH09-15-060622	PLF-BH09-16-060622	PLF-BH09-23-060622	PLF-BH09-32-060622	PLF-PEC-BH10-03-020922	PLF-PEC-BH10-12-020922	PLF-PEC-BH10-39-021022	PLF-PEC-BH10-54-021022	PLF-PEC-BH11-12-020722	PLF-PEC-BH11-20-020722	PLF-PEC-DUP3-020722
					Sample Date	6/6/2022	6/6/2022	6/6/2022	6/6/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022	2/7/2022	2/7/2022	2/7/2022
					Sample Depth (feet bgs)	15	16	23	32	3	12	39	54	12	20	20
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	*0.38 U*	0.17 U	0.18 U	0.18 U	0.17 U	*0.22 U*	0.19 U	*1.8 U*	0.18 U	*1.9 U*
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	10 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.63 U	0.57 U	0.61 U	0.6 U	0.58 U	*0.73 U*	0.62 U	*6.1 U*	0.59 U	*6.2 U*
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	*2.5 U*
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.11 U	0.097 U	0.1 U	0.1 U	0.098 U	0.12 U	0.11 U	*1 U*	0.1 U	*1 U*
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	2.5 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.04 U	0.036 U	0.038 U	0.038 U	0.037 U	0.046 U	0.039 U	0.39 U	0.038 U	0.39 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.023 U	0.021 U	0.022 U	0.022 U	0.021 U	*0.026 U*	0.022 U	*0.22 U*	0.021 U	*0.22 U*
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	0.2 U	*2 U*
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	1.5	0.29	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	40	0.65	14
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.24	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.3	0.1 U	4.7
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.3	0.1 U	64
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	18	0.47	5.6
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.049 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	2.9	0.28	1.3
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	*1 U*
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	*1 U*
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	75	1 U	26
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	*2.5 U*
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.15 U	0.13 U	0.14 U	0.14 U	0.13 U	*0.17 U*	0.14 U	*1.4 U*	0.14 U	*1.4 U*
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 UJ	0.1 UJ	1 UJ
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.076 U	0.078 U	0.071 U	0.075 U	0.075 U	0.072 U	0.09 U	0.077 U	29	0.086	*0.76 U*
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	*1 U*
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.094 U	0.1 U	0.1 U	0.095 U	0.12 U	0.1 U	*1 U*	0.098 U	*1 U*
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.038 U	0.034 U	0.036 U	0.036 U	0.035 U	0.044 U	0.037 U	0.37 U	0.036 U	0.37 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	4,900	25 U	3,500
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	4,200	64	4,000
Oil-range organics	ORO	2,000	2,000	--	mg/kg	82	50 U	50 U	50 U	50 U	50 U	50 U	50 U	4,000	91	5,100
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	82	50 U	50 U	50 U	50 U	50 U	50 U	50 U	13,000	160	13,000
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	120	50 U	50 U	50 U	50 U	50 U	50 U	50 U	13,000	170	13,000

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH11 (cont.)		BH12						BH13		
					Sample Name	PLF-PEC-BH11-48-020822	PLF-PEC-BH11-57-020822	PLF-BH12-05-060722	PLF-BH12-21-060722	PLF-BH12-24-060722	PLF-DUP12-060722	PLF-BH12-27-060722	PLF-BH12-38-060722	PLF-BH13-04-061522	PLF-BH13-18-061522	PLF-BH13-23-061522
					Sample Date	2/8/2022	2/8/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/15/2022	6/15/2022	6/15/2022
					Sample Depth (feet bgs)	48	57	5	21	24	24	27	38	4	18	23
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	*0.19 U*	*1.7 U*	*1.8 U*	*1.6 U*	0.014 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	3.9	450	410	690	0.083	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	2.8	490	810	1,500	0.14	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	42	1,600	1,400	2,300	0.31	0.02 U	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	28	610	450	800	0.13	0.01 U	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	70	2,200	1,900	3,100	0.44	0.02 U	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	70	2,200	1,900	3,100	0.44	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	77	3,200	3,100	5,300	0.66	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	77	3,200	3,100	5,300	0.67	0.02 U	0.02 U	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	*0.22 U*	*2 U*	*2.1 U*	*1.9 U*	0.017 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.74	9.3	17	36	0.019 U	0.0012	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	*0.21 U*	4.1	8	21	0.016 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	*0.01 U*	*0.091 U*	*0.095 U*	*0.086 U*	0.00077 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.74	13	25	57	0.019 U	0.0012	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.85	13	25	57	0.019 U	0.0017	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.3 U	2.7 U	2.8 U	2.5 U	0.023 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.36 U	*3.2 U*	*3.3 U*	*3 U*	0.027 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.39 U	*3.5 U*	*3.6 U*	*3.3 U*	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00032 U	0.00037 U	*0.27 U*	*2.4 U*	*2.5 U*	*2.3 U*	*0.021 U*	0.00035 U	0.00039 U	0.0005 U	0.00041 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	*0.098 U*	*0.87 U*	*0.91 U*	*0.83 U*	0.0074 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	*0.2 U*	*1.8 U*	*1.8 U*	*1.7 U*	0.015 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	*0.38 U*	*3.4 U*	*3.5 U*	*3.2 U*	0.029 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.53	*2 U*	0.7 J	*1.9 U*	0.017 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	*0.5 U*	*5 U*	*5 U*	*5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00011 U	0.00012 U	*0.091 U*	*0.81 U*	*0.84 U*	*0.77 U*	*0.0069 U*	0.00012 U	0.00013 U	0.00017 U	0.00014 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	3.9	1.2 U	1.2 U	3.7	0.01 U	0.001 U	0.001 U	0.0014	0.0084
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	*0.11 U*	*1 U*	*1 U*	*0.95 U*	0.0086 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	*0.12 U*	*1.1 U*	*1.1 U*	*1 U*	0.0091 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.12 U	1.1 U	1.1 U	1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.15 U	*1.4 U*	*1.4 U*	*1.3 U*	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	*0.67 U*	*6 U*	*6.2 U*	*5.7 U*	0.051 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.5 U	17	29	24	3.6	0.05 U	0.05 U	0.05 U	0.12
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	*0.12 U*	*1.1 U*	*1.1 U*	*1 U*	0.0089 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.14 U	*1.2 U*	*1.3 U*	*1.2 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	*0.4 U*	*3.6 U*	*3.7 U*	*3.4 U*	0.03 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.27 U	2.4 U	2.5 U	2.3 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	*0.2 U*	*1.7 U*	*1.8 U*	*1.7 U*	0.015 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.11 U	*1 U*	*1 U*	*1 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	*0.37 U*	*3.3 U*	*3.4 U*	*3.1 U*	0.028 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.35 U	3.2 U	3.3 U	3 U	0.027 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.16 U	1.5 U	1.5 U	1.4 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.38 U	3.4 U	3.6 U	3.2 U	0.029 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	1.1	48	29	61	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.5 U	16	25	25	1.2	0.05 U	0.05 U	0.05 U	0.12

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH11 (cont.)		BH12						BH13		
					Sample Name	PLF-PEC-BH11-48-020822	PLF-PEC-BH11-57-020822	PLF-BH12-05-060722	PLF-BH12-21-060722	PLF-BH12-24-060722	PLF-DUP12-060722	PLF-BH12-27-060722	PLF-BH12-38-060722	PLF-BH13-04-061522	PLF-BH13-18-061522	PLF-BH13-23-061522
					Sample Date	2/8/2022	2/8/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/15/2022	6/15/2022	6/15/2022
					Sample Depth (feet bgs)	48	57	5	21	24	24	27	38	4	18	23
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	1.5	160	150	280	0.54	0.05 U	0.05 U	0.2	0.12
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0022 U	0.005 U	*1.9 U*	*17 U*	*18 U*	*16 U*	*0.14 U*	0.0025 U	0.0028 U	0.0035 U	0.0028 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	*0.39 U*	*3.5 U*	*3.6 U*	*3.3 U*	0.03 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.15 U	1.4 U	1.4 U	1.3 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.26 U	2.3 U	2.4 U	2.2 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.25 U	2.2 U	2.3 U	2.1 U	0.019 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	85	3,400	3,300	5,700	6	0.0012	0.05 U	0.2	0.37
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	90	3,400	3,400 J	5,800	6.4	0.24	0.05 U	0.42	0.53
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	3.3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.18 U	0.1 U	0.1 U	1.8 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.14 U	0.1 U	0.1 U	4.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	25	34	46	67	0.14	0.19	0.1 U	0.1 U	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	6.8	5.6	8.2	12	0.25 U	0.65	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	11	11	15	22	0.25 U	1.1	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	43	51		100	0.14	1.9	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	43	51		100	0.39	1.9	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.13 U	0.1 U	0.1 U	1.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	1.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.15 U	0.1 U	0.1 U	1.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.36	0.1 U	0.1 U	1.3 U	0.1 U	0.27	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.3	0.1 U	0.1 U	1.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.94	0.72	1.3	1.8	0.1 U	0.52	0.1 U	0.1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.16	0.1 U	0.1 U	3.9 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.14 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.48 U	0.25 U	0.25 U	4.7 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.22 U	0.1 U	0.1 U	2.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.17 U	0.1 U	0.1 U	1.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.042 U	0.041 U	*0.18 U*	0.044 U	0.048 U	*1.7 U*	0.044 U	0.041 U	0.045 U	0.044 U	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.25 U	*1.1 U*	0.27 U	0.29 U	*11 U*	0.27 U	0.26 U	0.28 U	0.27 U	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.068 U	0.066 U	0.28 U	0.071 U	0.077 U	2.8 U	0.071 U	0.067 U	0.072 U	0.07 U	0.073 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	*0.23 U*	0.17 U	0.17 UJ	*2.3 UJ*	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.81 U	0.25 U	0.25 U	7.9 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	*4.3 U*	0.25 U	0.25 UJ	*13 UJ*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	1.5 U	0.1 U	0.1 U	4.4 U	0.1 U	0.83	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.14 U	0.1 U	0.1 U	1.3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	1.9 U	0.1 U	0.1 U	5.5 U	0.26	0.95	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	*0.13 U*	0.1 U	0.1 UJ	*1.2 UJ*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	1.4 U	0.5 U	0.5 UJ	14 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 UJ	0.1 U	0.24 U	0.1 U	0.1 U	2.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.15 U	0.15 U	0.82	0.5	*5.2 U*	8.9	0.16 U	0.83	0.16 U	0.43	0.17 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	1.8 U	0.1 U	0.1 U	5.2 U	0.45	0.1 U	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	*0.096 U*	0.034 U	0.034 U	*0.93 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.039 U	0.038 U	*0.16 U*	0.041 U	0.045 U	*1.6 U*	0.041 U	0.039 U	0.042 U	0.041 U	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.086 U	0.034 U	0.034 U	*0.84 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH11 (cont.)		BH12						BH13		
					Sample Name	PLF-PEC-BH11-48-020822	PLF-PEC-BH11-57-020822	PLF-BH12-05-060722	PLF-BH12-21-060722	PLF-BH12-24-060722	PLF-DUP12-060722	PLF-BH12-27-060722	PLF-BH12-38-060722	PLF-BH13-04-061522	PLF-BH13-18-061522	PLF-BH13-23-061522
					Sample Date	2/8/2022	2/8/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/7/2022	6/15/2022	6/15/2022	6/15/2022
					Sample Depth (feet bgs)	48	57	5	21	24	24	27	38	4	18	23
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.18 U	*0.76 U*	0.19 U	0.21 U	*22 U*	0.19 U	0.18 U	0.19 U	0.19 U	0.2 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	2.6 U	1 U	1 U	25 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.6 U	0.58 U	*2.5 U*	0.63 U	0.68 U	*25 U*	0.63 U	0.59 U	0.64 U	0.62 U	0.65 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.16 U	0.1 U	0.1 U	1.6 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.18 U	0.1 U	0.1 U	1.8 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	*0.56 U*	0.25 U	0.25 U	*5.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.099 U	*4.3 U*	0.11 U	0.12 U	*13 U*	0.11 U	0.1 U	0.11 U	0.11 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	5.6 U	0.25 U	0.25 U	16 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.038 U	0.037 U	0.16 U	0.04 U	0.043 U	*1.6 U*	0.04 U	0.037 U	0.041 U	0.039 U	0.041 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.021 U	*0.91 U*	0.023 U	0.025 U	*2.7 U*	0.023 U	0.021 U	0.023 U	0.022 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	*2 U*	0.2 U	0.2 U	*5.7 U*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	7.9	28	61	100	7.3	150	0.1 U	0.1 U	0.15
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	2.3	0.1 U	0.1 U	6.7	0.3	22	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.19 U	0.1 U		1.8 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.38	5.3		6.9	0.1 U	0.53	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	3.7	6.3		16	1	29	0.1 U	0.1 U	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.75	1.1		4.2	0.21	7.8	0.1 U	0.1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	*2 U*	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	*0.2 U*	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	3.2 U	28		68	17	2.6	1 U	1 U	14
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	2.3 U	0.1 U	0.1 U		0.43	0.1 U	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	*0.54 U*	0.25 U	0.25 U		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.14 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.13 U	*0.58 U*	0.14 U	0.16 U		0.14 U	0.14 U	0.15 U	0.14 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 UJ	0.1 U	0.11 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.074 U	0.072 U	9	51		33	1	0.073 U	0.079 U	0.077 U	0.08 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	*1.2 U*	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.099 U	0.096 U	*4.1 U*	0.1 U	0.11 U		0.1 U	0.097 U	0.11 U	0.1 U	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.036 U	0.035 U	0.15 U	0.038 U	0.041 U		0.038 U	0.035 U	0.038 U	0.037 U	0.039 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	2,800	15,000	11,000	25,000	25 U	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	1,900 U	*3,800 U*	*5,000 U*	*5,000 U*	150	*2,500 U*	50 U	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	1,400	1,900	3,700	3,100	180	3,100	310	50 U	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	4,200	17,000	15,000	28,000	330	3,100	310	50 U	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	5,200	19,000	17,000	31,000	340	4,400	350	50 U	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenze, and xylenes
CAS Chemical Abstracts Service
cPAH Carcinogenic polycyclic aromatic hydrocarbon
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
REL Remediation Level
TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH13 (cont.)			BH14						BH15	
					Sample Name	PLF-BH13-33-061522	PLF-DUP13-061522	PLF-BH13-55-061522	PLF-PEC-BH14-11-020822	PLF-PEC-DUP4-020822	PLF-PEC-BH14-15-020822	PLF-PEC-BH14-29-020822	PLF-PEC-BH14-64-020922	PLF-PEC-BH14-68-020922	PLF-PEC-BH15-11-021022	PLF-PEC-BH15-16-021022
					Sample Date	6/15/2022	6/15/2022	6/15/2022	2/8/2022	2/8/2022	2/8/2022	2/8/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022
					Sample Depth (feet bgs)	33	33	55	11	11	15	29	64	68	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.015 U	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.014 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.066	0.01 U	0.01 U	0.01 U	0.01 U	1.1	2.2
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.25	0.01 U	0.01 U	0.01 U	0.01 U	2	0.47
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.2	0.02 U	0.02 U	0.02 U	0.02 U	4.7	11
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.08	0.01 U	0.01 U	0.01 U	0.01 U	1.9	4.3
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.28	0.02 U	0.02 U	0.02 U	0.02 U	6.6	15
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.28	0.02 U	0.02 U	0.02 U	0.02 U	6.6	15
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.6	0.02 U	0.02 U	0.02 U	0.02 U	9.7	18
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.6	0.02 U	0.02 U	0.02 U	0.02 U	9.7	18
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.017 U	0.001 U	0.001 U	0.001 U	0.001 U	0.015 U	0.016 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.32	0.001 U	0.001 U	0.001 U	0.001 U	0.13	0.29
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.17	0.001 U	0.001 U	0.001 U	0.001 U	0.0032	0.0039
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00078 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00067 U	0.00075 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.49	0.001 U	0.001 U	0.001 U	0.001 U	0.13	0.29
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.49	0.001 U	0.001 U	0.001 U	0.001 U	0.13	0.29
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.023 U	0.01 U	0.01 U	0.01 U	0.01 U	0.019 U	0.022 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.027 U	0.01 U	0.01 U	0.01 U	0.01 U	0.023 U	0.026 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.046	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.029 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00041 U	0.00045 U	0.00036 U	0.00031 U	*0.021 U*	0.00033 U	0.00033 U	0.00026 U	0.0003 U	*0.018 U*	*0.02 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0075 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0064 U	0.0072 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.015 U	0.001 U	0.001 U	0.001 U	0.001 U	0.013 U	0.015 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.029 U	0.001 U	0.001 U	0.001 U	0.001 U	0.025 U	0.028 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.092	0.01 U	0.01 U	0.01 U	0.01 U		
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00014 U	0.00015 U	0.00012 U	0.0001 U	*0.0069 U*	0.00011 U	0.00011 U	0.000085 U	0.000098 U	*0.0059 U*	*0.0067 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U	0.001 U	0.001 U	0.001 U	0.001 U		
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0086 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0074 U	0.0083 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0092 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0079 U	0.0089 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U		
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.051 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.23	0.05 U	0.05 U	0.05 U	0.05 U	0.44	0.62
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.009 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0077 U	0.0087 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.031 U	0.001 U	0.001 U	0.001 U	0.001 U	0.026 U	0.03 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.017 U	0.02 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.015 U	0.001 U	0.001 U	0.001 U	0.001 U	0.013 U	0.014 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.048
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.028 U	0.001 U	0.001 U	0.001 U	0.001 U	0.024 U	0.027 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.027 U	0.01 U	0.01 U	0.01 U	0.01 U	0.023 U	0.026 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.012 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.029 U	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.028 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.25	0.57
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.16	0.21

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH13 (cont.)			BH14						BH15	
					Sample Name	PLF-BH13-33-061522	PLF-DUP13-061522	PLF-BH13-55-061522	PLF-PEC-BH14-11-020822	PLF-PEC-DUP4-020822	PLF-PEC-BH14-15-020822	PLF-PEC-BH14-29-020822	PLF-PEC-BH14-64-020922	PLF-PEC-BH14-68-020922	PLF-PEC-BH15-11-021022	PLF-PEC-BH15-16-021022
					Sample Date	6/15/2022	6/15/2022	6/15/2022	2/8/2022	2/8/2022	2/8/2022	2/8/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022
					Sample Depth (feet bgs)	33	33	55	11	11	15	29	64	68	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.6	1.4
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0029 U	0.0063 U	0.0025 U	0.011 J	0.8 J	0.0056	0.005 U	0.0018 U	*0.005 U*	0.031 J	0.015 J
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.03 U	0.001 U	0.001 U	0.001 U	0.001 U	0.026 U	0.029 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.017 U	0.019 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.019 U	0.01 U	0.01 U	0.01 U	0.01 U	0.016 U	0.018 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.011 J	2.3 J	0.0056	0.05 U	0.05 U	0.05 U	11 J	21 J
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.25 J	2.6 J	0.24	0.05 U	0.05 U	0.05 U	12 J	21 J
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	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	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	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	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	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	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	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	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	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	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	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	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	0.25	1.2	0.1 U	0.1 U	0.1 U	0.1 U	1.4	7.2
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.88	0.25 U	0.25 U	0.25 U	0.25 U	1.6	1.1
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.29	1.3	0.25 U	0.25 U	0.25 U	0.25 U	1.3	2.1
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.54	3.4	0.25 U	0.25 U	0.25 U	0.25 U	4.3	10
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.67	3.4	0.25 U	0.25 U	0.25 U	0.25 U	4.3	10
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	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	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	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	0.64	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.16	0.1 U	0.1 U	0.1 U	0.1 U	0.41	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	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	0.17	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.043 U	0.041 U	0.044 U	0.043 U	0.042 U	0.042 U	0.043 U	0.043 U	0.044 U	0.043 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.27 U	0.26 U	0.25 U	0.28 U	0.27 U	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.07 U	0.069 U	0.066 U	0.072 U	0.07 U	0.068 U	0.068 U	0.069 U	0.069 U	1.6	0.07 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.24	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 UJ	0.1 UJ
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.15 U	0.16 U	0.21	0.15 U	0.15 U	0.16 U	0.16 U	0.53	0.16 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	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	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.041 U	0.04 U	0.038 U	0.042 U	0.04 U	0.039 U	0.039 U	0.04 U	0.04 U	0.041 U	0.04 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH13 (cont.)			BH14						BH15	
				Sample Name		PLF-BH13-33-061522	PLF-DUP13-061522	PLF-BH13-55-061522	PLF-PEC-BH14-11-020822	PLF-PEC-DUP4-020822	PLF-PEC-BH14-15-020822	PLF-PEC-BH14-29-020822	PLF-PEC-BH14-64-020922	PLF-PEC-BH14-68-020922	PLF-PEC-BH15-11-021022	PLF-PEC-BH15-16-021022
				Sample Date		6/15/2022	6/15/2022	6/15/2022	2/8/2022	2/8/2022	2/8/2022	2/8/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022
				Sample Depth (feet bgs)		33	33	55	11	11	15	29	64	68	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.62 U	0.61 U	0.58 U	0.63 U	0.61 U	0.6 U	0.6 U	0.61 U	0.61 U	0.63 U	0.62 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.11 U	0.1 U	0.099 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.039 U	0.037 U	0.04 U	0.039 U	0.038 U	0.038 U	0.039 U	0.039 U	0.04 U	0.039 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.022 U	0.021 U	0.023 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.023 U	0.022 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	0.1 U	3.1	11	0.22	0.1 U	0.1 U	0.1 U	29	5.4
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.13	0.27	0.1 U	0.1 U	0.1 U	0.1 U	13	0.87
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1.4	4.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.22	0.41	0.1 U	0.1 U	0.1 U	0.1 U	0.65	0.4
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	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	0.78	0.19
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	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	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1.5	1 U	1 U	1 U	1 U	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.13 U	0.15 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.15 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.077 U	0.075 U	0.072 U	0.079 U	0.076 U	0.074 U	0.075 U	0.075 U	0.076 U	0.078 U	0.91
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	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	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.096 U	0.1 U	0.1 U	0.099 U	0.099 U	0.1 U	0.1 U	0.1 U	0.1 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.037 U	0.035 U	0.038 U	0.037 U	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.037 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	62	93	25 U	25 U	25 U	25 U	330	2,300
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	150	470	50 U	50 U	50 U	50 U	1,000	310
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	240	640	50 U	50 U	50 U	50 U	1,300	320
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	50 U	450	1,200	50 U	50 U	50 U	50 U	2,600	2,900
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	*50 U*	*50 U*	50 U	450	1,200	50 U	50 U	50 U	50 U	2,600	2,900

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH15 (cont.)		BH16								
					Sample Name	PLF-PEC-BH15-23-021122	PLF-PEC-BH15-48-021122	PLF-PEC-BH16-12-021322	PLF-PEC-BH16-17-021322	PLF-PEC-BH16-32-021322	PLF-PEC-BH16-36-021322	PLF-PEC-BH16-44-021322	PLF-BH16a-46-092222	PLF-BH116a-46-092222	PLF-BH16a-51-092222	PLF-PEC-BH16-62-021322
					Sample Date	2/11/2022	2/11/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	9/22/2022	9/22/2022	9/22/2022	2/13/2022
					Sample Depth (feet bgs)	23	48	12	17	32	36	44	46	46	51	62
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	*0.13 U*	0.001 U	0.001 U	0.002	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	62	0.01 U	0.78	24	7.7	1.4	1.7	0.01 U	0.01 U	0.22	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	62	0.01 U	0.028	6.7	3.1	0.59	0.63	0.01 U	0.01 U	0.018	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	250	0.02 U	4.6	120	31	5.6	21	0.031	0.02 U	0.93	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	77	0.01 U	2.8	52	11	1.9	7.3	0.013	0.01 U	0.3	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	330	0.02 U	7.4	170	42	7.5	28	0.044	0.02 U	1.2	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	330	0.02 U	7.4	170	42	7.5	28	0.044	0.02 U	1.2	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	450	0.02 U	8.2	200	53	9.5	31	0.044	0.02 U	1.5	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	450	0.02 U	8.2	200	53	9.5	31	0.055	0.02 U	1.5	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	*0.15 U*	0.001 U	0.001 U	0.041	0.001 U	0.014 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	4.9	0.001 U	0.017	0.81	0.015	0.039	0.73	0.0013	0.001 U	0.0037	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.99	0.001 U	0.001 U	0.42	0.003	0.013 U	0.0055	0.001 U	0.001 UJ	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.018	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00063 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	5.9	0.001 U	0.017	1.2	0.018	0.039	0.74	0.0013	0.001 UJ	0.0037	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	5.9	0.001 U	0.018	1.2	0.018	0.046	0.74	0.0018	0.001 UJ	0.0042	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.2 U	0.01 U	0.01 U	0.01 U	0.01 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.25 U	0.01 U	0.01 U	0.01 U	0.01 U	0.022 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.27 U	0.01 U	0.01 U	0.01 U	0.01 U	0.024 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	*0.19 U*	0.00036 U	*0.02 U*	*0.029 U*	*0.18 U*	*0.017 U*	*0.15 U*	0.00044 U	0.00042 U	0.00038 U	*0.00034 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	*0.067 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.006 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	*0.14 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	*0.26 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.33	0.01 U	0.038	0.023 U	0.14 U	0.014 U	0.12 U	0.01 U	0.01 UJ	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	*0.5 U*	0.05 U	0.05 U	0.05 U	*0.056 U*	0.05 U	0.048 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	*0.063 U*	0.00012 U	0.00012 U	0.00014 U	0.0001 U	*0.0056 U*	0.000094 U	0.00015 U	0.00014 U	0.00013 U	0.00011 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.091 U	0.001 U	0.069	0.38	0.087 U	0.0082 U	0.075 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	*0.078 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.007 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	*0.083 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.0074 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.1 U	0.01 U	0.01 U	0.013 U	0.081 U	0.01 U	0.07 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.1 U	0.01 U	0.011 U	0.45	0.1 U	0.01 U	0.086 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.5 U	0.05 U	0.22	2.3	0.05 U	0.05 U	0.091	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	*0.081 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.0073 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	*0.28 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.025 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.18 U	0.01 U	0.01 U	0.01 U	0.01 U	0.017 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	*0.13 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.1 U	0.01 U	0.01 U	0.029	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	*0.25 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.24 U	0.01 U	0.01 U	0.01 U	0.01 U	0.022 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.11 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.26 U	0.01 U	0.01 U	0.01 U	0.01 U	0.024 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	7.4	0.01 U	0.036	5.9	1.3	0.22	0.45	0.01 U	0.01 UJ	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.5 U	0.05 U	0.082	0.45	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH15 (cont.)		BH16								
					Sample Name	PLF-PEC-BH15-23-021122	PLF-PEC-BH15-48-021122	PLF-PEC-BH16-12-021322	PLF-PEC-BH16-17-021322	PLF-PEC-BH16-32-021322	PLF-PEC-BH16-36-021322	PLF-PEC-BH16-44-021322	PLF-BH16a-46-092222	PLF-BH116a-46-092222	PLF-BH16a-51-092222	PLF-PEC-BH16-62-021322
					Sample Date	2/11/2022	2/11/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	9/22/2022	9/22/2022	9/22/2022	2/13/2022
					Sample Depth (feet bgs)	23	48	12	17	32	36	44	46	46	51	62
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	8	0.05 U	0.37	1.4	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	*1.3 U*	0.0025 U	0.013	0.0088	0.005 U	0.005 U	0.005 U	0.0031 U	0.0029 U	0.0026 U	*0.005 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	*0.27 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.024 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.11 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.18 U	0.01 U	0.01 U	0.01 U	0.01 U	0.016 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.17 U	0.01 U	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	470	0.05 U	9.1	210	54	9.7	32	0.045	0.05 U	1.5	0.05 U
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	480	0.05 U	9.2	220	55	10	32	0.27	0.05 UJ	1.7	0.05 U
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 UJ	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.063 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.073 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.14 U	3 U	0.1 U	0.1 U	0.1 U	0.17 U	0.1 UJ	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.13 U	0.1 UJ	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.073 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.08 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.063 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.063 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	7.3	0.1 U	6.3	76	3.3	0.58	2.6	1	1.2	0.1 U	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	1.8	0.25 U	2	17	1	0.25 U	1.2	1.3	*3.5 U*	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	3.7	0.25 U	3.4	29	1.7	0.33	1.5	2	*3.1 U*	0.25 U	0.25 U
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	13	0.25 U	12	120	6	0.91	5.3	4.3	1.2	0.25 U	0.25 U
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	13	0.25 U	12	120	6	1	5.3	4.3	4.5	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.12 U	0.1 UJ	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 UJ	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.11 U	3 U	0.1 U	0.1 U	0.1 U	0.14 U	0.1 UJ	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.21	3 U	0.12	0.1 U	0.1	0.64 J	0.3 J	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.14 U	0.1 UJ	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.26	0.1 U	0.95	3 U	0.31	0.23	0.24	1.3 J	0.54 J	0.1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.12 U	0.1 UJ	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.13 U	0.1 UJ	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	7.5 U	0.25 U	0.25 U	0.25 U	0.44 U	0.25 UJ	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.13	3 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.16 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.045 U	0.041 U	0.044 U	*2.2 U*	0.043 U	0.042 U	0.046 U	*0.16 U*	0.079 U	0.044 U	0.042 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.28 U	0.26 U	0.27 U	*14 U*	0.27 U	0.26 U	0.28 U	*1 U*	*4.9 U*	0.27 U	0.26 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.072 U	0.067 U	0.07 U	3.6 U	0.07 U	0.069 U	0.074 U	0.67 J	1.3 U	0.071 U	0.067 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	*5.1 U*	0.17 U	0.17 U	0.17 U	*0.22 U*	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	10 U	0.25 U	0.25 U	0.25 U	0.75 U	3.7 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	*7.5 U*	0.25 U	0.25 U	0.25 U	0.4 U	*2 U*	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.14 U	0.68 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.13 U	0.62 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.72 J	0.85 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	*0.12 U*	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	18 U	0.5 U	0.5 U	0.5 U	1.3 U	6.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 UJ	0.1 UJ	0.1 UJ	3.1 UJ	0.1 U	0.1 U	0.1 U	0.22 U	0.11 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.15 U	1.8	*8.1 U*	0.18 UJ	0.16 UJ	0.17 UJ	1.3 J	0.98	0.16 U	0.15 UJ
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	0.93	27	0.1 U	0.1 U	0.1 U	0.16 U	0.8 U	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	*1.2 U*	0.034 U	0.034 U	0.034 U	*0.088 U*	*0.043 UJ*	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.042 U	0.039 U	0.041 U	*2.1 U*	0.04 U	0.04 U	0.043 U	*0.15 U*	*0.074 UJ*	0.041 U	0.039 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	*1.1 U*	0.034 U	0.034 U	0.034 U	0.08 U	*0.39 U*	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH15 (cont.)		BH16								
					Sample Name	PLF-PEC-BH15-23-021122	PLF-PEC-BH15-48-021122	PLF-PEC-BH16-12-021322	PLF-PEC-BH16-17-021322	PLF-PEC-BH16-32-021322	PLF-PEC-BH16-36-021322	PLF-PEC-BH16-44-021322	PLF-BH16a-46-092222	PLF-BH116a-46-092222	PLF-BH16a-51-092222	PLF-PEC-BH16-62-021322
					Sample Date	2/11/2022	2/11/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	2/13/2022	9/22/2022	9/22/2022	9/22/2022	2/13/2022
					Sample Depth (feet bgs)	23	48	12	17	32	36	44	46	46	51	62
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.19 U	0.18 U	0.19 U	*9.6 U*	0.19 U	0.18 U	0.2 U	*0.7 U*	*0.34 U*	0.19 U	0.18 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	33 U	1 U	1 U	1 U	2.4 U	1.2 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.64 U	0.59 U	0.62 U	*32 U*	0.62 U	0.61 U	0.66 U	*2.3 U*	*11 U*	0.63 U	0.59 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.15 U	0.1 UJ	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.17 U	0.1 UJ	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	*7.5 U*	0.25 U	0.25 U	0.25 U	*0.52 U*	0.25 UJ	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.11 U	0.1 U	0.11 U	*5.4 U*	0.11 U	0.1 U	0.11 U	*0.39 U*	*1.9 U*	0.11 U	0.1 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	7.5 U	0.25 U	0.25 U	0.25 U	0.52 U	2.5 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.041 U	0.037 U	0.039 U	*2 U*	0.039 U	0.038 U	0.042 U	0.15 U	0.072 UJ	0.04 U	0.038 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.023 U	0.021 U	0.022 U	*1.1 U*	0.022 U	0.022 U	0.024 U	*0.084 U*	*0.41 U*	0.023 U	0.021 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	*6 U*	0.2 U	0.2 U	0.2 U	0.2 U	*0.88 U*	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	25	0.1 U	8.5	76	10	9.6	16	82	*86 U*	2.9	0.97
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	2.5	0.1 U	0.1 U	5.3	0.74	0.47	0.46	3.6 J	1.5 J	0.12	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	3 U	0.1 U	0.1 U	0.1 U	0.17 U	0.1 UJ	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.45	0.1 U	0.1 U	3 U	0.32	0.1 U	0.1 U	0.17 U	0.1 UJ	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	6.2	0.1 U	0.66	30	6.7	4.5	4.8	51	57	1.1	0.27
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.73	0.1 U	0.15	3 U	0.75	0.51	1.1	4 J	1.7 J	0.11	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	*0.19 U*	*0.92 U*	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	*0.18 U*	0.1 UJ	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	4.7	150	26	8.2	1 U	3.3 J	14 U	1 U	1.5
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	26	0.1 U	0.1 U	0.1 U	0.21 U	1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	*7.5 U*	0.25 U	0.25 U	0.25 U	*0.49 U*	*2.4 U*	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	0.25	0.1 UJ	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.15 U	0.14 U	0.14 U	*7.3 U*	0.14 U	0.14 U	0.15 U	*0.53 U*	*2.6 U*	0.14 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	1.8	0.073 U	0.077 U	9.8	1.1	0.21	0.081 U	0.29 U	*1.4 U*	0.078 U	0.074 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	*3 U*	0.1 U	0.1 U	0.1 U	*0.11 U*	*0.54 U*	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.11 U	0.097 U	0.1 U	*5.2 U*	0.1 U	0.1 U	0.11 U	*0.38 U*	*1.9 U*	0.1 U	0.098 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.038 U	0.035 U	0.037 U	*1.9 U*	0.037 U	0.036 U	0.039 U	0.14 U	0.068 UJ	0.038 U	0.036 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	3,400	25 U	320	2,000	590	150	790	25 U	25 U	31	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	1,700	50 U	1,800	9,000	1,200	1,200	2,000	4,600	6,500	150	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	2,000	50 U	1,400	12,000	1,700	1,900	3,000	7,900	9,500	280	89
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	7,100	50 U	3,500	23,000	3,500	3,300	5,800	13,000	16,000	460	89
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	7,100	50 U	3,500	23,000	3,500	3,300	5,800	13,000	16,000	460	130

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenze, and xylenes
CAS Chemical Abstracts Service
cPAH Carcinogenic polycyclic aromatic hydrocarbon
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
REL Remediation Level
TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH17				BH18					
				Sample Name		PLF-PEC-BH17-03-021222	PLF-PEC-BH17-14-021222	PLF-PEC-BH17-26-021222	PLF-PEC-BH17-51-021322	PLF-PEC-BH18-12-021422	PLF-PEC-BH18-17-021422	PLF-PEC-BH18-22-021422	PLF-PEC-BH18-39-021422	PLF-PEC-BH18-45-021422	PLF-PEC-BH18-60-021422
				Sample Date		2/12/2022	2/12/2022	2/12/2022	2/13/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022
				Sample Depth (feet bgs)		3	14	26	51	12	17	22	39	45	60
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.016 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	55	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	41	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	220	0.038	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	71	0.019	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	290	0.057	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	290	0.057	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	390	0.057	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	390	0.068	0.02 U	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.018 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0028	4.6	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.2	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00084 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0028	5.8	0.001 U	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0033	5.8	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.024 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.029 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.032 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00034 U	0.00038 U	0.00032 U	0.00032 U	0.0004 U	*0.22 U*	0.00036 U	0.00034 U	0.00031 U	0.00028 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.008 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.016 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.031 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.18 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.071 U*	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00011 U	0.00013 U	0.00011 U	0.00011 U	0.00013 U	*0.0075 U*	0.00012 U	0.00011 U	0.0001 U	0.000094 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.72	0.001 U	0.001 U	0.001 U	0.001	7.9	0.0034	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0093 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0099 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.13 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.055 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.29	0.25	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0097 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.033 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.022 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.016 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.75	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.03 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.029 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.031 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	7.9	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.13	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH17				BH18					
				Sample Name		PLF-PEC-BH17-03-021222	PLF-PEC-BH17-14-021222	PLF-PEC-BH17-26-021222	PLF-PEC-BH17-51-021322	PLF-PEC-BH18-12-021422	PLF-PEC-BH18-17-021422	PLF-PEC-BH18-22-021422	PLF-PEC-BH18-39-021422	PLF-PEC-BH18-45-021422	PLF-PEC-BH18-60-021422
				Sample Date		2/12/2022	2/12/2022	2/12/2022	2/13/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022
				Sample Depth (feet bgs)		3	14	26	51	12	17	22	39	45	60
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	1.3	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0062	0.005 U	0.005 U	0.005 U	0.0078	*0.16 U*	0.005 U	0.005 U	0.005 U	*0.005 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.032 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.021 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.73	0.05 U	0.05 U	0.05 U	0.012	410	0.31	0.05 U	0.05 U	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.96	0.05 U	0.05 U	0.05 U	0.25	410	0.51	0.05 U	0.05 U	0.05 U
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.16	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.4	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.02	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.09	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.32	0.1 U	0.1 U	0.1 U	0.69	29	0.49	0.1 U	0.1 U	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.29	0.25 U	0.25 U	0.25 U	0.89	8.7	*0.5 U*	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.37	0.25 U	0.25 U	0.25 U	1	16	0.5 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.98	0.25 U	0.25 U	0.25 U	2.6	54	0.49	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.98	0.25 U	0.25 U	0.25 U	2.6	54	0.99	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.24	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.48	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.5 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.044 U	0.042 U	0.041 U	0.045 U	*0.47 U*	*0.099 U*	0.043 U	0.044 U	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.27 U	0.26 U	0.25 U	0.28 U	*2.9 U*	*0.61 U*	0.26 U	0.27 U	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.071 U	0.068 U	0.066 U	0.072 U	0.76 U	0.48	0.069 U	0.071 U	0.073 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	*0.34 U*	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.5 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*0.5 U*	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.8	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*0.2 U*	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	1 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.15 UJ	0.15 U	0.16 UJ	*1.7 UJ*	*0.36 UJ*	0.16 UJ	0.16 UJ	0.16 UJ
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.87	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.068 U*	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.041 U	0.039 U	0.038 U	0.042 U	*0.44 U*	*0.092 U*	0.04 U	0.041 U	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.068 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH17				BH18					
				Sample Name		PLF-PEC-BH17-03-021222	PLF-PEC-BH17-14-021222	PLF-PEC-BH17-26-021222	PLF-PEC-BH17-51-021322	PLF-PEC-BH18-12-021422	PLF-PEC-BH18-17-021422	PLF-PEC-BH18-22-021422	PLF-PEC-BH18-39-021422	PLF-PEC-BH18-45-021422	PLF-PEC-BH18-60-021422
				Sample Date		2/12/2022	2/12/2022	2/12/2022	2/13/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022	2/14/2022
				Sample Depth (feet bgs)		3	14	26	51	12	17	22	39	45	60
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	*2 U*	*0.43 U*	0.18 U	0.19 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.63 U	0.6 U	0.58 U	0.64 U	*6.7 U*	*1.4 U*	0.61 U	0.62 U	0.64 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*0.5 U*	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.11 U	0.1 U	0.099 U	0.11 U	*1.1 U*	*0.24 U*	0.1 U	0.11 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.5 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.04 U	0.038 U	0.037 U	0.04 U	0.43 U	0.089 U	0.039 U	0.04 U	0.041 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.023 U	0.022 U	0.021 U	0.023 U	*0.24 U*	*0.051 U*	0.022 U	0.023 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	*0.4 U*	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	1.9	0.1 U	0.1 U	0.1 U	12	27	3.5	0.1 U	0.1 U	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.39	1.8	0.21	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.29	1.4	0.2 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1.3	7.9	0.77	0.1 U	0.1 U	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*0.2 U*	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*0.2 U*	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	61	1 U	1 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*0.5 U*	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.14 U	0.13 U	0.15 U	*1.6 U*	*0.32 U*	0.14 U	0.14 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.2 U	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.24	0.078 U	0.075 U	0.072 U	0.079 U	3.7	0.18	0.075 U	0.078 U	0.08 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*0.2 U*	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.099 U	0.096 U	0.1 U	*1.1 U*	*0.23 U*	0.1 U	0.1 U	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.038 U	0.036 U	0.035 U	0.038 U	0.41 U	0.085 U	0.037 U	0.038 U	0.039 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	45	25 U	25 U	25 U	56	1,800	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	1,100	50 U	50 U	50 U	1,400	3,200	380	50 U	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	390	50 U	50 U	50 U	2,500	3,700	510	50 U	50 U	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	1,500	50 U	50 U	50 U	4,000	8,700	890	50 U	50 U	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	1,500	50 U	50 U	50 U	4,000	8,700	900	50 U	50 U	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH19					BH20				
				Sample Name		PLF-BH19-14-053122	PLF-BH19-16-053122	PLF-BH19-33-053122	PLF-BH19-39-053122	PLF-BH19-42-053122	PLF-BH20-13-060222	PLF-BH20-16-060222	PLF-DUP11-060222	PLF-BH20-22-060222	PLF-BH20-24-060222
				Sample Date		5/31/2022	5/31/2022	5/31/2022	5/31/2022	5/31/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022
				Sample Depth (feet bgs)		14	16	33	39	42	13	16	16	22	24
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.17 U*	*2 U*	*0.18 U*	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	41	75	8.5	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	9.7	17	1.3	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	210	360	41	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.014	100	180	22	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.014	310	540	63	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.024	310	540	63	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.014	360	630	73	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.035	360	630	73	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.2 U*	*2.3 U*	*0.22 U*	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.5	*2.6 U*	*0.24 U*	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.18 U*	*2.2 U*	*0.2 U*	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.0089 U*	*0.11 U*	*0.0099 U*	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.5	*2.6 U*	0.24 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	1.6	*2.6 U*	0.24 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.26 U	3.1 U	0.29 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.31 U	*3.7 U*	0.35 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.34 U	*4.1 U*	0.38 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00043 U	0.00043 U	0.00036 U	0.00039 U	0.00041 U	0.0004 U	*0.24 U*	*2.8 U*	*0.26 U*	0.00054 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.086 U*	*1 U*	*0.095 U*	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.17 U*	*2.1 U*	*0.19 U*	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.33 U*	*3.9 U*	*0.36 U*	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.1	*2.3 U*	0.21 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	*5 U*	*0.5 U*	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00014 U	0.00014 U	0.00012 U	0.00013 U	0.00014 U	0.00013 U	*0.08 U*	*0.95 U*	*0.088 U*	0.00018 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0051	21	33	12	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.099 U*	*1.2 U*	*0.11 U*	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.11 U*	*1.3 U*	*0.12 U*	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.11 U	1.3 U	0.12 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	2.9	*1.6 U*	0.92	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.59 U*	*7 U*	*0.65 U*	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	5 U	3.7	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.1 U*	*1.2 U*	*0.11 U*	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.12 U	*1.4 U*	0.13 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.35 U*	*4.2 U*	*0.39 U*	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.23 U	2.8 U	0.26 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.17 U*	*2 U*	*0.19 U*	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	*1.1 U*	0.1 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.32 U*	*3.8 U*	*0.36 U*	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.31 U	3.7 U	0.34 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.14 U	1.7 U	0.16 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.34 U	4 U	0.37 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	16	23	3.4	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	5 U	0.5 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH19					BH20				
				Sample Name		PLF-BH19-14-053122	PLF-BH19-16-053122	PLF-BH19-33-053122	PLF-BH19-39-053122	PLF-BH19-42-053122	PLF-BH20-13-060222	PLF-BH20-16-060222	PLF-DUP11-060222	PLF-BH20-22-060222	PLF-BH20-24-060222
				Sample Date		5/31/2022	5/31/2022	5/31/2022	5/31/2022	5/31/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022
				Sample Depth (feet bgs)		14	16	33	39	42	13	16	16	22	24
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	8.9	16	1.8	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.005 U	0.0075	0.005 U	0.005 U	0.005 U	0.005 U	*1.7 U*	*20 U*	*1.8 U*	0.005 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.34 U*	*4.1 U*	*0.38 U*	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.13 U	1.6 U	0.15 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.23 U	2.7 U	0.25 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.22 U	2.6 U	0.24 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.0075	0.05 U	0.05 U	0.05 U	0.019	410	700	88	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.25	0.05 U	0.05 U	0.05 U	0.25	420	760	100	0.05 U
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.93 U	1.2	1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.9	1 U	1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.49	1 U	1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.82	1 U	1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1 U	1.6	1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.32	1 U	1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1	0.14	1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1	0.84	1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	40	40	18	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	11	11	6.1	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	21	19	12	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	72	70	36	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	72	70	36	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.52	1 U	1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	2.4	2.4	1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	10	9.4	2.7	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1 U	3	1.1	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	2.5 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.044 U	0.041 U	0.041 U	0.04 U	0.046 U	0.048 U	*0.69 U*	*0.58 U*	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.27 U	0.26 U	0.25 U	0.25 U	0.29 U	0.3 U	*4.3 U*	*3.6 U*	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.071 U	0.067 U	0.066 U	0.065 U	0.075 U	0.077 U	1.1 U	0.93 U	0.073 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	*1.7 U*	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	3.2 U	2.7 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*12 U*	*17 U*	*14 U*	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	4.1 U	5.9 U	4.9 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U	7.4 U	6.2 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*1 U*	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.6 U	5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.15 U	0.15 U	0.15 U	0.17 U	14	17	4.5	0.16 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	4.8 U	6.9 U	5.8 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.38 U*	*0.34 U*	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.041 U	0.039 U	0.038 U	0.038 U	0.043 U	0.045 U	*0.65 U*	*0.54 U*	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	*0.34 U*	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH19					BH20				
				Sample Name		PLF-BH19-14-053122	PLF-BH19-16-053122	PLF-BH19-33-053122	PLF-BH19-39-053122	PLF-BH19-42-053122	PLF-BH20-13-060222	PLF-BH20-16-060222	PLF-DUP11-060222	PLF-BH20-22-060222	PLF-BH20-24-060222
				Sample Date		5/31/2022	5/31/2022	5/31/2022	5/31/2022	5/31/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022
				Sample Depth (feet bgs)		14	16	33	39	42	13	16	16	22	24
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.2 U	*6.2 U*	*3 U*	*2.5 U*	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	10 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.63 U	0.59 U	0.59 U	0.57 U	0.66 U	0.68 U	*9.9 U*	*8.2 U*	0.64 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.11 U	0.1 U	0.1 U	0.098 U	0.11 U	*12 U*	*17 U*	*14 U*	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	15 U	22 U	18 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.04 U	0.037 U	0.037 U	0.036 U	0.042 U	0.043 U	*0.63 U*	*0.52 U*	0.041 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.023 U	0.021 U	0.021 U	0.021 U	0.024 U	*2.5 U*	*3.6 U*	*3 U*	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*5.3 U*	*7.7 U*	*6.4 U*	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.27	0.8 U	290	84	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.81 U	1 U	1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	4.9	5.5	1.7	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.79 U	1.4	1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*5.6 U*	*8.1 U*	*6.7 U*	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	*1 U*	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	12 U	23	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	6.2 U	*8.9 U*	*7.4 U*	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	*2.5 U*	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.71	1 U	1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.14 U	0.13 U	0.13 U	0.15 U	0.16 U	*2.3 U*	*1.9 U*	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.075 U	0.078 U	0.073 U	0.073 U	0.071 U	0.082 U	0.085 U	*1.2 U*	2.3	0.08 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*3.2 U*	*4.7 U*	*3.9 U*	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.097 U	0.097 U	0.095 U	0.11 U	*11 U*	*16 U*	*14 U*	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.038 U	0.035 U	0.035 U	0.035 U	0.04 U	0.041 U	0.59 U	0.49 U	0.039 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 UJ	*10,000 U*	13,000	*2,500 U*	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	50 U	50 U	*7,800 U*	7,900	4,200	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	50 U	100	6,200	6,900	3,100	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	50 U	50 U	50 U	100	6,200	28,000	7,300	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	50 U	50 U	50 U	140 J	15,000	28,000	8,600	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH21				BH22				BH23		
					Sample Name	PLF-BH21-13-060122	PLF-BH21-15-062122	PLF-BH21-25-060122	PLF-BH21-31-060122	PLF-BH22-12-060122	PLF-BH22-15-060122	PLF-BH22-24-060122	PLF-BH22-28-060122	PLF-BH23-14-060222	PLF-BH23-17-060222	PLF-BH23-22-060222
					Sample Date	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022
					Sample Depth (feet bgs)	13	15	25	31	12	15	24	28	14	17	22
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.013 U	0.001 U	0.001 U	0.001 U	0.015 U	*0.17 U*	*0.15 U*	0.001 U	0.017 U	*0.22 U*	*0.19 U*
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	37	150	190	0.01 U	0.76	0.18 U	5.6
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	77	170	100	0.01 U	0.15	1.5	11
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.021 U	0.02 U	0.02 U	0.02 U	150	560	730	0.02 U	4	4.3	28
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.013 U	0.01 U	0.01 U	0.01 U	67	240	330	0.01 U	2.4	3.1	18
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.021 U	0.02 U	0.02 U	0.02 U	220	800	1,100	0.02 U	6.4	7.4	46
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.021 U	0.02 U	0.02 U	0.02 U	220	800	1,100	0.02 U	6.4	7.4	46
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.021 U	0.02 U	0.02 U	0.02 U	330	1,100	1,400	0.02 U	7.3	8.9	63
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.021 U	0.02 U	0.02 U	0.02 U	330	1,100	1,400	0.02 U	7.3	9.1	63
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.015 U	0.001 U	0.001 U	0.001 U	0.018 U	*0.2 U*	*0.18 U*	0.001 U	0.019 U	*0.25 U*	*0.22 U*
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.017 U	0.001 U	0.001 U	0.001 U	2	10	7.4	0.001 U	0.021 U	*0.28 U*	*0.24 U*
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.014 U	0.001 U	0.001 U	0.001 U	0.33	0.88	0.25	0.001 U	0.018 U	*0.24 U*	*0.2 U*
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00069 U	0.00008 U	0.00008 U	0.00008 U	0.00082 U	*0.0093 U*	*0.0081 U*	0.00008 U	0.00088 U	*0.012 U*	*0.0099 U*
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.017 U	0.001 U	0.001 U	0.001 U	2.3	11	7.7	0.001 U	0.021 U	0.28 U	0.24 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.017 U	0.001 U	0.001 U	0.001 U	2.3	11	7.7	0.001 U	0.021 U	0.28 U	0.24 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.02 U	0.01 U	0.01 U	0.01 U	0.024 U	0.27 U	0.24 U	0.01 U	0.026 U	0.34 U	0.29 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.024 U	0.01 U	0.01 U	0.01 U	0.029 U	0.33 U	0.28 U	0.01 U	0.031 U	0.41 U	0.35 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.026 U	0.01 U	0.01 U	0.01 U	0.031 U	0.35 U	0.31 U	0.01 U	0.034 U	0.44 U	0.38 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	*0.018 U*	0.00069 U	0.00039 U	0.00039 U	*0.022 U*	*0.25 U*	*0.22 U*	0.0004 U	*0.024 U*	*0.31 U*	*0.27 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.0066 U	0.001 U	0.001 U	0.001 U	0.0079 U	*0.089 U*	*0.077 U*	0.001 U	0.0085 U	*0.11 U*	*0.095 U*
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.013 U	0.001 U	0.001 U	0.001 U	0.016 U	*0.18 U*	*0.16 U*	0.001 U	0.017 U	*0.22 U*	*0.19 U*
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.026 U	0.001 U	0.001 U	0.001 U	0.03 U	*0.34 U*	*0.3 U*	0.001 U	0.033 U	*0.43 U*	*0.37 U*
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.015 U	0.01 U	0.01 U	0.01 U	0.4	1.2	0.8	0.01 U	0.21	0.98	1.2
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	*0.5 U*	0.05 U	0.05 U	*0.5 U*	*0.5 U*
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	*0.0062 U*	0.00023 U	0.00013 U	0.00013 U	*0.0073 U*	*0.083 U*	*0.072 U*	0.00013 U	*0.0079 U*	*0.1 U*	*0.089 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.009 U	0.001 U	0.001 U	0.0014	6.7	17	12	0.001 U	1.1	2	12
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.0076 U	0.001 U	0.001 U	0.001 U	0.0091 U	*0.1 U*	*0.089 U*	0.001 U	0.0098 U	*0.13 U*	*0.11 U*
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.0082 U	0.001 U	0.001 U	0.001 U	0.0097 U	*0.11 U*	*0.095 U*	0.001 U	0.01 U	*0.14 U*	*0.12 U*
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.11 U	0.1 U	0.01 U	0.011 U	0.14 U	0.12 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	1.1	2.7	2	0.01 U	0.11	0.17 U	1.4
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	1.1	3.9	3.4	0.05 U	0.058 U	*0.76 U*	1.2
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	1.7	5.3	0.15	0.13	2.3	18	9.5	0.05 U	0.42	1.6	5.6
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.008 U	0.001 U	0.001 U	0.001 U	0.0095 U	*0.11 U*	*0.093 U*	0.001 U	0.01 U	*0.13 U*	*0.11 U*
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.13 U	0.11 U	0.01 U	0.012 U	0.16 U	0.13 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.027 U	0.001 U	0.001 U	0.001 U	0.032 U	*0.36 U*	*0.32 U*	0.001 U	0.035 U	*0.46 U*	*0.39 U*
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.018 U	0.01 U	0.01 U	0.01 U	0.022 U	0.24 U	0.21 U	0.01 U	0.023 U	0.3 U	0.26 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.013 U	0.001 U	0.001 U	0.001 U	0.016 U	*0.18 U*	*0.15 U*	0.001 U	0.017 U	*0.22 U*	*0.19 U*
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.078	0.47	0.5	0.01 U	0.01 U	0.12 U	0.1 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.025 U	0.001 U	0.001 U	0.001 U	0.03 U	*0.33 U*	*0.29 U*	0.001 U	0.032 U	*0.42 U*	*0.36 U*
Chloromethane	74-87-3	--	--	--	mg/kg	0.024 U	0.01 U	0.01 U	0.01 U	0.029 U	0.32 U	0.28 U	0.01 U	0.031 U	0.4 U	0.34 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.013 U	0.15 U	0.13 U	0.01 U	0.014 U	0.19 U	0.16 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.026 U	0.01 U	0.01 U	0.01 U	0.031 U	0.35 U	0.3 U	0.01 U	0.033 U	0.43 U	0.37 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	6.3	28	32	0.01 U	0.32	0.17 U	2.2
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.16	0.84	0.05 U	0.05 U	2.6	5.9	2	0.05 U	0.14	0.5 U	1.4

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH21				BH22				BH23		
				Sample Name		PLF-BH21-13-060122	PLF-BH21-15-062122	PLF-BH21-25-060122	PLF-BH21-31-060122	PLF-BH22-12-060122	PLF-BH22-15-060122	PLF-BH22-24-060122	PLF-BH22-28-060122	PLF-BH23-14-060222	PLF-BH23-17-060222	PLF-BH23-22-060222
				Sample Date		6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022
				Sample Depth (feet bgs)		13	15	25	31	12	15	24	28	14	17	22
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	5.6	18	9	0.05 U	0.27	3.1	6.6
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	*0.13 U*	0.005 U	0.005 U	0.005 U	*0.15 U*	*1.7 U*	*1.5 U*	0.005 U	*0.17 U*	*2.2 U*	*1.9 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.027 U	0.001 U	0.001 U	0.001 U	0.032 U	*0.36 U*	*0.31 U*	0.001 U	0.034 U	*0.44 U*	*0.38 U*
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.14 U	0.12 U	0.01 U	0.013 U	0.17 U	0.15 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.017 U	0.01 U	0.01 U	0.01 U	0.021 U	0.23 U	0.2 U	0.01 U	0.022 U	0.29 U	0.25 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.017 U	0.01 U	0.01 U	0.01 U	0.02 U	0.22 U	0.19 U	0.01 U	0.021 U	0.28 U	0.24 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	1.9	6.1	0.15	0.13	360	1,200	1,400	0.05 U	9.4	18	94
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	2.3	6.3	0.37	0.35	360	1,200	1,400	0.05 U	10	23	99
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.6 U	0.5	0.1 U	0.39	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.32	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.65	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.72 U	0.64	0.1 U	1.1	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.0011	0.1 U	0.056	0.1 U	0.16	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.076	0.1 U	0.13	0.1 U	0.22	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	0.17	3.6	16	28	0.1 U	6.4	22	24
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.98	1.9	3.7	0.25 U	1.7	1.7	2.1
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	1.7	7.3	11	0.25 U	3.8	2.9	4.2
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.17	6.3	25	43	0.25 U	12	27	30
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.42	6.3	25	43	0.25 U	12	27	30
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.48	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.14	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.28	0.11	0.1 U	0.1 U	2.6	0.1 U	0.2
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.67	1.2	1.7	0.1 U	3.9	0.2	0.63
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.21	0.69 U	1.6	0.1 U	1.3	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.042 U	0.042 U	0.04 U	0.043 U	0.046 U	0.066 U	0.042 U	0.042 U	0.045 U	0.044 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.27 U	0.28 U	*0.41 U*	0.26 U	0.26 U	0.28 U	0.27 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.067 U	0.067 U	0.064 U	0.07 U	0.074 U	0.11 U	0.067 U	0.069 U	0.073 U	0.071 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.3 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*1.1 U*	*11 U*	*0.81 U*	0.25 U	*1 U*	55	200
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.37 U	3.9 U	0.28 U	0.1 U	0.36 U	1.2 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.21	0.56	0.19	0.1 U	0.46 U	4.9 U	0.35 U	0.1 U	0.46 U	1.5 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.53 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.15 U	0.15 U	0.15 U	2.9	7.8	18	0.15 U	9	0.78	2.3
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.28	0.89	0.22	0.1 U	0.43 U	4.6 U	0.33 U	3.2	1	140	280
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.036 U*	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.039 U	0.039 U	0.037 U	0.04 U	0.043 U	*0.061 U*	0.039 U	0.04 U	0.042 U	0.041 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH21				BH22				BH23		
				Sample Name		PLF-BH21-13-060122	PLF-BH21-15-062122	PLF-BH21-25-060122	PLF-BH21-31-060122	PLF-BH22-12-060122	PLF-BH22-15-060122	PLF-BH22-24-060122	PLF-BH22-28-060122	PLF-BH23-14-060222	PLF-BH23-17-060222	PLF-BH23-22-060222
				Sample Date		6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022
				Sample Depth (feet bgs)		13	15	25	31	12	15	24	28	14	17	22
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	*4 U*	*1.4 U*	0.18 U	0.18 U	0.19 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.59 U	0.59 U	0.57 U	0.62 U	0.66 U	*0.94 U*	0.59 U	0.61 U	0.64 U	0.63 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.1 U	0.1 U	0.096 U	*1.1 U*	*11 U*	*0.8 U*	0.1 U	*1 U*	*3.3 U*	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	1.4 U	15 U	1 U	0.25 U	1.3 U	4.3 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.038 U	0.038 U	0.036 U	0.039 U	0.042 U	0.059 U	0.038 U	0.038 U	0.041 U	0.04 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.021 U	0.021 U	0.02 U	*0.22 U*	*2.4 U*	*0.17 U*	0.021 U	*0.22 U*	*0.7 U*	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	*0.48 U*	*5.1 U*	*0.36 U*	0.2 U	*0.47 U*	*1.5 U*	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.2	0.11	0.1 U	0.73	12	46	98	0.1 U	24	11	44
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.52 U	9.2	0.1 U	0.1 U	0.22	4.9
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	0.1 U	1.9
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1	1.7	0.1 U	0.49	1.9	7.1
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.14	0.83	1.6	0.1 U	0.23	0.44	2.6
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*0.5 U*	*5.4 U*	*0.38 U*	0.1 U	*0.49 U*	*1.6 U*	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	7.8 U	20	1.2 U	1.5	9.2	6.9	12
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.56 U	5.9 U	0.42 U	0.1 U	0.55 U	1.7 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.3	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.14 U	0.13 U	0.14 U	0.15 U	*0.22 U*	0.14 U	0.14 U	0.15 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.18	0.51	0.074 U	0.07 U	0.077 U	0.081 U	0.12 U	0.073 U	0.075 U	0.08 U	0.078 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*0.29 U*	*3.1 U*	*0.22 U*	0.1 U	*0.29 U*	*0.91 U*	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.098 U	0.098 U	0.093 U	*1 U*	*11 U*	*0.77 U*	0.098 U	*1 U*	*3.2 U*	0.45
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.036 U	0.036 U	0.034 U	0.037 U	0.039 U	0.056 U	0.036 U	0.036 U	0.039 U	0.038 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	4,100	*10,000 U*	*10,000 U*	25 U	420	*2,500 U*	2,600
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	54	1,900 U	4,800	8,600	50 U	1,300	1,000	3,600
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	1,100	3,600	7,500	50 U	1,200	620	2,600
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	50 U	54	5,200	8,400	16,000	50 U	2,900	1,600	8,800
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	50 U	92	6,200	13,000	21,000	50 U	2,900	2,900	8,800

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH23 (cont.)		BH24					BH25			
					Sample Name	PLF-BH23-28-060222	PLF-BH23-31-060222	PLF-BH24-13-060122	PLF-BH24-18-060122	PLF-BH24-23-060122	PLF-BH24-32-060122	PLF-BH24-60-060122	PLF-BH25-15-060122	PLF-BH25-18-060122	PLF-BH25-22-060122	PLF-DUP10-060122
					Sample Date	6/2/2022	6/2/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022
					Sample Depth (feet bgs)	28	31	13	18	23	32	60	15	18	22	22
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.018 U	0.001 U	0.001 U	0.001 U	0.001 U	0.018 U	0.018 U	*0.031 U*	*0.13 U*
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.17	0.01 U	0.01 U	0.01 U	0.01 U	1.1	9.6	10	16
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.39	0.01 U	0.01 U	0.01 U	0.01 U	1.6	9.6	8.7	15
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.82	0.02 U	0.02 U	0.02 U	0.02 U	4	37	38	50
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.34	0.01 U	0.01 U	0.01 U	0.01 U	1.8	18	16	20
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	1.2	0.02 U	0.02 U	0.02 U	0.02 U	5.8	55	54	70
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	1.2	0.02 U	0.02 U	0.02 U	0.02 U	5.8	55	54	70
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	1.7	0.02 U	0.02 U	0.02 U	0.02 U	8.5	74	73	100
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	1.7	0.02 U	0.02 U	0.02 U	0.02 U	8.5	74	73	100
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.022 U	0.001 U	0.001 U	0.001 U	0.001 U	0.021 U	0.021 U	0.037 U	*0.15 U*
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.024 U	0.001 U	0.001 U	0.001 U	0.001 U	0.032	0.4	0.63	1.1
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.1	0.001 U	0.001 U	0.001 U	0.001 U	0.019 U	0.064	0.035	*0.14 U*
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00099 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00095 U	0.00097 U	0.0017 U	*0.007 U*
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.1	0.001 U	0.001 U	0.001 U	0.001 U	0.032	0.46	0.67	1.1
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.11	0.001 U	0.001 U	0.001 U	0.001 U	0.042	0.46	0.67	1.2
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.029 U	0.01 U	0.01 U	0.01 U	0.01 U	0.028 U	0.028 U	0.049 U	0.2 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.035 U	0.01 U	0.01 U	0.01 U	0.01 U	0.034 U	0.034 U	0.058 U	0.24 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.038 U	0.01 U	0.01 U	0.01 U	0.01 U	0.037 U	0.037 U	0.064 U	0.27 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00047 U	0.0006 U	*0.026 U*	0.00042 U	0.0004 U	0.0004 U	*0.0004 U*	*0.026 U*	*0.026 U*	*0.045 U*	*0.19 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.0094 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0092 U	0.0093 U	0.016 U	*0.067 U*
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.019 U	0.001 U	0.001 U	0.001 U	0.001 U	0.019 U	0.019 U	0.032 U	*0.14 U*
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.036 U	0.001 U	0.001 U	0.001 U	0.001 U	0.035 U	0.036 U	*0.062 U*	*0.26 U*
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.13	0.01 U	0.01 U	0.01 U	0.01 U	0.034	0.021 U	0.036 U	0.28
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00016 U	0.0002 U	*0.0088 U*	0.00014 U	0.00013 U	0.00013 U	*0.00013 U*	*0.0085 U*	*0.0086 U*	*0.015 U*	*0.062 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.19	0.0057	0.001 U	0.001 U	0.001 U	0.74	7.8	3.1	4.3
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.011 U	0.018 U	*0.077 U*
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.011 U	0.02 U	*0.082 U*
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.12	0.02 U	0.1 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	0.01 U	0.11	0.74	0.46	0.73
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.065 U	0.05 U	0.05 U	0.05 U	0.05 U	0.063 U	0.43	0.11 U	*0.5 U*
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.11	0.052	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.75	5.7	4.6	2.4
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.011 U	0.019 U	*0.08 U*
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.013 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.013 U	0.023 U	0.1 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.039 U	0.001 U	0.001 U	0.001 U	0.001 U	0.038 U	0.038 U	*0.066 U*	*0.27 U*
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.026 U	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.025 U	0.044 U	0.18 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.019 U	0.001 U	0.001 U	0.001 U	0.001 U	0.018 U	0.019 U	0.032 U	*0.13 U*
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	0.017 U	0.1 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.035 U	0.001 U	0.001 U	0.001 U	0.001 U	0.034 U	0.035 U	0.06 U	*0.25 U*
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.034 U	0.01 U	0.01 U	0.01 U	0.01 U	0.033 U	0.034 U	0.058 U	0.24 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.016 U	0.01 U	0.01 U	0.01 U	0.01 U	0.015 U	0.016 U	0.027 U	0.11 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.037 U	0.01 U	0.01 U	0.01 U	0.01 U	0.036 U	0.036 U	0.063 U	0.26 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.014 U	0.01 U	0.01 U	0.01 U	0.01 U	0.18	2.9	2	2.9
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.22	1.2	0.94	0.5 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH23 (cont.)		BH24					BH25			
					Sample Name	PLF-BH23-28-060222	PLF-BH23-31-060222	PLF-BH24-13-060122	PLF-BH24-18-060122	PLF-BH24-23-060122	PLF-BH24-32-060122	PLF-BH24-60-060122	PLF-BH25-15-060122	PLF-BH25-18-060122	PLF-BH25-22-060122	PLF-DUP10-060122
					Sample Date	6/2/2022	6/2/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022
					Sample Depth (feet bgs)	28	31	13	18	23	32	60	15	18	22	22
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5	2.1	1.4	1.6
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.005 U	0.005 U	*0.18 U*	0.005 U	0.005 U	0.005 U	*0.005 U*	*0.18 U*	*0.18 U*	*0.31 U*	*1.3 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.038 U	0.001 U	0.001 U	0.001 U	0.001 U	0.037 U	0.037 U	0.064 U	*0.27 U*
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.015 U	0.025 U	0.1 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.025 U	0.01 U	0.01 U	0.01 U	0.01 U	0.024 U	0.024 U	0.042 U	0.18 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.024 U	0.01 U	0.01 U	0.01 U	0.01 U	0.023 U	0.023 U	0.04 U	0.17 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	0.11	0.052	2.1	0.0057	0.05 U	0.05 U	0.05 U	11	96	86	110
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	0.33	0.27	2.7	0.25	0.05 U	0.05 U	0.05 U	12	96	87	120
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.19	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.6 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.68 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.3 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.29	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.68 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.75 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.022	0.1 U	0.1 U	0.1 U	0.1 U	0.6 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.092	0.1 U	0.1 U	0.1 U	0.1 U	0.6 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	4.9	0.8 U	0.1 U	0.1 U	0.1 U	57	73	34	33
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.93	0.28	0.25 U	0.25 U	0.25 U	7.3	10	5.8	6.2
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	1.6	0.49	0.25 U	0.25 U	0.25 U	15	20	11	12
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	7.4	0.77	0.25 U	0.25 U	0.25 U	79	100	51	51
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	7.4	1.2	0.25 U	0.25 U	0.25 U	79	100	51	51
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	1.5	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.8	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.14	0.1 U	0.11
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.7	0.1 U	0.1 U	0.1 U	0.1 U	1	3.3	1.3	1.5
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.51	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.23	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.042 U	0.042 U	0.04 U	0.039 U	0.044 U	0.042 U	0.041 U	0.044 U	0.046 U	0.044 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.26 U	0.26 U	0.24 U	0.24 U	0.27 U	0.26 U	0.25 U	*8.2 U*	0.28 U	0.27 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.067 U	0.068 U	0.064 U	0.063 U	0.071 U	0.068 U	0.066 U	0.071 U	0.074 U	0.071 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	6.1 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.33	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	2.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	11 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.15 U	7.8	*4.3 U*	0.14 U	0.16 U	0.15 U	0.15 U	0.16 U	0.17 U	0.16 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.88	0.58	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
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.039 U	0.039 U	0.037 U	0.037 U	0.041 U	0.039 U	0.038 U	0.041 U	0.043 U	0.041 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.65 U*	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH23 (cont.)		BH24					BH25			
					Sample Name	PLF-BH23-28-060222	PLF-BH23-31-060222	PLF-BH24-13-060122	PLF-BH24-18-060122	PLF-BH24-23-060122	PLF-BH24-32-060122	PLF-BH24-60-060122	PLF-BH25-15-060122	PLF-BH25-18-060122	PLF-BH25-22-060122	PLF-DUP10-060122
					Sample Date	6/2/2022	6/2/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022	6/1/2022
					Sample Depth (feet bgs)	28	31	13	18	23	32	60	15	18	22	22
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.18 U	0.18 U	0.17 U	0.17 U	0.19 U	0.18 U	0.18 U	0.19 U	0.2 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.59 U	0.6 U	0.56 U	0.56 U	0.63 U	0.6 U	0.59 U	*19 U*	0.65 U	0.63 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.1 U	0.1 U	0.096 U	0.095 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.038 U	0.038 U	0.036 U	0.036 U	0.04 U	0.038 U	0.037 U	0.04 U	0.041 U	0.04 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.021 U	0.022 U	0.02 U	0.02 U	0.023 U	0.022 U	0.021 U	0.023 U	0.023 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.99	0.22	5.5	0.66 U	0.12	0.1 U	0.1 U	51	88	46	55
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.69	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	2.3	2	2.2
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.12	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	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.47	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	17	1 U	0.1 U	0.26	0.1 U	2.5	8.3	5.8	6.1
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	4.9	3.2	3.5
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	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	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	16	21 U	1 U	1 U	1 U	1 U	24 U	33	30
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*4 U*	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.19	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.14 U	0.13 U	0.13 U	0.14 U	0.14 U	0.13 U	*4.3 U*	0.15 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.091	0.082	0.54	0.07 U	0.069 U	0.078 U	0.075 U	0.073 U	*2.3 U*	0.081 U	0.078 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	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	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.098 U	0.099 U	0.093 U	0.092 U	0.1 U	0.099 U	0.097 U	0.1 U	0.11 U	0.1 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.036 U	0.036 U	0.034 U	0.034 U	0.038 U	0.036 U	0.035 U	0.038 U	0.039 U	0.038 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	*250 U*	25 U	25 U	25 U	25 U	*2,500 U*	3,500	*2,500 U*	3,800
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	840	340	50 U	50 U	50 U	880 U	2,000 U	1,400	2,300
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	910	670	50 U	50 U	50 U	3,100	2,400	1,200	2,200
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	1,800	1,000	50 U	50 U	50 U	3,100	5,900	2,600	8,300
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	1,900	1,000	50 U	50 U	50 U	4,800	6,900	3,900	8,300

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH25 (cont.)			BH26				BH27			
					Sample Name	PLF-BH25-26-060122	PLF-BH25-34-060122	PLF-BH25-63-060122	PLF-BH26-17-060222	PLF-BH26-19-060222	PLF-BH26-24-060222	PLF-BH26-27-060222	PLF-BH27-14-060322	PLF-BH27-19-060322	PLF-BH27-22-060322	PLF-BH27-28-060322
					Sample Date	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/3/2022	6/3/2022	6/3/2022	6/3/2022
					Sample Depth (feet bgs)	26	34	63	17	19	24	27	14	19	22	28
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	*0.14 U*	0.001 U	0.001 U	0.001 U	0.019 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.8 U*	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	24	0.01 U	0.01 U	0.021	0.52	0.01 U	0.01 U	0.01 U	0.01 U	290	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	9.1	0.01 U	0.01 U	0.01 U	0.22	0.01 U	0.01 U	0.01 U	0.01 U	79	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	130	0.02 U	0.02 U	0.11	2.4	0.02 U	0.02 U	0.02 U	0.02 U	910	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	66	0.01 U	0.01 U	0.62	1.7	0.01 U	0.01 U	0.01 U	0.01 U	390	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	200	0.02 U	0.02 U	0.73	4.1	0.02 U	0.02 U	0.02 U	0.02 U	1,300	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	200	0.02 U	0.02 U	0.73	4.1	0.02 U	0.02 U	0.02 U	0.02 U	1,300	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	230	0.02 U	0.02 U	0.75	4.8	0.02 U	0.02 U	0.02 U	0.02 U	1,700	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	230	0.02 U	0.02 U	0.76	4.8	0.02 U	0.02 U	0.02 U	0.02 U	1,700	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	*0.16 U*	0.001 U	0.001 U	0.001 U	0.022 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.1 U*	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.96	0.001 U	0.001 U	0.0011	0.025 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.3 U*	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	*0.15 U*	0.001 U	0.001 U	0.001 U	0.021 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.9 U*	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	*0.0074 U*	0.00008 U	0.00008 U	0.00008 U	0.001 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.094 U*	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.96	0.001 U	0.001 U	0.0011	0.025 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.3 U*	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	1	0.001 U	0.001 U	0.0016	0.025 U	0.001 U	0.001 U	0.001 U	0.001 U	*2.3 U*	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.22 U	0.01 U	0.01 U	0.01 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	2.7 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.26 U	0.01 U	0.01 U	0.01 U	0.036 U	0.01 U	0.01 U	0.01 U	0.01 U	*3.3 U*	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.28 U	0.01 U	0.01 U	0.01 U	0.039 U	0.01 U	0.01 U	0.01 U	0.01 U	*3.6 U*	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	*0.2 U*	0.00042 U	*0.00039 U*	0.00047 U	*0.027 U*	0.00044 U	0.00042 U	0.00058 U	0.00047 U	*2.5 U*	0.00047 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	*0.071 U*	0.001 U	0.001 U	0.001 U	0.0097 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.9 U*	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	*0.14 U*	0.001 U	0.001 U	0.001 U	0.02 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.8 U*	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	*0.27 U*	0.001 U	0.001 U	0.001 U	0.038 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.5 U*	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.49	0.01 U	0.01 U	0.01 U	0.33	0.01 U	0.01 U	0.01 U	0.01 U	0.15	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*5 U*	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	*0.066 U*	0.00014 U	*0.00013 U*	0.00016 U	*0.0091 U*	0.00015 U	0.00014 U	0.00019 U	0.00016 U	*0.84 U*	0.00016 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	8.9	0.001 U	0.001 U	0.0031	0.35	0.001 U	0.001 U	0.001 U	0.001 U	20	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	*0.082 U*	0.001 U	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	*1 U*	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	*0.088 U*	0.001 U	0.001 U	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.1 U*	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.1 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U	1.1 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	1.7	0.01 U	0.01 U	0.01 U	0.081	0.01 U	0.01 U	0.01 U	0.01 U	*1.4 U*	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.74	0.05 U	0.05 U	0.05 U	0.067 U	0.05 U	0.05 U	0.05 U	0.05 U	*6.1 U*	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	1.5	0.05 U	0.05 U	0.05 U	0.18	0.05 U	0.05 U	0.05 U	1.8	5 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	*0.086 U*	0.001 U	0.001 U	0.001 U	0.012 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.1 U*	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.1 U	0.01 U	0.01 U	0.01 U	0.014 U	0.01 U	0.01 U	0.01 U	0.01 U	*1.3 U*	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	*0.29 U*	0.001 U	0.001 U	0.001 U	0.04 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.7 U*	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.19 U	0.01 U	0.01 U	0.01 U	0.027 U	0.01 U	0.01 U	0.01 U	0.01 U	2.5 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	*0.14 U*	0.001 U	0.001 U	0.001 U	0.02 U	0.001 U	0.001 U	0.001 U	0.001 U	*1.8 U*	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.1 U	0.01 U	0.01 U	0.01 U	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	*1 U*	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	*0.27 U*	0.001 U	0.001 U	0.001 U	0.037 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.4 U*	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.26 U	0.01 U	0.01 U	0.01 U	0.035 U	0.01 U	0.01 U	0.01 U	0.01 U	3.3 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.12 U	0.01 U	0.01 U	0.01 U	0.016 U	0.01 U	0.01 U	0.01 U	0.01 U	1.5 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.28 U	0.01 U	0.01 U	0.01 U	0.038 U	0.01 U	0.01 U	0.01 U	0.01 U	3.5 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	7.3	0.01 U	0.01 U	0.01 U	0.14	0.01 U	0.01 U	0.01 U	0.01 U	56	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.71	5 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH25 (cont.)			BH26				BH27			
				Sample Name		PLF-BH25-26-060122	PLF-BH25-34-060122	PLF-BH25-63-060122	PLF-BH26-17-060222	PLF-BH26-19-060222	PLF-BH26-24-060222	PLF-BH26-27-060222	PLF-BH27-14-060322	PLF-BH27-19-060322	PLF-BH27-22-060322	PLF-BH27-28-060322
				Sample Date		6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/3/2022	6/3/2022	6/3/2022	6/3/2022
				Sample Depth (feet bgs)		26	34	63	17	19	24	27	14	19	22	28
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	2.7	0.05 U	0.05 U	0.05 U	0.22	0.05 U	0.05 U	0.05 U	0.05 U	*5 U*	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	*1.4 U*	0.005 U	*0.005 U*	0.005 U	*0.19 U*	0.005 U	0.005 U	0.005 U	0.005 U	*18 U*	0.005 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	*0.29 U*	0.001 U	0.001 U	0.001 U	0.039 U	0.001 U	0.001 U	0.001 U	0.001 U	*3.6 U*	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.11 U	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	0.01 U	1.4 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.19 U	0.01 U	0.01 U	0.01 U	0.026 U	0.01 U	0.01 U	0.01 U	0.01 U	2.4 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.18 U	0.01 U	0.01 U	0.01 U	0.025 U	0.01 U	0.01 U	0.01 U	0.01 U	2.3 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	250	0.05 U	0.05 U	0.76	5.9	0.05 U	0.05 U	0.05 U	2.5	1,700	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	260	0.05 U	0.05 U	0.97	6.7	0.05 U	0.05 U	0.05 U	2.7	1,800	0.05 U
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.57 U	0.1 U	0.1 U	0.1 U	0.17	0.1 U	0.14 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.15	0.1 U	0.12 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.18	0.1 U	0.22 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.69 U	0.1 U	0.1 U	0.1 U	0.36	0.1 U	0.17 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12 U	0.1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.054	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	11	0.1 U	0.1 U	0.31	0.94	0.1 U	0.1 U	0.1 U	0.1 U	17	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	*3.9 U*	0.25 U	0.25 U	0.25 U	26	0.25 U	0.25 U	0.25 U	0.25 U	1.2	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	5.5	0.25 U	0.25 U	0.27	33	0.25 U	0.25 U	0.25 U	0.25 U	2.2	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	17	0.25 U	0.25 U	0.58	60	0.25 U	0.25 U	0.25 U	0.25 U	20	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	18	0.25 U	0.25 U	0.71	60	0.25 U	0.25 U	0.25 U	0.25 U	20	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.18 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.69	75	1.8	4.4	0.1 U	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	1.9	0.1 U	0.1 U	0.1 U	2.4	0.1 U	0.1 U	0.1 U	0.1 U	0.44	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.65 U	0.1 U	0.1 U	0.1 U	0.86	0.14	0.16 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	0.71	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.044 U	0.044 U	0.047 U	0.046 U	0.045 U	0.042 U	0.042 U	0.045 U	0.045 U	0.046 U	0.046 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.27 U	0.27 U	0.29 U	0.28 U	0.28 U	0.26 U	0.26 U	0.28 U	0.28 U	0.28 U	0.29 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.071 U	0.072 U	0.076 U	0.073 U	0.072 U	0.068 U	0.068 U	0.073 U	0.073 U	0.074 U	0.075 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*1.1 U*	0.25 U	0.25 U	0.25 U	*1.1 U*	0.25 U	*1.1 U*
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.38 U	0.1 U	0.1 U	0.1 U	0.39 U	0.1 U	0.39 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.48 U	0.1 U	0.1 U	0.1 U	1.5	0.1 U	0.5 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.17 U	1.2	0.16 U	0.15 U	0.15 U	0.25	0.17 U	1.4	0.17 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1.3	0.1 U	0.1 U	0.1 U	29	22	0.46 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.041 U	0.041 U	0.044 U	0.043 U	0.042 U	0.039 U	0.039 U	0.042 U	0.042 U	0.043 U	0.043 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH25 (cont.)			BH26				BH27			
					Sample Name	PLF-BH25-26-060122	PLF-BH25-34-060122	PLF-BH25-63-060122	PLF-BH26-17-060222	PLF-BH26-19-060222	PLF-BH26-24-060222	PLF-BH26-27-060222	PLF-BH27-14-060322	PLF-BH27-19-060322	PLF-BH27-22-060322	PLF-BH27-28-060322
					Sample Date	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/2/2022	6/2/2022	6/2/2022	6/3/2022	6/3/2022	6/3/2022	6/3/2022
					Sample Depth (feet bgs)	26	34	63	17	19	24	27	14	19	22	28
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	*3.8 U*	0.19 U	0.2 U	0.2 U	0.19 U	0.18 U	*0.91 U*	0.19 U	0.2 U	0.2 U	0.2 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.62 U	0.63 U	0.67 U	0.65 U	0.63 U	0.6 U	0.6 U	0.64 U	0.65 U	0.65 U	0.66 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.11 U	0.11 U	0.11 U	0.11 U	*1.1 U*	0.1 U	0.1 U	0.11 U	*1.1 U*	0.11 U	*1.1 U*
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	1.4 U	0.25 U	0.25 U	0.25 U	1.4 U	0.25 U	1.5 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.04 U	0.04 U	0.043 U	0.041 U	0.04 U	0.038 U	0.038 U	0.041 U	0.041 U	0.041 U	0.042 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.023 U	0.024 U	0.023 U	*0.23 U*	0.022 U	0.022 U	0.023 U	*0.23 U*	0.024 U	*0.24 U*
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	*0.49 U*	0.2 U	0.2 U	0.2 U	*0.5 U*	0.2 U	*0.51 U*
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	110	0.1 U	0.1 U	4.3	7.5	0.78	0.12 U	0.86	0.1 U	5.6	0.13
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.49 U	0.1 U	0.1 U	0.1 U	0.32	0.1 U	0.12 U	0.1 U	0.1 U	2.4	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.2	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	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	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	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	6.7	0.1 U	0.1 U	0.1 U	0.6	0.1 U	0.1 U	0.1 U	0.1 U	1.6	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	4.5	0.1 U	0.1 U	0.1 U	0.16	0.1 U	0.12 U	0.15	0.1 U	0.28	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*0.52 U*	0.1 U	0.1 U	0.1 U	*0.53 U*	0.1 U	*0.54 U*
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	25	1 U	1 U	1 U	11	1 U	1 U	1 U	9.1	17	8.3 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.57 U	0.1 U	0.1 U	0.1 U	1.8 J	0.1 U	0.59 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.15 U	0.15 U	0.15 U	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U	0.15 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.077 U	0.079 U	0.084 U	0.081 U	0.079 U	0.075 U	0.075 U	0.08 U	0.08 U	0.081 U	1.1
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*0.3 U*	0.1 U	0.1 U	0.1 U	*0.31 U*	0.1 U	*0.31 U*
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.11 U	0.11 U	*1 U*	0.099 U	0.099 U	0.11 U	*1.1 U*	0.11 U	*1.1 U*
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.038 U	0.04 U	0.039 U	0.038 U	0.036 U	0.036 U	0.039 U	0.039 U	0.039 U	0.04 U
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	*10,000 U*	25 U	25 U	44	330	25 U	33	25 U	25 U	14,000	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	2,600	50 U	50 U	410 U	4,200	210	78	160	130	1,600	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	3,100	50 U	50 U	670	1,200	94	57	350	50 U	1,200	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	5,700	50 U	50 U	710	5,700	300	170	510	130	17,000	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	11,000	50 U	50 U	920	5,700	320	170	520	170	17,000	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH27 (cont.)			BH28				BH29		
				Sample Name		PLF-BH27-33-060322	PLF-BH27-38-060322	PLF-BH27-61-060322	PLF-BH28-04-061622	PLF-BH28-17-061622	PLF-BH28-24-061622	PLF-BH28-29-061622	PLF-BH29-17-061622	PLF-BH29-20-061622	PLF-BH29-23-061622
				Sample Date		6/3/2022	6/3/2022	6/3/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022
				Sample Depth (feet bgs)		33	38	61	4	17	24	29	17	20	23
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.015 U	*0.17 U*	0.02 U	0.001 U	0.001 U	0.02 U	*0.17 U*
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.079	150	0.48	0.01 U	0.01 U	0.28	70
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.1	230	0.71	0.01 U	0.01 U	0.22	15
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.82	490	1.7	0.02 U	0.02 U	1.5	300
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	1.5	180	0.7	0.01 U	0.01 U	1.4	140
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	2.3	670	2.4	0.02 U	0.02 U	2.9	440
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	2.3	670	2.4	0.02 U	0.02 U	2.9	440
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	2.5	1,100	3.6	0.02 U	0.02 U	3.4	530
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	2.5	1,100	3.6	0.02 U	0.02 U	3.4	530
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.018 U	*0.2 U*	0.024 U	0.001 U	0.001 U	0.023 U	*0.2 U*
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.02 U	8.5	0.026 U	0.001 U	0.001 U	0.025 U	1.5
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.24	6.9	0.026	0.001 U	0.001 U	0.022 U	*0.18 U*
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00083 U	*0.009 U*	0.0011 U	0.00008 U	0.00008 U	0.0011 U	*0.0089 U*
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.24	15	0.026	0.001 U	0.001 U	0.025 U	1.5
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.25	15	0.04	0.001 U	0.001 U	0.025 U	1.6
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.024 U	0.26 U	0.032 U	0.01 U	0.01 U	0.031 U	0.26 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.029 U	0.32 U	0.038 U	0.01 U	0.01 U	0.037 U	0.31 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.032 U	0.34 U	0.042 U	0.01 U	0.01 U	0.04 U	0.34 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00037 U	0.0005 U	0.00032 U	*0.022 U*	*0.24 U*	*0.029 U*	0.0004 U	0.00042 U	*0.028 U*	*0.24 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.0079 U	*0.086 U*	0.01 U	0.001 U	0.001 U	0.01 U	*0.086 U*
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.016 U	*0.18 U*	0.021 U	0.001 U	0.001 U	0.021 U	*0.17 U*
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.03 U	*0.33 U*	0.04 U	0.001 U	0.001 U	0.039 U	*0.33 U*
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	3.7	2.4	0.024 U	0.01 U	0.01 U	0.023 U	1.9
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00012 U	0.00017 U	0.00011 U	*0.0074 U*	*0.08 U*	*0.0097 U*	0.00013 U	0.00014 U	*0.0094 U*	*0.08 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	5.3	9.9	0.16	0.001 U	0.0042	1.7	5.9
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.0091 U	*0.1 U*	0.012 U	0.001 U	0.001 U	0.012 U	*0.099 U*
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.0098 U	*0.11 U*	0.013 U	0.001 U	0.001 U	0.012 U	*0.11 U*
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.11 U	0.013 U	0.01 U	0.01 U	0.013 U	0.11 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.42	1.1	0.016 U	0.01 U	0.01 U	0.21	0.68
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.054 U	3.6	0.071 U	0.05 U	0.05 U	0.069 U	*0.59 U*
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.2	29	2	0.14	0.05 U	0.18	4.1
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.0095 U	*0.1 U*	0.013 U	0.001 U	0.001 U	0.012 U	*0.1 U*
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.011 U	0.12 U	0.015 U	0.01 U	0.01 U	0.014 U	0.12 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.033 U	*0.35 U*	0.043 U	0.001 U	0.001 U	0.042 U	*0.35 U*
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.022 U	0.24 U	0.029 U	0.01 U	0.01 U	0.028 U	0.23 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.016 U	*0.17 U*	0.021 U	0.001 U	0.001 U	0.02 U	*0.17 U*
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.011 U	0.01 U	0.01 U	0.011 U	0.1 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.03 U	*0.32 U*	0.039 U	0.001 U	0.001 U	0.038 U	*0.32 U*
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.029 U	0.31 U	0.038 U	0.01 U	0.01 U	0.037 U	0.31 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.013 U	0.14 U	0.018 U	0.01 U	0.01 U	0.017 U	0.14 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.031 U	0.34 U	0.041 U	0.01 U	0.01 U	0.04 U	0.34 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.012 U	18	0.066	0.01 U	0.01 U	0.26	7.8
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.14	22	0.87	0.05 U	0.05 U	0.098	2.8

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH27 (cont.)			BH28				BH29		
				Sample Name		PLF-BH27-33-060322	PLF-BH27-38-060322	PLF-BH27-61-060322	PLF-BH28-04-061622	PLF-BH28-17-061622	PLF-BH28-24-061622	PLF-BH28-29-061622	PLF-BH29-17-061622	PLF-BH29-20-061622	PLF-BH29-23-061622
				Sample Date		6/3/2022	6/3/2022	6/3/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022
				Sample Depth (feet bgs)		33	38	61	4	17	24	29	17	20	23
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.094	51	0.71	0.05 U	0.05 U	0.05 U	14
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.005 U	0.005 U	*0.005 U*	*0.15 U*	*1.7 U*	*0.2 U*	0.0035 U	0.0029 U	*0.2 U*	*1.7 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.032 U	*0.35 U*	0.042 U	0.001 U	0.001 U	0.041 U	*0.34 U*
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.012 U	0.14 U	0.016 U	0.01 U	0.01 U	0.016 U	0.13 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.021 U	0.23 U	0.027 U	0.01 U	0.01 U	0.027 U	0.23 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.02 U	0.22 U	0.026 U	0.01 U	0.01 U	0.025 U	0.22 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	11	1,200	7.4	0.14	0.0042	5.8	560
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	13	1,200	8	0.35	0.24	6.4	570
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.14	1 U	0.1 U	0.1 U	0.18	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.0014	1 U	0.1 U	0.1 U	0.0018	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.076	1 U	0.1 U	0.1 U	0.077	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	1.2	60	0.17	0.1 U	3.9	35	27
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	3.8	12	0.25 U	0.25 U	1.1	8	2.5
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	2	22	0.25 U	0.25 U	1.8	15	11
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	7	94	0.17	0.25 U	6.8	58	41
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	7	94	0.42	0.25 U	6.8	58	41
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.26	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	1.8	3.9	0.1 U	0.1 U	0.58	0.1 U	0.15
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.31	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.8	1.7	0.1 U	0.1 U	0.52	0.48	0.31
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.35	1 U	0.1 U	0.1 U	0.3	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.048 U	0.047 U	0.045 U	0.042 U	*0.52 U*	0.047 U	0.04 U	0.042 U	0.042 U	0.04 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.3 U	0.29 U	0.28 U	0.26 U	*3.2 U*	0.29 U	0.25 U	0.26 U	0.26 U	0.25 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.078 U	0.075 U	0.072 U	0.069 U	0.84 U	0.075 U	0.065 U	0.067 U	0.068 U	0.065 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	*1.2 U*	0.25 U	0.25 U	0.25 U	28	0.59	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.41 U	0.1 U	0.1 U	0.1 U	4.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.52 U	0.1 U	0.1 U	0.1 U	5.6 U	0.72	0.2	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.18 U	0.17 U	0.16 U	0.24	*1.9 U*	0.17 U	0.15 U	0.56	0.15 U	0.15 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.48 U	0.1 U	0.1 U	0.96	35	4	1.7	1.8	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.045 U	0.044 U	0.042 U	0.04 U	*0.48 U*	0.044 U	0.037 U	0.039 U	0.039 U	0.038 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH27 (cont.)			BH28				BH29		
				Sample Name		PLF-BH27-33-060322	PLF-BH27-38-060322	PLF-BH27-61-060322	PLF-BH28-04-061622	PLF-BH28-17-061622	PLF-BH28-24-061622	PLF-BH28-29-061622	PLF-BH29-17-061622	PLF-BH29-20-061622	PLF-BH29-23-061622
				Sample Date		6/3/2022	6/3/2022	6/3/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022
				Sample Depth (feet bgs)		33	38	61	4	17	24	29	17	20	23
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.21 U	0.2 U	0.19 U	0.18 U	*2.2 U*	0.2 U	0.17 U	0.18 U	0.18 U	0.17 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	10 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.69 U	0.67 U	0.64 U	0.61 U	*7.4 U*	0.66 U	0.57 U	0.59 U	0.6 U	0.58 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	*1.2 U*	0.11 U	0.11 U	0.1 U	*13 U*	0.11 U	0.097 U	0.1 U	0.1 U	0.098 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	1.5 U	0.25 U	0.25 U	0.25 U	16 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.044 U	0.042 U	0.041 U	0.038 U	*0.47 U*	0.042 U	0.036 U	0.038 U	0.038 U	0.037 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	*0.25 U*	0.024 U	0.023 U	0.022 U	*2.7 U*	0.024 U	0.021 U	0.021 U	0.022 U	0.021 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	*0.53 U*	0.2 U	0.2 U	0.2 U	*5.8 U*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	0.1 U	15	28	0.67	0.1 U	19	31	16
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.19
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.24	0.99	0.77
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	12	0.15	0.1 U	5.2	12	6.6
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	2.5	2.3	1.5
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	*0.56 U*	0.1 U	0.1 U	0.1 U	*6 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	3.1	1 U	1 U	2.9	10 U	11	2.4	1 U	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.62 U	0.1 U	0.1 U	0.1 U	6.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.16 U	0.15 U	0.15 U	0.14 U	*1.7 U*	0.15 U	0.13 U	0.14 U	0.14 U	0.13 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.31	0.083 U	0.079 U	0.75	16	0.39	0.077	1.5	10	6.9
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	*0.32 U*	0.1 U	0.1 U	0.1 U	*3.5 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	*1.1 U*	0.11 U	0.11 U	0.1 U	*12 U*	0.11 U	0.094 U	0.098 U	0.099 U	0.095 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.041 U	0.04 U	0.038 U	0.036 U	0.44 U	0.04 U	0.034 U	0.036 U	0.036 U	0.035 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	*1,000 U*	*10,000 U*	52	25 U	*2,500 U*	*10,000 U*	*10,000 U*
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	540	*4,500 U*	50 U	50 U	1,300	*4,500 U*	*2,200 U*
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	490	3,200	50 U	50 U	1,500	3,100	1,400
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	50 U	1,000	3,200	52	50 U	2,800	3,100	1,400
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	50 U	1,500	10,000	100	50 U	4,100	10,000	7,500

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH29 (cont.)		BH30				BH31			
				Sample Name		PLF-BH29-33-061622	PLF-BH29-44-061622	PLF-BH30-03-061622	PLF-BH30-16-061622	PLF-BH30-24-061622	PLF-BH30-32-061622	PLF-BH31-14-061522	PLF-BH31-17-061522	PLF-BH31-23-061522	PLF-BH31-32-061522
				Sample Date		6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		33	44	3	16	24	32	14	17	23	32
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	*0.19 U*	*0.14 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	80	130	0.019	0.01	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.013	86	150	0.021	0.39	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	270	450	0.067	0.036	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	140	190	0.034	0.018	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	410	640	0.1	0.054	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	410	640	0.1	0.054	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.013	580	920	0.14	0.45	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.034	580	920	0.14	0.45	0.02 U	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.0022	*0.22 U*	*0.16 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	1.1	2.5	0.001 U	0.0032	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.007	25	13	0.0014	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	*0.01 U*	*0.0073 U*	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.007	26	16	0.0014	0.0032	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.0075	26	16	0.0019	0.0037	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.29 U	0.21 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.35 U	0.26 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.39 U	0.28 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00041 U	0.00033 U	0.00041 U	*0.27 U*	*0.2 U*	0.00042 U	0.00039 U	0.00043 U	0.00036 U	0.00038 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	*0.097 U*	*0.07 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	*0.2 U*	*0.14 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	*0.37 U*	*0.27 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.22 U	0.16 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	*0.5 U*	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00014 U	0.00011 U	0.00014 U	*0.09 U*	*0.065 U*	0.00014 U	0.00013 U	0.00014 U	0.00012 U	0.00013 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.0062	0.001 U	810	250	0.23	0.0047	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	*0.11 U*	*0.081 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	*0.12 U*	*0.086 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.12 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	32	19	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	*0.66 U*	*0.5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.96	0.75	0.05 U	12	5.7	0.13	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	*0.12 U*	*0.084 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.14 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	*0.4 U*	*0.29 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.26 U	0.19 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	*0.19 U*	*0.14 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.11 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	*0.36 U*	*0.26 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.35 U	0.25 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.16 U	0.12 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.38 U	0.27 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	12	15	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.33	0.77	0.05 U	27 J	10 J	0.095	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH29 (cont.)		BH30				BH31			
				Sample Name		PLF-BH29-33-061622	PLF-BH29-44-061622	PLF-BH30-03-061622	PLF-BH30-16-061622	PLF-BH30-24-061622	PLF-BH30-32-061622	PLF-BH31-14-061522	PLF-BH31-17-061522	PLF-BH31-23-061522	PLF-BH31-32-061522
				Sample Date		6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		33	44	3	16	24	32	14	17	23	32
Analyte	**CAS No.**	**Adjusted Screening Levels Vadose [1]**	**Adjusted Screening Levels Saturated [2]**	**Adjusted MTCA Method C [3]**	**Unit**										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.99	0.05 U	72	33	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0029 U	0.0023 U	0.0035 U	5	3.4	0.0029 UJ	0.0027 U	0.003 U	0.0025 U	0.0027 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	*0.39 U*	*0.28 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.15 U	0.11 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.25 U	0.18 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.24 U	0.18 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	1.3	2.5	0.022	1,600	1,200	0.6	0.46	0.05 U	0.05 U	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	1.5	2.7	0.26	1,600 J	1,300 J	0.76 J	0.68	0.05 U	0.05 U	0.05 U
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	77	110	0.1 U	1 U	0.1 U	0.1 U	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	13	49	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	25	93	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	120	250	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	120	250	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	2.9 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	2.6 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	2.4 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	2.7	25	0.1 U	3 U	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	3.6 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	2.9	2.6	0.1 U	2.7 U	0.1 U	0.1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	2.6	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	3.3 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	11 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	*5.1 U*	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	4 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.04 U	0.039 U	0.045 U	*0.52 U*	0.049 U	0.044 U	*4.1 U*	0.046 U	0.044 U	0.041 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.24 U	0.24 U	0.28 U	*3.2 U*	0.31 U	0.27 U	*2.5 U*	0.28 U	0.27 U	0.26 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.064 U	0.063 U	0.072 U	13	0.08 U	0.071 U	0.66 U	0.074 U	0.071 U	0.067 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	*1.7 U*	0.17 U	0.17 U	*5.4 U*	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	*2.5 U*	*12 U*	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	4.2 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	5.3 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	*2.9 U*	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	5.6 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.14 U	0.14 U	0.16 U	*1.9 U*	0.18 U	0.16 U	*15 U*	0.17 U	0.16 U	0.15 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.23	1.6	0.1 U	320	38	0.1 U	23	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	*2.2 U*	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.037 U	0.037 U	0.042 U	*0.49 U*	0.046 U	0.041 U	*3.8 U*	0.043 U	0.041 U	0.039 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH29 (cont.)		BH30				BH31			
				Sample Name		PLF-BH29-33-061622	PLF-BH29-44-061622	PLF-BH30-03-061622	PLF-BH30-16-061622	PLF-BH30-24-061622	PLF-BH30-32-061622	PLF-BH31-14-061522	PLF-BH31-17-061522	PLF-BH31-23-061522	PLF-BH31-32-061522
				Sample Date		6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/16/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		33	44	3	16	24	32	14	17	23	32
Analyte	**CAS No.**	**Adjusted Screening Levels Vadose (1)**	**Adjusted Screening Levels Saturated (2)**	**Adjusted MTCA Method C (3)**	**Unit**										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	*1.9 U*	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.17 U	0.17 U	0.19 U	*2.2 U*	0.21 U	0.19 U	*1.8 U*	0.2 U	0.19 U	0.18 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	10 U	1 U	1 U	60 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.56 U	0.56 U	0.63 U	*7.4 U*	0.7 U	0.63 U	*5.8 U*	0.65 U	0.63 U	0.59 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	3.7 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	4.3 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	*13 U*	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.096 U	0.095 U	0.11 U	*1.3 U*	*12 U*	0.11 U	*0.99 U*	0.11 U	0.11 U	0.1 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	2.5 U	16 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.036 U	0.035 U	0.04 U	*0.47 U*	0.045 U	0.04 U	*3.7 U*	0.042 U	0.04 U	0.037 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.02 U	0.02 U	0.023 U	*0.27 U*	*2.5 U*	0.023 U	*0.21 U*	0.024 U	0.023 U	0.021 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	*2 U*	*5.5 U*	0.2 U	*2 U*	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	0.1 U	27	54	0.11	1 U	0.93	0.1 U	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	14	6.8	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	4.3 U	0.1 U	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	1.3	3.6	0.1 U	4.3 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	7	9.2	0.1 U	3.5 U	0.1 U	0.1 U	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	4.5	2.6	0.1 U	1 U	0.1 U	0.1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	*1 U*	*5.7 U*	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	*4.5 U*	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1.8	1 U	1 U	18	1 U	1 U	460	1 U	1	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	6.3 U	0.1 U	28	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	*3.3 U*	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.13 U	0.13 U	0.15 U	*1.7 U*	0.16 U	0.14 U	*1.3 U*	0.15 U	0.14 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	*2.5 U*	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.2	0.16	0.079 U	16	0.087 U	0.078 U	*0.72 U*	0.081 U	0.078 U	0.073 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	*1 U*	*3.3 U*	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.093 U	0.092 U	0.1 U	*1.2 U*	*12 U*	0.1 U	*0.96 U*	0.11 U	0.1 U	0.097 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.034 U	0.034 U	0.038 U	0.45 U	0.042 U	0.038 U	*3.5 U*	0.039 U	0.038 U	0.035 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	13,000	11,000	25 U	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	*5,000 U*	*7,500 U*	50 U	1,500	50 U	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	150	3,800	5,000	50 U	320	50 U	50 U	50 U
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	50 U	50 U	150	17,000	16,000	50 U	1,800	50 U	50 U	50 U
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	50 U	50 U	190	19,000	20,000	50 U	1,800	50 U	50 U	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH32				BH33					BH34		
					Sample Name	PLF-BH32-03-061522	PLF-BH32-15-061522	PLF-BH32-28-061522	PLF-BH32-32-061522	PLF-BH33-15-060622	PLF-BH33-20-060622	PLF-BH33-28-060622	PLF-BH33-33-060622	PLF-BH33-37-060622	PLF-BH34-10-060622	PLF-BH34-15-060622	PLF-BH34-18-060622
					Sample Date	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022
					Sample Depth (feet bgs)	3	15	28	32	15	20	28	33	37	10	15	18
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit												
Volatile Organic Compounds (VOCs)																	
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.18 U*	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	37	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	16	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	200	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	82	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	280	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	280	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	340	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	340	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.21 U*	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	20	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	2	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	*0.0095 U*	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	22	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	22	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.28 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.33 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.36 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00042 U	0.00049 U	0.00042 U	0.00042 U	0.00047 U	0.00037 U	0.00056 U	0.00041 U	0.00047 U	0.00037 U	*0.25 U*	0.00045 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.091 U*	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.18 U*	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.35 U*	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.21 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.5 U*	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00014 U	0.00016 U	0.00014 U	0.00014 U	0.00016 U	0.00012 U	0.00019 U	0.00014 U	0.00016 U	0.00012 U	*0.085 U*	0.00015 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	6	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.1 U*	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.11 U*	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.12 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.14 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*0.62 U*	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.11 U*	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.13 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.37 U*	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.25 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.18 U*	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.34 U*	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.33 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.15 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.36 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	8	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH32				BH33					BH34		
					Sample Name	PLF-BH32-03-061522	PLF-BH32-15-061522	PLF-BH32-28-061522	PLF-BH32-32-061522	PLF-BH33-15-060622	PLF-BH33-20-060622	PLF-BH33-28-060622	PLF-BH33-33-060622	PLF-BH33-37-060622	PLF-BH34-10-060622	PLF-BH34-15-060622	PLF-BH34-18-060622
					Sample Date	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022
					Sample Depth (feet bgs)	3	15	28	32	15	20	28	33	37	10	15	18
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit												
Volatile Organic Compounds (VOCs) (cont.)																	
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.003 U	0.0062 U	0.0038 U	0.0046 U	0.0072	0.0026 U	0.0039 U	0.0053	0.0035	0.0026 U	*1.8 U*	0.0031 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	*0.36 U*	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.14 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.24 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.23 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.0072	0.05 U	0.05 U	0.0053	0.0035	0.05 U	370	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.25	0.05 U	0.05 U	0.24	0.24	0.05 U	380	0.05 U
Semivolatile Organic Compounds (SVOCs)																	
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	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	0.1 U	1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	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	0.1 U	23	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	7.1	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	13	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	43	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	43	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	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	0.1 U	1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	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	0.1 U	1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	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	0.1 U	1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	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	0.1 U	1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	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	0.1 U	1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	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	0.1 U	1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	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	0.1 U	1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	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	0.1 U	1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.043 U	0.043 U	0.044 U	0.043 U	0.047 U	0.044 U	0.045 U	0.043 U	0.045 U	0.042 U	*0.58 U*	0.043 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.27 U	0.27 U	0.27 U	0.27 U	0.29 U	0.27 U	0.28 U	0.27 U	0.28 U	0.26 U	*3.6 U*	0.27 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.069 U	0.069 U	0.071 U	0.07 U	0.076 U	0.071 U	0.073 U	0.07 U	0.073 U	0.067 U	0.94 U	0.07 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.7 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	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	0.1 U	1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	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	0.1 U	*1 U*	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	0.17 U	0.15 U	5.6	0.16 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	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	0.1 U	1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.04 U	0.04 U	0.041 U	0.04 U	0.044 U	0.041 U	0.042 U	0.041 U	0.042 U	0.039 U	*0.54 U*	0.04 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH32				BH33					BH34		
					Sample Name	PLF-BH32-03-061522	PLF-BH32-15-061522	PLF-BH32-28-061522	PLF-BH32-32-061522	PLF-BH33-15-060622	PLF-BH33-20-060622	PLF-BH33-28-060622	PLF-BH33-33-060622	PLF-BH33-37-060622	PLF-BH34-10-060622	PLF-BH34-15-060622	PLF-BH34-18-060622
					Sample Date	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022	6/6/2022
					Sample Depth (feet bgs)	3	15	28	32	15	20	28	33	37	10	15	18
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit												
Semivolatile Organic Compounds (SVOCs) (cont.)																	
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	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	0.1 U	1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.18 U	*2.5 U*	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.61 U	0.61 U	0.63 U	0.61 U	0.67 U	0.63 U	0.65 U	0.62 U	0.65 U	0.59 U	*8.3 U*	0.62 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.1 U	0.11 U	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.1 U	*1.4 U*	0.1 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.039 U	0.039 U	0.04 U	0.039 U	0.043 U	0.04 U	0.041 U	0.039 U	0.041 U	0.038 U	*0.53 U*	0.039 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.022 U	0.023 U	0.022 U	0.024 U	0.023 U	0.023 U	0.022 U	0.023 U	0.021 U	*0.3 U*	0.022 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.18	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	66	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	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	0.1 U	1.5	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	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	0.1 U	1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	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	0.1 U	1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	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	0.1 U	6.1	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	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	0.1 U	1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	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	0.1 U	*1 U*	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	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	0.1 U	*1 U*	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	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	0.1 U	1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	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	0.1 U	1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.14 U	0.14 U	0.16 U	0.14 U	0.15 U	0.14 U	0.15 U	0.14 U	*1.9 U*	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	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	0.1 U	1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.076 U	0.076 U	0.078 U	0.076 U	0.084 U	0.078 U	0.08 U	0.077 U	0.08 U	0.074 U	*1 U*	0.076 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	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	0.1 U	*1 U*	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U	0.098 U	*1.4 U*	0.1 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.037 U	0.037 U	0.038 U	0.037 U	0.041 U	0.038 U	0.039 U	0.037 U	0.039 U	0.036 U	0.5 U	0.037 U
Total Petroleum Hydrocarbons (TPH)																	
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	7,000	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	5,700	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	77	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	8,500	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	77	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	21,000	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	110	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	21,000	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH35				BH36			BH37		
				Sample Name		PLF-BH35-12-053122	PLF-BH35-16-053122	PLF-BH35-23-053122	PLF-BH35-33-060122	PLF-BH36-06-060622	PLF-BH36-16-060622	PLF-BH36-23-060622	PLF-BH37-05X-061522	PLF-BH37-11-061522	PLF-BH37-16-061522
				Sample Date		5/31/2022	5/31/2022	5/31/2022	6/1/2022	6/6/2022	6/6/2022	6/6/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		12	16	23	33	6	16	23	5	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Volatile Organic Compounds (VOCs)															
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.018 U	0.001 U	0.001 U	0.63	0.0059	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.13	0.01 U	0.01 U	0.013	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.089	0.01 U	0.01 U	0.038	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.63	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.43	0.01 U	0.01 U	0.01	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	1.1	0.02 U	0.02 U	0.01	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	1.1	0.02 U	0.02 U	0.02	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	1.3	0.02 U	0.02 U	0.69	0.0059	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	1.3	0.02 U	0.02 U	0.7	0.031	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.021 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.02 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00096 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.023 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.028 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.034 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.037 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00043 U	0.00043 U	0.00039 U	0.00038 U	*0.026 U*	0.00046 U	0.00038 U	0.00037 U	0.00053 U	0.0004 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.0092 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.019 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.036 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.021 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00014 U	0.00014 U	0.00013 U	0.00013 U	*0.0086 U*	0.00015 U	0.00013 U	0.00012 U	0.00018 U	0.00013 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.0017	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.063 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.12	0.28	0.05 U	0.24	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.011 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.038 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.018 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.035 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.033 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.036 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.12	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH35				BH36			BH37		
				Sample Name		PLF-BH35-12-053122	PLF-BH35-16-053122	PLF-BH35-23-053122	PLF-BH35-33-060122	PLF-BH36-06-060622	PLF-BH36-16-060622	PLF-BH36-23-060622	PLF-BH37-05X-061522	PLF-BH37-11-061522	PLF-BH37-16-061522
				Sample Date		5/31/2022	5/31/2022	5/31/2022	6/1/2022	6/6/2022	6/6/2022	6/6/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		12	16	23	33	6	16	23	5	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit										
Volatile Organic Compounds (VOCs) (cont.)															
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.22	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	*0.18 U*	0.0032 U	0.0077	0.0026 U	0.0064 U	0.0044 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.037 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.01 U	0.01 U	0.71	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.024 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.023 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) (4,7)	T_VOC (U=0)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	1.4	0.62	0.0077	1.6	0.0059	0.05 U
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	--	--	--	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	1.9	0.79	0.25	1.8	0.25	0.05 U
Semivolatile Organic Compounds (SVOCs)															
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) (4,8)	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) (5,8)	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.24	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.43	0.29	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.28	0.39	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.31	0.25 U
Total Naphthalenes (U=0) (4,9)	T_Napth (U=0)	--	--	--	mg/kg	0.24	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.71	0.99	0.25 U
Total Naphthalenes (U=1/2) (5,9)	T_Napth (U=1/2)	--	--	--	mg/kg	0.49	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.84	0.99	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	3.1	1.5	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	0.042 U	0.042 U	0.04 U	0.04 U	*0.42 U*	0.045 U	0.046 U	0.15	0.074	0.045 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	0.26 U	0.26 U	0.25 U	0.25 U	*2.6 U*	0.28 U	0.29 U	0.28 U	0.26 U	0.28 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.068 U	0.068 U	0.064 U	0.064 U	0.68 U	0.072 U	0.075 U	0.072 U	0.068 U	0.072 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.17 U	0.17 U	0.17 U	0.17 U	*1.7 U*	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	0.58	0.15 U	0.15 U	0.15 U	*1.5 U*	0.16 U	0.17 U	0.16 U	0.15 U	0.16 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	1.1	1.2	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	0.039 U	0.039 U	0.037 U	0.037 U	*0.4 U*	0.042 U	0.043 U	0.042 U	0.039 U	0.042 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.034 U	0.034 U	0.034 U	0.034 U	*0.34 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH35				BH36			BH37		
				Sample Name		PLF-BH35-12-053122	PLF-BH35-16-053122	PLF-BH35-23-053122	PLF-BH35-33-060122	PLF-BH36-06-060622	PLF-BH36-16-060622	PLF-BH36-23-060622	PLF-BH37-05X-061522	PLF-BH37-11-061522	PLF-BH37-16-061522
				Sample Date		5/31/2022	5/31/2022	5/31/2022	6/1/2022	6/6/2022	6/6/2022	6/6/2022	6/15/2022	6/15/2022	6/15/2022
				Sample Depth (feet bgs)		12	16	23	33	6	16	23	5	11	16
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit										
Semivolatile Organic Compounds (SVOCs) (cont.)															
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	0.18 U	0.18 U	0.17 U	0.17 U	*1.8 U*	0.19 U	0.2 U	0.19 U	0.18 U	0.19 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	10 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	0.6 U	0.6 U	0.57 U	0.57 U	*6 U*	0.64 U	0.66 U	0.64 U	0.6 U	0.64 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	0.1 U	0.1 U	0.097 U	0.097 U	*1 U*	0.11 U	0.11 U	0.11 U	0.1 U	0.11 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.038 U	0.038 U	0.036 U	0.036 U	0.38 U	0.052	0.042 U	0.041 U	0.038 U	0.04 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	0.022 U	0.022 U	0.02 U	0.021 U	*0.22 U*	0.023 U	0.024 U	0.023 U	0.022 U	0.023 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	*2 U*	0.2 U	0.2 U	1.1	0.45	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	1	0.1 U	0.1 U	0.1 U	4.8	1.9	0.14	0.62	1.5	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	1 U	1 U	1 U	1 U	16	1 U	1 U	43	12	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.59	0.47	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	0.14 U	0.14 U	0.13 U	0.13 U	*1.4 U*	0.15 U	0.15 U	0.15 U	0.14 U	0.15 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.074 U	0.074 U	0.07 U	0.071 U	*0.75 U*	0.59	0.082 U	0.079 U	0.074 U	0.079 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	0.099 U	0.098 U	0.094 U	0.094 U	*0.99 U*	0.11 U	0.11 U	0.11 U	0.098 U	0.11 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.036 U	0.036 U	0.034 U	0.034 U	0.36 U	0.038 U	0.04 U	0.038 U	0.036 U	0.038 U
Total Petroleum Hydrocarbons (TPH)															
Gasoline-range organics	GRO	30	30	--	mg/kg	*50 U*	25 U	25 U	25 U	*250 U*	*250 U*	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	63	50 U	50 U	50 U	350 U	67	50 U	260	590	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	96	50 U	50 U	50 U	440	78	50 U	50 U	120	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	160	50 U	50 U	50 U	440	150	50 U	260	710	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	180	50 U	50 U	50 U	740	270	50 U	300	720	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH38			BH39				BH40		BH41	
					Sample Name	PLF-BH38-15-061522	PLF-BH38-24-061522	PLF-BH38-28-061522	PLF-BH39-13-061522	PLF-BH39-18-061522	PLF-BH39-23-061522	PLF-BH39-29-061522	PLF-BH40-15-061522	PLF-BH40-24-061522	PLF-BH41-13-061622	PLF-DUP15-061622
					Sample Date	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/16/2022	6/16/2022
					Sample Depth (feet bgs)	15	24	28	13	18	23	29	15	24	13	13
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs)																
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.021 U	0.015 U	0.001 U	250	0.018	0.053	0.001 U	0.001 U	0.001 U	0.02 U	0.02 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.018 U	0.012 U	0.01 U	1.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.71	0.53
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.11	0.17	0.01 U	3,200	0.076	0.34	0.01 U	0.01 U	0.01 U	0.53	0.34
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.035 U	0.024 U	0.02 U	15	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	2.8	2.1
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.022 U	0.015 U	0.01 U	1.9 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.7	1.3
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.035 U	0.024 U	0.02 U	15	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	4.5	3.4
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.035 U	0.024 U	0.02 U	16	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	4.5	3.4
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.11	0.17	0.02 U	3,500	0.094	0.39	0.02 U	0.02 U	0.02 U	5.7	4.3
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.16	0.2	0.02 U	3,500	0.11	0.41	0.02 U	0.02 U	0.02 U	5.8	4.3
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.025 U	0.017 U	0.001 U	*2.2 U*	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.023 U	0.023 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.078	0.38	0.001 U	*2.4 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.026 U	0.026 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.023 U	0.016 U	0.001 U	*2 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.022 U	0.022 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.0011 U	0.00078 U	0.00008 U	*0.098 U*	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.0011 U	0.0011 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.078	0.38	0.001 U	*2.4 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.026 U	0.026 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.09	0.39	0.001 U	*2.4 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.026 U	0.026 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.033 U	0.023 U	0.01 U	2.9 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.031 U	0.031 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.04 U	0.027 U	0.01 U	*3.5 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.038 U	0.037 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.044 U	0.03 U	0.01 U	*3.8 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.041 U	0.041 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	*0.03 U*	*0.021 U*	0.0005 U	*2.6 U*	0.00051 U	0.00038 U	0.00045 U	0.00042 U	0.00045 U	*0.029 U*	*0.028 U*
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.011 U	0.0075 U	0.001 U	*0.94 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U	0.01 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.022 U	0.015 U	0.001 U	*1.9 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.021 U	0.021 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.042 U	0.029 U	0.001 U	*3.6 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.039 U	0.039 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.025 U	0.017 U	0.01 U	*2.1 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.43	0.33
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	*5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	*0.01 U*	*0.007 U*	0.00017 U	*0.88 U*	0.00017 U	0.00013 U	0.00015 U	0.00014 U	0.00015 U	*0.0095 U*	*0.0095 U*
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.015 U	0.01 U	0.001 U	1.3 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.31	0.29
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.013 U	0.0087 U	0.001 U	*1.1 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.012 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.013 U	0.0092 U	0.001 U	*1.2 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.013 U	0.013 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.014 U	0.01 U	0.01 U	1.2 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U	0.013 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.017 U	0.012 U	0.01 U	*1.5 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.06	0.059
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.075 U	0.051 U	0.05 U	*6.4 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.07 U	0.07 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	2.4	2.5	0.05 U	5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.68	0.58
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.013 U	0.009 U	0.001 U	*1.1 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.012 U	0.012 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.015 U	0.011 U	0.01 U	*1.3 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.045 U	0.031 U	0.001 U	*3.9 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.042 U	0.042 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.03 U	0.021 U	0.01 U	2.6 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.028 U	0.028 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.022 U	0.015 U	0.001 U	*1.9 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.021 U	0.02 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.012 U	0.01 U	0.01 U	*1 U*	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.041 U	0.028 U	0.001 U	*3.5 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.038 U	0.038 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.039 U	0.027 U	0.01 U	3.4 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.037 U	0.037 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.018 U	0.013 U	0.01 U	1.6 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.017 U	0.017 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.043 U	0.029 U	0.01 U	3.7 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.04 U	0.04 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.016 U	0.011 U	0.01 U	1.4 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.16	0.12
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	0.05 U	0.05 U	0.05 U	5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.31	0.33

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH38			BH39				BH40		BH41	
				Sample Name		PLF-BH38-15-061522	PLF-BH38-24-061522	PLF-BH38-28-061522	PLF-BH39-13-061522	PLF-BH39-18-061522	PLF-BH39-23-061522	PLF-BH39-29-061522	PLF-BH40-15-061522	PLF-BH40-24-061522	PLF-BH41-13-061622	PLF-DUP15-061622
				Sample Date		6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/16/2022	6/16/2022
				Sample Depth (feet bgs)		15	24	28	13	18	23	29	15	24	13	13
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Volatile Organic Compounds (VOCs) (cont.)																
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.051 U	0.05 U	0.05 U	*5 U*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.68	0.57
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	*0.21 U*	*0.15 U*	0.0089 U	*18 U*	0.0036 U	0.0026 U	0.0031 U	0.003 U	0.0031 U	*0.2 U*	*0.2 U*
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.044 U	0.03 U	0.001 U	*3.8 U*	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.041 U	0.041 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.017 U	0.012 U	0.01 U	1.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.016 U	0.016 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.029 U	0.02 U	0.01 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.027 U	0.027 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.027 U	0.019 U	0.01 U	2.4 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.026 U	0.026 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	2.6	3.1	0.05 U	3,500	0.094	0.39	0.05 U	0.05 U	0.05 U	8.1	6.5
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	3.2	3.5	0.05 U	3,500	0.33	0.63	0.05 U	0.05 U	0.05 U	8.9	7.1
Semivolatile Organic Compounds (SVOCs)																
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.18	1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	1 U	0.1 U	0.1 U	1.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	1 U	0.1 U	0.1 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Chrysene	218-01-9	--	--	--	mg/kg	1 U	0.1 U	0.1 U	2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.28	1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.6 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.021	1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	1 U	0.1 U	0.1 U	1.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.091	1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	1 U	2.7 U	0.1 U	5.9	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.4	1.1
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	*2.5 U*	*18 U*	0.25 U	*11 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.2	*2.5 U*
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	*2.5 U*	*15 U*	0.25 U	*9.8 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.4	2.8
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	2.5 U	18 U	0.25 U	5.9	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	4	3.9
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	2.5 U	18 U	0.25 U	16	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	4	5.2
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	1 U	2.8 U	0.1 U	1.8 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.65 U	1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	1 U	2.6 U	0.1 U	1.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.68 U	1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	1 U	0.1 U	0.1 U	15 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.19	1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	1 U	0.1 U	0.1 U	2.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	1 U	0.1 U	0.1 U	19 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.3	1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	1 U	3.5 U	0.1 U	3.9	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.75 U	1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	1 U	0.1 U	0.1 U	17 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	2.6	1.5
Pyrene	129-00-0	330	16	110,000	mg/kg	1 U	0.1 U	0.1 U	1.9 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	2.3	2 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	1 U	3.2 U	0.1 U	2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.65 U	1 U
Carbazole	86-74-8	--	--	--	mg/kg	2.5 U	0.25 U	0.25 U	69 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.53	2.5 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	1 U	*5 U*	0.1 U	3.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.54 U	1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	1 U	3.9 U	0.1 U	2.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.66 U	1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	*0.4 U*	*3.9 U*	0.041 U	*2.6 U*	0.042 U	0.044 U	0.04 U	0.044 U	0.044 U	*0.55 U*	*1 U*
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	*2.5 U*	*24 U*	0.25 U	*16 U*	0.26 U	0.27 U	0.25 U	0.27 U	0.28 U	*0.5 U*	*5 U*
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.65 U	*6.4 U*	0.066 U	4.1 U	0.068 U	0.071 U	0.065 U	0.07 U	0.072 U	0.1 U	1 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	*1.7 U*	*5.3 U*	0.17 U	*3.4 U*	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	*0.75 U*	*1 U*
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	2.5 U	18 U	0.25 U	12 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	*2.5 U*	0.25 U	0.25 U	*63 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*1 U*	*2.5 U*
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	1 U	0.1 U	0.1 U	*22 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.75 U	1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	1 U	3.1 U	0.1 U	2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	9.7	0.1 U	0.1 U	27 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.3	3.2
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	*1 U*	0.1 U	0.1 U	*18 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*0.5 U*	*5 U*
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	5 U	*32 U*	0.5 U	21 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	1 U	5.4 U	0.1 U	3.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.72 U	1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	*1.5 U*	0.14 U	0.15 U	*93 U*	0.15 U	0.16 U	0.15 U	0.16 U	0.16 U	0.27	*2.5 U*
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	1.2	0.1 U	0.1 U	1,900	0.1 U	2.8	0.1 U	0.1 U	0.1 U	11	23
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	*0.34 U*	*2.1 U*	0.034 U	*1.4 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	*0.71 U*	*1 U*
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	*0.38 U*	*3.7 U*	0.038 U	*2.4 U*	0.039 U	0.041 U	0.038 U	0.041 U	0.042 U	*0.66 U*	*1 U*
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	*0.34 U*	*1.9 U*	0.034 U	*1.3 U*	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.1 U	*1 U*

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH38			BH39				BH40		BH41	
					Sample Name	PLF-BH38-15-061522	PLF-BH38-24-061522	PLF-BH38-28-061522	PLF-BH39-13-061522	PLF-BH39-18-061522	PLF-BH39-23-061522	PLF-BH39-29-061522	PLF-BH40-15-061522	PLF-BH40-24-061522	PLF-BH41-13-061622	PLF-DUP15-061622
					Sample Date	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/16/2022	6/16/2022
					Sample Depth (feet bgs)	15	24	28	13	18	23	29	15	24	13	13
Analyte	CAS No.	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Adjusted MTCA Method C (3)	Unit											
Semivolatile Organic Compounds (SVOCs) (cont.)																
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	1 U	*1.9 U*	0.1 U	*1.2 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.68 U	1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	*1.7 U*	0.17 U	0.18 U	*11 U*	0.18 U	0.19 U	0.17 U	0.19 U	0.19 U	*0.25 U*	*2.5 U*
3-Nitroaniline	99-09-2	--	--	--	mg/kg	10 U	58 U	1 U	37 U	1 U	1 U	1 U	1 U	1 U	6 U	10 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	*5.7 U*	*56 U*	0.58 U	*36 U*	0.6 U	0.62 U	0.57 U	0.62 U	0.63 U	*1 U*	*10 U*
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	1 U	0.1 U	0.1 U	23 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	1 U	4.1 U	0.1 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.8 U	1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	*2.5 U*	*13 U*	0.25 U	*8.2 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*1.3 U*	*2.5 U*
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	*0.98 U*	0.096 U	0.099 U	*62 U*	0.1 U	0.11 U	0.098 U	0.11 U	0.11 U	*1 U*	*2.5 U*
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	2.5 U	0.25 U	0.25 U	81 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.3 U	2.5 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.36 U	0.036 U	0.037 U	*23 U*	0.038 U	0.04 U	0.036 U	0.039 U	0.04 U	0.1 U	*1 U*
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	*0.21 U*	0.02 U	0.021 U	*13 U*	0.022 U	0.022 U	0.021 U	0.022 U	0.023 U	*0.69 U*	*1 U*
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	*2 U*	0.2 U	0.2 U	*28 U*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	*0.99 U*	*2 U*
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	1 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.89	1.7
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	1 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	1 U	4.2 U	0.1 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.7 U	1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	1 U	4.2 U	0.1 U	2.7 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.68 U	1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	1 U	0.1 U	0.1 U	22 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12	1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	1 U	0.1 U	0.1 U	1.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	*1 U*	0.1 U	0.1 U	*30 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*0.49 U*	*1 U*
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	*1 U*	0.1 U	0.1 U	*28 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*1 U*
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	10 U	71 U	1 U	13,000	1 U	25	1 U	1 U	1 U	410	680
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	1 U	0.1 U	0.1 U	400	0.1 U	0.84	0.1 U	0.1 U	0.1 U	2.6	5.1
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	*2.5 U*	*12 U*	0.25 U	*7.8 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	*2.5 U*
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	1 U	*3.2 U*	0.1 U	28	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.81	1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	*1.3 U*	*13 U*	0.13 U	*8.4 U*	0.14 U	0.14 U	0.13 U	0.14 U	0.15 U	*0.25 U*	*2.5 U*
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	1 U	*2.5 U*	0.1 U	*1.6 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.73 U	1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	*0.71 U*	*7 U*	0.072 U	*4.5 U*	0.075 U	0.077 U	0.071 U	0.077 U	0.079 U	3.1	1.7
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	*1 U*	0.1 U	0.1 U	*17 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*0.59 U*	*1 U*
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	*0.95 U*	0.093 U	0.096 U	*60 U*	0.099 U	0.1 U	0.095 U	0.1 U	0.1 U	*1 U*	*2.5 U*
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.35 U	0.034 U	0.035 U	*22 U*	0.036 U	0.037 U	0.034 U	0.037 U	0.038 U	0.5 U	*5 U*
Total Petroleum Hydrocarbons (TPH)																
Gasoline-range organics	GRO	30	30	--	mg/kg	330	*250 U*	25 U	6,700	25 U	25 U	25 U	25 U	25 U	66	56
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	*5,000 U*	8,000	50 U	30,000	50 U	66	50 U	50 U	50 U	1,800 U	920
Oil-range organics	ORO	2,000	2,000	--	mg/kg	1,500	1,000 U	50 U	7,600	50 U	50 U	50 U	50 U	50 U	570	480
Total TPH (U=0) (4)	T_TPH (U=0)	--	--	--	mg/kg	1,800	8,000	50 U	44,000	50 U	66	50 U	50 U	50 U	640	1,500
Total TPH (U=1/2) (5)	T_TPH (U=1/2)	--	--	--	mg/kg	4,300	8,600	50 U	44,000	50 U	100	50 U	50 U	50 U	1,500	1,500

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.4
PEC Data for Primary Analytes

					Location Name	BH41 (cont.)			BH42	BH43	
					Sample Name	PLF-BH41-17-061622	PLF-BH41-22-061622	PLF-BH41-32-061622	PLF-BH42-10-061622	PLF-BH43-22-092222	PLF-BH43-25-092222
					Sample Date	6/16/2022	6/16/2022	6/16/2022	6/16/2022	9/22/2022	9/22/2022
					Sample Depth (feet bgs)	17	22	32	10	22	25
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit						
Volatile Organic Compounds (VOCs)											
Benzene	71-43-2	0.027	0.0017	2,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	100-41-4	5.9	0.34	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	108-88-3	4.5	0.27	280,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (meta & para)	108-38-3/106-42-3	17	0.96	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Xylene (ortho)	95-47-6	14	0.84	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total Xylene (U=0) [4]	1330-20-7	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total Xylene (U=1/2) [5]	T_XYL (U=1/2)	14	0.83	700,000	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=0) [4]	T_BTEX (U=0)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
cis-1,2-Dichloroethene	156-59-2	0.079	0.0052	7,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	127-18-4	0.05	0.0028	21,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	79-01-6	0.025	0.0015	1,800	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	75-01-4	0.0017	0.00009	88	mg/kg	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U	0.00008 U
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	--	--	--	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroethane	75-00-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,2-Dichloroethene	156-60-5	0.52	0.032	70,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,1-Trichloroethane	71-55-6	1.5	0.084	7,000,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1,2,2-Tetrachloroethane	79-34-5	0.0012	0.00032	660	mg/kg	0.00051 U	0.00043 U	0.00039 U	0.0004 U	0.00039 U	0.00039 U
1,1,2-Trichloroethane	79-00-5	0.017	0.0011	2,300	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethane	75-34-3	0.041	0.0026	23,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	75-35-4	0.046	0.0025	180,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trichlorobenzene	120-82-1	0.56	0.029	4,500	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.05	160	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane	106-93-4	0.00027	0.00011	66	mg/kg	0.00017 U	0.00014 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U
1,2-Dichlorobenzene	95-50-1	7	0.4	320,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	107-06-2	0.023	0.0016	1,400	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	78-87-5	0.025	0.0017	3,500	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	541-73-1	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,4-Dichlorobenzene	106-46-7	1.2	0.068	24,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	591-78-6	0.17	0.05	18,000	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	67-64-1	29	2.1	3,200,000	mg/kg	2.2	1.7	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	75-27-4	0.033	0.0022	2,100	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	75-25-2	0.36	0.023	17,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Bromomethane	74-83-9	0.051	0.0033	4,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	75-15-0	4.1	0.25	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	56-23-5	0.041	0.0022	1,900	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	108-90-7	0.86	0.051	70,000	mg/kg	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U
Chloroform	67-66-3	0.074	0.0048	4,200	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	74-87-3	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	10061-01-5	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichlorodifluoromethane	75-71-8	38	0.53	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	98-82-8	15	0.79	350,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl ethyl ketone	78-93-3	20	1.4	2,100,000	mg/kg	1.1	0.92	0.05 U	0.05 U	0.05 U	0.05 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH41 (cont.)			BH42	BH43	
				Sample Name		PLF-BH41-17-061622	PLF-BH41-22-061622	PLF-BH41-32-061622	PLF-BH42-10-061622	PLF-BH43-22-092222	PLF-BH43-25-092222
				Sample Date		6/16/2022	6/16/2022	6/16/2022	6/16/2022	9/22/2022	9/22/2022
				Sample Depth (feet bgs)		17	22	32	10	22	25
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit						
Volatile Organic Compounds (VOCs) (cont.)											
Methyl isobutyl ketone	108-10-1	2.7	0.19	280,000	mg/kg	0.39	0.35	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	0.022	0.0023	21,000	mg/kg	0.0059 U	0.0052 U	0.0027 U	0.0028 U	0.0028 U	0.0027 U
Methyl-tert-butyl ether	1634-04-4	0.1	0.0072	73,000	mg/kg	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	100-42-5	2.2	0.12	700,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
trans-1,3-Dichloropropene	10061-02-6	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorofluoromethane	75-69-4	23	0.79	1,100,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total VOCs (U=0) [4,7]	T_VOC (U=0)	--	--	--	mg/kg	3.7	3	0.05 U	0.05 U	0.05 U	0.05 U
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	--	--	--	mg/kg	3.9	3.1	0.05 UJ	0.05 U	0.05 U	0.05 U
Semivolatile Organic Compounds (SVOCs)											
Benzo(a)anthracene	56-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	50-32-8	3.9	0.19	130	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	205-99-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	207-08-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	218-01-9	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenzo(a,h)anthracene	53-70-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-c,d)pyrene	193-39-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-ZeroND) [4,8]	BaPEq (U=0)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cPAHs (MTCA TEQ-HalfND) [5,8]	BaPEq (U=1/2)	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Naphthalene	91-20-3	4.5	0.24	70,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1-Methylnaphthalene	90-12-0	0.25	0.25	4,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	91-57-6	1.7	0.25	14,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=0) [4,9]	T_Napth (U=0)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Naphthalenes (U=1/2) [5,9]	T_Napth (U=1/2)	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Acenaphthene	83-32-9	49	2.5	210,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Acenaphthylene	208-96-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Anthracene	120-12-7	1,100	57	1,100,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	191-24-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	206-44-0	630	32	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluorene	86-73-7	51	2.6	140,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Phenanthrene	85-01-8	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pyrene	129-00-0	330	16	110,000	mg/kg	0.2 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U
2-Chloronaphthalene	91-58-7	34	1.8	280,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Carbazole	86-74-8	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,3,4,6-Tetrachlorophenol	58-90-2	4.6	0.27	110,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	95-95-4	58	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,6-Trichlorophenol	88-06-2	0.092	0.049	3,500	mg/kg	*0.1 U*	0.046 U	*0.1 U*	0.042 U	0.044 U	0.041 U
2,4-Dichlorophenol	120-83-2	0.33	0.31	11,000	mg/kg	*0.5 U*	0.29 U	*0.5 U*	0.26 U	0.28 U	0.26 U
2,4-Dimethylphenol	105-67-9	4.4	0.25	70,000	mg/kg	0.1 U	0.075 U	0.1 U	0.067 U	0.072 U	0.067 U
2,4-Dinitrophenol	51-28-5	0.17	0.17	7,000	mg/kg	0.1 U	0.17 U		0.17 U	0.17 U	0.17 U
2,6-Dichlorophenol	87-65-0	--	--	--	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	95-57-8	0.47	0.25	18,000	mg/kg	*11 U*	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	95-48-7	8.1	0.47	180,000	mg/kg	5.4	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Nitrophenol	88-75-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3- & 4-Methylphenol	15831-10-4	--	--	--	mg/kg	21	1.1	0.1 U	0.1 U	0.1 U	0.1 U
4,6-Dinitro-o-cresol	534-52-1	0.1	0.1	280	mg/kg	*0.5 U*	0.1 U		0.1 U	0.1 U	0.1 U
4-Chloro-3-Methylphenol	59-50-7	22	1.2	350,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	100-02-7	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	87-86-5	0.18	0.18	330	mg/kg	*0.25 U*	0.17 U	*0.25 U*	0.15 U	0.16 U	0.15 U
Phenol	108-95-2	37	2.3	1,100,000	mg/kg	48	6.8	0.1 U	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	121-14-2	0.034	0.034	420	mg/kg	*0.1 U*	0.034 U	*0.1 U*	0.034 U	0.034 U	0.034 U
2,6-Dinitrotoluene	606-20-2	0.046	0.046	88	mg/kg	*0.1 U*	0.043 U	*0.1 U*	0.039 U	0.042 U	0.039 U
Nitrobenzene	98-95-3	0.1	0.034	7,000	mg/kg	0.1 U	0.034 U	0.1 U	0.034 U	0.034 U	0.034 U

Table 4.4
PEC Data for Primary Analytes

				Location Name		BH41 (cont.)			BH42	BH43	
				Sample Name		PLF-BH41-17-061622	PLF-BH41-22-061622	PLF-BH41-32-061622	PLF-BH42-10-061622	PLF-BH43-22-092222	PLF-BH43-25-092222
				Sample Date		6/16/2022	6/16/2022	6/16/2022	6/16/2022	9/22/2022	9/22/2022
				Sample Depth (feet bgs)		17	22	32	10	22	25
Analyte	CAS No.	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Adjusted MTCA Method C [3]	Unit						
Semivolatile Organic Compounds (SVOCs) (cont.)											
2-Nitroaniline	88-74-4	1	0.1	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3,3'-Dichlorobenzidine	91-94-1	0.21	0.21	290	mg/kg	*0.25 U*	0.2 U	*0.25 U*	0.18 U	0.19 U	0.18 U
3-Nitroaniline	99-09-2	--	--	--	mg/kg	1 U	1 U	1 U	1 U	1 U	1 U
4-Chloroaniline	106-47-8	0.71	0.71	660	mg/kg	*1 U*	0.66 U	*1 U*	0.59 U	0.63 U	0.59 U
4-Bromophenyl phenyl ether	101-55-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chlorophenyl phenyl ether	7005-72-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Nitroaniline	100-01-6	0.25	0.25	6,600	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Bis(2-chloroethyl)ether	111-44-4	0.12	0.12	120	mg/kg	*11 U*	0.11 U	*0.25 U*	0.1 U	0.11 U	0.1 U
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	--	mg/kg	14 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	118-74-1	0.44	0.045	82	mg/kg	0.1 U	0.042 U	0.1 U	0.16	0.04 U	0.037 U
Hexachloroethane	67-72-1	0.025	0.025	2,500	mg/kg	*2.3 U*	0.024 U	*0.1 U*	0.021 U	0.023 U	0.021 U
Pyridine	110-86-1	0.2	0.2	3,500	mg/kg	*5.1 U*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bis(2-ethylhexyl)phthalate	117-81-7	13	0.67	9,400	mg/kg	0.1 U	0.1 U	0.1 U	2.6	0.1 U	0.1 U
Butyl benzyl phthalate	85-68-7	13	0.65	69,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Diethylphthalate	84-66-2	72	4.7	2,800,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dimethyl phthalate	131-11-3	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-butyl phthalate	84-74-2	57	3	350,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Di-n-octyl phthalate	117-84-0	450	23	35,000	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Aniline	62-53-3	0.1	0.1	23,000	mg/kg	*5.3 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Azobenzene	103-33-3	0.1	0.1	1,200	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzoic acid	65-85-0	260	18	14,000,000	mg/kg	980	26	1.6	1.1	1 U	1 U
Benzyl alcohol	100-51-6	7.1	0.49	350,000	mg/kg	5.9 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Bis(2-chloroethoxy)methane	111-91-1	0.25	0.25	11,000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	132-64-9	1.5	0.1	3,500	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	87-68-3	0.16	0.16	1,700	mg/kg	*0.25 U*	0.15 U	*0.25 U*	0.14 U	0.15 U	0.14 U
Hexachlorocyclopentadiene	77-47-4	1.5	0.1	21,000	mg/kg	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Isophorone	78-59-1	0.49	0.087	140,000	mg/kg	0.1 U	0.082 U	0.1 U	0.074 U	0.079 U	0.073 U
N-Nitrosodimethylamine	62-75-9	0.1	0.1	2.6	mg/kg	*3.1 U*	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
N-Nitrosodi-n-propylamine	621-64-7	0.12	0.12	19	mg/kg	*11 U*	0.11 U	*0.25 U*	0.098 U	0.1 U	0.097 U
N-Nitrosodiphenylamine	86-30-6	1	0.052	27,000	mg/kg	0.5 U	0.04 U	0.5 U	0.036 U	0.038 U	0.035 U
Total Petroleum Hydrocarbons (TPH)											
Gasoline-range organics	GRO	30	30	--	mg/kg	25 U	25 U	25 U	25 U	25 U	25 U
Diesel-range organics	DRO	2,000	2,000	--	mg/kg	200	50 U	50 U	90	50 U	50 U
Oil-range organics	ORO	2,000	2,000	--	mg/kg	50 U	50 U	50 U	220	50 U	50 U
Total TPH (U=0) [4]	T_TPH (U=0)	--	--	--	mg/kg	200	50 U	50 U	310	50 U	50 U
Total TPH (U=1/2) [5]	T_TPH (U=1/2)	--	--	--	mg/kg	240	50 U	50 U	320	50 U	50 U

Notes:

All results are rounded to two significant figures.

Blanks are intentional; sample was not analyzed.

-- Value does not exist.

Italic Analyte was not detected. Reported limit exceeds applicable criteria.

Analyte was detected. Result exceeds applicable screening criteria.

1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.

2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.

3 Criteria applied to all samples.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of cPAH TEQ concentrations was performed using the California Environmental Protection Agency 2005 Toxic Equivalency Factors as presented in Table 708-2 of WAC 173-340-900.

9 Calculation of total naphthalenes concentration was performed using napthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenze, and xylenes

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

REL Remediation Level

TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.5
PEC Data for Secondary Analytes

					Location Name	BH01	BH07	BH08		BH11		BH12		BH14		
					Sample Name	PLF-PEC-BH01-61-012522	PLF-PEC-BH07-15-020222	PLF-PEC-BH08-61-021222	PLF-PEC-DUP5-021222	PLF-PEC-BH11-12-020722	PLF-PEC-BH11-20-020722	PLF-BH12-24-060722	PLF-DUP12-060722	PLF-PEC-BH14-11-020822	PLF-PEC-DUP4-020822	PLF-PEC-BH14-68-020922
					Sample Date	1/25/2022	2/2/2022	2/12/2022	2/12/2022	2/7/2022	2/7/2022	6/7/2022	6/7/2022	2/8/2022	2/8/2022	2/9/2022
					Sample Depth (feet bgs)	61	15	61	61	12	20	24	24	11	11	68
Analyte	CAS No.	Adjusted Protection of Groundwater Vadose [1]	Adjusted Protection of Groundwater Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Metals																
Arsenic	7440-38-2	5.1	5.1	88	mg/kg	1.9	5	1.5	1.6	7.3	3.6			5.2		1.2
Barium	7440-39-3	1,600	83	700,000	mg/kg	92	110	77 J	83 J	440	73			150		75
Cadmium	7440-43-9	0.93	0.93	3,500	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	2.6	0.25 U			1.6		0.25 U
Chromium	7440-47-3	0.5	0.5	--	mg/kg	17	17	3.2	3.2	220	8.3			35		3.3
Lead	7439-92-1	3,000	150	--	mg/kg	4.6	11	2.5	2.6	410	2.5			360		2.1
Mercury	7439-97-6	2.1	0.1	--	mg/kg	0.02 U	0.082	0.02 U	0.02 U	37	0.02 U			0.21		0.02 U
Selenium	7782-49-2	5.2	0.5	18,000	mg/kg	1.1	0.96	1.3	1.3	1	1			0.99		1.1
Silver	7440-22-4	14	0.69	18,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			0.94		0.5 U
Polychlorinated Biphenyls (PCBs)																
Aroclor 1016	12674-11-2	1.2	0.1	250	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U	*2.7 U*	0.1 U		0.1 U
Aroclor 1221	11104-28-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	1 U	2.7 U	0.1 U		0.1 U
Aroclor 1232	11141-16-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	11	20	0.1 U		0.1 U
Aroclor 1242	53469-21-9	--	--	--	mg/kg	0.1 U	1.1	0.1 U	0.1 U	49	0.74	1 U	2.7 U	0.66		0.1 U
Aroclor 1248	12672-29-6	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	1 U	0.1 U	3.7	7.4	0.1 U		0.1 U
Aroclor 1254	11097-69-1	0.1	0.1	66	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	48	0.1 U	*1 U*	*2.7 U*	0.61		0.1 U
Aroclor 1260	11096-82-5	0.36	0.1	66	mg/kg	0.1 U	0.25	0.1 U	0.1 U	22	0.45	1.9	3.2	0.15		0.1 U
Aroclor 1268	11100-14-4	--	--	--	mg/kg	0.1 U						1 U	2.7 U			
Total PCB Aroclors (U=0) [4]	T_PCB (U=0)	0.34	0.1	66	mg/kg	0.1 U	1.4	0.1 U	0.1 U	120	1.2	17	31	1.4		0.1 U
Total PCB Aroclors (U=1/2) [5]	T_PCB (U=1/2)	0.34	0.1	66	mg/kg	0.1 U	1.6	0.1 U	0.1 U	120	1.4	19	37	1.6		0.1 U
Pesticides																
4,4'-DDD	72-54-8	0.34	0.017	110	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.04 U	0.01 U			0.022 U		0.01 U
4,4'-DDE	72-55-9	0.22	0.011	390	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.04 U		0.01 U
4,4'-DDT	50-29-3	3.5	0.17	390	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.4 U	0.01 U			0.06 U		0.01 U
Aldrin	309-00-2	0.0027	0.0027	7.7	mg/kg	*0.003 U*	*0.01 U*	0.0027 U	0.0024 U	*0.01 U*	*0.01 U*			0.0024 U		0.0024 U
alpha-BHC	319-84-6	0.01	0.01	21	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
alpha-Endosulfan	959-98-8	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
beta-BHC	319-85-7	0.01	0.01	73	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	*0.03 U*	0.01 U			0.01 U		0.01 U
beta-Endosulfan	33213-65-9	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.03 U	0.01 U			0.015 U		0.01 U
Chlordane	57-74-9	--	--	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U			0.02 U		0.02 U
delta-BHC	319-86-8	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
Dieldrin	60-57-1	0.003	0.003	8.2	mg/kg	*0.0033 U*	*0.01 U*	0.003 U	0.0027 U	*0.23 U*	*0.01 U*			0.0027 U		0.0026 U
Endosulfan sulfate	1031-07-8	19	0.97	21,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
Endrin	72-20-8	0.44	0.022	1,100	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.06 U	0.027 U			0.01 U		0.01 U
Endrin Aldehyde	7421-93-4	--	--	--	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
gamma-BHC	58-89-9	0.01	0.01	120	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	*0.014 U*	0.01 U			0.01 U		0.01 U
Heptachlor	76-44-8	0.019	0.0033	29	mg/kg	*0.0036 U*	0.017 U	*0.0034 U*	0.0029 U	*0.07 U*	0.015 U			0.0029 U		0.0029 U
Heptachlor Epoxide	1024-57-3	0.0099	0.003	14	mg/kg	*0.0033 U*	*0.01 U*	0.003 U	0.0027 U	*0.3 U*	*0.01 U*			0.0027 U		0.0026 U
Methoxychlor	72-43-5	64	3.2	18,000	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U			0.01 U		0.01 U
Toxaphene	8001-35-2	1.5	0.076	120	mg/kg	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		0.05 U

Table 4.5
PEC Data for Secondary Analytes

					Location Name	BH01	BH07	BH08		BH11		BH12		BH14		
					Sample Name	PLF-PEC-BH01-61-012522	PLF-PEC-BH07-15-020222	PLF-PEC-BH08-61-021222	PLF-PEC-DUP5-021222	PLF-PEC-BH11-12-020722	PLF-PEC-BH11-20-020722	PLF-BH12-24-060722	PLF-DUP12-060722	PLF-PEC-BH14-11-020822	PLF-PEC-DUP4-020822	PLF-PEC-BH14-68-020922
					Sample Date	1/25/2022	2/2/2022	2/12/2022	2/12/2022	2/7/2022	2/7/2022	6/7/2022	6/7/2022	2/8/2022	2/8/2022	2/9/2022
					Sample Depth (feet bgs)	61	15	61	61	12	20	24	24	11	11	68
Analyte	CAS No.	Adjusted Protection of Groundwater Vadose [1]	Adjusted Protection of Groundwater Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Herbicides																
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	0.08	0.0054	3,500	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	
2,4,5-Trichlorophenoxyacetic acid	93-76-5	0.98	0.063	35,000	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	
2,4-DB	94-82-6	5.5	0.32	110,000	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	
2,4-Dichlorophenoxyacetic acid	94-75-7	0.32	0.022	35,000	mg/kg	0.005 U	0.0069	0.005 U	0.005 U		0.33			0.87	1.4	
Dicamba	1918-00-9	2.2	0.15	110,000	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.093	0.15	
Dichloroprop	120-36-5	--	--	--	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	
Dinoseb	88-85-7	0.63	0.032	3,500	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	
MCPA	94-74-6	0.037	0.0025	1,800	mg/kg	*0.005 U*	0.13	*0.005 U*	*0.005 U*		0.095			0.005 U	0.005 U	
Silvex	93-72-1	0.38	0.023	28,000	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U		0.005 U			0.005 U	0.005 U	

Notes:

All results are rounded to two significant figures.
Blanks are intentional; sample was not analyzed.
-- Value does not exist.
Italic Analyte was not detected. Reported limit exceeds applicable criteria.
Analyte was detected. Result exceeds applicable screening criteria.
1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.
2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.
3 Criteria applied to all samples.
4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.
5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

Abbreviations:

2,4-DB 4(2,4-Dichlorophenoxy)butyric acid
bgs Below ground surface
BHC Benzene hexachloride
CAS Chemical Abstracts Service
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
mg/kg Milligrams per kilogram
MCPA (4-Chloro-2-methylphenoxy)acetic acid
MTCA Model Toxics Control Act
REL Remediation Level

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.5
PEC Data for Secondary Analytes

					Location Name	BH16		BH18	BH22	BH24		BH26	BH27	BH30	BH31	
					Sample Name	PLF-PEC-BH16-32-021322	PLF-PEC-BH16-62-021322	PLF-PEC-BH18-17-021422	PLF-BH22-24-060122	PLF-BH24-23-060122	PLF-BH24-60-060122	PLF-BH26-24-060222	PLF-BH27-22-060322	PLF-BH30-16-061622	PLF-BH31-17-061522	PLF-DUP14-061522
					Sample Date	2/13/2022	2/13/2022	2/14/2022	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/3/2022	6/16/2022	6/15/2022	6/15/2022
					Sample Depth (feet bgs)	32	62	17	24	23	60	24	22	16	17	17
Analyte	CAS No.	Adjusted Protection of Groundwater Vadose [1]	Adjusted Protection of Groundwater Saturated [2]	Adjusted MTCA Method C [3]	Unit											
Metals																
Arsenic	7440-38-2	5.1	5.1	88	mg/kg	6.3	2.4	14	7.1	5.6		4.5		14	14	16
Barium	7440-39-3	1,600	83	700,000	mg/kg	100	82	130	150	120		90		120	120	120
Cadmium	7440-43-9	0.93	0.93	3,500	mg/kg	0.31	0.25 U	0.25 U	0.25 U	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U
Chromium	7440-47-3	0.5	0.5	--	mg/kg	15	6.8	15	12	7		16		13	12	12
Lead	7439-92-1	3,000	150	--	mg/kg	7.6	2.5	15	6.3	3.9		3.2		15	14	13
Mercury	7439-97-6	2.1	0.1	--	mg/kg	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U		0.021	0.02 U	0.02 U
Selenium	7782-49-2	5.2	0.5	18,000	mg/kg	0.96	1.1	0.82	0.57	0.53		0.59		0.48	0.52	0.51
Silver	7440-22-4	14	0.69	18,000	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U	0.5 U	0.5 U
Polychlorinated Biphenyls (PCBs)																
Aroclor 1016	12674-11-2	1.2	0.1	250	mg/kg	0.1 U	0.1 U	0.1 U	*50 U*	0.1 U	0.1 U	0.1 U		0.56 U	0.002 U	0.002 U
Aroclor 1221	11104-28-2	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	50 U	0.1 U	0.1 U	0.1 U		0.56 U	0.002 U	0.002 U
Aroclor 1232	11141-16-5	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	190	0.1 U	0.1 U	2		9.4	0.002 U	0.002 U
Aroclor 1242	53469-21-9	--	--	--	mg/kg	1.8	0.12	6.8	50 U	0.1 U	0.1 U	0.1 U		0.56 U	0.002 U	0.002 U
Aroclor 1248	12672-29-6	--	--	--	mg/kg	0.1 U	0.1 U	0.1 U	210	0.1 U	0.1 U	0.82		3.6	0.002 U	0.002 U
Aroclor 1254	11097-69-1	0.1	0.1	66	mg/kg	0.97	0.1 U	0.1 U	350	0.1 U	0.1 U	0.1 U		*0.56 U*	0.002 U	0.002 U
Aroclor 1260	11096-82-5	0.36	0.1	66	mg/kg	0.61	0.1 U	0.1 U	*50 U*	0.1 U	0.1 U	0.85		1.4	0.0029	0.0058
Aroclor 1268	11100-14-4	--	--	--	mg/kg									0.56 U	0.002 U	0.002 U
Total PCB Aroclors (U=0) [4]	T_PCB (U=0)	0.34	0.1	66	mg/kg	3.4	0.12	6.8	750	0.1 U	0.1 U	3.7		14	0.0029	0.0058
Total PCB Aroclors (U=1/2) [5]	T_PCB (U=1/2)	0.34	0.1	66	mg/kg	3.6	0.42	7.1	850	0.1 U	0.1 U	3.9		16	0.0099	0.013
Pesticides																
4,4'-DDD	72-54-8	0.34	0.017	110	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
4,4'-DDE	72-55-9	0.22	0.011	390	mg/kg	0.032 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
4,4'-DDT	50-29-3	3.5	0.17	390	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
Aldrin	309-00-2	0.0027	0.0027	7.7	mg/kg	*0.01 U*	0.0025 U	*0.026 U*		*0.01 U*			*0.02 U*		*0.01 U*	*0.01 U*
alpha-BHC	319-84-6	0.01	0.01	21	mg/kg	0.01 U	0.01 U	*0.1 U*		0.01 U			*0.02 U*		0.01 U	0.01 U
alpha-Endosulfan	959-98-8	--	--	--	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.02 U		0.01 U	0.01 U
beta-BHC	319-85-7	0.01	0.01	73	mg/kg	0.01 U	0.01 U	*0.1 U*		0.01 U			*0.02 U*		0.01 U	0.01 U
beta-Endosulfan	33213-65-9	--	--	--	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
Chlordane	57-74-9	--	--	--	mg/kg	0.02 U	0.02 U	0.2 U		0.01 UJ			0.08 UJ		0.02 U	0.02 U
delta-BHC	319-86-8	--	--	--	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.02 U		0.01 U	0.01 U
Dieldrin	60-57-1	0.003	0.003	8.2	mg/kg	*0.01 U*	0.0028 U	*0.029 U*		*0.01 U*			*0.04 U*		0.003 U	*0.01 U*
Endosulfan sulfate	1031-07-8	19	0.97	21,000	mg/kg	0.026 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
Endrin	72-20-8	0.44	0.022	1,100	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
Endrin Aldehyde	7421-93-4	--	--	--	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
gamma-BHC	58-89-9	0.01	0.01	120	mg/kg	0.01 U	0.01 U	*0.1 U*		0.01 U			*0.02 U*		0.01 U	0.01 U
Heptachlor	76-44-8	0.019	0.0033	29	mg/kg	*0.034 U*	0.0031 U	*0.031 U*		0.01 U			*0.02 U*		0.01 U	0.01 U
Heptachlor Epoxide	1024-57-3	0.0099	0.003	14	mg/kg	*0.01 U*	0.0028 U	*0.029 U*		*0.01 U*			*0.02 U*		*0.01 U*	*0.01 U*
Methoxychlor	72-43-5	64	3.2	18,000	mg/kg	0.01 U	0.01 U	0.1 U		0.01 U			0.04 U		0.01 U	0.01 U
Toxaphene	8001-35-2	1.5	0.076	120	mg/kg	0.05 U	0.05 U	0.5 U		0.01 U			0.2 U		0.01 U	0.01 U

Table 4.5
PEC Data for Secondary Analytes

					Location Name	BH16		BH18	BH22	BH24		BH26	BH27	BH30	BH31	
					Sample Name	PLF-PEC-BH16-32-021322	PLF-PEC-BH16-62-021322	PLF-PEC-BH18-17-021422	PLF-BH22-24-060122	PLF-BH24-23-060122	PLF-BH24-60-060122	PLF-BH26-24-060222	PLF-BH27-22-060322	PLF-BH30-16-061622	PLF-BH31-17-061522	PLF-DUP14-061522
					Sample Date	2/13/2022	2/13/2022	2/14/2022	6/1/2022	6/1/2022	6/1/2022	6/2/2022	6/3/2022	6/16/2022	6/15/2022	6/15/2022
					Sample Depth (feet bgs)	32	62	17	24	23	60	24	22	16	17	17
Analyte	**CAS No.**	**Adjusted Protection of Groundwater Vadose (1)**	**Adjusted Protection of Groundwater Saturated (2)**	**Adjusted MTCA Method C (3)**	**Unit**											
Herbicides																
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	0.08	0.0054	3,500	mg/kg	0.005 U		0.005 U		0.005 U			*12 U*		0.005 U	0.005 U
2,4,5-Trichlorophenoxyacetic acid	93-76-5	0.98	0.063	35,000	mg/kg	0.005 U		0.005 U		0.005 U			0.012 U		0.005 U	0.005 U
2,4-DB	94-82-6	5.5	0.32	110,000	mg/kg	0.005 U		0.005 U		0.005 U			0.25 U		0.005 U	0.005 U
2,4-Dichlorophenoxyacetic acid	94-75-7	0.32	0.022	35,000	mg/kg	0.0053		0.005 U		0.005 U			0.05 U		0.005 U	0.005 U
Dicamba	1918-00-9	2.2	0.15	110,000	mg/kg	0.005 U		0.005 U		0.005 U			0.025 U		0.005 U	0.005 U
Dichloroprop	120-36-5	--	--	--	mg/kg	0.005 U		0.005 U		0.005 U			0.005 U		0.005 U	0.005 U
Dinoseb	88-85-7	0.63	0.032	3,500	mg/kg	0.005 U		0.005 U		0.005 U			0.025 U		0.005 U	0.005 U
MCPA	94-74-6	0.037	0.0025	1,800	mg/kg	0.005 U		0.005 U		0.01 U			1.6 J		0.005 U	0.005 U
Silvex	93-72-1	0.38	0.023	28,000	mg/kg	0.005 U		0.005 U		0.005 U			0.012 U		0.005 U	0.005 U

Notes:

All results are rounded to two significant figures.
Blanks are intentional; sample was not analyzed.
-- Value does not exist.
Italic Analyte was not detected. Reported limit exceeds applicable criteria.
Analyte was detected. Result exceeds applicable screening criteria.
1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.
2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.
3 Criteria applied to all samples.
4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.
5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

Abbreviations:

2,4-DB 4(2,4-Dichlorophenoxy)butyric acid
bgs Below ground surface
BHC Benzene hexachloride
CAS Chemical Abstracts Service
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
mg/kg Milligrams per kilogram
MCPA (4-Chloro-2-methylphenoxy)acetic acid
MTCA Model Toxics Control Act
REL Remediation Level

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 4.6a
Frequency of Detections and Exceedances in Vadose Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location Of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria [1,2]	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (VOCs)														
Benzene	71-43-2	mg/kg	175	7	4.0%	0.0020	250	BH39	6/15/2022	13	0.027	4	2.3%	9,300
Ethylbenzene	100-41-4	mg/kg	175	50	29%	0.010	690	BH12	6/7/2022	24	5.9	24	14%	120
Toluene	108-88-3	mg/kg	175	56	32%	0.013	3,200	BH39	6/15/2022	13	4.5	24	14%	710
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	175	53	30%	0.031	2,300	BH12	6/7/2022	24	17	28	16%	140
Xylene (ortho)	95-47-6	mg/kg	175	54	31%	0.010	800	BH12	6/7/2022	24	14	25	14%	57
Xylene (total)	1330-20-7	mg/kg	175	55	31%	0.010	3,100	BH12	6/7/2022	24	14	31	18%	220
Total BTEX (U=0) [4]	T_BTEX (U=0)	mg/kg	175	62	35%	0.0010	5,300	BH12	6/7/2022	24	--	NA	NA	NA
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	mg/kg	175	62	35%	0.026	5,300	BH12	6/7/2022	24	--	NA	NA	NA
Tetrachloroethene	127-18-4	mg/kg	175	37	21%	0.0011	36	BH12	6/7/2022	24	0.050	26	15%	720
Trichloroethene	79-01-6	mg/kg	175	27	15%	0.0014	25	BH30	6/16/2022	16	0.025	20	11%	1,000
Vinyl chloride	75-01-4	mg/kg	175	1	0.57%	0.018	0.018	BH15	2/11/2022	23	0.0017	1	0.57%	11
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	mg/kg	175	42	24%	0.0011	57	BH12	6/7/2022	24	--	NA	NA	NA
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	mg/kg	175	42	24%	0.0011	57	BH12	6/7/2022	24	--	NA	NA	NA
cis-1,2-Dichloroethene	156-59-2	mg/kg	175	3	1.7%	0.0011	0.041	BH16	2/13/2022	17	0.079	None	None	None
Chloroethane	75-00-3	mg/kg	175	None	None	None	None	None	None	None	--	NA	NA	NA
trans-1,2-Dichloroethene	156-60-5	mg/kg	175	None	None	None	None	None	None	None	0.52	None	None	None
1,1,1-Trichloroethane	71-55-6	mg/kg	175	1	0.57%	0.046	0.046	BH14	2/8/2022	11	1.5	None	None	None
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	175	1	0.57%	0.081	0.081	BH11	2/7/2022	20	0.0012	1	0.57%	68
1,1,2-Trichloroethane	79-00-5	mg/kg	175	None	None	None	None	None	None	None	0.017	None	None	None
1,1-Dichloroethane	75-34-3	mg/kg	175	None	None	None	None	None	None	None	0.041	None	None	None
1,1-Dichloroethene	75-35-4	mg/kg	175	None	None	None	None	None	None	None	0.046	None	None	None
1,2,4-Trichlorobenzene	120-82-1	mg/kg	180	28	16%	0.034	10	BH11	2/7/2022	20	0.56	12	6.7%	18
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	175	None	None	None	None	None	None	None	0.050	None	None	None
1,2-Dibromoethane	106-93-4	mg/kg	175	None	None	None	None	None	None	None	0.00027	None	None	None
1,2-Dichlorobenzene	95-50-1	mg/kg	180	54	30%	0.0010	1,600	BH07	2/2/2022	12	7.0	16	8.9%	230
1,2-Dichloroethane	107-06-2	mg/kg	175	None	None	None	None	None	None	None	0.023	None	None	None
1,2-Dichloropropane	78-87-5	mg/kg	175	None	None	None	None	None	None	None	0.025	None	None	None
1,3-Dichlorobenzene	541-73-1	mg/kg	180	4	2.2%	0.12	90	BH07	2/2/2022	12	--	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	mg/kg	180	25	14%	0.059	67	BH07	2/2/2022	12	1.2	10	5.6%	56
2-Hexanone	591-78-6	mg/kg	175	8	4.6%	0.12	3.9	BH22	6/1/2022	15	0.17	7	4.0%	23
Acetone	67-64-1	mg/kg	175	51	29%	0.052	29	BH12	6/7/2022	24	29	None	None	None
								BH28	6/16/2022	17				
Bromodichloromethane	75-27-4	mg/kg	175	None	None	None	None	None	None	None	0.033	None	None	None
Bromoform	75-25-2	mg/kg	175	None	None	None	None	None	None	None	0.36	None	None	None
Bromomethane	74-83-9	mg/kg	175	None	None	None	None	None	None	None	0.051	None	None	None
Carbon disulfide	75-15-0	mg/kg	175	None	None	None	None	None	None	None	4.1	None	None	None
Carbon tetrachloride	56-23-5	mg/kg	175	None	None	None	None	None	None	None	0.041	None	None	None
Chlorobenzene	108-90-7	mg/kg	175	7	4.0%	0.029	0.75	BH18	2/14/2022	17	0.86	None	None	None
Chloroform	67-66-3	mg/kg	175	None	None	None	None	None	None	None	0.074	None	None	None
Chloromethane	74-87-3	mg/kg	175	None	None	None	None	None	None	None	--	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	mg/kg	175	None	None	None	None	None	None	None	--	NA	NA	NA

Table 4.6a
Frequency of Detections and Exceedances in Vadose Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location Of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria [1,2]	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (cont.)														
Dichlorodifluoromethane	75-71-8	mg/kg	175	None	None	None	None	None	None	None	38	None	None	None
Isopropylbenzene	98-82-8	mg/kg	175	38	22%	0.036	61	BH12	6/7/2022	24	15	7	4.0%	4.1
Methyl ethyl ketone	78-93-3	mg/kg	175	35	20%	0.082	27	BH30	6/16/2022	16	20	3	1.7%	1.4
Methyl isobutyl ketone	108-10-1	mg/kg	175	40	23%	0.094	280	BH12	6/7/2022	24	2.7	15	8.6%	100
Methylene chloride	75-09-2	mg/kg	175	25	14%	0.0030	5.0	BH30	6/16/2022	16	0.022	4	2.3%	230
Methyl-tert-butyl ether	1634-04-4	mg/kg	175	None	None	None	None	None	None	None	0.10	None	None	None
Styrene	100-42-5	mg/kg	175	1	0.57%	0.71	0.71	BH37	6/15/2022	5	2.2	None	None	None
trans-1,3-Dichloropropene	10061-02-6	mg/kg	175	None	None	None	None	None	None	None	--	NA	NA	NA
Trichlorofluoromethane	75-69-4	mg/kg	175	None	None	None	None	None	None	None	23	None	None	None
Total VOCs (U=0) [4,7]	T_VOC (U=0)	mg/kg	175	100	57%	0.0012	5,700	BH12	6/7/2022	24	--	NA	NA	NA
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	mg/kg	175	100	57%	0.24	5,800	BH12	6/7/2022	24	--	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)														
Benzo(a)anthracene	56-55-3	mg/kg	176	6	3.4%	0.17	1.2	BH20	6/2/2022	16	--	NA	NA	NA
Benzo(a)pyrene	50-32-8	mg/kg	176	1	0.57%	0.90	0.90	BH20	6/2/2022	16	3.9	None	None	None
Benzo(b)fluoranthene	205-99-2	mg/kg	176	4	2.3%	0.15	0.49	BH20	6/2/2022	16	--	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	mg/kg	176	3	1.7%	0.18	0.82	BH20	6/2/2022	16	--	NA	NA	NA
Chrysene	218-01-9	mg/kg	176	10	5.7%	0.11	1.6	BH20	6/2/2022	16	--	NA	NA	NA
Dibenzo(a,h)anthracene	53-70-3	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	176	2	1.1%	0.13	0.32	BH20	6/2/2022	16	--	NA	NA	NA
Naphthalene	91-20-3	mg/kg	176	59	34%	0.12	110	BH30	6/16/2022	24	4.5	35	20%	24
1-Methylnaphthalene	90-12-0	mg/kg	176	48	27%	0.28	49	BH30	6/16/2022	24	0.25	48	27%	200
2-Methylnaphthalene	91-57-6	mg/kg	176	51	29%	0.27	93	BH30	6/16/2022	24	1.7	36	20%	55
Total Naphthalenes [4,8]	T_Napth (U=0)	mg/kg	176	60	34%	0.12	250	BH30	6/16/2022	24	--	NA	NA	NA
Total Naphthalenes (U=1/2) [5,8]	T_Napth (U=1/2)	mg/kg	176	60	34%	0.37	250	BH30	6/16/2022	24	--	NA	NA	NA
Acenaphthene	83-32-9	mg/kg	176	2	1.1%	0.26	0.48	BH23	6/2/2022	14	49	None	None	None
Acenaphthylene	208-96-8	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
Anthracene	120-12-7	mg/kg	176	2	1.1%	0.19	1.5	BH24	6/1/2022	13	1,100	None	None	None
Benzo(g,h,i)perylene	191-24-2	mg/kg	176	2	1.1%	0.14	0.52	BH20	6/2/2022	16	--	NA	NA	NA
Fluoranthene	206-44-0	mg/kg	176	28	16%	0.10	75	BH26	6/2/2022	19	630	None	None	None
Fluorene	86-73-7	mg/kg	176	3	1.7%	0.30	3.9	BH39	6/15/2022	13	51	None	None	None
Phenanthrene	85-01-8	mg/kg	176	44	25%	0.16	10	BH20	6/2/2022	16	--	NA	NA	NA
Pyrene	129-00-0	mg/kg	176	16	9.1%	0.14	3.0	BH20	6/2/2022	16	330	None	None	None
2-Chloronaphthalene	91-58-7	mg/kg	176	None	None	None	None	None	None	None	34	None	None	None
Carbazole	86-74-8	mg/kg	176	1	0.57%	0.53	0.53	BH41	6/16/2022	13	--	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	176	4	2.3%	0.10	0.71	BH27	6/3/2022	22	4.6	None	None	None
2,4,5-Trichlorophenol	95-95-4	mg/kg	176	None	None	None	None	None	None	None	58	None	None	None
2,4,6-Trichlorophenol	88-06-2	mg/kg	176	2	1.1%	0.074	0.15	BH37	6/15/2022	5	0.092	1	0.57%	1.6
2,4-Dichlorophenol	120-83-2	mg/kg	176	None	None	None	None	None	None	None	0.33	None	None	None
2,4-Dimethylphenol	105-67-9	mg/kg	176	5	2.8%	0.48	13	BH30	6/16/2022	16	4.4	2	1.1%	3.0
2,4-Dinitrophenol	51-28-5	mg/kg	175	None	None	None	None	None	None	None	0.17	None	None	None
2,6-Dichlorophenol	87-65-0	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA

Table 4.6a
Frequency of Detections and Exceedances in Vadose Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location Of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria (1,2)	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor (3)
Semivolatile Organic Compounds (cont.)														
2-Chlorophenol	95-57-8	mg/kg	176	5	2.8%	0.33	200	BH23	6/2/2022	22	0.47	4	2.3%	430
2-Methylphenol	95-48-7	mg/kg	176	2	1.1%	0.83	5.4	BH41	6/16/2022	17	8.1	None	None	None
2-Nitrophenol	88-75-5	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
3- & 4-Methylphenol	15831-10-4	mg/kg	176	16	9.1%	0.19	21	BH41	6/16/2022	17	--	NA	NA	NA
4,6-Dinitro-o-cresol	534-52-1	mg/kg	175	None	None	None	None	None	None	None	0.10	None	None	None
4-Chloro-3-Methylphenol	59-50-7	mg/kg	176	None	None	None	None	None	None	None	22	None	None	None
4-Nitrophenol	100-02-7	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
Pentachlorophenol	87-86-5	mg/kg	176	30	17%	0.21	18	BH22	6/1/2022	24	0.18	30	17%	100
Phenol	108-95-2	mg/kg	176	35	20%	0.22	1,900	BH39	6/15/2022	13	37	6	3.4%	51
2,4-Dinitrotoluene	121-14-2	mg/kg	176	1	0.57%	0.055	0.055	BH09	6/6/2022	15	0.034	1	0.57%	1.6
2,6-Dinitrotoluene	606-20-2	mg/kg	176	1	0.57%	0.055	0.055	BH09	6/6/2022	15	0.046	1	0.57%	1.2
Nitrobenzene	98-95-3	mg/kg	176	None	None	None	None	None	None	None	0.10	None	None	None
2-Nitroaniline	88-74-4	mg/kg	176	None	None	None	None	None	None	None	1.0	None	None	None
3,3'-Dichlorobenzidine	91-94-1	mg/kg	176	None	None	None	None	None	None	None	0.21	None	None	None
3-Nitroaniline	99-09-2	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
4-Chloroaniline	106-47-8	mg/kg	176	4	2.3%	7.1	180	BH07	2/3/2022	27	0.71	4	2.3%	250
4-Bromophenyl phenyl ether	101-55-3	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
4-Nitroaniline	100-01-6	mg/kg	176	None	None	None	None	None	None	None	0.25	None	None	None
Bis(2-chloroethyl)ether	111-44-4	mg/kg	176	None	None	None	None	None	None	None	0.12	None	None	None
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	176	None	None	None	None	None	None	None	--	NA	NA	NA
Hexachlorobenzene	118-74-1	mg/kg	176	2	1.1%	0.052	0.16	BH42	6/16/2022	10	0.44	None	None	None
Hexachloroethane	67-72-1	mg/kg	176	None	None	None	None	None	None	None	0.025	None	None	None
Pyridine	110-86-1	mg/kg	176	2	1.1%	0.45	1.1	BH37	6/15/2022	5	0.20	2	1.1%	5.5
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	176	81	46%	0.11	290	BH20	6/2/2022	16	13	31	18%	22
Butyl benzyl phthalate	85-68-7	mg/kg	176	37	21%	0.11	22	BH12	6/7/2022	38	13	2	1.1%	1.7
Diethylphthalate	84-66-2	mg/kg	176	4	2.3%	0.12	1.9	BH23	6/2/2022	22	72	None	None	None
Dimethyl phthalate	131-11-3	mg/kg	177	22	12%	0.12	64	BH11	2/7/2022	20	--	NA	NA	NA
Di-n-butyl phthalate	84-74-2	mg/kg	176	52	30%	0.12	57	BH16	9/22/2022	46	57	None	None	None
Di-n-octyl phthalate	117-84-0	mg/kg	176	38	22%	0.11	7.8	BH12	6/7/2022	38	450	None	None	None
Aniline	62-53-3	mg/kg	176	1	0.57%	14	14	BH03	2/7/2022	5	0.10	1	0.57%	140
Azobenzene	103-33-3	mg/kg	176	1	0.57%	0.20	0.20	BH03	2/7/2022	5	0.10	1	0.57%	2.0
Benzoic acid	65-85-0	mg/kg	176	46	26%	1.0	13,000	BH39	6/15/2022	13	260	4	2.3%	50
Benzyl alcohol	100-51-6	mg/kg	176	7	4.0%	0.43	400	BH39	6/15/2022	13	7.1	3	1.7%	56
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	176	None	None	None	None	None	None	None	0.25	None	None	None
Dibenzofuran	132-64-9	mg/kg	176	8	4.5%	0.19	28	BH39	6/15/2022	13	1.5	1	0.57%	19
Hexachlorobutadiene	87-68-3	mg/kg	176	None	None	None	None	None	None	None	0.16	None	None	None
Hexachlorocyclopentadiene	77-47-4	mg/kg	176	None	None	None	None	None	None	None	1.5	None	None	None
Isophorone	78-59-1	mg/kg	176	43	24%	0.077	110	BH07	2/3/2022	30	0.49	28	16%	220
N-Nitrosodimethylamine	62-75-9	mg/kg	176	1	0.57%	0.24	0.24	BH07	9/22/2022	34	0.10	1	0.57%	2.4
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	176	1	0.57%	0.45	0.45	BH23	6/2/2022	22	0.12	1	0.57%	3.8
N-Nitrosodiphenylamine	86-30-6	mg/kg	176	2	1.1%	0.38	1.5	BH01	1/24/2022	10	1.0	1	0.57%	1.5

Table 4.6a
Frequency of Detections and Exceedances in Vadose Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location Of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria (1,2)	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor (3)
Total Petroleum Hydrocarbons (TPH)														
Gasoline-range organics	GRO	mg/kg	176	42	24%	31	25,000	BH12	6/7/2022	24	30	42	24%	830
Diesel-range organics	DRO	mg/kg	176	57	32%	54	30,000	BH39	6/15/2022	13	2,000	21	12%	15
Oil-range organics	ORO	mg/kg	176	73	41%	57	12,000	BH16	2/13/2022	17	2,000	26	15%	6.0
Total TPH (U=0)	T_TPH (U=0)	mg/kg	176	80	45%	52	44,000	BH39	6/15/2022	13	--	NA	NA	NA
Total TPH (U=1/2)	T_TPH (U=1/2)	mg/kg	176	80	45%	92	44,000	BH39	6/15/2022	13	--	NA	NA	NA

Notes:

All results are rounded to two significant figures.

For sample/sample duplicates pairs, only one result per pair, per analyte, is included in the sample count per project data usage rules.

-- Value does not exist.

1 VOC and SVOC criteria based on default MTCA Method B CULs for protection of groundwater for vadose zone soil.

2 TPH criteria based on default MTCA Method A CULs for protection of direct contact.

3 Exceedance factor rounded to two significant figures.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
CAS Chemical Abstracts Service
CUL Cleanup level
cVOC Chlorinated volatile organic compound
mg/kg Milligram per kilogram
MTCA Model Toxics Control Act
NA Not applicable

Table 4.6b
Frequency of Detections and Exceedances in Vadose Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria [1,2]	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (VOCs)											
Benzene	71-43-2	mg/kg	175	168	96%	0.0010	1.8	0.027	22	13%	67
Ethylbenzene	100-41-4	mg/kg	175	125	71%	0.010	1.5	5.9	None	None	None
Toluene	108-88-3	mg/kg	175	119	68%	0.010	0.010	4.5	None	None	None
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	175	122	70%	0.020	0.035	17	None	None	None
Xylene (ortho)	95-47-6	mg/kg	175	121	69%	0.010	1.9	14	None	None	None
Xylene (total)	1330-20-7	mg/kg	175	120	69%	0.020	0.035	14	None	None	None
Total BTEX (U=0) [4]	T_BTEX (U=0)	mg/kg	175	113	65%	0.020	0.021	--	NA	NA	NA
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	mg/kg	175	113	65%	0.020	0.021	--	NA	NA	NA
Tetrachloroethene	127-18-4	mg/kg	175	138	79%	0.0010	2.4	0.050	9	5.1%	48
Trichloroethene	79-01-6	mg/kg	175	148	85%	0.0010	2.0	0.025	13	7.4%	80
Vinyl chloride	75-01-4	mg/kg	175	174	99%	0.000080	0.10	0.0017	22	13%	59
Total cVOCs (U=0) [4,6]	T_cVOC (U=0)	mg/kg	175	133	75%	0.0010	2.4	--	NA	NA	NA
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	mg/kg	175	133	75%	0.0010	2.4	--	NA	NA	NA
cis-1,2-Dichloroethene	156-59-2	mg/kg	175	172	98%	0.0010	2.2	0.079	23	13%	28
Chloroethane	75-00-3	mg/kg	175	175	100%	0.010	2.9	--	NA	NA	NA
trans-1,2-Dichloroethene	156-60-5	mg/kg	175	175	100%	0.010	3.5	0.52	7	4.0%	6.7
1,1,1-Trichloroethane	71-55-6	mg/kg	175	174	99%	0.010	3.8	1.5	6	3.4%	2.5
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	175	174	99%	0.00027	2.6	0.0012	48	27%	2,200
1,1,2-Trichloroethane	79-00-5	mg/kg	175	175	100%	0.0010	0.94	0.017	23	13%	55
1,1-Dichloroethane	75-34-3	mg/kg	175	175	100%	0.0010	1.9	0.041	23	13%	46
1,1-Dichloroethene	75-35-4	mg/kg	175	175	100%	0.0010	3.6	0.046	25	14%	78
1,2,4-Trichlorobenzene	120-82-1	mg/kg	180	152	84%	0.010	2.3	0.56	7	3.9%	4.1
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	175	175	100%	0.048	5.0	0.050	25	14%	100
1,2-Dibromoethane	106-93-4	mg/kg	175	175	100%	0.000089	0.88	0.00027	45	26%	3,300
1,2-Dichlorobenzene	95-50-1	mg/kg	180	126	70%	0.0010	1.3	7.0	None	None	None
1,2-Dichloroethane	107-06-2	mg/kg	175	175	100%	0.0010	1.1	0.023	23	13%	48
1,2-Dichloropropane	78-87-5	mg/kg	175	175	100%	0.0010	1.2	0.025	23	13%	48
1,3-Dichlorobenzene	541-73-1	mg/kg	180	176	98%	0.010	1.3	--	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	mg/kg	180	155	86%	0.010	1.6	1.2	7	3.9%	1.3
2-Hexanone	591-78-6	mg/kg	175	167	95%	0.050	6.4	0.17	18	10%	38
Acetone	67-64-1	mg/kg	175	124	71%	0.05	5	29	None	None	None
Bromodichloromethane	75-27-4	mg/kg	175	175	100%	0.0010	1.1	0.033	23	13%	33
Bromoform	75-25-2	mg/kg	175	175	100%	0.010	1.3	0.36	6	3.4%	3.6
Bromomethane	74-83-9	mg/kg	175	175	100%	0.0010	3.9	0.051	25	14%	76
Carbon disulfide	75-15-0	mg/kg	175	175	100%	0.010	2.6	4.1	None	None	None
Carbon tetrachloride	56-23-5	mg/kg	175	175	100%	0.0010	1.9	0.041	23	13%	46
Chlorobenzene	108-90-7	mg/kg	175	168	96%	0.010	1.0	0.86	6	3.4%	1.2
Chloroform	67-66-3	mg/kg	175	175	100%	0.0010	3.5	0.074	23	13%	47
Chloromethane	74-87-3	mg/kg	175	175	100%	0.010	3.4	--	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	mg/kg	175	175	100%	0.010	1.6	--	NA	NA	NA
Dichlorodifluoromethane	75-71-8	mg/kg	175	175	100%	0.010	3.7	38	None	None	None
Isopropylbenzene	98-82-8	mg/kg	175	137	78%	0.010	1.4	15	None	None	None

Table 4.6b
Frequency of Detections and Exceedances in Vadose Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria [1,2]	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (cont.)											
Methyl ethyl ketone	78-93-3	mg/kg	175	140	80%	0.050	5.0	20	None	None	None
Methyl isobutyl ketone	108-10-1	mg/kg	175	135	77%	0.050	5.0	2.7	4	2.3%	1.9
Methylene chloride	75-09-2	mg/kg	175	150	86%	0.0019	18	0.022	40	23%	820
Methyl-tert-butyl ether	1634-04-4	mg/kg	175	175	100%	0.0010	3.8	0.10	23	13%	38
Styrene	100-42-5	mg/kg	175	174	99%	0.010	1.5	2.2	None	None	None
trans-1,3-Dichloropropene	10061-02-6	mg/kg	175	175	100%	0.010	2.5	--	NA	NA	NA
Trichlorofluoromethane	75-69-4	mg/kg	175	175	100%	0.010	2.4	23	None	None	None
Total VOCs (U=0) [4,7]	T_VOC (U=0)	mg/kg	175	75	43%	0.050	0.050	--	NA	NA	NA
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	mg/kg	175	75	43%	0.050	0.050	--	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)											
Benzo(a)anthracene	56-55-3	mg/kg	176	170	97%	0.057	3.0	--	NA	NA	NA
Benzo(a)pyrene	50-32-8	mg/kg	176	175	99%	0.063	3.0	3.9	None	None	None
Benzo(b)fluoranthene	205-99-2	mg/kg	176	172	98%	0.073	3.0	--	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	mg/kg	176	173	98%	0.10	3.0	--	NA	NA	NA
Chrysene	218-01-9	mg/kg	176	166	94%	0.070	3.0	--	NA	NA	NA
Dibenzo(a,h)anthracene	53-70-3	mg/kg	176	176	100%	0.073	3.0	--	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	176	174	99%	0.080	3.0	--	NA	NA	NA
Naphthalene	91-20-3	mg/kg	176	117	66%	0.10	2.7	4.5	None	None	None
1-Methylnaphthalene	90-12-0	mg/kg	176	128	73%	0.25	18	0.25	9	5.1%	72
2-Methylnaphthalene	91-57-6	mg/kg	176	125	71%	0.25	15	1.7	7	4.0%	8.8
Total Naphthalenes [4,8]	T_Napth (U=0)	mg/kg	176	116	66%	0.25	18	--	NA	NA	NA
Total Naphthalenes (U=1/2) [5,8]	T_Napth (U=1/2)	mg/kg	176	116	66%	0.25	18	--	NA	NA	NA
Acenaphthene	83-32-9	mg/kg	176	174	99%	0.10	3.0	49	None	None	None
Acenaphthylene	208-96-8	mg/kg	176	176	100%	0.10	3.0	--	NA	NA	NA
Anthracene	120-12-7	mg/kg	176	174	99%	0.10	15	1,100	None	None	None
Benzo(g,h,i)perylene	191-24-2	mg/kg	176	174	99%	0.10	3.0	--	NA	NA	NA
Fluoranthene	206-44-0	mg/kg	176	148	84%	0.10	19	630	None	None	None
Fluorene	86-73-7	mg/kg	176	173	98%	0.10	3.6	51	None	None	None
Phenanthrene	85-01-8	mg/kg	176	132	75%	0.10	17	--	NA	NA	NA
Pyrene	129-00-0	mg/kg	176	160	91%	0.066	3.0	330	None	None	None
2-Chloronaphthalene	91-58-7	mg/kg	176	176	100%	0.10	3.3	34	None	None	None
Carbazole	86-74-8	mg/kg	176	175	99%	0.25	69	--	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	176	172	98%	0.10	5.1	4.6	2	1.1%	1.1
2,4,5-Trichlorophenol	95-95-4	mg/kg	176	176	100%	0.10	4.0	58	None	None	None
2,4,6-Trichlorophenol	88-06-2	mg/kg	176	174	99%	0.039	4.1	0.092	22	13%	45
2,4-Dichlorophenol	120-83-2	mg/kg	176	176	100%	0.24	24	0.33	25	14%	73
2,4-Dimethylphenol	105-67-9	mg/kg	176	171	97%	0.063	6.4	4.4	1	0.57%	1.5
2,4-Dinitrophenol	51-28-5	mg/kg	175	175	100%	0.10	5.4	0.17	20	11%	32
2,6-Dichlorophenol	87-65-0	mg/kg	176	176	100%	0.25	18	--	NA	NA	NA
2-Chlorophenol	95-57-8	mg/kg	176	171	97%	0.25	63	0.47	29	16%	130
2-Methylphenol	95-48-7	mg/kg	176	174	99%	0.10	22	8.1	1	0.57%	2.7
2-Nitrophenol	88-75-5	mg/kg	176	176	100%	0.10	3.1	--	NA	NA	NA

Table 4.6b
Frequency of Detections and Exceedances in Vadose Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria [1,2]	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor [3]
Semivolatile Organic Compounds (cont.)											
3- & 4-Methylphenol	15831-10-4	mg/kg	176	160	91%	0.10	27	--	NA	NA	NA
4,6-Dinitro-o-cresol	534-52-1	mg/kg	175	175	100%	0.10	18	0.10	20	11%	180
4-Chloro-3-Methylphenol	59-50-7	mg/kg	176	176	100%	0.50	32	22	1	0.57%	1.5
4-Nitrophenol	100-02-7	mg/kg	176	176	100%	0.10	5.6	--	NA	NA	NA
Pentachlorophenol	87-86-5	mg/kg	176	146	83%	0.14	93	0.18	17	9.7%	520
Phenol	108-95-2	mg/kg	176	141	80%	0.10	5.8	37	None	None	None
2,4-Dinitrotoluene	121-14-2	mg/kg	176	175	99%	0.034	2.2	0.034	24	14%	65
2,6-Dinitrotoluene	606-20-2	mg/kg	176	175	99%	0.037	3.8	0.046	25	14%	83
Nitrobenzene	98-95-3	mg/kg	176	176	100%	0.034	1.9	0.10	18	10%	19
2-Nitroaniline	88-74-4	mg/kg	176	176	100%	0.10	3.0	1.0	4	2.3%	3.0
3,3'-Dichlorobenzidine	91-94-1	mg/kg	176	176	100%	0.17	11	0.21	29	16%	52
3-Nitroaniline	99-09-2	mg/kg	176	176	100%	1.0	60	--	NA	NA	NA
4-Chloroaniline	106-47-8	mg/kg	176	172	98%	0.56	56	0.71	24	14%	79
4-Bromophenyl phenyl ether	101-55-3	mg/kg	176	176	100%	0.10	23	--	NA	NA	NA
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	176	176	100%	0.10	4.3	--	NA	NA	NA
4-Nitroaniline	100-01-6	mg/kg	176	176	100%	0.25	13	0.25	20	11%	52
Bis(2-chloroethyl)ether	111-44-4	mg/kg	176	176	100%	0.095	62	0.12	33	19%	520
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	176	176	100%	0.25	81	--	NA	NA	NA
Hexachlorobenzene	118-74-1	mg/kg	176	174	99%	0.035	23	0.44	7	4.0%	52
Hexachloroethane	67-72-1	mg/kg	176	176	100%	0.020	13	0.025	35	20%	520
Pyridine	110-86-1	mg/kg	176	174	99%	0.20	28	0.20	31	18%	140
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	176	95	54%	0.10	1.4	13	None	None	None
Butyl benzyl phthalate	85-68-7	mg/kg	176	139	79%	0.050	1.4	13	None	None	None
Diethylphthalate	84-66-2	mg/kg	176	172	98%	0.10	4.3	72	None	None	None
Dimethyl phthalate	131-11-3	mg/kg	177	155	88%	0.10	4.3	--	NA	NA	NA
Di-n-butyl phthalate	84-74-2	mg/kg	176	124	70%	0.10	22	57	None	None	None
Di-n-octyl phthalate	117-84-0	mg/kg	176	138	78%	0.049	3.0	450	None	None	None
Aniline	62-53-3	mg/kg	176	175	99%	0.10	30	0.10	32	18%	300
Azobenzene	103-33-3	mg/kg	176	175	99%	0.10	28	0.10	18	10%	280
Benzoic acid	65-85-0	mg/kg	176	130	74%	1.0	71	260	None	None	None
Benzyl alcohol	100-51-6	mg/kg	176	169	96%	0.10	7.4	7.1	1	0.57%	1.0
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	176	176	100%	0.25	12	0.25	21	12%	48
Dibenzofuran	132-64-9	mg/kg	176	168	95%	0.10	3.3	1.5	3	1.7%	2.2
Hexachlorobutadiene	87-68-3	mg/kg	176	176	100%	0.13	13	0.16	26	15%	81
Hexachlorocyclopentadiene	77-47-4	mg/kg	176	176	100%	0.10	3.0	1.5	4	2.3%	2.0
Isophorone	78-59-1	mg/kg	176	133	76%	0.069	7.0	0.49	7	4.0%	14
N-Nitrosodimethylamine	62-75-9	mg/kg	176	175	99%	0.10	17	0.10	32	18%	170
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	176	175	99%	0.092	60	0.12	33	19%	500
N-Nitrosodiphenylamine	86-30-6	mg/kg	176	174	99%	0.034	22	1.0	3	1.7%	22

Table 4.6b
Frequency of Detections and Exceedances in Vadose Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria (1,2)	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor (3)
Total Petroleum Hydrocarbons (TPH)											
Gasoline-range organics	GRO	mg/kg	176	134	76%	25	10,000	30	16	9.1%	330
Diesel-range organics	DRO	mg/kg	176	119	68%	50	7,500	2,000	9	5.1%	3.8
Oil-range organics	ORO	mg/kg	176	103	59%	50	1,000	2,000	None	None	None
Total TPH (U=0)	T_TPH (U=0)	mg/kg	176	96	55%	50	50	--	NA	NA	NA
Total TPH (U=1/2)	T_TPH (U=1/2)	mg/kg	176	96	55%	50	50	--	NA	NA	NA

Notes:

All results are rounded to two significant figures.

For sample/sample duplicates pairs, only one result per pair, per analyte, is included in the sample count per project data usage rules.

-- Value does not exist.

1 VOC and SVOC criteria based on default MTCA Method B CULs for protection of groundwater for vadose zone soil.

2 TPH criteria based on default MTCA Method A CULs for protection of direct contact.

3 Exceedance factor rounded to two significant figures.

4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.

5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.

8 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
CAS Chemical Abstracts Service
CUL Cleanup level
cVOC Chlorinated volatile organic compound
mg/kg Milligram per kilogram
MTCA Model Toxics Control Act
NA Not applicable

Table 4.7a
Frequency of Detections and Exceedances in Saturated Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria [1,2]	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (VOCs)														
Benzene	71-43-2	mg/kg	12	None	None	None	None	None	None	None	0.0017	None	None	None
Ethylbenzene	100-41-4	mg/kg	12	None	None	None	None	None	None	None	0.34	None	None	None
Toluene	108-88-3	mg/kg	12	None	None	None	None	None	None	None	0.27	None	None	None
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	12	None	None	None	None	None	None	None	0.96	None	None	None
Xylene (ortho)	95-47-6	mg/kg	12	None	None	None	None	None	None	None	0.84	None	None	None
Xylene (total)	1330-20-7	mg/kg	12	None	None	None	None	None	None	None	0.83	None	None	None
Total BTEX (U=0) [4]	T_BTEX (U=0)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Tetrachloroethene	127-18-4	mg/kg	12	None	None	None	None	None	None	None	0.0028	None	None	None
Trichloroethene	79-01-6	mg/kg	12	None	None	None	None	None	None	None	0.0015	None	None	None
Vinyl chloride	75-01-4	mg/kg	12	None	None	None	None	None	None	None	0.000090	None	None	None
TotalcVOCs (U=0) [4,6]	T_cVOC (U=0)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Total cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
cis-1,2-Dichloroethene	75-00-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Chloroethane	156-59-2	mg/kg	12	None	None	None	None	None	None	None	0.0052	None	None	None
trans-1,2-Dichloroethene	156-60-5	mg/kg	12	None	None	None	None	None	None	None	0.032	None	None	None
1,1,1-Trichloroethane	71-55-6	mg/kg	12	None	None	None	None	None	None	None	0.084	None	None	None
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	12	None	None	None	None	None	None	None	0.00032	None	None	None
1,1,2-Trichloroethane	79-00-5	mg/kg	12	None	None	None	None	None	None	None	0.0011	None	None	None
1,1-Dichloroethane	75-34-3	mg/kg	12	None	None	None	None	None	None	None	0.0026	None	None	None
1,1-Dichloroethene	75-35-4	mg/kg	12	None	None	None	None	None	None	None	0.0025	None	None	None
1,2,4-Trichlorobenzene	120-82-1	mg/kg	12	None	None	None	None	None	None	None	0.029	None	None	None
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	12	None	None	None	None	None	None	None	0.050	None	None	None
1,2-Dibromoethane	106-93-4	mg/kg	12	None	None	None	None	None	None	None	0.00011	None	None	None
1,2-Dichlorobenzene	95-50-1	mg/kg	12	2	17%	0.0021	0.0031	BH07	2/3/2022	63	0.40	None	None	None
1,2-Dichloroethane	107-06-2	mg/kg	12	None	None	None	None	None	None	None	0.0016	None	None	None
1,2-Dichloropropane	78-87-5	mg/kg	12	None	None	None	None	None	None	None	0.0017	None	None	None
1,3-Dichlorobenzene	541-73-1	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	mg/kg	12	None	None	None	None	None	None	None	0.068	None	None	None
2-Hexanone	591-78-6	mg/kg	12	None	None	None	None	None	None	None	0.050	None	None	None
Acetone	67-64-1	mg/kg	12	None	None	None	None	None	None	None	2.1	None	None	None
Bromodichloromethane	75-27-4	mg/kg	12	None	None	None	None	None	None	None	0.0022	None	None	None
Bromoform	75-25-2	mg/kg	12	None	None	None	None	None	None	None	0.023	None	None	None
Bromomethane	74-83-9	mg/kg	12	None	None	None	None	None	None	None	0.0033	None	None	None
Carbon disulfide	75-15-0	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
Carbon tetrachloride	56-23-5	mg/kg	12	None	None	None	None	None	None	None	0.0022	None	None	None
Chlorobenzene	108-90-7	mg/kg	12	None	None	None	None	None	None	None	0.051	None	None	None
Chloroform	67-66-3	mg/kg	12	None	None	None	None	None	None	None	0.0048	None	None	None
Chloromethane	74-87-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA

Table 4.7a
Frequency of Detections and Exceedances in Saturated Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria [1,2]	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor [3]
Volatile Organic Compounds (cont.)														
cis-1,3-Dichloropropene	10061-01-5	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Dichlorodifluoromethane	75-71-8	mg/kg	12	None	None	None	None	None	None	None	0.53	None	None	None
Isopropylbenzene	98-82-8	mg/kg	12	None	None	None	None	None	None	None	0.79	None	None	None
Methyl ethyl ketone	78-93-3	mg/kg	12	None	None	None	None	None	None	None	1.4	None	None	None
Methyl isobutyl ketone	108-10-1	mg/kg	12	None	None	None	None	None	None	None	0.19	None	None	None
Methylene chloride	75-09-2	mg/kg	12	1	8.3%	0.0026	0.0026	BH01	1/25/2022	60	0.0023	1	8.3%	1.1
Methyl-tert-butyl ether	1634-04-4	mg/kg	12	None	None	None	None	None	None	None	0.0072	None	None	None
Styrene	100-42-5	mg/kg	12	None	None	None	None	None	None	None	0.12	None	None	None
trans-1,3-Dichloropropene	10061-02-6	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Trichlorofluoromethane	75-69-4	mg/kg	12	None	None	None	None	None	None	None	0.79	None	None	None
Total VOCs (U=0) [4,7]	T_VOC (U=0)	mg/kg	12	3	25%	0.0021	0.0031	BH07	2/3/2022	63	--	NA	NA	NA
Total VOCs (U=1/2) [5,7]	T_VOC (U=1/2)	mg/kg	12	3	25%	0.24	0.24	BH07	2/3/2022	63	--	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)														
Benzo(a)anthracene	56-55-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Benzo(a)pyrene	50-32-8	mg/kg	12	None	None	None	None	None	None	None	0.19	None	None	None
Benzo(b)fluoranthene	205-99-2	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Chrysene	218-01-9	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Dibenzo(a,h)anthracene	53-70-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Naphthalene	91-20-3	mg/kg	12	None	None	None	None	None	None	None	0.24	None	None	None
1-Methylnaphthalene	90-12-0	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
2-Methylnaphthalene	91-57-6	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
Total Naphthalenes [4,8]	T_Napth (U=0)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Total Naphthalenes (U=1/2) [5,8]	T_Napth (U=1/2)	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Acenaphthene	83-32-9	mg/kg	12	None	None	None	None	None	None	None	2.5	None	None	None
Acenaphthylene	208-96-8	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Anthracene	120-12-7	mg/kg	12	None	None	None	None	None	None	None	57	None	None	None
Benzo(g,h,i)perylene	191-24-2	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Fluoranthene	206-44-0	mg/kg	12	None	None	None	None	None	None	None	32	None	None	None
Fluorene	86-73-7	mg/kg	12	None	None	None	None	None	None	None	2.6	None	None	None
Phenanthrene	85-01-8	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Pyrene	129-00-0	mg/kg	12	None	None	None	None	None	None	None	16	None	None	None
2-Chloronaphthalene	91-58-7	mg/kg	12	None	None	None	None	None	None	None	1.8	None	None	None
Carbazole	86-74-8	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	12	None	None	None	None	None	None	None	0.27	None	None	None
2,4,5-Trichlorophenol	95-95-4	mg/kg	12	None	None	None	None	None	None	None	3.0	None	None	None
2,4,6-Trichlorophenol	88-06-2	mg/kg	12	None	None	None	None	None	None	None	0.049	None	None	None
2,4-Dichlorophenol	120-83-2	mg/kg	12	None	None	None	None	None	None	None	0.31	None	None	None

Table 4.7a
Frequency of Detections and Exceedances in Saturated Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria (1,2)	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor (3)
Semivolatile Organic Compounds (cont.)														
2,4-Dimethylphenol	105-67-9	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
2,4-Dinitrophenol	51-28-5	mg/kg	12	None	None	None	None	None	None	None	0.17	None	None	None
2,6-Dichlorophenol	87-65-0	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
2-Chlorophenol	95-57-8	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
2-Methylphenol	95-48-7	mg/kg	12	None	None	None	None	None	None	None	0.47	None	None	None
2-Nitrophenol	88-75-5	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
3- & 4-Methylphenol	15831-10-4	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
4,6-Dinitro-o-cresol	534-52-1	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
4-Chloro-3-Methylphenol	59-50-7	mg/kg	12	None	None	None	None	None	None	None	1.2	None	None	None
4-Nitrophenol	100-02-7	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Pentachlorophenol	87-86-5	mg/kg	12	None	None	None	None	None	None	None	0.18	None	None	None
Phenol	108-95-2	mg/kg	12	None	None	None	None	None	None	None	2.3	None	None	None
2,4-Dinitrotoluene	121-14-2	mg/kg	12	None	None	None	None	None	None	None	0.034	None	None	None
2,6-Dinitrotoluene	606-20-2	mg/kg	12	None	None	None	None	None	None	None	0.046	None	None	None
Nitrobenzene	98-95-3	mg/kg	12	None	None	None	None	None	None	None	0.034	None	None	None
2-Nitroaniline	88-74-4	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
3,3'-Dichlorobenzidine	91-94-1	mg/kg	12	None	None	None	None	None	None	None	0.21	None	None	None
3-Nitroaniline	99-09-2	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
4-Chloroaniline	106-47-8	mg/kg	12	None	None	None	None	None	None	None	0.71	None	None	None
4-Bromophenyl phenyl ether	101-55-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
4-Nitroaniline	100-01-6	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
Bis(2-chloroethyl)ether	111-44-4	mg/kg	12	None	None	None	None	None	None	None	0.12	None	None	None
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Hexachlorobenzene	118-74-1	mg/kg	12	None	None	None	None	None	None	None	0.045	None	None	None
Hexachloroethane	67-72-1	mg/kg	12	None	None	None	None	None	None	None	0.025	None	None	None
Pyridine	110-86-1	mg/kg	12	None	None	None	None	None	None	None	0.20	None	None	None
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	12	1	8.3%	0.97	0.97	BH16	2/13/2022	62	0.67	1	8.3%	1.4
Butyl benzyl phthalate	85-68-7	mg/kg	12	None	None	None	None	None	None	None	0.65	None	None	None
Diethylphthalate	84-66-2	mg/kg	12	None	None	None	None	None	None	None	4.7	None	None	None
Dimethyl phthalate	131-11-3	mg/kg	12	None	None	None	None	None	None	None	--	NA	NA	NA
Di-n-butyl phthalate	84-74-2	mg/kg	12	1	8.3%	0.27	0.27	BH16	2/13/2022	62	3.0	None	None	None
Di-n-octyl phthalate	117-84-0	mg/kg	12	None	None	None	None	None	None	None	23	None	None	None
Aniline	62-53-3	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
Azobenzene	103-33-3	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
Benzoic acid	65-85-0	mg/kg	12	1	8.3%	1.5	1.5	BH16	2/13/2022	62	18	None	None	None
Benzyl alcohol	100-51-6	mg/kg	12	None	None	None	None	None	None	None	0.49	None	None	None
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	12	None	None	None	None	None	None	None	0.25	None	None	None
Dibenzofuran	132-64-9	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None

Table 4.7a
Frequency of Detections and Exceedances in Saturated Zone—Detected Results

Analyte	CAS No.	Unit	Number of Results	Number of Detects	Percentage of Detects	Minimum Detected Value	Maximum Detected Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect (feet bgs)	Adjusted Screening Level Criteria (1,2)	Number of Detect Exceedances	Percentage of Detects Exceeding Criteria	Exceedance Factor (3)
Semivolatile Organic Compounds (cont.)														
Hexachlorobutadiene	87-68-3	mg/kg	12	None	None	None	None	None	None	None	0.16	None	None	None
Hexachlorocyclopentadiene	77-47-4	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
Isophorone	78-59-1	mg/kg	12	None	None	None	None	None	None	None	0.087	None	None	None
N-Nitrosodimethylamine	62-75-9	mg/kg	12	None	None	None	None	None	None	None	0.10	None	None	None
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	12	None	None	None	None	None	None	None	0.12	None	None	None
N-Nitrosodiphenylamine	86-30-6	mg/kg	12	None	None	None	None	None	None	None	0.052	None	None	None
Total Petroleum Hydrocarbons (TPH)														
Gasoline-range organics	GRO	mg/kg	12	None	None	None	None	None	None	None	30	None	None	None
Diesel-range organics	DRO	mg/kg	12	None	None	None	None	None	None	None	2,000	None	None	None
Oil-range organics	ORO	mg/kg	12	1	8.3%	89	89	BH16	2/13/2022	62	2,000	None	None	None
Total TPH (U=0)	T_TPH (U=0)	mg/kg	12	1	8.3%	89	89	BH16	2/13/2022	62	--	NA	NA	NA
Total TPH (U=1/2)	T_TPH (U=1/2)	mg/kg	12	1	8.3%	130	130	BH16	2/13/2022	62	--	NA	NA	NA

Notes:

All results are rounded to two significant figures.
For sample/sample duplicates pairs, only one result per pair, per analyte, is included in the sample count per project data usage rules.
-- Value does not exist.
1 VOC and SVOC criteria based on default MTCA Method B CULs for protection of groundwater for saturated zone soil.
2 TPH criteria based on default MTCA Method A CULs for protection of direct contact.
3 Exceedance factor rounded to two significant figures.
4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.
5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.
7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.
8 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
CAS Chemical Abstracts Service
CUL Cleanup level
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
NA Not applicable

Table 4.7b
Frequency of Detections and Exceedances in Saturated Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria [1,2,3]	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor [4]
Volatile Organic Compounds (VOCs)											
Benzene	71-43-2	mg/kg	12	12	100%	0.0010	0.0010	0.0017	None	None	None
Ethylbenzene	100-41-4	mg/kg	12	12	100%	0.010	0.010	0.34	None	None	None
Toluene	108-88-3	mg/kg	12	12	100%	0.010	0.010	0.27	None	None	None
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	12	12	100%	0.020	0.020	0.96	None	None	None
Xylene (ortho)	95-47-6	mg/kg	12	12	100%	0.010	0.010	0.84	None	None	None
Xylene (total)	1330-20-7	mg/kg	12	12	100%	0.020	0.020	0.83	None	None	None
Total BTEX (U=0) [4]	T_BTEX (U=0)	mg/kg	12	12	100%	0.020	0.020	--	NA	NA	NA
Total BTEX (U=1/2) [5]	T_BTEX (U=1/2)	mg/kg	12	12	100%	0.020	0.020	--	NA	NA	NA
Tetrachloroethene	127-18-4	mg/kg	12	12	100%	0.0010	0.0010	0.0028	None	None	None
Trichloroethene	79-01-6	mg/kg	12	12	100%	0.0010	0.0010	0.0015	None	None	None
Vinyl chloride	75-01-4	mg/kg	12	12	100%	0.000080	0.000080	0.000090	None	None	None
Selected cVOCs (U=0) [4,6]	T_cVOC (U=0)	mg/kg	12	12	100%	0.0010	0.0010	--	NA	NA	NA
Selected cVOCs (U=1/2) [5,6]	T_cVOC (U=1/2)	mg/kg	12	12	100%	0.0010	0.0010	--	NA	NA	NA
Chloroethane	75-00-3	mg/kg	12	12	100%	0.010	0.010	--	NA	NA	NA
cis-1,2-Dichloroethene	156-59-2	mg/kg	12	12	100%	0.0010	0.0010	0.0052	None	None	None
trans-1,2-Dichloroethene	156-60-5	mg/kg	12	12	100%	0.010	0.010	0.032	None	None	None
1,1,1-Trichloroethane	71-55-6	mg/kg	12	12	100%	0.010	0.010	0.084	None	None	None
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	12	12	100%	0.00025	0.00040	0.00032	6	50%	1.3
1,1,2-Trichloroethane	79-00-5	mg/kg	12	12	100%	0.0010	0.0010	0.0011	None	None	None
1,1-Dichloroethane	75-34-3	mg/kg	12	12	100%	0.0010	0.0010	0.0026	None	None	None
1,1-Dichloroethene	75-35-4	mg/kg	12	12	100%	0.0010	0.0010	0.0025	None	None	None
1,2,4-Trichlorobenzene	120-82-1	mg/kg	12	12	100%	0.010	0.010	0.029	None	None	None
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	12	12	100%	0.050	0.050	0.050	None	None	None
1,2-Dibromoethane	106-93-4	mg/kg	12	12	100%	0.000084	0.00013	0.00011	3	25%	1.2
1,2-Dichlorobenzene	95-50-1	mg/kg	12	10	83%	0.0010	0.0010	0.40	None	None	None
1,2-Dichloroethane	107-06-2	mg/kg	12	12	100%	0.0010	0.0010	0.0016	None	None	None
1,2-Dichloropropane	78-87-5	mg/kg	12	12	100%	0.0010	0.0010	0.0017	None	None	None
1,3-Dichlorobenzene	541-73-1	mg/kg	12	12	100%	0.010	0.010	--	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	mg/kg	12	12	100%	0.010	0.010	0.068	None	None	None
2-Hexanone	591-78-6	mg/kg	12	12	100%	0.050	0.050	0.050	None	None	None
Acetone	67-64-1	mg/kg	12	12	100%	0.050	0.050	2.1	None	None	None
Bromodichloromethane	75-27-4	mg/kg	12	12	100%	0.0010	0.0010	0.0022	None	None	None
Bromoform	75-25-2	mg/kg	12	12	100%	0.010	0.010	0.023	None	None	None
Bromomethane	74-83-9	mg/kg	12	12	100%	0.0010	0.0010	0.0033	None	None	None
Carbon disulfide	75-15-0	mg/kg	12	12	100%	0.010	0.010	0.25	None	None	None
Carbon tetrachloride	56-23-5	mg/kg	12	12	100%	0.0010	0.0010	0.0022	None	None	None
Chlorobenzene	108-90-7	mg/kg	12	12	100%	0.010	0.010	0.051	None	None	None
Chloroform	67-66-3	mg/kg	12	12	100%	0.0010	0.0010	0.0048	None	None	None
Chloromethane	74-87-3	mg/kg	12	12	100%	0.010	0.010	--	NA	NA	NA

Table 4.7b
Frequency of Detections and Exceedances in Saturated Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria (1,2,3)	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor (4)
Volatile Organic Compounds (cont.)											
cis-1,3-Dichloropropene	10061-01-5	mg/kg	12	12	100%	0.010	0.010	--	NA	NA	NA
Dichlorodifluoromethane	75-71-8	mg/kg	12	12	100%	0.010	0.010	0.53	None	None	None
Isopropylbenzene	98-82-8	mg/kg	12	12	100%	0.010	0.010	0.79	None	None	None
Methyl ethyl ketone	78-93-3	mg/kg	12	12	100%	0.050	0.050	1.4	None	None	None
Methyl isobutyl ketone	108-10-1	mg/kg	12	12	100%	0.050	0.050	0.19	None	None	None
Methylene chloride	75-09-2	mg/kg	12	11	92%	0.0018	0.0050	0.0023	8	67%	2.2
Methyl-tert-butyl ether	1634-04-4	mg/kg	12	12	100%	0.0010	0.0010	0.0072	None	None	None
Styrene	100-42-5	mg/kg	12	12	100%	0.010	0.010	0.12	None	None	None
trans-1,3-Dichloropropene	10061-02-6	mg/kg	12	12	100%	0.010	0.010	--	NA	NA	NA
Trichlorofluoromethane	75-69-4	mg/kg	12	12	100%	0.010	0.010	0.79	None	None	None
Total VOCs (U=0) (4,7)	T_VOC (U=0)	mg/kg	12	9	75%	0.050	0.050	--	NA	NA	NA
Total VOCs (U=1/2) (5,7)	T_VOC (U=1/2)	mg/kg	12	9	75%	0.050	0.050	--	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)											
Benzo(a)anthracene	56-55-3	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Benzo(a)pyrene	50-32-8	mg/kg	12	12	100%	0.10	0.10	0.19	None	None	None
Benzo(b)fluoranthene	205-99-2	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Chrysene	218-01-9	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Dibenzo(a,h)anthracene	53-70-3	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Naphthalene	91-20-3	mg/kg	12	12	100%	0.10	0.10	0.24	None	None	None
1-Methylnaphthalene	90-12-0	mg/kg	12	12	100%	0.25	0.25	0.25	None	None	None
2-Methylnaphthalene	91-57-6	mg/kg	12	12	100%	0.25	0.25	0.25	None	None	None
Total Naphthalenes (4,8)	T_Napth (U=0)	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Total Naphthalenes (U=1/2) (5,8)	T_Napth (U=1/2)	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Acenaphthene	83-32-9	mg/kg	12	12	100%	0.10	0.10	2.5	None	None	None
Acenaphthylene	208-96-8	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Anthracene	120-12-7	mg/kg	12	12	100%	0.10	0.10	57	None	None	None
Benzo(g,h,i)perylene	191-24-2	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Fluoranthene	206-44-0	mg/kg	12	12	100%	0.10	0.10	32	None	None	None
Fluorene	86-73-7	mg/kg	12	12	100%	0.10	0.10	2.6	None	None	None
Phenanthrene	85-01-8	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Pyrene	129-00-0	mg/kg	12	12	100%	0.10	0.10	16	None	None	None
2-Chloronaphthalene	91-58-7	mg/kg	12	12	100%	0.10	0.10	1.8	None	None	None
Carbazole	86-74-8	mg/kg	12	12	100%	0.25	0.25	--	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	12	12	100%	0.10	0.10	0.27	None	None	None
2,4,5-Trichlorophenol	95-95-4	mg/kg	12	12	100%	0.10	0.10	3.0	None	None	None
2,4,6-Trichlorophenol	88-06-2	mg/kg	12	12	100%	0.042	0.051	0.049	1	8.3%	1.0
2,4-Dichlorophenol	120-83-2	mg/kg	12	12	100%	0.26	0.32	0.31	1	8.3%	1.0

Table 4.7b
Frequency of Detections and Exceedances in Saturated Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria (1,2,3)	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor (4)
Semivolatile Organic Compounds (cont.)											
2,4-Dimethylphenol	105-67-9	mg/kg	12	12	100%	0.067	0.083	0.25	None	None	None
2,4-Dinitrophenol	51-28-5	mg/kg	12	12	100%	0.17	0.17	0.17	None	None	None
2,6-Dichlorophenol	87-65-0	mg/kg	12	12	100%	0.25	0.25	--	NA	NA	NA
2-Chlorophenol	95-57-8	mg/kg	12	12	100%	0.25	0.25	0.25	None	None	None
2-Methylphenol	95-48-7	mg/kg	12	12	100%	0.10	0.10	0.47	None	None	None
2-Nitrophenol	88-75-5	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
3- & 4-Methylphenol	15831-10-4	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
4,6-Dinitro-o-cresol	534-52-1	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
4-Chloro-3-Methylphenol	59-50-7	mg/kg	12	12	100%	0.50	0.50	1.2	None	None	None
4-Nitrophenol	100-02-7	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Pentachlorophenol	87-86-5	mg/kg	12	12	100%	0.15	0.19	0.18	1	8.3%	1.1
Phenol	108-95-2	mg/kg	12	12	100%	0.10	0.10	2.3	None	None	None
2,4-Dinitrotoluene	121-14-2	mg/kg	12	12	100%	0.034	0.034	0.034	None	None	None
2,6-Dinitrotoluene	606-20-2	mg/kg	12	12	100%	0.039	0.048	0.046	1	8.3%	1.0
Nitrobenzene	98-95-3	mg/kg	12	12	100%	0.034	0.034	0.034	None	None	None
2-Nitroaniline	88-74-4	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
3,3'-Dichlorobenzidine	91-94-1	mg/kg	12	12	100%	0.18	0.22	0.21	1	8.3%	1.0
3-Nitroaniline	99-09-2	mg/kg	12	12	100%	1.0	1.0	--	NA	NA	NA
4-Chloroaniline	106-47-8	mg/kg	12	12	100%	0.59	0.73	0.71	1	8.3%	1.0
4-Bromophenyl phenyl ether	101-55-3	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
4-Nitroaniline	100-01-6	mg/kg	12	12	100%	0.25	0.25	0.25	None	None	None
Bis(2-chloroethyl)ether	111-44-4	mg/kg	12	12	100%	0.10	0.12	0.12	None	None	None
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	12	12	100%	0.25	0.25	--	NA	NA	NA
Hexachlorobenzene	118-74-1	mg/kg	12	12	100%	0.038	0.046	0.045	1	8.3%	1.0
Hexachloroethane	67-72-1	mg/kg	12	12	100%	0.021	0.026	0.025	1	8.3%	1.0
Pyridine	110-86-1	mg/kg	12	12	100%	0.20	0.20	0.20	None	None	None
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	12	11	92%	0.10	0.10	0.67	None	None	None
Butyl benzyl phthalate	85-68-7	mg/kg	12	12	100%	0.10	0.10	0.65	None	None	None
Diethylphthalate	84-66-2	mg/kg	12	12	100%	0.10	0.10	4.7	None	None	None
Dimethyl phthalate	131-11-3	mg/kg	12	12	100%	0.10	0.10	--	NA	NA	NA
Di-n-butyl phthalate	84-74-2	mg/kg	12	11	92%	0.10	0.10	3.0	None	None	None
Di-n-octyl phthalate	117-84-0	mg/kg	12	12	100%	0.10	0.10	23	None	None	None
Aniline	62-53-3	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
Azobenzene	103-33-3	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
Benzoic acid	65-85-0	mg/kg	12	11	92%	1.0	1.0	18	None	None	None
Benzyl alcohol	100-51-6	mg/kg	12	12	100%	0.10	0.10	0.49	None	None	None
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	12	12	100%	0.25	0.25	0.25	None	None	None
Dibenzofuran	132-64-9	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None

Table 4.7b
Frequency of Detections and Exceedances in Saturated Zone—Non-Detect Results

Analyte	CAS No.	Unit	Number of Results	Number of Non-Detects	Percentage of Non-Detects	Minimum Non-Detect Value	Maximum Non-Detect Value	Adjusted Screening Level Criteria (1,2,3)	Number of Non-Detects Exceeding Criteria	Percentage of Non-Detects Exceeding Criteria	Exceedance Factor (4)
Semivolatile Organic Compounds (cont.)											
Hexachlorobutadiene	87-68-3	mg/kg	12	12	100%	0.14	0.17	0.16	1	8.3%	1.1
Hexachlorocyclopentadiene	77-47-4	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
Isophorone	78-59-1	mg/kg	12	12	100%	0.074	0.091	0.087	1	8.3%	1.0
N-Nitrosodimethylamine	62-75-9	mg/kg	12	12	100%	0.10	0.10	0.10	None	None	None
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	12	12	100%	0.098	0.12	0.12	None	None	None
N-Nitrosodiphenylamine	86-30-6	mg/kg	12	12	100%	0.036	0.044	0.052	None	None	None
Total Petroleum Hydrocarbons (TPH)											
Gasoline-range organics (7)	GRO	mg/kg	12	12	100%	25	25	30	None	None	None
Diesel-range organics (7)	DRO	mg/kg	12	12	100%	50	50	2,000	None	None	None
Oil-range organics	ORO	mg/kg	12	11	92%	50	50	2,000	None	None	None
Total TPH (U=0)	T_TPH (U=0)	mg/kg	12	11	92%	50	50	--	NA	NA	NA
Total TPH (U=1/2)	T_TPH (U=0)	mg/kg	12	11	92%	50	50	--	NA	NA	NA

Notes:

All results are rounded to two significant figures.
For sample/sample duplicates pairs, only one result per pair, per analyte, is included in the sample count per project data usage rules.
-- Value does not exist.
1 VOC and SVOC criteria based on default MTCA Method B CULs for protection of groundwater for saturated zone soil.
2 TPH criteria based on default MTCA Method A CULs for protection of direct contact.
3 Exceedance factor rounded to two significant figures.
4 Summation was performed using only detected concentrations for component analytes. If all analytes were not detected, the maximum reported non-detect concentration is used.
5 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.
7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.
8 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and xylenes
CAS Chemical Abstracts Service
CUL Cleanup level
cVOC Chlorinated volatile organic compound
mg/kg Milligram per kilogram
MTCA Model Toxics Control Act
NA Not applicable

Table 5.2
PEC Data Compared to RELs

			Analyte	Total BTEX (1)	Total cVOCs (1,2)	Total Naphthalenes (1,3)	Gasoline-Range Organics	Diesel-Range Organics
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			Remediation Level	250	1.0	65	1,000	2,000
Location Name	Sample Name	Date	Sample Depth (feet bgs)					
BH01	PLF-PEC-BH01-10-012422	1/24/2022	10	0.021 U	0.0010 U	0.37	25 U	240
	PLF-PEC-BH01-14-012422	1/24/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH01-35-012522	1/25/2022	35	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH01-60-012522	1/25/2022	60	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH01-61-012522	1/25/2022	61	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH02	PLF-PEC-BH02-11-012622	1/26/2022	11	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH02-14-012622	1/26/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH02-22-012622	1/26/2022	22	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH02-54-013122	1/31/2022	54	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-DUP1-013122	1/31/2022	54	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH03	PLF-PEC-BH03-05-020722	2/7/2022	5	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH03-14-020722	2/7/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-DUP2-020722	2/7/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH03-25-020722	2/7/2022	25	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH03-56-020722	2/7/2022	56	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH04	PLF-PEC-BH04-11-013122	1/31/2022	11	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH04-14-013122	1/31/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH04-25-020122	2/1/2022	25	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH04-38-020122	2/1/2022	38	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH05	PLF-PEC-BH05-11-020422	2/4/2022	11	15	0.27 U	27	790	**2,100**
	PLF-PEC-BH05-17-020422	2/4/2022	17	**280**	*1.4 U*	**140**	**4,900**	**6,500**
	PLF-PEC-BH05-23-020422	2/4/2022	23	0.021 U	0.0010 U	11	300	1,600
	PLF-PEC-BH05-36-020422	2/4/2022	36	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH05-44-020422	2/4/2022	44	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH05-61-020422	2/4/2022	61	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH06	PLF-PEC-BH06-12-020122	2/1/2022	12	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH06-14-020122	2/1/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH06-24-020122	2/1/2022	24	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH06-44-020222	2/2/2022	44	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH07	PLF-PEC-BH07-12-020222	2/2/2022	12	**470**	**19**	1.6	**3,000**	100 U
	PLF-PEC-BH07-15-020222	2/2/2022	15	24	0.48	3.0 U	40	**3,100**
	PLF-PEC-BH07-27-020322	2/3/2022	27	--	--	9.4	66	**3,300**
	PLF-PEC-BH07-30-020322	2/3/2022	30	37	0.20 U	9.10	660	**3,000**
	PLF-BH07a-34-092222	9/22/2022	34	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH07a-41-092222	9/22/2022	41	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH07-53-020322	2/3/2022	53	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH07-63-020322	2/3/2022	63	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH08	PLF-PEC-BH08-05-021122	2/11/2022	5	0.021 U	0.0062	0.30 U	25 U	50 U
	PLF-PEC-BH08-18-021122	2/11/2022	18	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH08-24-021122	2/11/2022	24	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH08-37-021222	2/12/2022	37	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH08-61-021222	2/12/2022	61	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-DUP5-021222	2/12/2022	61	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH09	PLF-BH09-15-060622	6/6/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH09-16-060622	6/6/2022	16	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH09-23-060622	6/6/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH09-32-060622	6/6/2022	32	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH10	PLF-PEC-BH10-03-020922	2/9/2022	3	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH10-12-020922	2/9/2022	12	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH10-39-021022	2/10/2022	39	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH10-54-021022	2/10/2022	54	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH11	PLF-PEC-BH11-12-020722	2/7/2022	12	170	*2.0 U*	**120**	**4,900**	**4,200**
	PLF-PEC-BH11-20-020722	2/7/2022	20	0.93	0.013 U	0.30 U	25 U	64
	PLF-PEC-DUP3-020722	2/7/2022	20	140	*1.6 U*	**78**	**3,500**	**4,000**
	PLF-PEC-BH11-48-020822	2/8/2022	48	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH11-57-020822	2/8/2022	57	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH12	PLF-BH12-05-060722	6/7/2022	5	77	0.85	43	**2,800**	1,900 U
	PLF-BH12-21-060722	6/7/2022	21	**3,100**	**13**	51	**15,000**	*3,800 U*
	PLF-BH12-24-060722	6/7/2022	24	**3,100**	**25**	**69**	**11,000**	*5,000 U*
	PLF-DUP12-060722	6/7/2022	24	**5,300**	**57**	**100**	**25,000**	*5,000 U*
	PLF-BH12-27-060722	6/7/2022	27	0.67	0.018 U	0.39	25 U	150
	PLF-BH12-38-060722	6/7/2022	38	0.021 U	0.0017	1.90	25 U	*2,500 U*
BH13	PLF-BH13-04-061522	6/15/2022	4	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH13-18-061522	6/15/2022	18	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH13-23-061522	6/15/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH13-33-061522	6/15/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-DUP13-061522	6/15/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH13-55-061522	6/15/2022	55	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH14	PLF-PEC-BH14-11-020822	2/8/2022	11	0.021 U	0.0010 U	0.67	62	150
	PLF-PEC-DUP4-020822	2/8/2022	11	0.60	0.49	3.4	93	470
	PLF-PEC-BH14-15-020822	2/8/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH14-29-020822	2/8/2022	29	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH14-64-020922	2/9/2022	64	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH14-68-020922	2/9/2022	68	0.021 U	0.0010 U	0.30 U	25 U	50 U

Table 5.2
PEC Data Compared to RELs

			Analyte	Total BTEX (1)	Total cVOCs (1,2)	Total Naphthalenes (1,3)	Gasoline-Range Organics	Diesel-Range Organics
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			Remediation Level	250	1.0	65	1,000	2,000
Location Name	Sample Name	Date	Sample Depth (feet bgs)					
BH15	PLF-PEC-BH15-11-021022	2/10/2022	11	9.7	0.13	4.3	330	1,000
	PLF-PEC-BH15-16-021022	2/10/2022	16	18	0.29	10	**2,300**	310
	PLF-PEC-BH15-23-021122	2/11/2022	23	**450**	**5.9**	13	**3,400**	1,700
	PLF-PEC-BH15-48-021122	2/11/2022	48	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH16	PLF-PEC-BH16-12-021322	2/13/2022	12	8.2	0.018	12	320	1,800
	PLF-PEC-BH16-17-021322	2/13/2022	17	200	**1.2**	**120**	**2,000**	**9,000**
	PLF-PEC-BH16-32-021322	2/13/2022	32	53	0.018	6.0	590	1,200
	PLF-PEC-BH16-36-021322	2/13/2022	36	9.5	0.046	1.0	150	1,200
	PLF-PEC-BH16-44-021322	2/13/2022	44	30	0.74	5.3	790	2,000
	PLF-BH16a-46-092222	9/22/2022	46	0.021 U	0.0010 U	4.5	25 U	**6,500**
	PLF-BH116a-46-092222	9/22/2022	46	0.055	0.0018	4.3	25 U	**4,600**
	PLF-BH16a-51-092222	9/22/2022	51	1.4	0.0042	0.30 U	31	150
	PLF-PEC-BH16-62-021322	2/13/2022	62	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH17	PLF-PEC-BH17-03-021222	2/12/2022	3	0.021 U	0.0010 U	0.98	45	1,100
	PLF-PEC-BH17-14-021222	2/12/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH17-26-021222	2/12/2022	26	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH17-51-021322	2/13/2022	51	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH18	PLF-PEC-BH18-12-021422	2/14/2022	12	0.021 U	0.0033	2.6	56	1,400
	PLF-PEC-BH18-17-021422	2/14/2022	17	**390**	**5.8**	54	**1,800**	**3,200**
	PLF-PEC-BH18-22-021422	2/14/2022	22	0.068	0.0010 U	0.99	25 U	380
	PLF-PEC-BH18-39-021422	2/14/2022	39	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH18-45-021422	2/14/2022	45	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-PEC-BH18-60-021422	2/14/2022	60	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH19	PLF-BH19-14-053122	5/31/2022	14	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH19-16-053122	5/31/2022	16	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH19-33-053122	5/31/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH19-39-053122	5/31/2022	39	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH19-42-053122	5/31/2022	42	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH20	PLF-BH20-13-060222	6/2/2022	13	0.025	0.0010 U	0.30 U	25 UJ	50 U
	PLF-BH20-16-060222	6/2/2022	16	**360**	**1.6**	**72**	*10,000 U*	*7,800 U*
	PLF-DUP11-060222	6/2/2022	16	**630**	*2.5 U*	**70**	**13,000**	**7,900**
	PLF-BH20-22-060222	6/2/2022	22	73	0.22 U	36	*2,500 U*	**4,200**
	PLF-BH20-24-060222	6/2/2022	24	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH21	PLF-BH21-13-060122	6/1/2022	13	0.028 U	0.016 U	0.30 U	25 U	50 U
	PLF-BH21-15-062122	6/1/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH21-25-060122	6/1/2022	25	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH21-31-060122	6/1/2022	31	0.021 U	0.0010 U	0.42	25 U	54
BH22	PLF-BH22-12-060122	6/1/2022	12	**330**	**2.3**	6.3	**4,100**	1,900 U
	PLF-BH22-15-060122	6/1/2022	15	**1,100**	**11**	25	*10,000 U*	**4,800**
	PLF-BH22-24-060122	6/1/2022	24	**1,400**	**7.7**	43	*10,000 U*	**8,600**
	PLF-BH22-28-060122	6/1/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH23	PLF-BH23-14-060222	6/2/2022	14	7.3	0.020 U	12	420	1,300
	PLF-BH23-17-060222	6/2/2022	17	9.1	0.27 U	27	*2,500 U*	1,000
	PLF-BH23-22-060222	6/2/2022	22	63	0.22 U	30	**2,600**	**3,600**
	PLF-BH23-28-060222	6/2/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH23-31-060222	6/2/2022	31	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH24	PLF-BH24-13-060122	6/1/2022	13	1.8	0.11	7.4	250 U	840
	PLF-BH24-18-060122	6/1/2022	18	0.021 U	0.0010 U	1.2	25 U	340
	PLF-BH24-23-060122	6/1/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH24-32-060122	6/1/2022	32	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH24-60-060122	6/1/2022	60	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH25	PLF-BH25-15-060122	6/1/2022	15	8.5	0.042	**79**	*2,500 U*	880 U
	PLF-BH25-18-060122	6/1/2022	18	74	0.46	**100**	**3,500**	2,000 U
	PLF-BH25-22-060122	6/1/2022	22	73	0.67	51	*2,500 U*	1,400
	PLF-DUP10-060122	6/1/2022	22	100	**1.2**	51	**3,800**	**2,300**
	PLF-BH25-26-060122	6/1/2022	26	230	1.0	18	*10,000 U*	**2,600**
	PLF-BH25-34-060122	6/1/2022	34	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH25-63-060122	6/1/2022	63	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH26	PLF-BH26-17-060222	6/2/2022	17	0.76	0.0016	0.71	44	410 U
	PLF-BH26-19-060222	6/2/2022	19	4.8	0.024 U	60	330	**4,200**
	PLF-BH26-24-060222	6/2/2022	24	0.021 U	0.0010 U	0.30 U	25 U	210
	PLF-BH26-27-060222	6/2/2022	27	0.021 U	0.0010 U	0.30 U	33	78
BH27	PLF-BH27-14-060322	6/3/2022	14	0.021 U	0.0010 U	0.30 U	25 U	160
	PLF-BH27-19-060322	6/3/2022	19	0.021 U	0.0010 U	0.30 U	25 U	130
	PLF-BH27-22-060322	6/3/2022	22	**1,700**	*2.1 U*	20	**14,000**	1,600
	PLF-BH27-28-060322	6/3/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH27-33-060322	6/3/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH27-38-060322	6/3/2022	38	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH27-61-060322	6/3/2022	61	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH28	PLF-BH28-04-061622	6/16/2022	4	2.5	0.25	7.0	1,000 U	540
	PLF-BH28-17-061622	6/16/2022	17	**1,100**	**15**	**94**	*10,000 U*	*4,500 U*
	PLF-BH28-24-061622	6/16/2022	24	3.6	0.040	0.42	52	50 U
	PLF-BH28-29-061622	6/16/2022	29	0.021 U	0.0010 U	0.30 U	25 U	50 U

Table 5.2
PEC Data Compared to RELs

			Analyte	Total BTEX (1)	Total cVOCs (1,2)	Total Naphthalenes (1,3)	Gasoline-Range Organics	Diesel-Range Organics
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			Remediation Level	250	1.0	65	1,000	2,000
Location Name	Sample Name	Date	Sample Depth (feet bgs)					
BH29	PLF-BH29-17-061622	6/16/2022	17	0.021 U	0.0010 U	6.8	*2,500 U*	1,300
	PLF-BH29-20-061622	6/16/2022	20	3.4	0.024 U	58	*10,000 U*	*4,500 U*
	PLF-BH29-23-061622	6/16/2022	23	**530**	**1.6**	41	*10,000 U*	*2,200 U*
	PLF-BH29-33-061622	6/16/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH29-44-061622	6/16/2022	44	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH30	PLF-BH30-03-061622	6/16/2022	3	0.029	0.0075	0.30 U	25 U	50 U
	PLF-BH30-16-061622	6/16/2022	16	**580**	**26**	**120**	**13,000**	*5,000 U*
	PLF-BH30-24-061622	6/16/2022	24	**920**	**16**	**250**	**11,000**	*7,500 U*
	PLF-BH30-32-061622	6/16/2022	32	0.14	0.0019	0.30 U	25 U	50 U
BH31	PLF-BH31-14-061522	6/15/2022	14	0.45	0.0037	3.0 U	25 U	1,500
	PLF-BH31-17-061522	6/15/2022	17	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-DUP14-061522	6/15/2022	17	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH31-23-061522	6/15/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH31-32-061522	6/15/2022	32	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH32	PLF-BH32-03-061522	6/15/2022	3	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH32-15-061522	6/15/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH32-28-061522	6/15/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH32-32-061522	6/15/2022	32	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH33	PLF-BH33-15-060622	6/6/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH33-20-060622	6/6/2022	20	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH33-28-060622	6/6/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH33-33-060622	6/6/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH33-37-060622	6/6/2022	37	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH34	PLF-BH34-10-060622	6/6/2022	10	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH34-15-060622	6/6/2022	15	**330**	**22**	43	**7,000**	**5,700**
	PLF-BH34-18-060622	6/6/2022	18	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH35	PLF-BH35-12-053122	5/31/2022	12	0.021 U	0.0010 U	0.49	50 U	63
	PLF-BH35-16-053122	5/31/2022	16	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH35-23-053122	5/31/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH35-33-060122	6/1/2022	33	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH36	PLF-BH36-06-060622	6/6/2022	6	1.3	0.022 U	3.0 U	250 U	350 U
	PLF-BH36-16-060622	6/6/2022	16	0.021 U	0.0010 U	0.30 U	250 U	67
	PLF-BH36-23-060622	6/6/2022	23	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH37	PLF-BH37-05X-061522	6/15/2022	5	0.69	0.0010 U	0.84	25 U	260
	PLF-BH37-11-061522	6/15/2022	11	0.026	0.0010 U	0.99	25 U	590
	PLF-BH37-16-061522	6/15/2022	16	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH38	PLF-BH38-15-061522	6/15/2022	15	0.15	0.090	3.0 U	330	*5,000 U*
	PLF-BH38-24-061522	6/15/2022	24	0.20	0.39	18 U	250 U	**8,000**
	PLF-BH38-28-061522	6/15/2022	28	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH39	PLF-BH39-13-061522	6/15/2022	13	**3,500**	*2.2 U*	16	**6,700**	**30,000**
	PLF-BH39-18-061522	6/15/2022	18	0.11	0.0010 U	0.30 U	25 U	50 U
	PLF-BH39-23-061522	6/15/2022	23	0.41	0.0010	0.30 U	25 U	66
	PLF-BH39-29-061522	6/15/2022	29	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH40	PLF-BH40-15-061522	6/15/2022	15	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH40-24-061522	6/15/2022	24	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH41	PLF-BH41-13-061622	6/16/2022	13	5.8	0.025 U	4.0	66	1,800 U
	PLF-DUP15-061622	6/16/2022	13	4.3	0.025 U	5.2	56	920
	PLF-BH41-17-061622	6/16/2022	17	0.021 U	0.0010 U	0.30 U	25 U	200
	PLF-BH41-22-061622	6/16/2022	22	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH41-32-061622	6/16/2022	32	0.021 U	0.0010 U	0.30 U	25 U	50 U
BH42	PLF-BH42-10-061622	6/16/2022	10	0.021 U	0.0010 U	0.30 U	25 U	90
BH43	PLF-BH43-22-092222	9/22/2022	22	0.021 U	0.0010 U	0.30 U	25 U	50 U
	PLF-BH43-25-092222	9/22/2022	25	0.021 U	0.0010 U	0.30 U	25 U	50 U

Notes:

-- Analyte was not tested.

Italic Analyte was not detected. Reported limit exceeds REL.

BOLD Analyte was detected. Result exceeds applicable REL.

1 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

2 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

3 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and xylenes

cVOC Chlorinated volatile organic compound

mg/kg Milligrams per kilogram

REL Remediation Level

Qualifiers:

U Analyte was not detected at the associated reporting limit.

UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 5.3
Analyte Fate and Transport Characteristics

Analyte	CAS No.	Henry's Law Constant (25 °C, dimensionless) (1)	Vapor Pressure (25 °C, mmHg) (1)	Boiling Point (°C) (2)	Aqueous Solubility (mg/L) (1)	Soil Adsorption Coefficient (K_d) (L/kg) (1)
Total Petroleum Hydrocarbons						
Gasoline-range organics	GRO	--	--	--	--	--
Diesel-range organics	DRO	--	--	--	--	--
Oil-range organics	ORO	--	--	--	--	--
Volatile Organic Compounds (VOCs)						
Benzene	71-43-2	0.23	95	80.1	1,750	0.062
Ethylbenzene	100-41-4	0.32	9.6	136.2	169	0.204
Toluene	108-88-3	0.27	28	110.6	526	0.14
Xylene (meta)	108-38-3	0.29	8.3	139.0	161	0.196
Xylene (para)	106-42-3	0.21	6.6	138.4	162	0.311
Xylene (ortho)	95-47-6	0.21	6.6	144.4	178	0.241
cis-1,2-Dichloroethene	156-59-2	0.17	200	60.2	6,410	0.0396
Tetrachloroethene	127-18-4	0.72	19	121.1	206	0.265
Trichloroethene	79-01-6	0.40	69	87.2	1,280	0.094
Vinyl chloride	75-01-4	1.1	3,000	-13.4	8,800	0.02173
Chloroethane	75-00-3	0.45	1,000	12.3	6,710	0.02173
trans-1,2-Dichloroethene	156-60-5	0.38	330	47.0	4,520	0.038
1,1,1-Trichloroethane	71-55-6	0.70	120	74.0	1,290	0.135
1,1,2,2-Tetrachloroethane	79-34-5	0.015	4.6	146.7	2,830	0.079
1,1,2-Trichloroethane	79-00-5	0.034	23	113.9	4,590	0.075
1,1-Dichloroethane	75-34-3	0.23	230	57.2	5,040	0.053
1,1-Dichloroethene	75-35-4	1.1	600	32.0	2,420	0.065
1,2,4-Trichlorobenzene	120-82-1	0.058	0.46	214.4	49	1.659
1,2-Dibromo-3-chloropropane	96-12-8	0.0060	0.58	196	1,230	0.1158
1,2-Dibromoethane	106-93-4	0.027	11	131	3,910	0.066
1,2-Dichlorobenzene	95-50-1	0.078	1.4	180.5	156	0.379
1,2-Dichloroethane	107-06-2	0.048	79	83.47	8,600	0.038
1,2-Dichloropropane	78-87-5	0.12	53	96	2,800	0.047
1,3-Dichlorobenzene	541-73-1	0.11	2.2	173	125	0.3753
1,4-Dichlorobenzene	106-46-7	0.099	1.7	174	81.3	0.616
2-Hexanone	591-78-6	0.0038	12	128	17,200	0.01498
Acetone	67-64-1	0.0014	230	56	1,000,000	0.002364
Bromodichloromethane	75-27-4	0.087	50	90	3,032	0.03182
Bromoform	75-25-2	0.022	5.4	149.1	3,100	0.126
Bromomethane	74-83-9	0.30	1,600	3.56	15,200	0.009
Carbon disulfide	75-15-0	0.59	360	46.3	2,160	0.02173
Carbon tetrachloride	56-23-5	1.1	120	76.72	793	0.152
Chlorobenzene	108-90-7	0.13	12	132	498	0.224
Chloroform	67-66-3	0.15	200	61.2	7,950	0.053
Chloromethane	74-87-3	0.36	4,300	-24.2	5,320	0.006
cis-1,3-Dichloropropene	10061-01-5	--	--	104	--	--
Dichlorodifluoromethane	75-71-8	14	4,800	-29.8	280	0.04389
Isopropylbenzene	98-82-8	0.47	4.5	152.4	61.3	0.6978
Methyl ethyl ketone	78-93-3	0.0023	91	79.64	223,000	0.00451
Methyl isobutyl ketone	108-10-1	0.0056	20	116	19,000	0.0126
Methylene chloride	75-09-2	0.13	440	39.6	13,000	0.01
Methyl-tert-butyl ether	1634-04-4	0.018	250	55.2	50,000	0.0109
Styrene	100-42-5	0.11	6.4	145	310	0.912
trans-1,3-Dichloropropene	10061-02-6	--	--	112	--	--
Trichlorofluoromethane	75-69-4	4.0	800	23.77	1,100	0.04389
Semivolatile Organic Compounds (SVOCs)						
Benzo(a)anthracene	56-55-3	0.00049	0.00000021	438	0.0094	357.537
Benzo(a)pyrene	50-32-8	0.000019	0.0000000055	495	0.00162	968.774
Benzo(b)fluoranthene	205-99-2	0.000027	0.00000050	481	0.0015	599.4
Benzo(k)fluoranthene	207-08-9	0.000024	0.00000000097	480	0.0008	587.4
Chrysene	218-01-9	0.00021	0.0000000062	448	0.002	180.5
Dibenzo(a,h)anthracene	53-70-3	0.0000058	0.00000000096	797	0.00249	1,789.101
Indeno(1,2,3-c,d)pyrene	193-39-5	0.000014	0.00000000013	536	0.00019	1,951
1-Methylnaphthalene	90-12-0	0.021	0.067	244.4	25.8	2.528
2-Methylnaphthalene	91-57-6	0.021	0.055	242	24.6	2.478
Acenaphthene	83-32-9	0.0075	0.0022	279	3.9	4.898
Acenaphthylene	208-96-8	--	--	280	--	--
Anthracene	120-12-7	0.0023	0.0000065	340	0.0434	23.493
Benzo(g,h,i)perylene	191-24-2	--	--	550	--	--
Fluoranthene	206-44-0	0.00036	0.0000092	384	0.26	49.096
Fluorene	86-73-7	0.0039	0.00060	295	1.69	7.707
Naphthalene	91-20-3	0.020	0.085	218	31	1.191
Phenanthrene	85-01-8	--	--	340	--	--
Pyrene	129-00-0	0.00049	0.0000045	404	0.135	67.992
2-Chloronaphthalene	91-58-7	0.013	0.012	256	11.7	2.478
Carbazole	86-74-8	--	--	354.7	--	--
2,3,4,6-Tetrachlorophenol	58-90-2	0.00036	0.00067	270	23	0.28
2,4,5-Trichlorophenol	95-95-4	0.000066	0.0075	253	1,200	1.597
2,4,6-Trichlorophenol	88-06-2	0.00011	0.0080	246	800	0.381
2,4-Dichlorophenol	120-83-2	0.00018	0.090	210	5,550	0.147
2,4-Dimethylphenol	105-67-9	0.000039	0.10	211	7,870	0.4918
2,4-Dinitrophenol	51-28-5	0.0000035	0.00039	113	2,790	0.00001
2,6-Dichlorophenol	87-65-0	--	--	219	--	--

Table 5.3
Analyte Fate and Transport Characteristics

Analyte	CAS No.	Henry's Law Constant (25 °C, dimensionless) (1)	Vapor Pressure (25 °C, mmHg) (1)	Boiling Point (°C) (2)	Aqueous Solubility (mg/L) (1)	Soil Adsorption Coefficient (K_d) (L/kg) (1)
Semivolatile Organic Compounds (cont.)						
2-Chlorophenol	95-57-8	0.00046	2.5	174.9	11,300	0.388
2-Methylphenol	95-48-7	0.000049	0.30	191	25,900	0.3065
2-Nitrophenol	88-75-5	--	--	216	--	--
3- & 4-Methylphenol	15831-10-4	--	--	235	--	--
4,6-Dinitro-o-cresol	534-52-1	0.000057	0.00012	312	198	0.7544
4-Chloro-3-methylphenol	59-50-7	0.00010	0.050	235	3,834	0.4918
4-Nitrophenol	100-02-7	--	--	279	--	--
Pentachlorophenol	87-86-5	0.0000010	0.00011	309	14	0.592
Phenol	108-95-2	0.000014	0.35	181.7	82,800	0.1872
2,4-Dinitrotoluene	121-14-2	0.0000022	0.00015	250	200	0.5756
2,6-Dinitrotoluene	606-20-2	0.000031	0.00057	285	182	0.5874
Nitrobenzene	98-95-3	0.00098	0.25	210.9	2,090	0.119
2-Nitroaniline	88-74-4	0.0000024	0.0028	284	1,470	0.1113
3,3'-Dichlorobenzidine	91-94-1	0.0000000012	0.00000026	368	3.1	3.19
3-Nitroaniline	99-09-2	--	--	306	--	--
4-Chloroaniline	106-47-8	0.000047	0.027	232	3,900	0.1127
PBDE-003	101-55-3	--	--	--	--	--
4-Chlorophenyl phenyl ether	7005-72-3	--	--	284.5	--	--
4-Nitroaniline	100-01-6	0.000000052	0.0000032	332	728	0.1091
Bis(2-chloroethyl)ether	111-44-4	0.00070	1.6	178	17,200	0.076
Bis(2-chloroisopropyl)ether	39638-32-9	--	--	187.3	--	--
Hexachlorobenzene	118-74-1	0.070	0.000018	--	0.0062	80
Hexachloroethane	67-72-1	0.16	0.21	187	50	0.1968
Pyridine	110-86-1	0.00045	21	115	1,000,000	0.07172
Bis(2-ethylhexyl)phthalate	117-81-7	0.000011	0.00000014	385	0.27	111.123
Butyl benzyl phthalate	85-68-7	0.000052	0.0000083	370	2.69	13.746
Diethylphthalate	84-66-2	0.000025	0.0021	302	1,080	0.082
Dimethyl phthalate	131-11-3	0.0000081	0.0031	283	4,000	0.03159
Di-n-butyl phthalate	84-74-2	0.000074	0.000020	350	11.2	1.567
Di-n-octyl phthalate	117-84-0	0.00011	0.00000010	385	0.022	140.8
Aniline	62-53-3	0.000083	0.67	184.1	36,000	0.07023
Azobenzene	103-33-3	0.00055	0.00036	293	6.4	3.759
Benzoic acid	65-85-0	0.0000016	0.00070	249.2	3,400	0.0006
Benzyl alcohol	100-51-6	0.000014	0.094	205	42,900	0.02146
Bis(2-chloroethoxy)methane	111-91-1	0.00016	0.13	217.5	7,800	0.01438
Dibenzofuran	132-64-9	0.0087	0.0025	285	3.1	9.161
Hexachlorobutadiene	87-68-3	0.42	0.22	215	3.2	0.8452
Hexachlorocyclopentadiene	77-47-4	1.1	0.060	--	1.8	1.404
Isophorone	78-59-1	0.00027	0.44	215.2	12,000	0.06515
N-Nitrosodimethylamine	62-75-9	0.000074	2.7	151	1,000,000	0.02279
N-Nitroso-di-n-propylamine	621-64-7	0.00022	0.086	206	13,000	0.2754
N-Nitrosodiphenylamine	86-30-6	0.000049	0.10	101	35	2.632
Pesticides						
4,4'-DDD	72-54-8	0.00027	0.0000014	--	0.09	45.8
4,4'-DDE	72-55-9	0.0017	0.0000060	--	0.04	86.405
4,4'-DDT	50-29-3	0.00034	0.00000016	--	0.0055	677.934
Aldrin	309-00-2	0.0018	0.00012	--	0.017	48.685
alpha-BHC	319-84-6	0.00027	0.000035	--	2	1.762
alpha-Endosulfan	959-98-8	0.00029	0.0000030	--	0.51	6.761
beta-BHC	319-85-7	0.000018	0.00000036	--	0.24	2.139
beta-Endosulfan	33213-65-9	0.000016	0.00000060	--	0.45	6.761
Chlordane	57-74-9	--	--	--	--	--
delta-BHC	319-86-8	--	--	--	--	--
Dieldrin	60-57-1	0.00041	0.0000059	--	0.195	25.546
Endosulfan sulfate	1031-07-8	0.000013	0.00000028	--	0.48	9.847
Endrin	72-20-8	0.00026	0.0000030	--	0.25	10.811
Endrin aldehyde	7421-93-4	0.00017	0.00000020	--	0.024	3.271
gamma-BHC	58-89-9	0.00021	0.000042	--	7.3	1.352
Heptachlor	76-44-8	0.012	0.00040	--	0.18	9.528
Heptachlor epoxide	1024-57-3	0.00086	0.000020	--	0.2	10.11
Methoxychlor	72-43-5	0.0000083	0.0000026	--	0.1	80
Toxaphene	8001-35-2	0.00025	0.0000067	--	0.55	95.816
Herbicides						
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	0.00000074	0.00000075	--	620	0.04851
2,4,5-Trichlorophenoxyacetic acid	93-76-5	0.00000035	0.000038	--	278	0.107
2,4-DB	94-82-6	--	--	--	--	--
2,4-Dichlorophenoxyacetic acid	94-75-7	0.0000014	0.000083	--	677	0.02963
Dicamba	1918-00-9	0.000000089	0.000013	--	8,310	0.02901
Dichloroprop	120-36-5	--	--	--	--	--
Dinoseb	88-85-7	0.000019	0.000075	--	52	4.294
MCPA	94-74-6	0.000000054	0.0000059	--	630	0.02963
Silvex	93-72-1	0.00000037	0.0000100	--	71	0.1753

Table 5.3
Analyte Fate and Transport Characteristics

Analyte	CAS No.	Henry's Law Constant (25 °C, dimensionless) (1)	Vapor Pressure (25 °C, mmHg) (1)	Boiling Point (°C) (2)	Aqueous Solubility (mg/L) (1)	Soil Adsorption Coefficient (K_d) (L/kg) (1)
Polychlorinated Biphenyls (PCBs)						
Aroclor 1016	12674-11-2	0.0082	0.00040	385	0.42	107.285
Aroclor 1221	11104-28-2	--	--	--	--	--
Aroclor 1232	11141-16-5	--	--	--	--	--
Aroclor 1242	53469-21-9	--	--	325	--	--
Aroclor 1248	12672-29-6	--	--	340	--	--
Aroclor 1254	11097-69-1	0.012	0.000077	365	0.043	130.5
Aroclor 1260	11096-82-5	0.014	0.000041	385	0.0144	822.422
Aroclor 1268	11100-14-4	--	--	--	--	--
Metals						
Arsenic	7440-38-2	--	--	--	--	29
Barium	7440-39-3	--	--	--	--	41
Cadmium	7440-43-9	--	--	--	--	6.7
Chromium	7440-47-3	--	--	--	--	--
Lead	7439-92-1	--	--	--	--	10000
Mercury	7439-97-6	0.35	0.0020	--	0.06	52
Selenium	7782-49-2	--	0.00000000014	--	--	5
Silver	7440-22-4	--	--	--	--	8.3

Notes:

-- Value not available in Ecology CLARC tables or PubChem.
1 Values obtained from Ecology CLARC tables.
2 Values obtained from PubChem. Boiling point values only obtained for VOCs, SVOCs, and PCBs.

Abbreviations:

2,4-DB 4(2,4-Dichlorophenoxy)butyric acid
BHC Benzene hexachloride
°C Degrees Celsius
CAS Chemical Abstracts Service
CLARC Cleanup Levels and Risk Calculation
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
L/kg Liter per kilogram
MCPA (4-Chloro-2-methylphenoxy)acetic acid
mg/L Milligram per liter
mmHg Millimeters of mercury
PBDE Polybrominated diphenyl ether
PCB Polychlorinated Biphenyls
SVOC Semivolatile organic compound
VOC Volatile organic compound

Table 5.4
Frequency of Detections and Exceedances Outside Thermal Treatment Area

			Analyte Information			Detected Result Information										95% UCL Information				Non-Detected Result Information	
Analyte	CAS No.	Unit	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Number of Results	Number of Detects	Detect Percentage	Minimum Detect Value	Maximum Detect Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect	Number of Detect Exceedances	Percentage of Detect Exceedances	Detect Exceedance Factor	95% UCL [3]	Suggested UCL Distribution [3]	95% UCL > SL	SL Exceedance Factor of 95% UCL	Number of Non-Detects	Non-Detect Percentage
Volatile Organic Compounds (VOCs)																					
Benzene	71-43-2	mg/kg	0.027	0.0017	143	5	3.5%	0.0059	0.63	BH37	06/15/2022	5	3	2.1%	23	0.020	95% KM (t) UCL	No	0.73	138	97%
Ethylbenzene	100-41-4	mg/kg	5.9	0.34	143	16	11%	0.010	24	BH25	06/01/2022	26	2	1.4%	4.1	0.98	95% KM Approximate Gamma UCL	No	0.17	127	89%
Toluene	108-88-3	mg/kg	4.5	0.27	143	19	13%	0.018	9.1	BH25	06/01/2022	26	1	0.70%	2.0	0.045	KM H-UCL	No	0.010	124	87%
Xylene (meta & para)	108-38-3/106-42-3	mg/kg	17	0.96	143	17	12%	0.031	130	BH25	06/01/2022	26	4	2.8%	7.6	5.3	95% KM Approximate Gamma UCL	No	0.31	126	88%
Xylene (ortho)	95-47-6	mg/kg	14	0.84	143	18	13%	0.010	66	BH25	06/01/2022	26	1	0.70%	4.7	2.7	95% KM Approximate Gamma UCL	No	0.19	125	87%
Total Xylene (U=1/2) [4]	T_XYL (U=1/2)	mg/kg	14	0.83	143	18	13%	0.020	200	BH25	06/01/2022	26	4	2.8%	14	0.19	KM H-UCL	No	0.014	125	87%
Total BTEX (U=1/2) [4,5]	T_BTEX (U=1/2)	mg/kg	--	--	143	23	16%	0.031	230	BH25	06/01/2022	26	--	--	--	0.28	KM H-UCL	--	--	120	84%
Tetrachloroethene	127-18-4	mg/kg	0.05	0.0028	143	1	0.70%	0.0011	0.0011	BH39	06/15/2022	23	--	--	--	0.048	95% KM Approximate Gamma UCL	No	0.96	142	99%
Trichloroethene	79-01-6	mg/kg	0.025	0.0015	143	13	9.1%	0.0011	0.96	BH25	06/01/2022	26	5	3.5%	19	0.0055	95% KM (t) UCL	No	0.22	130	91%
Vinyl chloride	75-01-4	mg/kg	0.0017	9.00E-05	143	6	4.2%	0.0014	0.17	BH14	02/08/2022	11	2	1.4%	6.8	--	--	--	--	137	96%
Total cVOCs (U=1/2) [4,5,6]	T_cVOC (U=1/2)	mg/kg	--	--	143	15	10%	0.0011	0.96	BH25	06/01/2022	26	--	--	--	0.051	95% KM Approximate Gamma UCL	--	--	128	90%
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.079	0.0052	143	15	10%	0.0016	1.0	BH25	06/01/2022	26	--	--	--	0.0010	95% KM (t) UCL	No	0.013	128	90%
Chloroethane	75-00-3	mg/kg	--	--	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.52	0.032	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,1,1-Trichloroethane	71-55-6	mg/kg	1.5	0.084	143	1	0.70%	0.046	0.046	BH14	02/08/2022	11	--	--	--	0.046 [9]	NA	No	0.031	142	99%
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0012	0.00032	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,1,2-Trichloroethane	79-00-5	mg/kg	0.017	0.0011	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,1-Dichloroethane	75-34-3	mg/kg	0.041	0.0026	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,1-Dichloroethene	75-35-4	mg/kg	0.046	0.0025	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.56	0.029	144	7	4.9%	0.040	0.68	BH07	02/03/2022	30	1	0.69%	1.2	0.037	95% KM (t) UCL	No	0.066	137	95%
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	0.05	0.05	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,2-Dibromoethane	106-93-4	mg/kg	0.00027	0.00011	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,2-Dichlorobenzene	95-50-1	mg/kg	7	0.4	144	22	15%	0.0014	140	BH07	02/03/2022	30	2	1.4%	20	2.7	95% KM (t) UCL	No	0.39	122	85%
1,2-Dichloroethane	107-06-2	mg/kg	0.023	0.0016	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,2-Dichloropropane	78-87-5	mg/kg	0.025	0.0017	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
1,3-Dichlorobenzene	541-73-1	mg/kg	--	--	144	1	0.69%	12	12	BH07	02/03/2022	30	--	--	--	12 [9]	NA	--	--	143	99%
1,4-Dichlorobenzene	106-46-7	mg/kg	1.2	0.068	144	4	2.8%	0.060	5.5	BH07	02/03/2022	30	2	1.4%	4.6	0.13	95% KM (t) UCL	No	0.11	140	97%
2-Hexanone	591-78-6	mg/kg	0.17	0.05	143	1	0.70%	0.74	0.74	BH25	06/01/2022	26	1	0.70%	4.4	0.066	95% KM (t) UCL	No	0.39	142	99%
Acetone	67-64-1	mg/kg	29	2.1	143	25	17%	0.052	5.3	BH21	06/01/2022	15	--	--	--	0.31	95% KM (t) UCL	No	0.011	118	83%
Bromodichloromethane	75-27-4	mg/kg	0.033	0.0022	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Bromoform	75-25-2	mg/kg	0.36	0.023	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Bromomethane	74-83-9	mg/kg	0.051	0.0033	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Carbon disulfide	75-15-0	mg/kg	4.1	0.25	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Carbon tetrachloride	56-23-5	mg/kg	0.041	0.0022	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Chlorobenzene	108-90-7	mg/kg	0.86	0.051	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Chloroform	67-66-3	mg/kg	0.074	0.0048	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Chloromethane	74-87-3	mg/kg	--	--	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
cis-1,3-Dichloropropene	10061-01-5	mg/kg	--	--	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Dichlorodifluoromethane	75-71-8	mg/kg	38	0.53	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Isopropylbenzene	98-82-8	mg/kg	15	0.79	143	6	4.2%	0.14	7.3	BH25	06/01/2022	26	--	--	--	0.30	95% KM Approximate Gamma UCL	No	0.020	137	96%
Methyl ethyl ketone	78-93-3	mg/kg	20	1.4	143	11	7.7%	0.095	1.2	BH12	06/07/2022	27	--	--	--	0.11	95% KM (t) UCL	No	0.0057	132	92%
Methyl isobutyl ketone	108-10-1	mg/kg	2.7	0.19	143	11	7.7%	0.12	2.7	BH25	06/01/2022	26	--	--	--	0.15	95% KM (t) UCL	No	0.056	132	92%
Methylene chloride	75-09-2	mg/kg	0.022	0.0023	143	19	13%	0.0026	0.80	BH14	02/08/2022	11	2	1.4%	36	0.018	95% KM (t) UCL	No	0.80	124	87%
Methyl-tert-butyl ether	1634-04-4	mg/kg	0.1	0.0072	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Styrene	100-42-5	mg/kg	2.2	0.12	143	1	0.70%	0.71	0.71	BH37	06/15/2022	5	--	--	--	0.71	NA	No	0.32	142	99%
trans-1,3-Dichloropropene	10061-02-6	mg/kg	--	--	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Trichlorofluoromethane	75-69-4	mg/kg	23	0.79	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
Total VOCs (U=1/2) [4,7]	T_VOC (U=1/2)	mg/kg	--	--	143	62	43%	0.24	260	BH25	06/01/2022	26	--	--	--	8.3	95% KM (t) UCL	--	--	81	57%
Semivolatile Organic Compounds (SVOCs)																					
Benzo(a)anthracene	56-55-3	mg/kg	--	--	144	3	2.1%	0.17	0.19	BH24	06/01/2022	13	--	--	--	0.063	95% KM (t) UCL	--	--	141	98%
Benzo(a)pyrene	50-32-8	mg/kg	3.9	0.19	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Benzo(b)fluoranthene	205-99-2	mg/kg	--	--	144	2	1.4%	0.15	0.16	BH17	02/12/2022	3	--	--	--	0.10	95% KM (t) UCL	--	--	142	99%
Benzo(k)fluoranthene	207-08-9	mg/kg	--	--	144	1	0.69%	0.18	0.18	BH26	06/02/2022	19	--	--	--	0.18 [9]	NA	--	--	143	99%
Chrysene	218-01-9	mg/kg	--	--	144	4	2.8%	0.28	0.40	BH17	02/12/2022	3	--	--	--	0.085	95% KM (t) UCL	--	--	140	97%

Table 5.4
Frequency of Detections and Exceedances Outside Thermal Treatment Area

			Analyte Information			Detected Result Information										95% UCL Information				Non-Detected Result Information	
Analyte	CAS No.	Unit	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Number of Results	Number of Detects	Detect Percentage	Minimum Detect Value	Maximum Detect Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect	Number of Detect Exceedances	Percentage of Detect Exceedances	Detect Exceedance Factor	95% UCL [3]	Suggested UCL Distribution [3]	95% UCL > SL	SL Exceedance Factor of 95% UCL	Number of Non-Detects	Non-Detect Percentage
Semivolatile Organic Compounds (SVOCs) (cont.)																					
Dibenzo(a,h)anthracene	53-70-3	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Naphthalene	91-20-3	mg/kg	4.5	0.24	144	22	15%	0.12	11	BH25	06/01/2022	26	5	3.5%	2.4	0.69	95% KM Approximate Gamma UCL	No	0.15	122	85%
1-Methylnaphthalene	90-12-0	mg/kg	0.25	0.25	144	14	9.7%	0.28	26	BH26	06/02/2022	19	14	9.7%	100	0.80	95% KM (t) UCL	Yes	3.2	130	90%
2-Methylnaphthalene	91-57-6	mg/kg	1.7	0.25	144	16	11%	0.27	33	BH26	06/02/2022	19	5	3.5%	19	0.43	KM H-UCL	No	0.25	128	89%
Total Naphthalenes (U=1/2) [4,5,8]	T_Napth (U=1/2)	mg/kg	--	--	144	23	16%	0.37	60	BH26	06/02/2022	19	--	--	--	0.71	KM H-UCL	--	--	121	84%
Acenaphthene	83-32-9	mg/kg	49	2.5	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Acenaphthylene	208-96-8	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Anthracene	120-12-7	mg/kg	1100	57	144	2	1.4%	0.19	1.5	BH24	06/01/2022	13	--	--	--	0.13	95% KM (t) UCL	No	0.00012	142	99%
Benzo(g,h,i)perylene	191-24-2	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Fluoranthene	206-44-0	mg/kg	630	32	144	11	7.6%	0.10	75	BH26	06/02/2022	19	--	--	--	0.18	KM H-UCL	No	0.00028	133	92%
Fluorene	86-73-7	mg/kg	51	2.6	144	--	--	--	--	--	--	--	--	--	--	3.9 [9]	NA	No	0.076	144	100%
Phenanthrene	85-01-8	mg/kg	--	--	144	15	10%	0.16	3.1	BH37	06/15/2022	5	--	--	--	0.26	95% KM (t) UCL	--	--	129	90%
Pyrene	129-00-0	mg/kg	330	16	144	6	4.2%	0.14	2.6	BH31	06/15/2022	14	--	--	--	0.16	95% KM (t) UCL	No	0.00047	138	96%
2-Chloronaphthalene	91-58-7	mg/kg	34	1.8	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Carbazole	86-74-8	mg/kg	--	--	144	1	0.69%	0.53	0.53	BH41	06/16/2022	13	--	--	--	0.53 [9]	NA	--	--	143	99%
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg	4.6	0.27	144	1	0.69%	0.12	0.12	BH24	06/01/2022	13	--	--	--	0.12 [9]	NA	No	0.026	143	99%
2,4,5-Trichlorophenol	95-95-4	mg/kg	58	3	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
2,4,6-Trichlorophenol	88-06-2	mg/kg	0.092	0.049	144	2	1.4%	0.074	0.15	BH37	06/15/2022	5	1	0.69%	1.6	0.042	95% KM (t) UCL	No	0.46	142	99%
2,4-Dichlorophenol	120-83-2	mg/kg	0.33	0.31	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
2,4-Dimethylphenol	105-67-9	mg/kg	4.4	0.25	144	2	1.4%	0.48	0.67	BH16	09/22/2022	46	--	--	--	0.083	95% KM (t) UCL	No	0.019	142	99%
2,4-Dinitrophenol	51-28-5	mg/kg	0.17	0.17	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
2,6-Dichlorophenol	87-65-0	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
2-Chlorophenol	95-57-8	mg/kg	0.47	0.25	144	1	0.69%	0.33	0.33	BH23	06/02/2022	28	--	--	--	0.33	NA	No	0.70	143	99%
2-Methylphenol	95-48-7	mg/kg	8.1	0.47	144	2	1.4%	0.83	5.4	BH41	06/16/2022	17	--	--	--	0.23	95% KM (t) UCL	No	0.028	142	99%
2-Nitrophenol	88-75-5	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
3- & 4-Methylphenol	15831-10-4	mg/kg	--	--	144	14	9.7%	0.19	21	BH41	06/16/2022	17	--	--	--	0.19	KM H-UCL	NA	NA	130	90%
4,6-Dinitro-o-cresol	534-52-1	mg/kg	0.1	0.1	143	--	--	--	--	--	--	--	--	--	--	--	--	--	--	143	100%
4-Chloro-3-Methylphenol	59-50-7	mg/kg	22	1.2	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
4-Nitrophenol	100-02-7	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Pentachlorophenol	87-86-5	mg/kg	0.18	0.18	144	10	6.9%	0.21	7.8	BH24	06/01/2022	13	10	6.9%	43	0.35	95% KM Approximate Gamma UCL	Yes	1.9	134	93%
Phenol	108-95-2	mg/kg	37	2.3	144	20	14%	0.22	48	BH41	06/16/2022	17	1	0.69%	1.3	1.6	95% KM (t) UCL	No	0.043	124	86%
2,4-Dinitrotoluene	121-14-2	mg/kg	0.034	0.034	144	1	0.69%	0.055	0.055	BH09	06/06/2022	15	1	0.69%	1.6	0.055 [9]	NA	Yes	1.6	143	99%
2,6-Dinitrotoluene	606-20-2	mg/kg	0.046	0.046	144	1	0.69%	0.055	0.055	BH09	06/06/2022	15	1	0.69%	1.2	0.055 [9]	NA	Yes	1.2	143	99%
Nitrobenzene	98-95-3	mg/kg	0.1	0.034	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
2-Nitroaniline	88-74-4	mg/kg	1	0.1	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.21	0.21	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
3-Nitroaniline	99-09-2	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
4-Chloroaniline	106-47-8	mg/kg	0.71	0.71	144	2	1.4%	33	180	BH07	02/03/2022	27	2	1.4%	250	5.0	95% KM (t) UCL	Yes	7.0	142	99%
4-Bromophenyl phenyl ether	101-55-3	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
4-Nitroaniline	100-01-6	mg/kg	0.25	0.25	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Bis(2-chloroethyl)ether	111-44-4	mg/kg	0.12	0.12	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Bis(2-chloroisopropyl)ether	39638-32-9	mg/kg	--	--	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Hexachlorobenzene	118-74-1	mg/kg	0.44	0.045	144	2	1.4%	0.052	0.16	BH42	06/16/2022	10	--	--	--	0.038	95% KM (t) UCL	No	0.087	142	99%
Hexachloroethane	67-72-1	mg/kg	0.025	0.025	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Pyridine	110-86-1	mg/kg	0.2	0.2	144	2	1.4%	0.45	1.1	BH37	06/15/2022	5	2	1.4%	5.5	0.22	95% KM (t) UCL	Yes	1.1	142	99%
Bis(2-ethylhexyl)phthalate	117-81-7	mg/kg	13	0.67	144	44	31%	0.11	150	BH12	06/07/2022	38	6	4.2%	12	1.3	KM H-UCL	No	0.10	100	69%
Butyl benzyl phthalate	85-68-7	mg/kg	13	0.65	144	15	10%	0.12	22	BH12	06/07/2022	38	1	0.69%	1.7	0.11	KM H-UCL	No	0.0087	129	90%
Diethylphthalate	84-66-2	mg/kg	72	4.7	144	2	1.4%	0.12	0.20	BH25	06/01/2022	26	--	--	--	0.10	95% KM (t) UCL	No	0.0014	142	99%
Dimethyl phthalate	131-11-3	mg/kg	--	--	144	7	4.9%	0.12	4.1	BH14	02/08/2022	11	--	--	--	0.21	95% KM Approximate Gamma UCL	--	--	137	95%
Di-n-butyl phthalate	84-74-2	mg/kg	57	3	144	18	13%	0.12	57	BH16	09/22/2022	46	--	--	--	2.5	95% KM Approximate Gamma UCL	No	0.044	126	88%
Di-n-octyl phthalate	117-84-0	mg/kg	450	23	144	10	6.9%	0.11	7.8	BH12	06/07/2022	38	--	--	--	0.37	95% KM Approximate Gamma UCL	No	0.00082	134	93%
Aniline	62-53-3	mg/kg	0.1	0.1	144	1	0.69%	14	14	BH03	02/07/2022	5	1	0.69%	140	14 [9]	NA	Yes	140	143	99%
Azobenzene	103-33-3	mg/kg	0.1	0.1	144	1	0.69%	0.20	0.20	BH03	02/07/2022	5	1	0.69%	2.0	0.20 [9]	NA	Yes	2.0	143	99%
Benzoic acid	65-85-0	mg/kg	260	18	144	28	19%	1.0	980	BH41	06/16/2022	17	3	2.1%	3.8	4.5	KM H-UCL	No	0.017	116	81%

Table 5.4
Frequency of Detections and Exceedances Outside Thermal Treatment Area

			Analyte Information			Detected Result Information										95% UCL Information				Non-Detected Result Information	
Analyte	CAS No.	Unit	Adjusted Screening Levels Vadose [1]	Adjusted Screening Levels Saturated [2]	Number of Results	Number of Detects	Detect Percentage	Minimum Detect Value	Maximum Detect Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect	Number of Detect Exceedances	Percentage of Detect Exceedances	Detect Exceedance Factor	95% UCL [3]	Suggested UCL Distribution [3]	95% UCL > SL	SL Exceedance Factor of 95% UCL	Number of Non-Detects	Non-Detect Percentage
Semivolatile Organic Compounds (SVOCs) (cont.)																					
Benzyl alcohol	100-51-6	mg/kg	7.1	0.49	144	4	2.8%	0.43	28	BH31	06/15/2022	14	1	0.69%	3.9	0.71	95% KM (t) UCL	No	0.10	140	97%
Bis(2-chloroethoxy)methane	111-91-1	mg/kg	0.25	0.25	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Dibenzofuran	132-64-9	mg/kg	1.5	0.1	144	5	3.5%	0.19	0.81	BH41	06/16/2022	13	--	--	--	0.13	95% KM (t) UCL	No	0.084	139	97%
Hexachlorobutadiene	87-68-3	mg/kg	0.16	0.16	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Hexachlorocyclopentadiene	77-47-4	mg/kg	1.5	0.1	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
Isophorone	78-59-1	mg/kg	0.49	0.087	144	22	15%	0.077	110	BH07	02/03/2022	30	10	6.9%	220	3.3	95% KM (t) UCL	Yes	6.8	122	85%
N-Nitrosodimethylamine	62-75-9	mg/kg	0.1	0.1	144	1	0.69%	0.24	0.24	BH07	09/22/2022	34	1	0.69%	2.4	0.24	NA	Yes	2.4	143	99%
N-Nitrosodi-n-propylamine	621-64-7	mg/kg	0.12	0.12	144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	144	100%
N-Nitrosodiphenylamine	86-30-6	mg/kg	1	0.052	144	2	1.4%	0.38	1.5	BH01	01/24/2022	10	1	0.69%	1.5	0.071	95% KM (t) UCL	No	0.071	142	99%
Total Petroleum Hydrocarbons (TPH)																					
Gasoline-range organics [5]	GRO	mg/kg	30	30	144	14	9.7%	31	790	BH16	02/13/2022	44	14	9.7%	26	62	95% KM (t) UCL	Yes	2.1	130	90%
Diesel-range organics [5]	DRO	mg/kg	2000	2000	144	30	21%	54	8,000	BH38	06/15/2022	24	6	4.2%	4.0	530	95% KM Approximate Gamma UCL	No	0.27	114	79%
Oil-range organics	ORO	mg/kg	2000	2000	144	34	24%	57	9,500	BH16	09/22/2022	46	4	2.8%	4.8	480	95% KM Approximate Gamma UCL	No	0.24	110	76%
Total TPH (U=1/2) [4]	T_TPH (U=1/2)	mg/kg	--	--	144	39	27%	92	16,000	BH16	09/22/2022	46	--	--	--	1,100	95% KM Approximate Gamma UCL	--	--	105	73%
Polychlorinated Biphenyls (PCBs)																					
Aroclor 1016	12674-11-2	mg/kg	1.2	0.1	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	100%
Aroclor 1221	11104-28-2	mg/kg	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	100%
Aroclor 1232	11141-16-5	mg/kg	--	--	10	1	10%	2.0	2.0	BH26	06/02/2022	24	--	--	--	2.0 [9]	NA	NA	NA	9	90%
Aroclor 1242	53469-21-9	mg/kg	--	--	10	3	30%	0.12	1.8	BH16	02/13/2022	32	--	--	--	0.65	95% KM (t) UCL	NA	NA	7	70%
Aroclor 1248	12672-29-6	mg/kg	--	--	10	1	10%	0.82	0.82	BH26	06/02/2022	24	--	--	--	0.82 [9]	NA	NA	NA	9	90%
Aroclor 1254	11097-69-1	mg/kg	0.1	0.1	10	2	20%	0.61	0.97	BH16	2/13/2022	32	2	20%	9.7	0.43	95% KM (t) UCL	Yes	4.3	8	80%
Aroclor 1260	11096-82-5	mg/kg	0.36	0.1	10	4	40%	0.0058	0.85	BH26	06/02/2022	24	2	20%	2.4	0.36	95% KM (t) UCL	No	1.0	6	60%
Aroclor 1268	11100-14-4	mg/kg	--	--	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	100%
Total PCB Aroclors (U=1/2) [4]	T_PCB (U=1/2)	mg/kg	0.34	0.1	10	5	50%	0.013	3.9	BH26	06/02/2022	24	4	40%	11	1.9	95% KM (t) UCL	Yes	5.6	5	50%
Metals																					
Arsenic	7440-38-2	mg/kg	5.1	5.1	9	9	100%	1.2	16	BH31	06/15/2022	17	4	44%	3.1	7.8	95% Student's-t UCL	Yes	1.5	--	--
Barium	7440-39-3	mg/kg	1600	83	9	9	100%	75	150	BH14	02/08/2022	11	1	11%	1.1	120	95% Student's-t UCL	No	0.075	--	--
Cadmium	7440-43-9	mg/kg	0.93	0.93	9	2	22%	0.31	1.6	BH14	02/08/2022	11	1	11%	1.7	0.78	95% KM (t) UCL	No	0.84	7	78%
Chromium	7440-47-3	mg/kg	0.5	0.5	9	9	100%	3.2	35	BH14	02/08/2022	11	9	100%	70	19	95% Student's-t UCL	Yes	38	--	--
Lead	7439-92-1	mg/kg	3000	150	9	9	100%	2.1	360	BH14	02/08/2022	11	--	--	--	--	Recommendation cannot be provided	--	--	--	--
Mercury	7439-97-6	mg/kg	2.1	0.1	9	1	11%	0.21	0.21	BH14	02/08/2022	11	--	--	--	0.21 [9]	--	No	0.10	8	89%
Selenium	7782-49-2	mg/kg	5.2	0.5	9	9	100%	0.52	1.3	BH08	02/12/2022	61	4	44%	2.6	1.1	95% Student's-t UCL	No	0.21	--	--
Silver	7440-22-4	mg/kg	14	0.69	9	1	11%	0.94	0.94	BH14	02/08/2022	11	--	--	--	0.94 [9]	--	No	0.067	8	89%
Pesticides																					
4,4'-DDD	72-54-8	mg/kg	0.34	0.017	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
4,4'-DDE	72-55-9	mg/kg	0.22	0.011	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
4,4'-DDT	50-29-3	mg/kg	3.5	0.17	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Aldrin	309-00-2	mg/kg	0.0027	0.0027	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
alpha-BHC	319-84-6	mg/kg	0.01	0.01	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
alpha-Endosulfan	959-98-8	mg/kg	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
beta-BHC	319-85-7	mg/kg	0.01	0.01	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
beta-Endosulfan	33213-65-9	mg/kg	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Chlordane	57-74-9	mg/kg	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
delta-BHC	319-86-8	mg/kg	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Dieldrin	60-57-1	mg/kg	0.003	0.003	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Endosulfan sulfate	1031-07-8	mg/kg	19	0.97	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Endrin	72-20-8	mg/kg	0.44	0.022	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Endrin Aldehyde	7421-93-4	mg/kg	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
gamma-BHC	58-89-9	mg/kg	0.01	0.01	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Heptachlor	76-44-8	mg/kg	0.019	0.0033	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Heptachlor Epoxide	1024-57-3	mg/kg	0.0099	0.003	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Methoxychlor	72-43-5	mg/kg	64	3.2	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%
Toxaphene	8001-35-2	mg/kg	1.5	0.076	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	100%

Table 5.4
Frequency of Detections and Exceedances Outside Thermal Treatment Area

			Analyte Information			Detected Result Information										95% UCL Information				Non-Detected Result Information	
Analyte	CAS No.	Unit	Adjusted Screening Levels Vadose (1)	Adjusted Screening Levels Saturated (2)	Number of Results	Number of Detects	Detect Percentage	Minimum Detect Value	Maximum Detect Value	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect	Number of Detect Exceedances	Percentage of Detect Exceedances	Detect Exceedance Factor	95% UCL (3)	Suggested UCL Distribution (3)	95% UCL > SL	SL Exceedance Factor of 95% UCL	Number of Non-Detects	Non-Detect Percentage
Herbicides																					
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	mg/kg	0.08	0.0054	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
2,4,5-Trichlorophenoxyacetic acid	93-76-5	mg/kg	0.98	0.063	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
2,4-DB	94-82-6	mg/kg	5.5	0.32	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
2,4-Dichlorophenoxyacetic acid	94-75-7	mg/kg	0.32	0.022	6	2	33%	0.0053	1.4	BH14	02/08/2022	11	1	17%	4.4	--	Recommendation cannot be provided	--	--	4	67%
Dicamba	1918-00-9	mg/kg	2.2	0.15	6	1	17%	0.15	0.15	BH14	02/08/2022	11	--	--	--	0.15 (9)	NA	No	0.068	5	83%
Dichloroprop	120-36-5	mg/kg	--	--	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
Dinoseb	88-85-7	mg/kg	0.63	0.032	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
MCPA	94-74-6	mg/kg	0.037	0.0025	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%
Silvex	93-72-1	mg/kg	0.38	0.023	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	100%

Notes:

All results are rounded to two significant figures.
For sample/sample duplicates pairs, only one result per pair, per analyte, is included in the sample count per project data usage rules.
-- Value does not exist or value could not be calculated.
95% UCL > SL.
1 Criteria applied only to samples in the vadose zone, determined to be 0–59 feet bgs.
2 Criteria applied only to samples in the saturated zone, determined to be 60 feet bgs and deeper.
3 Suggested UCL and distribution based on ouput from statistical software ProUCL 5.2.0.
4 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
5 Analyte or analte sum has a proposed remediation level.
6 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.
7 Calculation of total VOC concentration was performed using all analytes analyzed by EPA 8260 methods for the sample.
8 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
9 A 95% UCL could not be calculated due to too few detections. The maximum detected value was used in place of a 95% UCL.

Abbreviations:

2,4-DB 4(2,4-Dichlorophenoxy)butyric acid
bgs Below ground surface
BHC Benzene hexachloride
BTEX Benzene, toluene, ethylbenzene, and xylenes
CAS Chemical Abstracts Service
cPAH Carcinogenic polycyclic aromatic hydrocarbon
CUL Cleanup level
cVOC Chlorinated volatile organic compound
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
MCPA (4-Chloro-2-methylphenoxy)acetic acid
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
NA Not applicable
SL Screening level
TEQ Toxic equivalent
TPH Total Petroleum Hydrocarbons
UCL Upper confidence limit

Table 8.1
Applicable or Relevant and Appropriate Requirements

Authorizing Statute	Implementing Regulation	Rationale
Substantive Requirements		
Safe Drinking Water Act 42 USC 300	• Primary Drinking Water Standards 40 CFR 141 • Secondary Drinking Water Standards 40 CFR 143	Groundwater is a potential source of drinking water downgradient of the Site. Groundwater will be monitored during the thermal treatment to assess short-term impacts from treatment.
Clean Water Act 33 USC 1251	• Water Quality Standards 40 CFR 131	Groundwater discharge to surface water, which supports aquatic life and is potentially a source of drinking water. Groundwater will be monitoring during the thermal treatment to assess short-term impacts from treatment.
Resource Conservation and Recovery Act 42 USC 6901	• Criteria for Classification of Solid Waste Disposal Facilities and Practices 40 CFR 257 • Air Emission Standards for Process Vents, Air Emission Standards for Equipment Leaks, and Air Emission Standards for Tanks, Surface Impoundments, and Containers 40 CFR 265AA, 265BB, and 265CC	Excavated wastes and soils may contain listed wastes. Applies to vapor treatment systems.
Clean Air Act 42 USC 7401	• National Ambient Air Quality Standards 40 CFR 50 • Ambient Air Quality Monitoring 40 CFR 58 • Standards of Performance for New Stationary Sources 40 CFR 60 • National Emission Standards for Hazardous Air pollutants 40 CFR 61 • National Emission Standards for Hazardous Air Pollutants for Source Categories 40 CFR 63	Applies to vapor treatment systems.
Hazardous Materials Transportation Act 49 USC 1801	• Hazardous Materials Regulation 49 CFR 171 • Hazardous Materials Tables, Communications Requirements, and Emergency Response Information Requirements 49 CFR 172	May apply to condensate disposal, if disposed of off-site.
Clean Air Act RCW 70.94 and 43.21A	• General regulations for Air Pollution Sources WAC 173-400 • Controls for New Sources for Toxic Air Pollutants WAC 173-460 • Ambient Air Quality Standards for Particulate matter WAC 173-470 • Emission Standards and Controls for Sources Emitting Volatile Organic Compounds (VOCs) WAC 173-490	Applies to vapor treatment systems.
Solid Waste Management Act RCW 70.95	• Criteria for Municipal Solid Waste (MSW) Landfills WAC 173-351 • Minimum Functional Standards for Solid Waste Handling WAC 173-304	WAC 173-351 applies to the MSW Landfill after closure activities. WAC 173-304 may not apply.
Model Toxics Control Act (MTCA) RCW 70.95	• Model Toxics Control Act Cleanup Regulation WAC 173-340	Establishes cleanup standards for soil, groundwater, surface water, and air.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 USC 103	• Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA	Meets CERCLA requirements.
Water Pollution Control/Water Resource Act RCW 90.48 and 90.54	• Surface Water Quality Standards WAC 173-201A • Protection of Upper Aquifer Zones WAC 173-154 • State Waste Discharge Program WAC 173-216	Establishes narrative and numeric standards for waters of the state. No water discharge permits are anticipated for the Site. May apply to condensate.

Table 8.1
Applicable or Relevant and Appropriate Requirements

Authorizing Statute	Implementing Regulation	Rationale
Substantive Requirements (cont.)		
Water Pollution Control Act RCW 90.48	• Groundwater Quality Standards for the State of Washington WAC 173-200	Cleanup actions under MTCA are exempt from state groundwater standards.
Public Water Supplies RCW 90.48	• Maximum Contaminant Levels WAC 246-290	Groundwater is a potential source of drinking water downgradient of the Site. Groundwater will be monitored during the thermal treatment to assess short-term impacts from treatment.
State Environmental Policy Act (SEPA) RCW 43.21C	• SEPA Rules WAC 197-11	Cleanup actions under MTCA are exempt from SEPA. A SEPA determination of non-significance was received for the project.
Action- and Chemical-Specific Requirements		
Hazardous Waste Management Act RCW 70.105	• Dangerous Waste Regulations WAC 173-303	Generation, storage, and treatment requirements may apply to condensate. Generation, accumulation, and treatment requirements for waste from the thermal treatment.
Model Toxics Control Act RCW 70.105D	• Model Toxics Control Act Cleanup Regulation WAC 173-340	Sets minimum requirements for cleanup actions.
Resource Conservation and Recovery Act Subtitle C 42 USC 6901	• Identification and Listing of Wastes 40 CFR 261 • Corrective Action Management Units (CAMU) 40 CFR 264.552 • Closure and Post-Closure 40 CFR 265 • Land Disposal Restrictions 40 CFR 268	Excavated wastes and soils may contain listed wastes. May apply to cleanup actions. Applies to handling and off-site treatment and disposal of the CAMU-eligible wastes from Zone A.
Water Well Construction RCW 18.104	• Minimum Standards for Construction and Maintenance of Wells WAC 173-160 • Rules and Regulations Governing the Licensing of Well Contractors and Operators WAC 173-162	Minimum standards for design and installation of wells. May not apply.
Washington Industrial Safety and Health RCW 49.17	• General Occupational Health Standards WAC 296-62 • Part N, Excavation, Trenching and Shoring WAC 296-155 (and associated provisions of 29 CFR 1926 [Subpart P]) WAC 296-841 • Airborne Contaminants. This includes, but is not limited to, WAC 296-841-20025, specifically addressing permissible exposure limits.	Applies to on-site workers involved in cleanup implementation.
Franklin County Code Chapter 17.56	• Heavy Industrial Zone I-3	Zoning applies to future Site use.
City of Pasco Municipal Code Chapter 16.06	• Building Permit Requirements, Utility Service Requirements for Building Permits	Applies to future construction. May not apply.
Franklin County Code, Title 15, Buildings and Construction	• Building Permit Requirements	Required for construction and use of a temporary structure. May not apply
Washington Administrative Code 296-46B-901(14)	• Electrical Permit Requirements, Temporary Construction Project Installations	Required for the installation, alteration, or maintenance of all electrical systems or equipment. Electrical work is permitted and inspected by the Washington State Department of Labor and Industries. May not apply.
Federal Insecticide, Fungicide, and Rodenticide Act 40 CFR 150	• FIFRA Rules 40 CFR 150	May apply if rodent control or application of insecticide is required for Site maintenance; however, rodent control and application of insecticide are not anticipated for this phase of work and have not been required on-site to date.

Table 8.1
Applicable or Relevant and Appropriate Requirements

Authorizing Statute	Implementing Regulation	Rationale
Action- and Chemical-Specific Requirements (cont.)		
Occupational Safety and Health Act 29 USC 651	• Safety and Health Rules 29 CFR 1910	Applies to on-site workers involved in cleanup implementation.
Toxic Substances Control Act 15 USC 2601	• 15 USC s/s 2601 et seq. [1976]	Tracks industrial chemicals, such as polychlorinated biphenyls in the United States, and regulates intrastate and interstate commerce. May apply to condensate and soil boring clippings disposed of off-site.
Washington Clean Air Act RCW 70.94 and 43.21A	• General Regulations for Air Pollution Sources WAC 173-400 • Emission Standards and Controls for Sources Emitting VOCs WAC 173-490	Establishes air quality standards for protection of human health. Applies to emissions from vapor treatment systems.

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Figures

Note:
· Basemap tiles by Stamen Design, under CC BY 3.0.
Data by OpenStreetMap, under ODbL.

0 2,000 4,000 8,000
Scale in Feet

N

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Figure 1.1
Site Location

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4/28/2023

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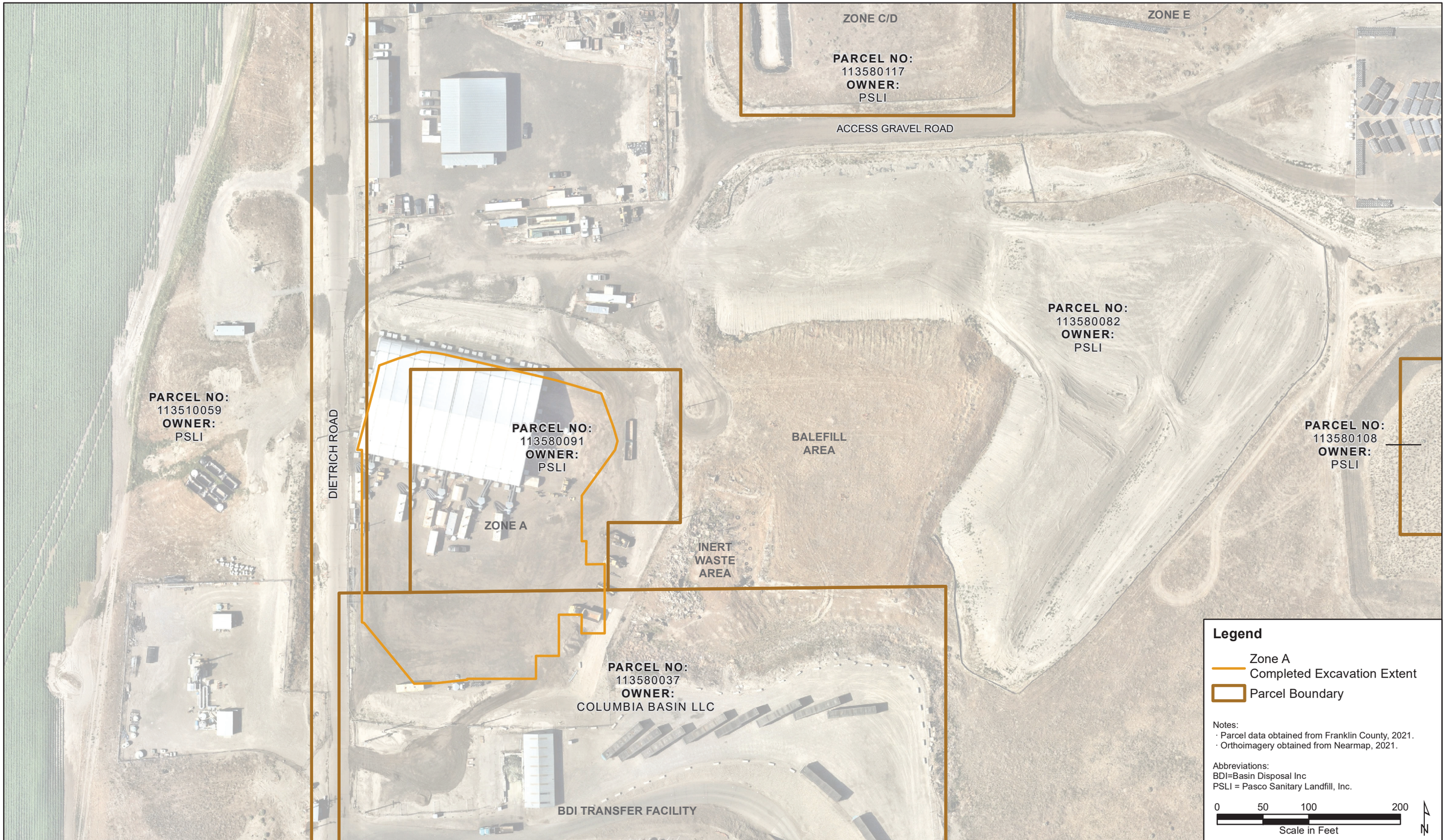
Figure 1.2
Property and Waste Disposal Areas

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 1.2 Property and Waste Disposal Areas.mxd
5/2/2023



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Engineering Design Report
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Figure 2.1
Landfill Property Ownership

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4/28/2023

0 500 1500ft

Source: Zone A Removal Action Engineering Design Report (Floyd|Snider and PBS 2020).
Figure produced by GHD. Google Earth Imagery, Date 7/20/2018.

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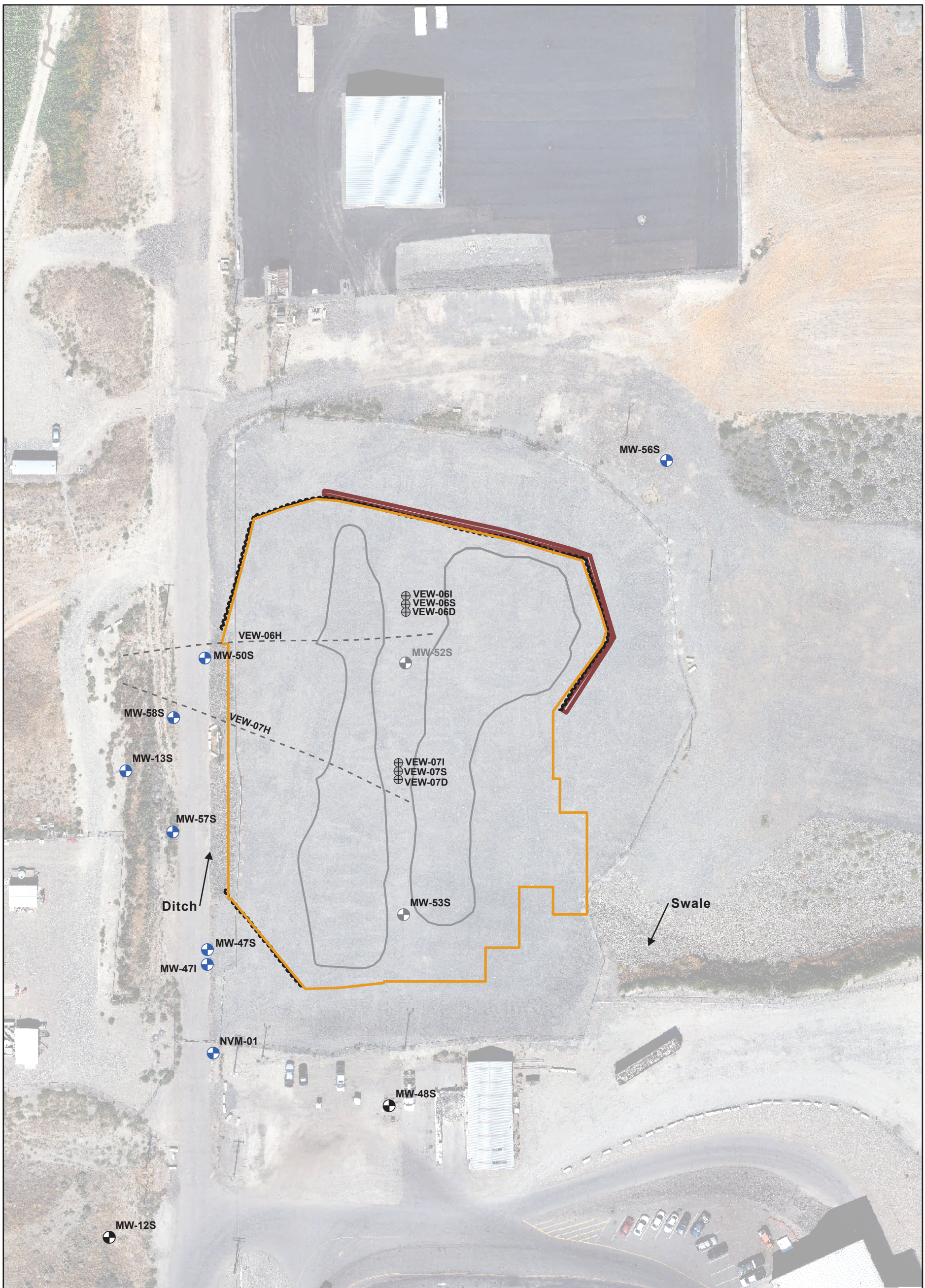
Zone A Post-Excavation Engineering Design Report
Pasco Sanitary Landfill NPL Site
Pasco, Washington

Figure 2.2
Groundwater Protection Areas



Legend

- Former Vertical VEW
- Zone A Groundwater Monitoring Network Well
- Decomissioned Monitoring Well
- Monitoring Well
- Horizontal VEW
- Former Drum Area
- Zone A Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall

Notes:
· Map data provided by PBS Engineering and Environmental Inc.
· Orthoimagery obtained from NearMap, 2022.

Abbreviation:
VEW = Vapor extraction well

N

0 35 70 140
Scale in Feet

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Figure 2.3
Zone A Key Features

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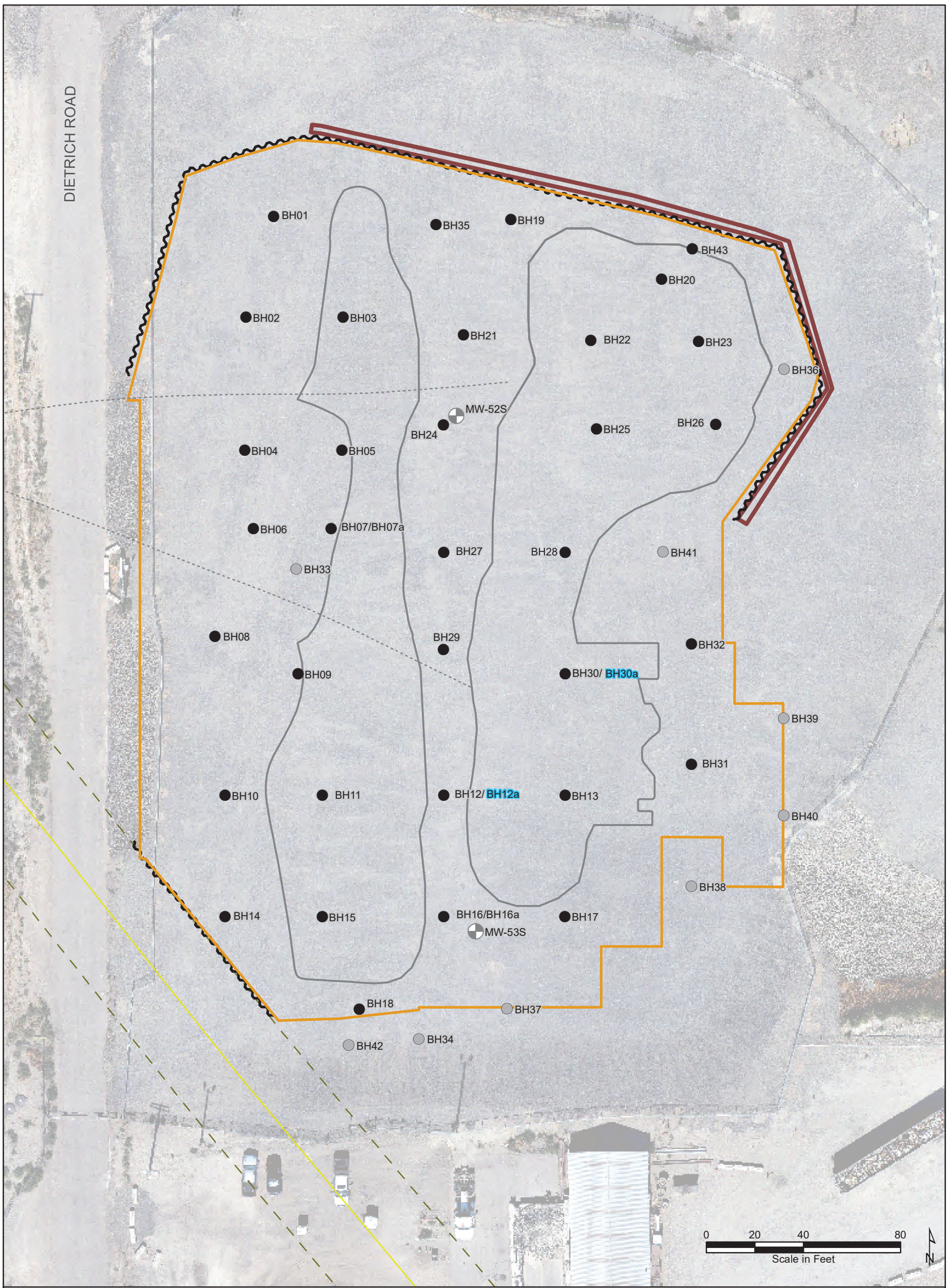
5/3/2023



Legend

- Borehole[1]
- Focused Design Borehole[2]
- Decomissioned Groundwater Monitoring Well
- BH12a Bench-Scale Treatability Test Location
- Horizontal VEW
- Completed Excavation Extent
- Sheet Pile Wall
- Former Drum Area
- Existing Gas Line
- Existing Utility Easements
- Protection Barrier Wall

Notes:
1. Borings were advanced to the capillary fringe/ water table or a maximum depth of 70 feet bgs.
2. Focused design borings were advanced 40 feet bgs except BH42, which was advanced 20 feet bgs.

Abbreviations:
bgs = Below ground surface
SVE = Soil vapor extraction
VEW = Vapor extraction well

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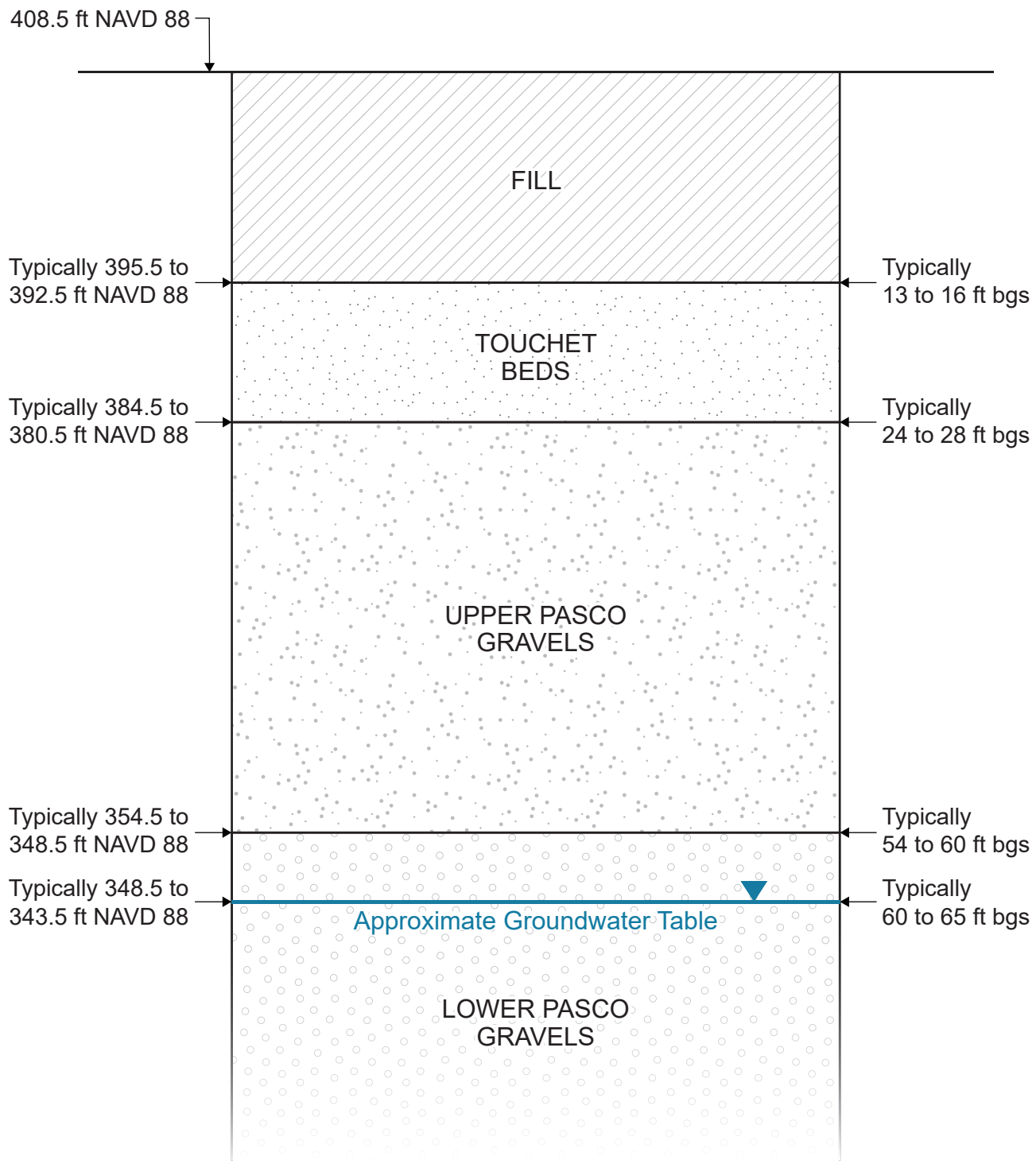
Figure 4.1
Post-Excavation Characterization Borehole Locations

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 4.1 Post-Excavation Characterization Borehole Locations.mxd
4/28/2023



Notes:
- Geologic layer depths shown based on observations during PEC drilling.
- Elevations and depths shown were based on typical observations of layer transitions. Shallower and deeper transitions between layers were observed at some borings.

Abbreviations:
bgs = Below ground surface, ft = Feet, NAVD 88 = North American Vertical Datum of 1988,
PEC = Post-excavation characterization

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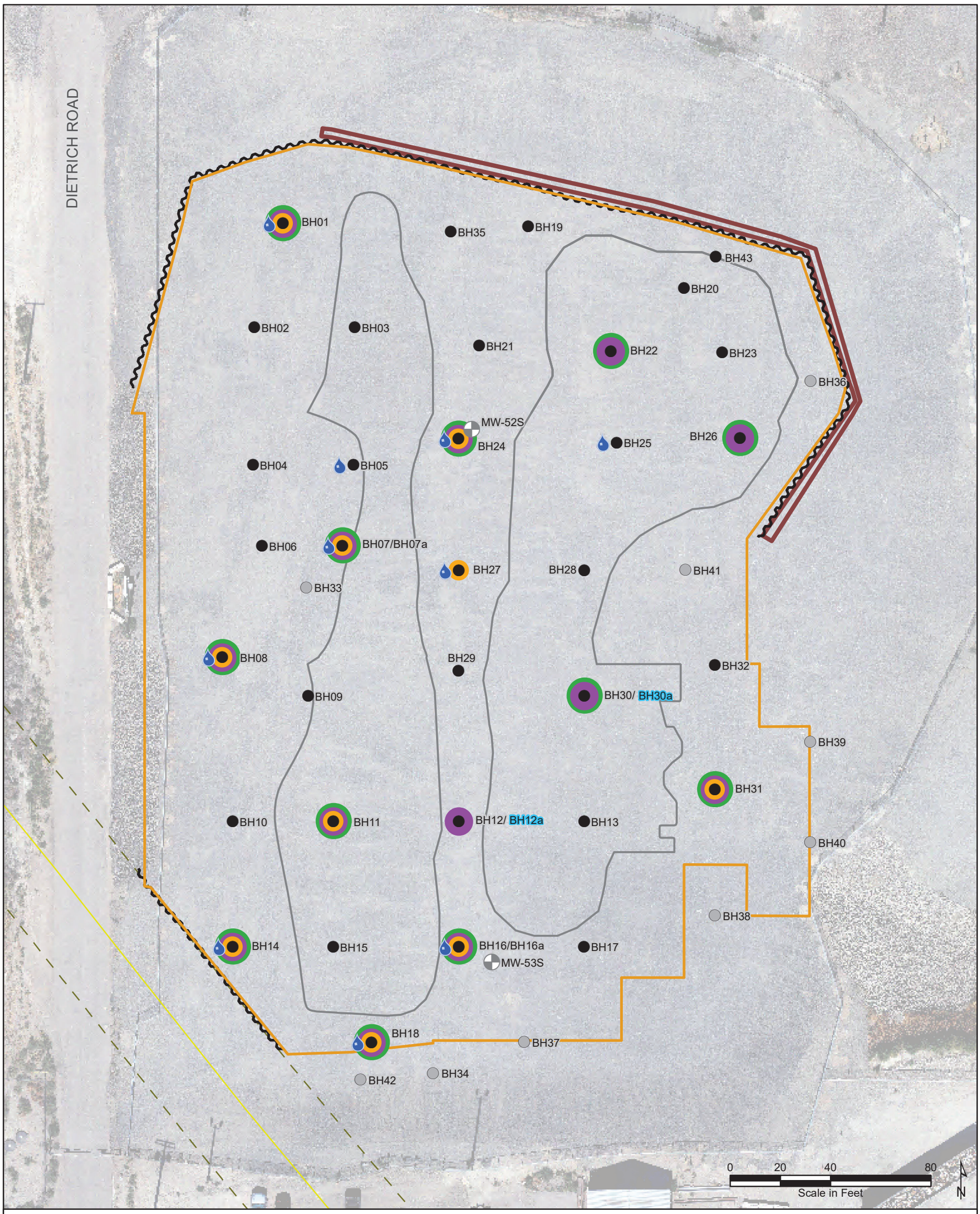
Figure 4.2
Zone A Geologic Layers

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 4.2 Zone A Geologic Layers.ai
5/5/2023



Legend

Sample Information

- Borehole(1)
- Focused Design Borehole(2)
- Decomissioned Groundwater Monitoring Well
- Additional Soil Sample at the Water Table(3)
- Additional Soil Sample for Herbicides and Pesticides(4)
- Additional Soil Sample for PCBs(4)
- Additional Soil Sample for RCRA Metals(4)
- BH12a Bench-Scale Treatability Test Location

Other Features

- Completed Excavation Extent
- Sheet Pile Wall
- Former Drum Area(5)
- Existing Gas Line
- Existing Utility Easements
- Protection Barrier Wall

Notes:
1. Borings were advanced to the capillary fringe/ water table or a maximum depth of 70 feet bgs.
2. Focused design borings were advanced 40 feet bgs except BH42, which was advanced 20 feet bgs.
3. Additional capillary fringe/water table sample was analyzed for VOCs, SVOCs, and TPH. Selected locations were analyzed for additional parameters. Refer to Table 4.2 for an analytical schedule.
4. Sample collected from the depth interval with the greatest field indication of contamination or at the water table if no evidence of contamination.
5. Areas of stacked and randomly placed drums based on final excavation limit drawings provided by ENTACT.

· All samples were analyzed for a minimum of TPH (GRO, DRO, and ORO), VOCs, and SVOCs.
· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
DRO = Diesel-range organics
GRO = Gasoline-range organics
ORO = Oil-range organics
PEC = Post-excavation characterization
PCB = Polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
SVOC = Semivolatile organic compound
TPH = Total petroleum hydrocarbons
VOC = Volatile organic compound

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Figure 4.3
PEC Sample Analyses Summary

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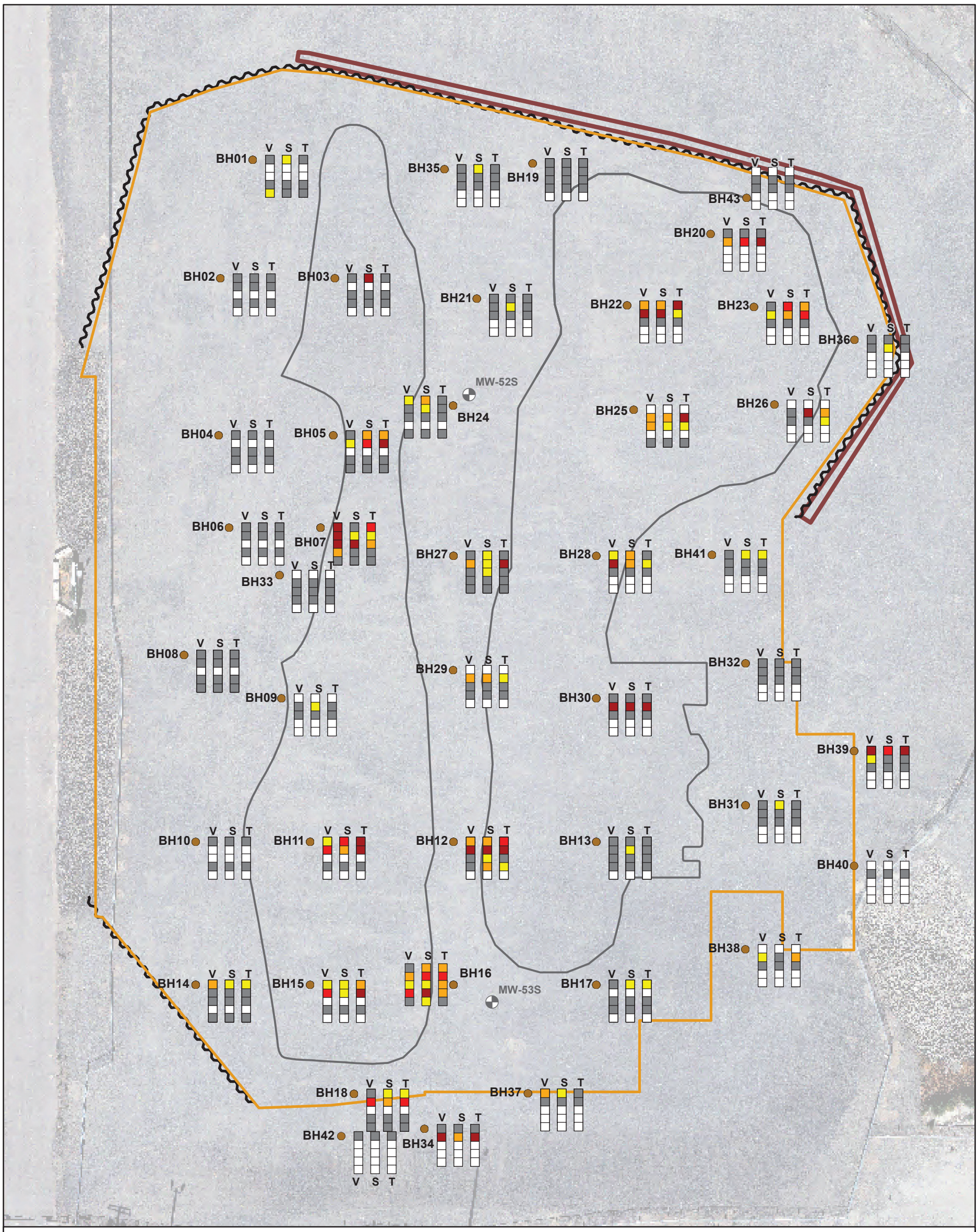
4/28/2023



Legend

- Decomissioned Monitoring Well

Sample Locations

- Soil Boring

Other Layers

- Completed Excavation Extent
- Sheet Pile Wall
- Former Drum Area
- Protection Barrier Wall

Results

- One or more detected results >100x SL
- One or more detected results >50–100x SL
- One or more detected results >10–50x SL
- One or more detected results >1–10x SL
- All results non-detect or detected less than SL
- Not Sampled

Soil Labels

Location ID → BH14

Chemical Group → V S T

Sample Depth Interval →
- 0–14 ft bgs
- 15–24 ft bgs
- 25–34 ft bgs
- 35–59 ft bgs
- 60+ ft bgs

Chemical Group Key:
V = VOCs S = SVOCs T = TPH

Note:
· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
mg/kg = Milligrams per kilogram
PEC = Post-excavation characterization
SL = Screening level
SVOC = Semivolatile organic compound
TPH = Total petroleum hydrocarbons
VOC = Volatile organic compound

N

0 17.5 35 70
Scale in Feet

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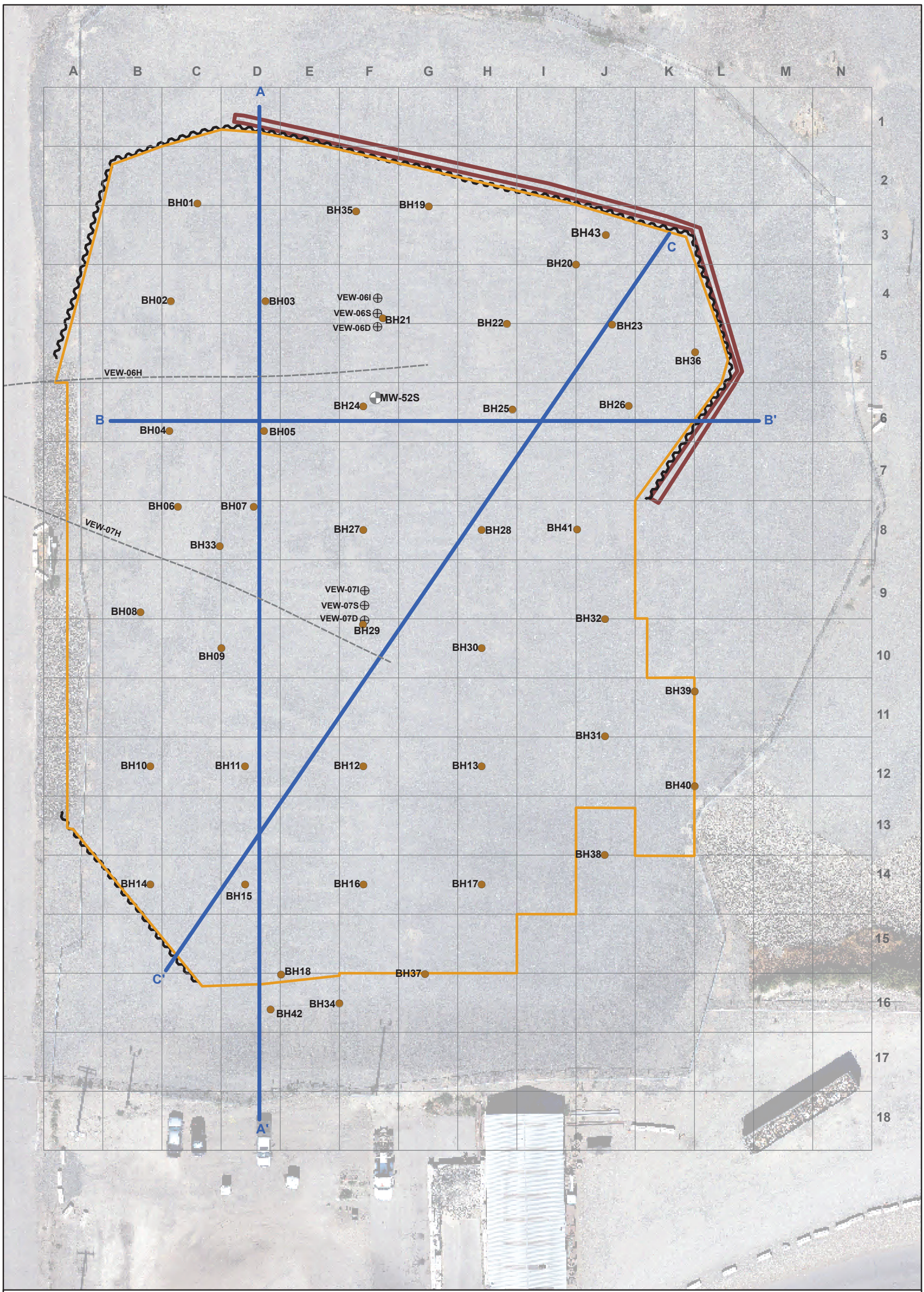
Figure 4.4
PEC Initial Data Summary: VOCs, SVOCs, and TPH

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 4.4 PEC Initial Data Summary VOCs, SVOCs, and TPH.mxd
4/28/2023



Legend

- Soil Boring
- Vertical VEW
- Decomissioned Monitoring Well
- Horizontal VEW
- A — A' Cross Section Line
- Zone A Excavation Grid
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall

Note:
· Map data provided by PBS Engineering and Environmental Inc.

Abbreviation:
VEW = Vapor extraction well

N

0 15 30 60
Scale in Feet

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Figure 4.5
Cross Section Locations

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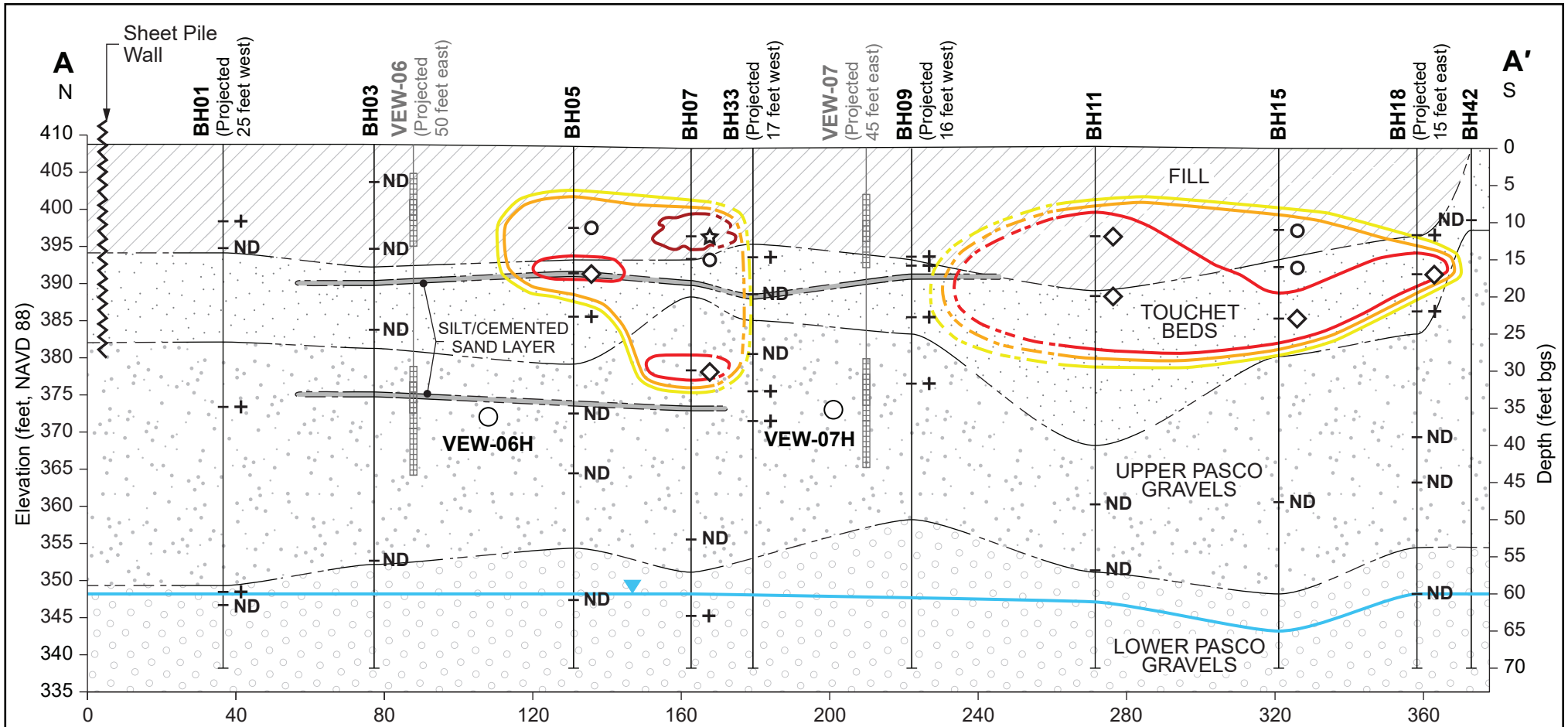
5/2/2023



Legend

Contact Boundary Between Lithologies (dashed where inferred)

Approximate Extent of Total VOCs in Soil (dashed where inferred)

- ND All VOCs Non-Detect
- + <1 mg/kg
- 1 mg/kg to <10 mg/kg
- 10 mg/kg to <100 mg/kg
- 100 mg/kg to <1,000 mg/kg
- ≥1,000 mg/kg

Horizontal Vapor Extraction Well (1)

Boring

Water Table

Removed Vapor Extraction Well

Horizontal Scale in Feet 0' 20' 40' 80'

Vertical Scale in Feet 0' 10' 20' 40'

Notes:

1 Horizontal Vapor Extraction Wells shown on this figure are the intersection points of the piping with the cross section. VEW-06H and VEW-07H are screened between 364 and 368 feet NAVD 88.

- Only the intermediate and deep screened zones for vapor extraction wells VEW-06 and VEW-07 are shown. The shallow screened zone was above the current grade.
- Refer to Table 4.4 for VOC analytes and data.

Abbreviations: bgs = Below ground surface, mg/kg = Milligrams per kilogram, NAVD 88 = North American Vertical Datum of 1988, VOC = Volatile organic compound

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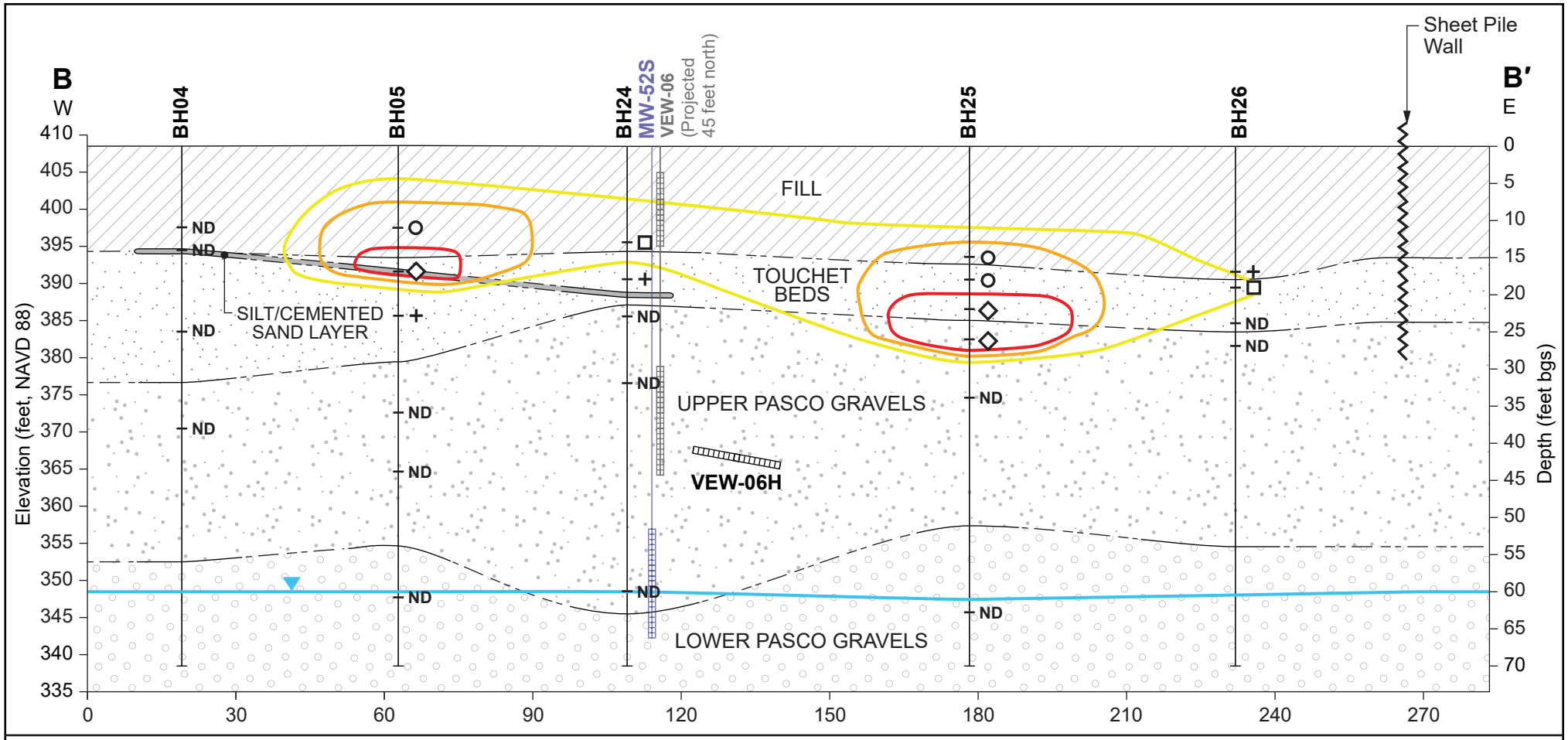
Figure 4.6
Cross Section A-A' with Total VOCs

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 4.6 Cross Section A-A' with Total VOCs.ai
5/1/2023



Legend

Contact Boundary Between Lithologies (dashed where inferred)

Approximate Extent of Total VOCs in Soil (dashed where inferred)

- ND All VOCs Non-Detect
- + <1 mg/kg
- 1 mg/kg to <10 mg/kg
- 10 mg/kg to <100 mg/kg
- 100 mg/kg to <1,000 mg/kg
- ≥1,000 mg/kg

Horizontal Vapor Extraction Screen

Boring

Water Table

Removed Vapor Extraction Well

Decommissioned Monitoring Well

Horizontal Scale in Feet 0' 15' 30' 60'

Vertical Scale in Feet 0' 10' 20' 40'

Notes:

- Only the intermediate and deep screened zones for vapor extraction well VEW-06 are shown. The shallow screened zone was above the current grade.
- Refer to Table 4.4 for VOC analytes and data.

Abbreviations: bgs = Below ground surface, mg/kg = Milligrams per kilogram, NAVD 88 = North American Vertical Datum of 1988, VOC = Volatile organic compound

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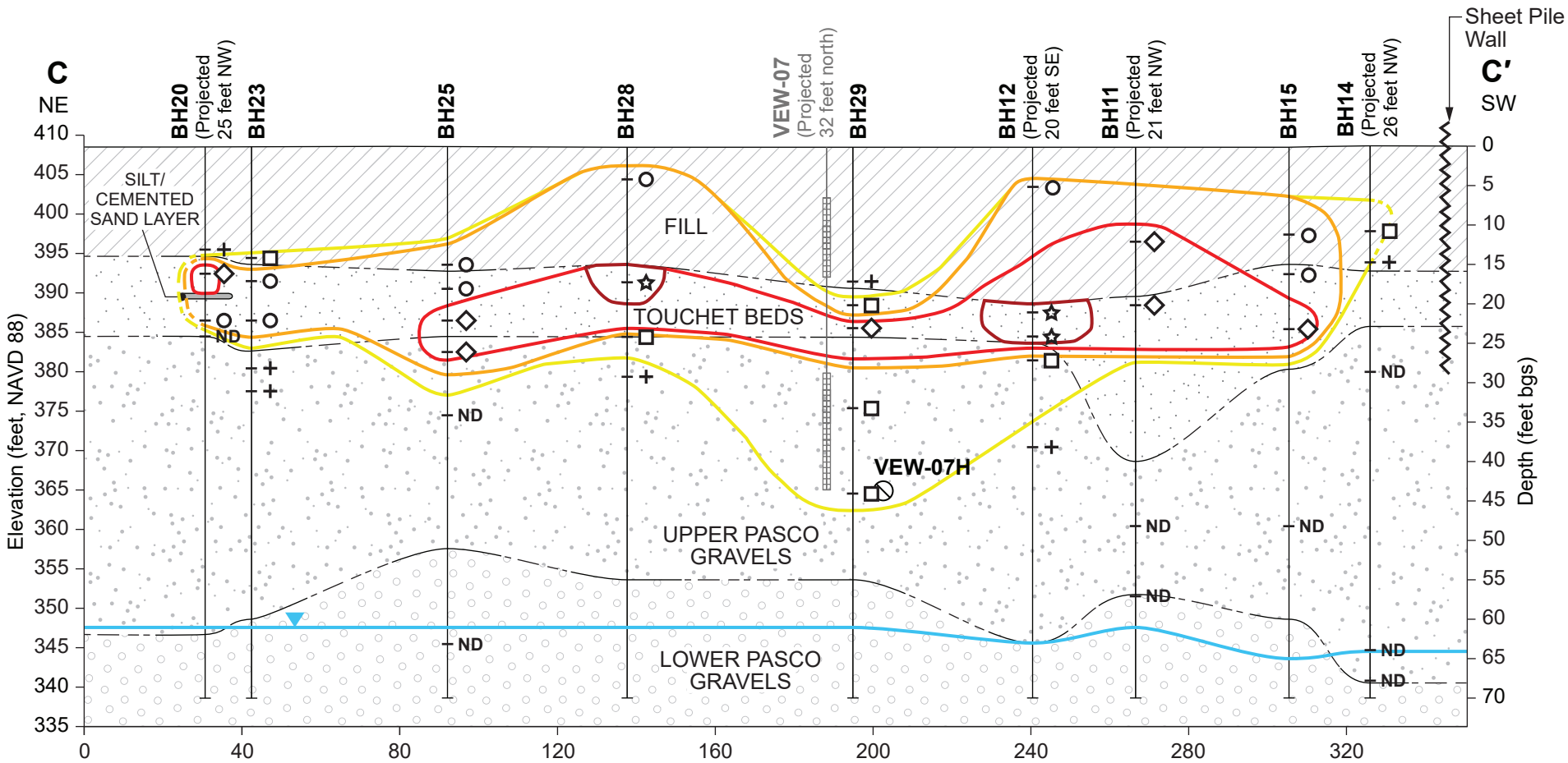
Figure 4.7
Cross Section B-B′ with Total VOCs

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 4.7 Cross Section B-B' with Total VOCs.ai
5/1/2023



Legend

Contact Boundary Between Lithologies (dashed where inferred)

Approximate Extent of Total VOCs in Soil (dashed where inferred)

- ND All VOCs Non-Detect
- + <1 mg/kg
- 1 mg/kg to <10 mg/kg
- 10 mg/kg to <100 mg/kg
- 100 mg/kg to <1,000 mg/kg
- ≥1,000 mg/kg

Horizontal Vapor Extraction Screen

Boring

Water Table

Removed Vapor Extraction Well

Horizontal Scale in Feet 0' 20' 40' 80'

Vertical Scale in Feet 0' 10' 20' 40'

Notes:

- Only the intermediate and deep screened zones for vapor extraction well VEW-07 are shown. The shallow screened zone was above the current grade
- Refer to Table 4.4 for VOC analytes and data.

Abbreviations: bgs = Below ground surface, mg/kg = Milligrams per kilogram, NAVD 88 = North American Vertical Datum of 1988, VOC = Volatile organic compound

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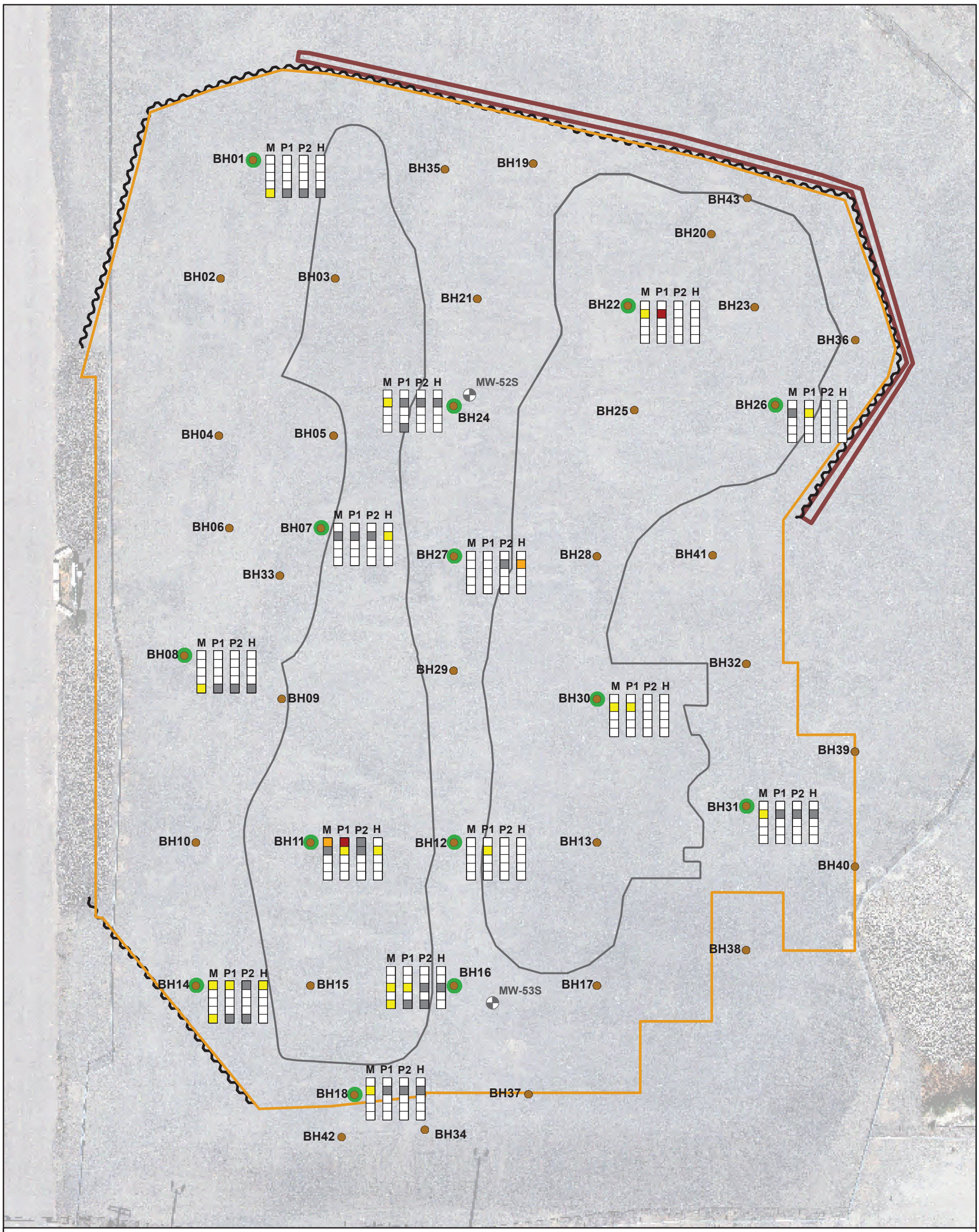
Figure 4.8
Cross Section C-C′ with Total VOCs

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 4.8 Cross Section C-C' with Total VOCs.ai
5/1/2023



Legend

- Decomissioned Monitoring Well

Sample Locations

- Soil Boring
- Soil Boring With Secondary Analyte Analyses

Other Layers

- Completed Excavation Extent
- Sheet Pile Wall
- Former Drum Area
- Protection Barrier Wall

Results

- One or more detected results >100x SL
- One or more detected results >50–100x SL
- One or more detected results >10–50x SL
- One or more detected results >1–10x SL
- All results non-detect or detected less than SL
- Not Sampled

Soil Labels

Location ID → BH14

Chemical Group → M P1 P2 H

Sample Depth Interval →
- 0–14 ft bgs
- 15–24 ft bgs
- 25–34 ft bgs
- 35–59 ft bgs
- 60+ ft bgs

Chemical Group Key:
M = Metals
P1 = PCBs
P2 = Pesticides
H = Herbicides

Note:
- Metals, PCBs, pesticides, and herbicides were only analyzed at select PEC locations. Refer to Section 4.2.3 for details.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
mg/kg = Milligrams per kilogram
PEC = Post-excavation characterization
PCB = Polychlorinated biphenyl
SL = Screening level

N

0 17.5 35 70
Scale in Feet

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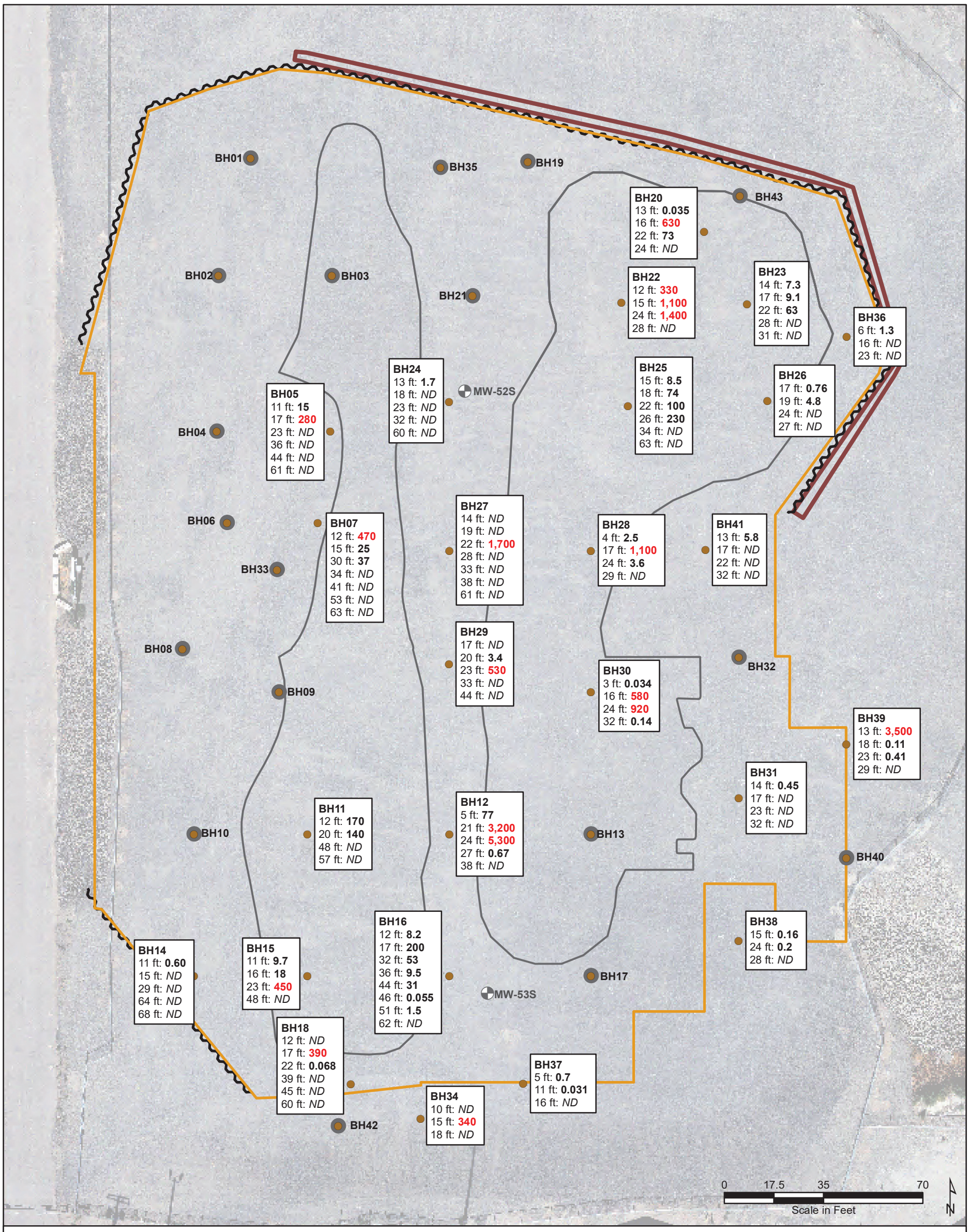
Figure 4.9
PEC Initial Data Summary: Metals, PCBs, Pesticides, and Herbicides

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 4.9 PEC Initial Data Summary Metals, Pesticides, and Herbicides.mxd
4/28/2023



Legend

Sample Locations

- Soil Boring
- All Results Non-Detect

Other Layers

- Decomissioned Monitoring Well
- Completed Excavation Extent
- Former Drum Area
- Sheet Pile Wall
- Protection Barrier Wall

Label Key

Location ID →

Sample Depth (ft bgs) →

← Total BTEX Result (mg/kg)

BH07
12 ft: **2,300**
15 ft: **64**
30 ft: **200**
53 ft: *ND*
63 ft: **0.0031**

Remediation Level
Total BTEX: 250 mg/kg

Notes:
- Results shown in **RED BOLD** are detected greater than the REL.
- Results shown in **BOLD** are detected.
- Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
- All results are in mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
BTEX = Benzene, toluene, ethylbenzene, and xylenes
mg/kg = Milligrams per kilogram
ND = Not detected
REL = Remediation level

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Figure 5.1
Total BTEX in Soil

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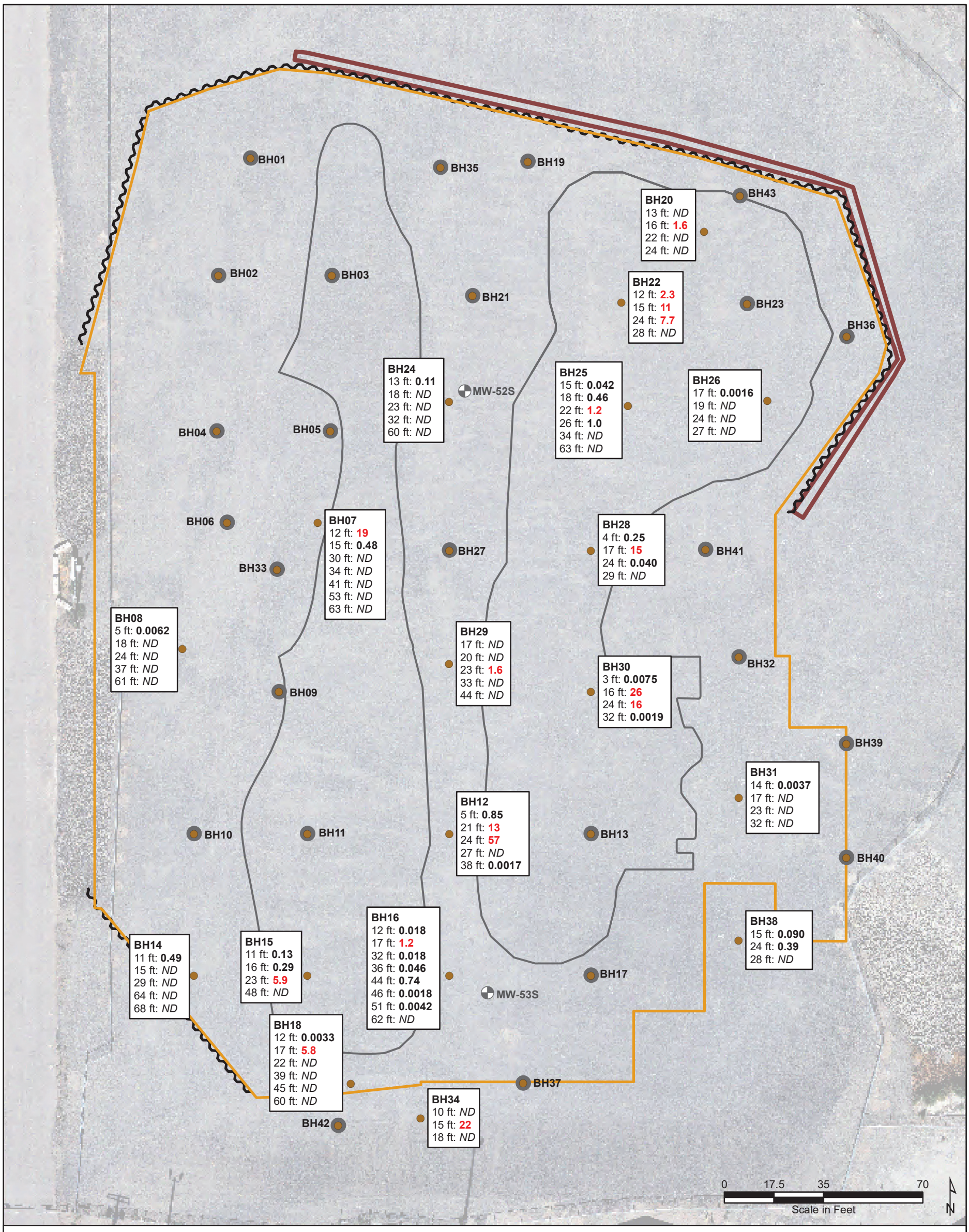
4/28/2023



Legend

Sample Locations

- Soil Boring
- All Results Non-Detect

Other Layers

- Decomissioned Monitoring Well
- Completed Excavation Extent
- Former Drum Area
- Sheet Pile Wall
- Protection Barrier Wall

Label Key

Location ID → **BH07**
12 ft: **2,300**
Sample Depth (ft bgs) → 15 ft: **64** ← Total cVOCs Result (mg/kg)
30 ft: **200**
53 ft: *ND*
63 ft: **0.0031**

Remediation Level
Total cVOCs: 1.0 mg/kg

Notes:
- Results shown in **RED BOLD** are detected greater than the REL.
- Results shown in **BOLD** are detected.
- The calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.
- Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
- All results are in mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
cVOC = Chlorinated volatile organic compound
ft = Feet
mg/kg = Milligrams per kilogram
ND = Not detected
REL = Remediation Level

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Figure 5.2
Total cVOCs in Soil

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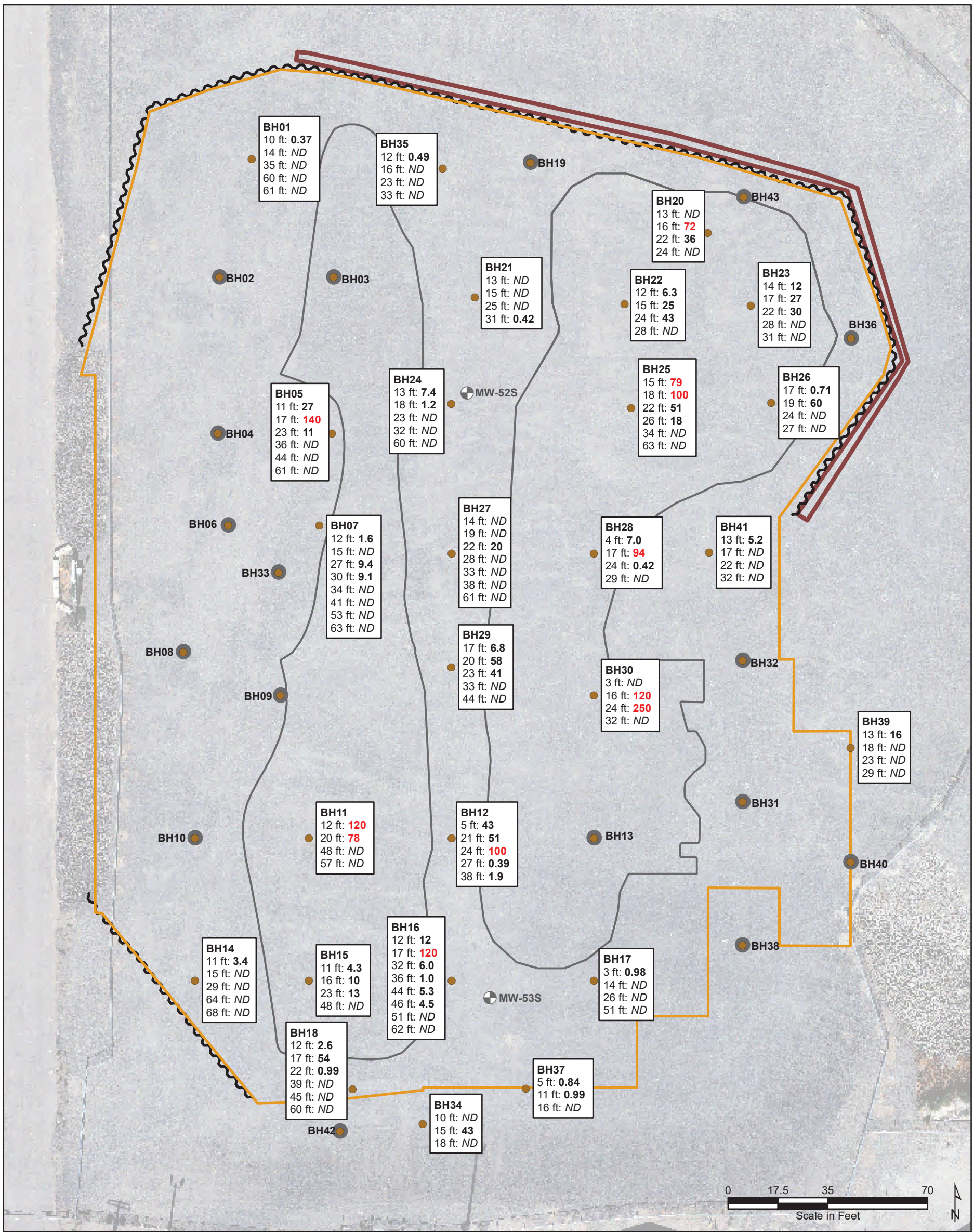
4/28/2023



Legend

Sample Locations

- Soil Boring
- All Results Non-Detect

Other Layers

- Decomissioned Monitoring Well
- Completed Excavation Extent
- Sheet Pile Wall
- Former Drum Area
- Protection Barrier Wall

Label Key

Location ID → **BH07**
Sample Depth (ft bgs) →
12 ft: **2,300**
15 ft: **64** ← Total Naphthalenes Result (mg/kg)
30 ft: **200**
53 ft: *ND*
63 ft: **0.0031**

Remediation Level
Total Naphthalenes: 65 mg/kg

Notes:
- Results shown in **RED BOLD** are detected greater than the REL.
- Results shown in **BOLD** are detected.
- The calculation of total naphthalenes was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.
- All results are in mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
mg/kg = Milligrams per kilogram
ND = Not detected
REL = Remediation level

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Figure 5.3
Total Naphthalenes in Soil

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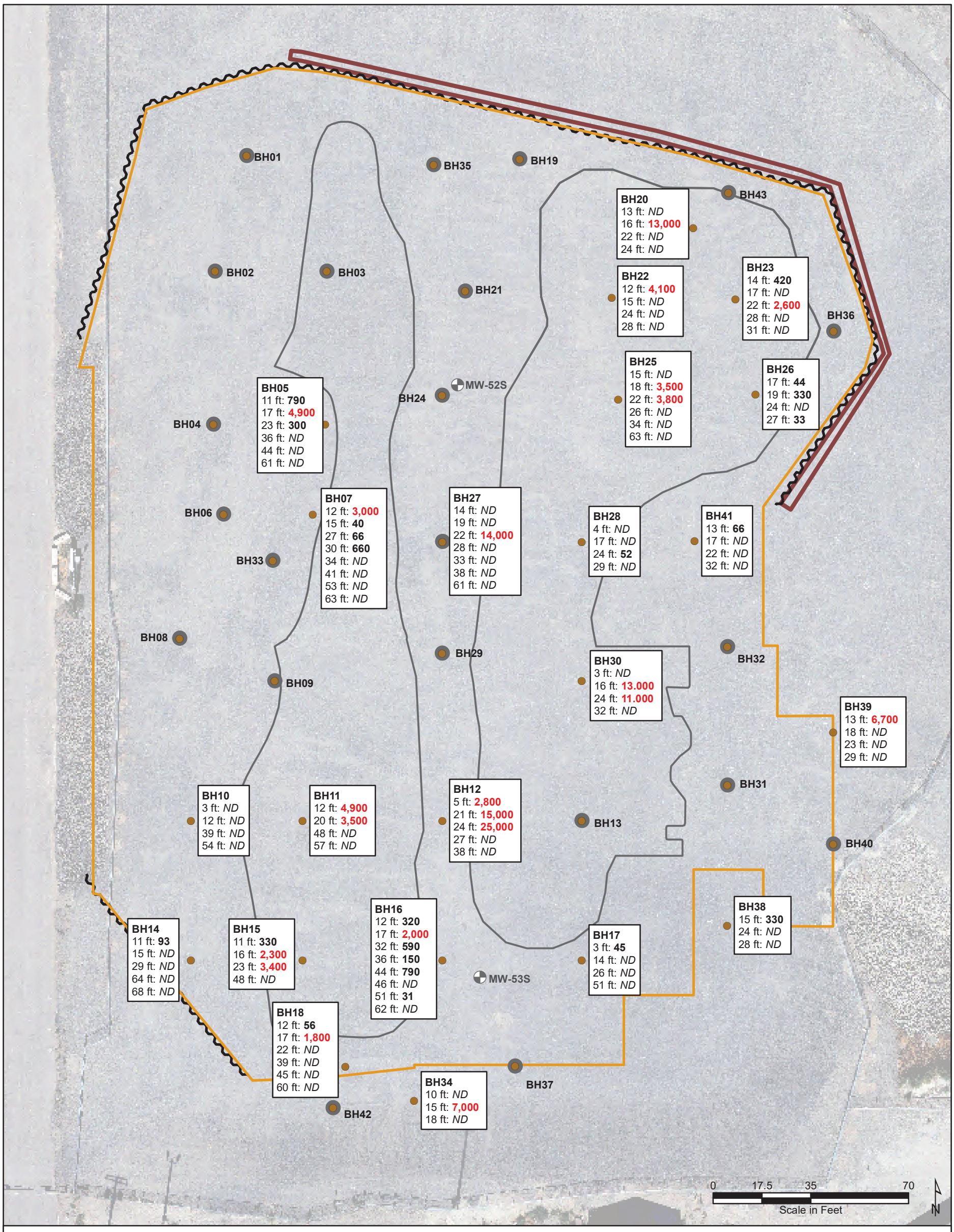
4/28/2023



Legend

Sample Locations

- Soil Boring
- All Results Non-Detect

Other Layers

- Decomissioned Monitoring Well
- Completed Excavation Extent
- Former Drum Area
- Sheet Pile Wall
- Protection Barrier Wall

Label Key

Location ID → **BH07**
12 ft: **2,300**
Sample Depth → 15 ft: **64** ← GRO Result (mg/kg)
30 ft: **200**
53 ft: *ND*
63 ft: **0.0031**

Remediation Level
Total GRO: 1,000 mg/kg

Notes:
- Results shown in **RED BOLD** are detected greater than the REL.
- Results shown in **BOLD** are detected.
- All results are in mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
ND = Not detected
REL = Remediation level

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Figure 5.4
GRO in Soil

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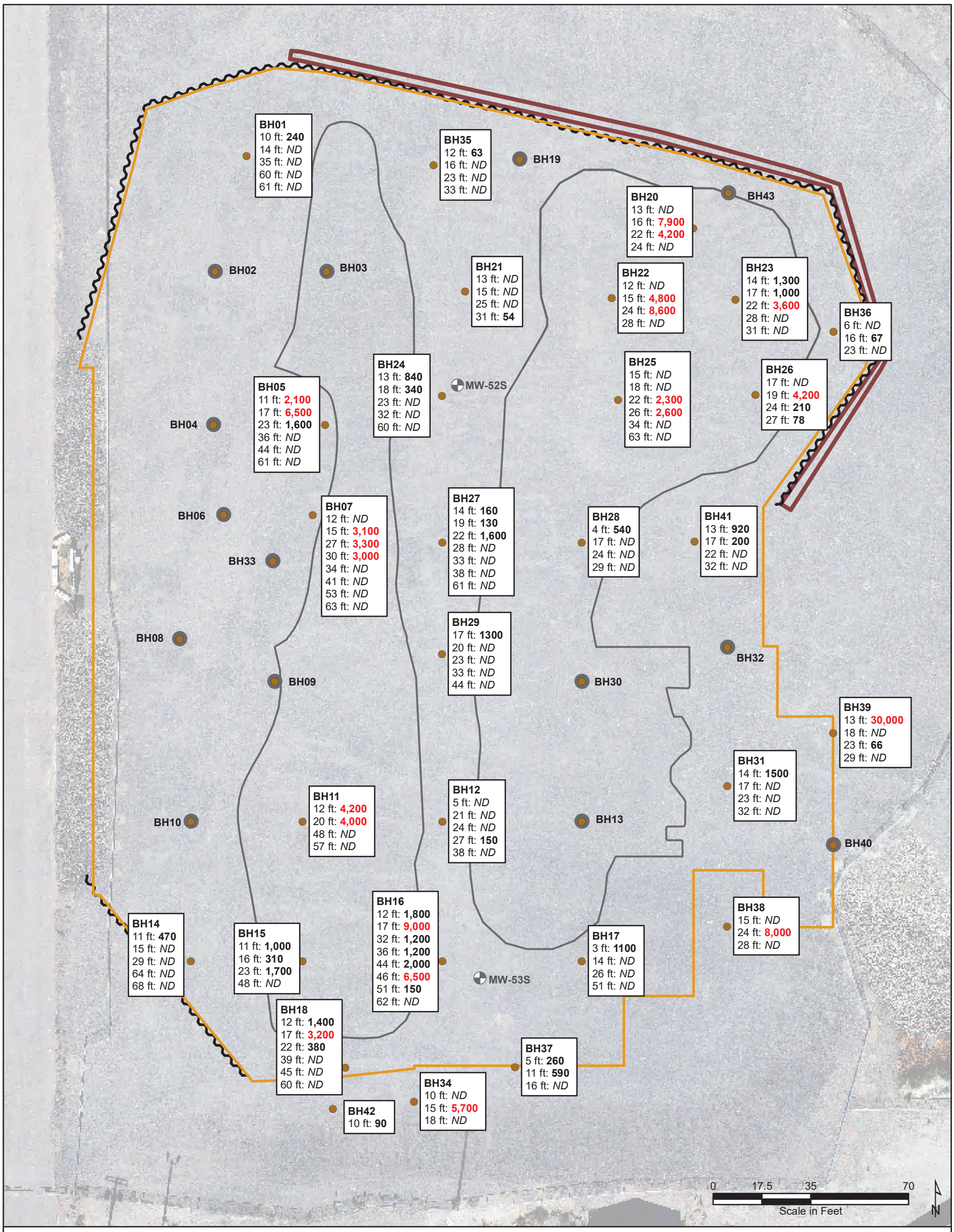
4/28/2023



Legend

Sample Locations

- Soil Boring
- All Results Non-Detect

Other Layers

- Decomissioned Monitoring Well
- Completed Excavation Extent
- Former Drum Area
- Sheet Pile Wall
- Protection Barrier Wall

Label Key

Location ID → **BH07**
Sample Depth (ft bgs) →
12 ft: **2,300**
15 ft: **64** ← GRO Result (mg/kg)
30 ft: **200**
53 ft: *ND*
63 ft: **0.0031**

Remediation Level
Total DRO: 2,000 mg/kg

Notes:
- Results shown in **RED BOLD** are detected greater than the REL.
- Results shown in **BOLD** are detected.
- All results are in mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
DRO = Diesel-range organics
mg/kg = Milligrams per kilogram
ND = Not detected
REL = Remediation level

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Figure 5.5
DRO in Soil

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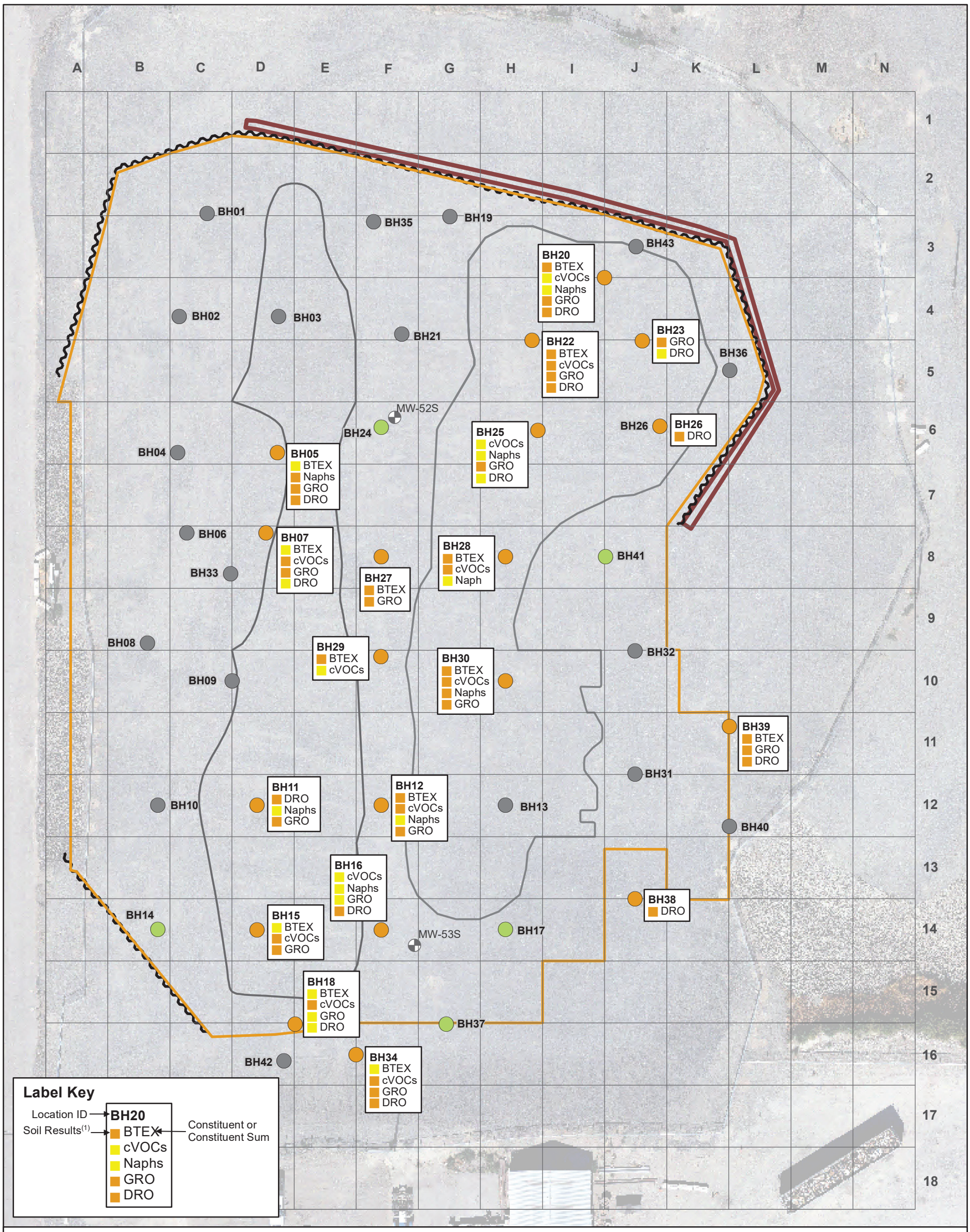
4/28/2023



Legend

Soil Results(1)

- All Results Non-Detect or ≤SL
- One or More Detected Results >SL to ≤REL
- One or More Detected Results >REL to ≤2X REL
- One or More Detected Results >2X REL

Other Layers

- Decomissioned Monitoring Well
- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall

Notes:
1. Soil results shown only for analytes or analyte sums with proposed RELs. Soil results in data labels shown for analyte groups with a REL exceedance.
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total Naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene
- Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration was used.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naph: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
BTEX = Benzene, toluene, ethylbenzene, and xylenes
CUL = Cleanup level
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Total naphthalenes
PEC = Post-excavation characterization
REL = Remediation level
SL = Screening level
SVOC = Semivolatile organic compound
TPH = Total petroleum hydrocarbons
VOC = Volatile organic compound

0 20 40 80
Scale in Feet
N

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Zone A Post-Excavation Engineering Design Report Pasco, Washington

Figure 5.6
PEC Data Compared to RELs

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 5.6 PEC Data Compared to RELs.mxd
4/28/2023

Legend

Soil Results (1)

- All Results Non-Detect or ≤SL
- One or More Detected Results >SL to ≤REL
- One or More Detected Results >REL to ≤2X REL
- One or More Detected Results >2X REL

- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area

Label Key

Number of roll-offs with total VOCs > 500 mg/kg → 1/18 ← Total number of roll-offs

Notes:
1. Soil results shown only for analytes or analyte sums with proposed RELs.
- Light shaded grids had at least one roll-off with total VOCs > 500 mg/kg.
- Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
PEC = Post-excavation characterization
REL = Remediation Level
SL = Screening level

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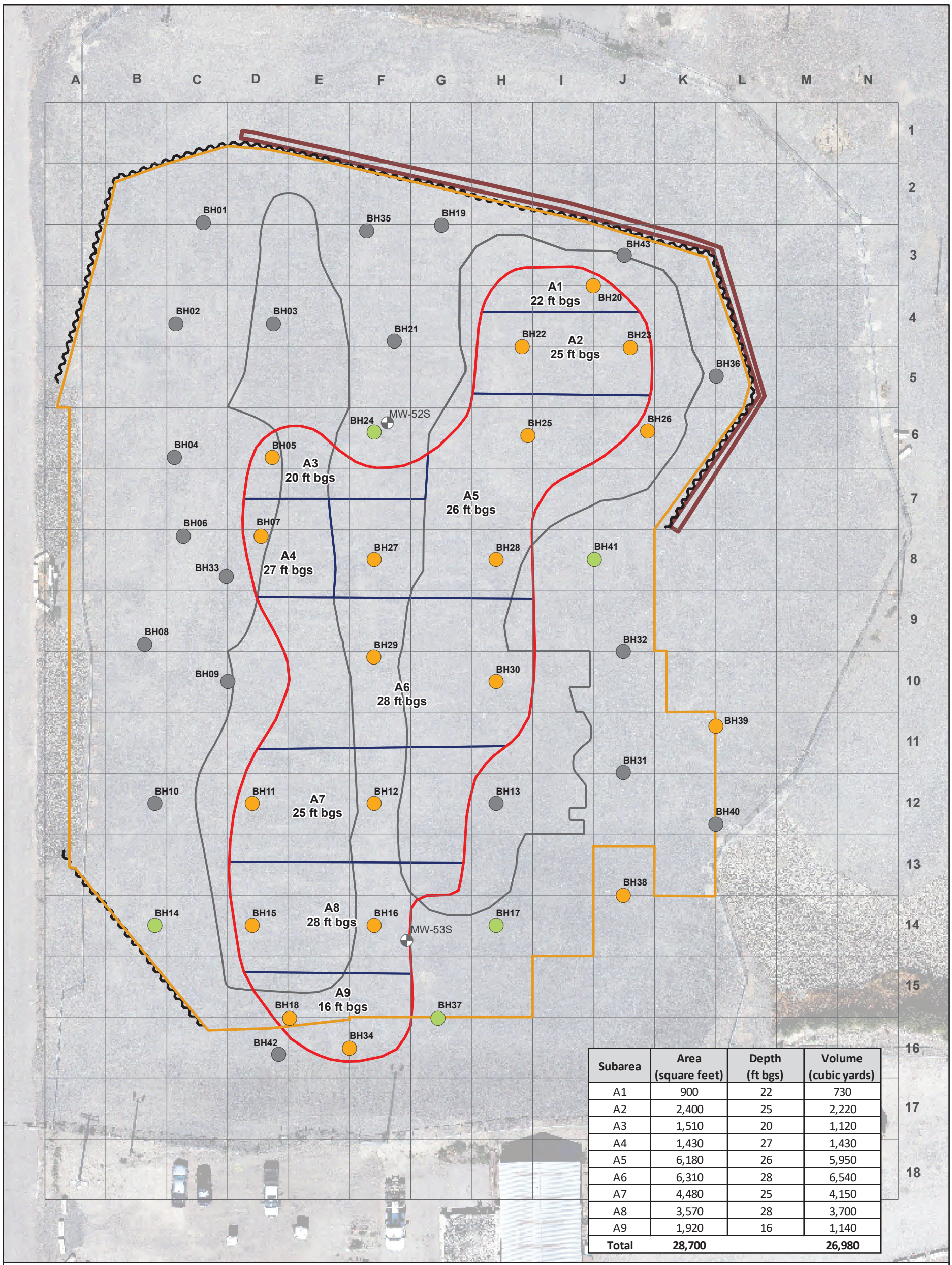
Figure 5.7
Proposed Lateral Limits of Thermal Treatment Area

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 5.7 Proposed Lateral Limits of Thermal Treatment Area.mxd
5/2/2023



Subarea	Area (square feet)	Depth (ft bgs)	Volume (cubic yards)
A1	900	22	730
A2	2,400	25	2,220
A3	1,510	20	1,120
A4	1,430	27	1,430
A5	6,180	26	5,950
A6	6,310	28	6,540
A7	4,480	25	4,150
A8	3,570	28	3,700
A9	1,920	16	1,140
Total	**28,700**		**26,980**

Legend

Soil Results (1)

- All Results Non-Detect or ≤SL
- One or More Detected Results >SL to ≤REL
- One or More Detected Results >REL to ≤2X REL
- One or More Detected Results >2X REL
- Decomissioned Monitoring Well

- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area
- Thermal Subareas(1)

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft below the targeted treatment depths.
· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = Below ground surface
ft = Feet
PEC = Post-excavation characterization
REL = Remediation Level
SL = Screening level

0 20 40 80
Scale in Feet
N

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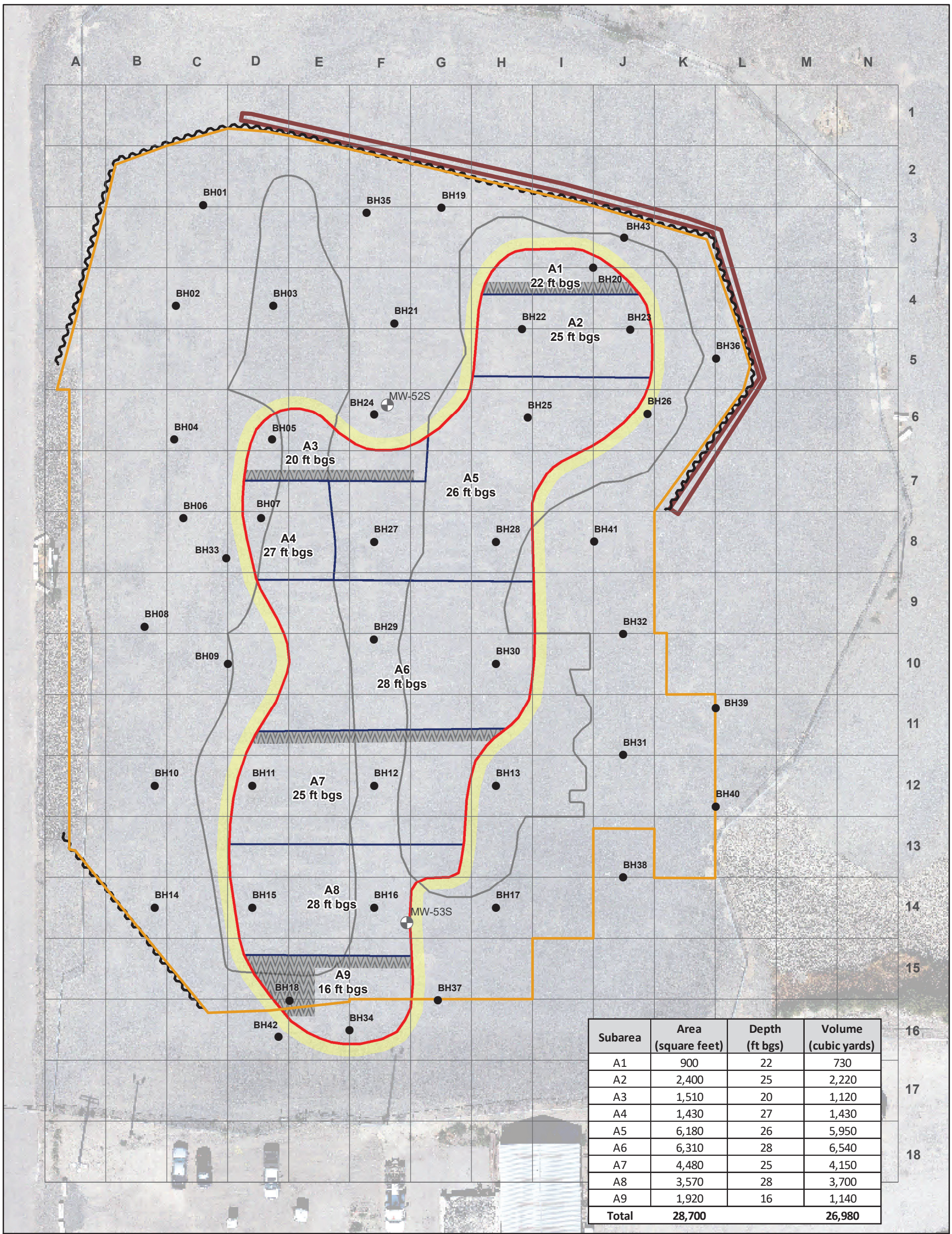
Figure 5.8
Proposed Vertical Limits of Thermal Treatment Area

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 5.8 Proposed Vertical Limits of Thermal Treatment Area.mxd
7/25/2023



Subarea	Area (square feet)	Depth (ft bgs)	Volume (cubic yards)
A1	900	22	730
A2	2,400	25	2,220
A3	1,510	20	1,120
A4	1,430	27	1,430
A5	6,180	26	5,950
A6	6,310	28	6,540
A7	4,480	25	4,150
A8	3,570	28	3,700
A9	1,920	16	1,140
Total	**28,700**		**26,980**

Legend

- Existing PEC Boring
- Decomissioned Monitoring Well
- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area
- Thermal Treatment Halo(1)
- Thermal Subareas(2)
- Heater Transition Zone(3)

Notes:
1. Heat will radiate approximately 5 to 8 feet laterally and vertically from the edges of the treatment area.This extended heat will result in a halo of contaminant concentration reductions surrounding the treatment area.
2. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft below the targeted treatment depths.
3. Heater depths will be stair stepped between thermal subareas to reduce heat loss between different depths. The width of each transition zone will depend on the final heater positioning and difference between depths. Refer to EDR Appendix E for design details.

· Phase 1 of treatment will include subareas A6 through A9 and phase 2 of treatment will include subareas A1 through A5.
· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
bgs = below ground surface
EDR = Engineering Design Report
ft = Feet
ISTR = In situ thermal remediation
PEC = Post-excavation characterization

0 20 40 80
Scale in Feet
N

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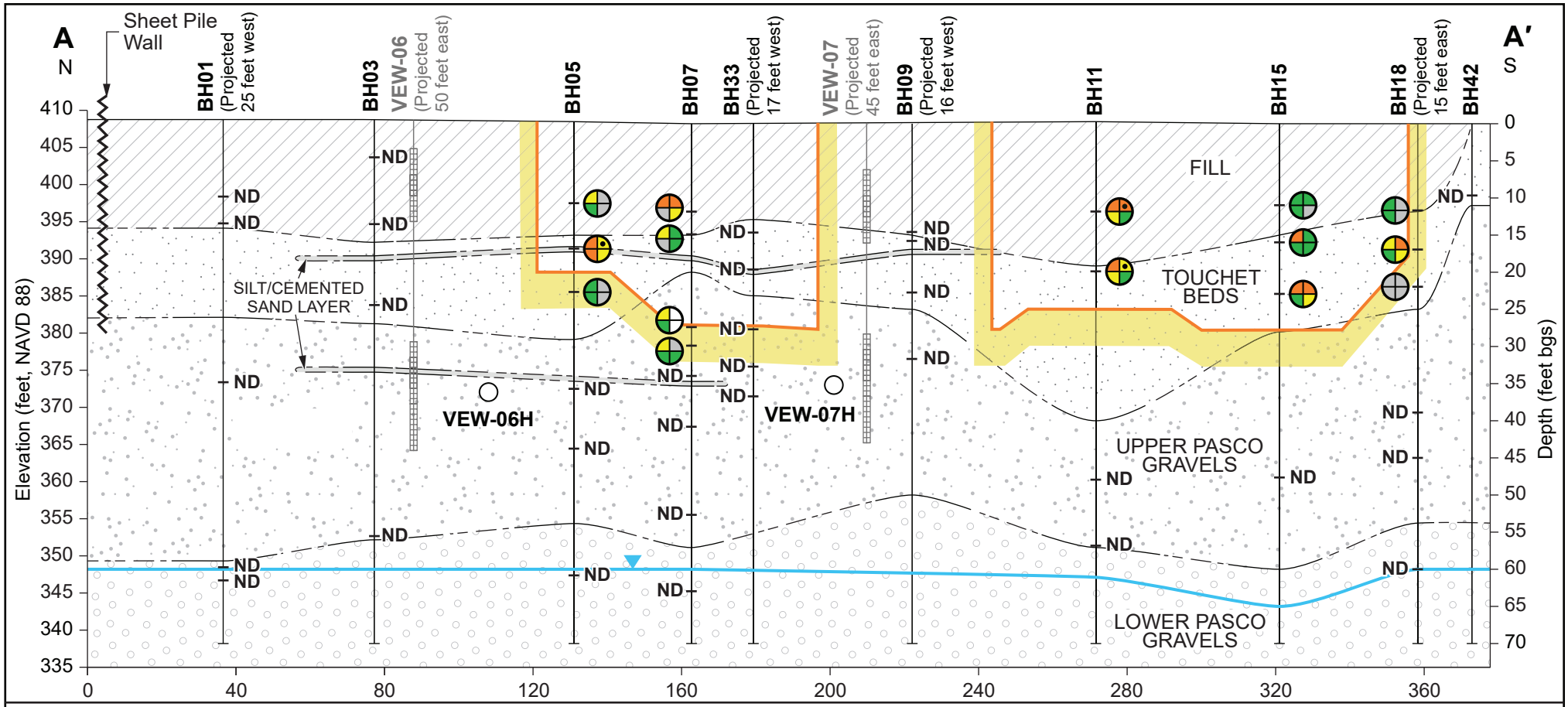
Figure 7.1
Proposed Thermal Treatment Area and ISTR Details

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Figure 7.1 Proposed Thermal Treatment Area and ISTR Details.mxd
8/8/2023



Legend

REL Analytes or Analyte Sums in Soil

ND	All Results Non-Detect
•	ND Exceedances
Gray	≤SL
Green	>SL to ≤REL
Yellow	>REL to ≤2x REL
Orange	>2x REL

GRO & DRO | Total cVOCs | Total Naph | Total BTEX

Remediation Levels

Total BTEX = 250 mg/kg
Total cVOCs = 1.0 mg/kg
Total Naph = 65 mg/kg
GRO = 1,000 mg/kg
DRO = 2,000 mg/kg

Vertical Thermal Treatment Boundary
Thermal Treatment Halo
Horizontal Vapor Extraction Well (1)
Boring
Water Table
Removed Vapor Extraction Well

Contact Boundary Between Lithologies (dashed where inferred)

Horizontal Scale in Feet 0' 20' 40' 80'
Vertical Scale in Feet 0' 10' 20' 40'

Notes:
1 Horizontal Vapor Extraction Wells shown on this figure are the intersection points of the piping with the cross section. VEW-06H and VEW-07H are screened between 364 and 368 feet NAVD 88.
- Only the intermediate and deep screened zones for vapor extraction wells VEW-06 and VEW-07 are shown. The shallow screened zone was above the current grade.
- Refer to Table 4.4 for VOC analytes and data.
- Heat will radiate approximately 5 to 8 feet laterally and vertically from the edges of the treatment area. This will result in a halo of reduced contaminant concentrations surrounding the treatment area.

Abbreviations: bgs = Below ground surface, BTEX = Benzene, toluene, ethylbenzene, and xylenes, cVOC = Chlorinated volatile organic compound, DRO = Diesel-range organics, GRO = Gasoline-range organics, mg/kg = Milligrams per kilogram, Naph = Naphthalenes, NAVD 88 = North American Vertical Datum of 1988, ND = Non-detect, REL = Remediation level, SL = Screening level

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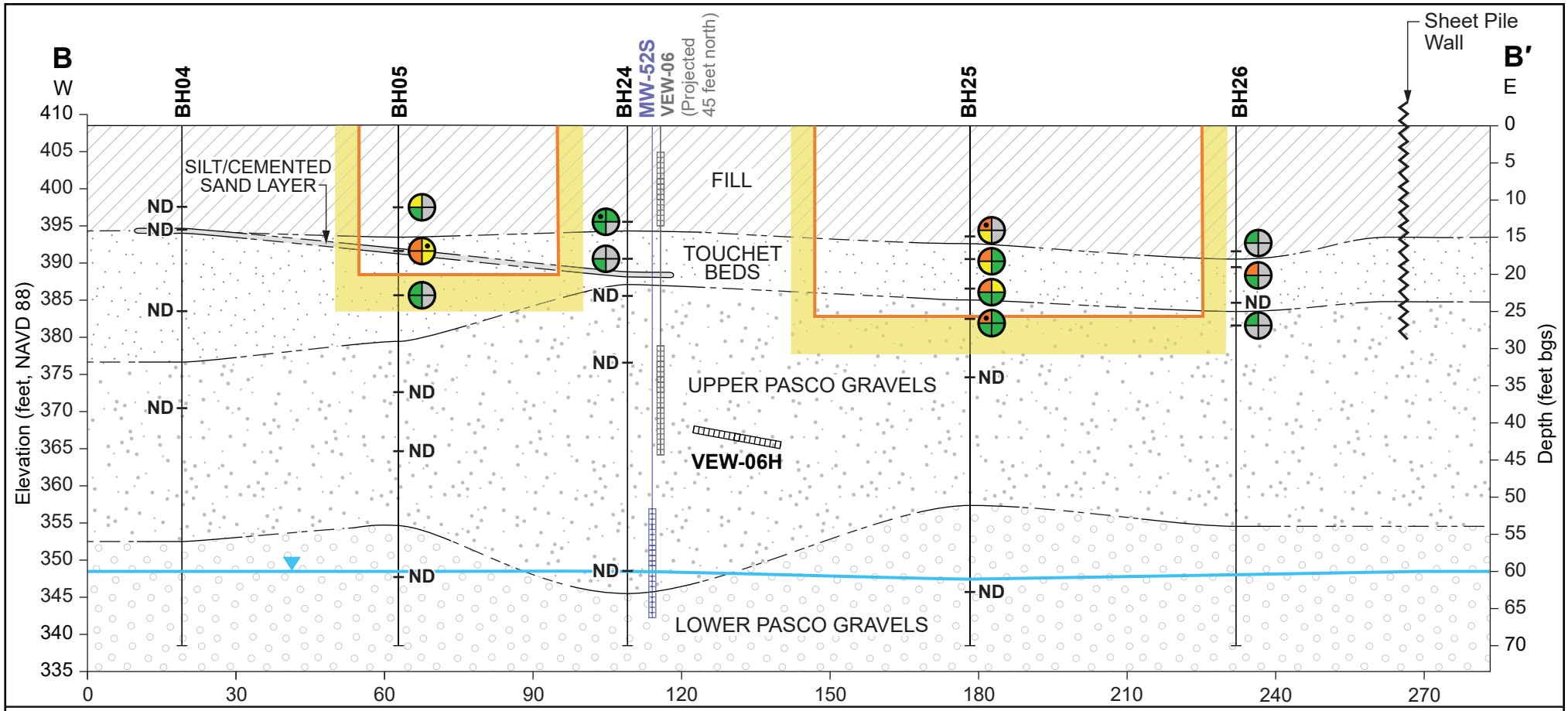
Figure 7.2
Cross Section A-A′
Extent of REL Exceedances

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 7.2 Cross Section A-A' Extent of REL Exceedances.ai
5/1/2023



Legend

REL Analytes or Analyte Sums in Soil

ND	All Results Non-Detect
•	ND Exceedances
Gray	≤SL
Green	>SL to ≤REL
Yellow	>REL to ≤2x REL
Orange	>2x REL

GRO & DRO | Total cVOCs | Total Naph | Total BTEX

Remediation Levels

Total BTEX = 250 mg/kg
Total cVOCs = 1.0 mg/kg
Total Naph = 65 mg/kg
GRO = 1,000 mg/kg
DRO = 2,000 mg/kg

Vertical Thermal Treatment Boundary
Thermal Treatment Halo

Boring
Water Table
Removed Vapor Extraction Well
Decommissioned Monitoring Well

Contact Boundary Between Lithologies (dashed where inferred)
Horizontal Vapor Extraction Screen

Horizontal Scale in Feet: 0' 15' 30' 60'
Vertical Scale in Feet: 0' 10' 20' 40'

Notes:
- Only the intermediate and deep screened zones for vapor extraction well VEW-06 are shown. The shallow screened zone was above the current grade.
- Refer to Table 4.4 for VOC analytes and data.
- Heat will radiate approximately 5 to 8 feet laterally and vertically from the edges of the treatment area. This will result in a halo of reduced contaminant concentrations surrounding the treatment area.

Abbreviations: bgs = Below ground surface, BTEX = Benzene, toluene, ethylbenzene, and xylenes, cVOC = Chlorinated volatile organic compound, DRO = Diesel-range organics, GRO = Gasoline-range organics, mg/kg = Milligrams per kilogram, Naph = Naphthalenes, NAVD 88 = North American Vertical Datum of 1988, ND = Non-detect, REL = Remediation level, SL = Screening level

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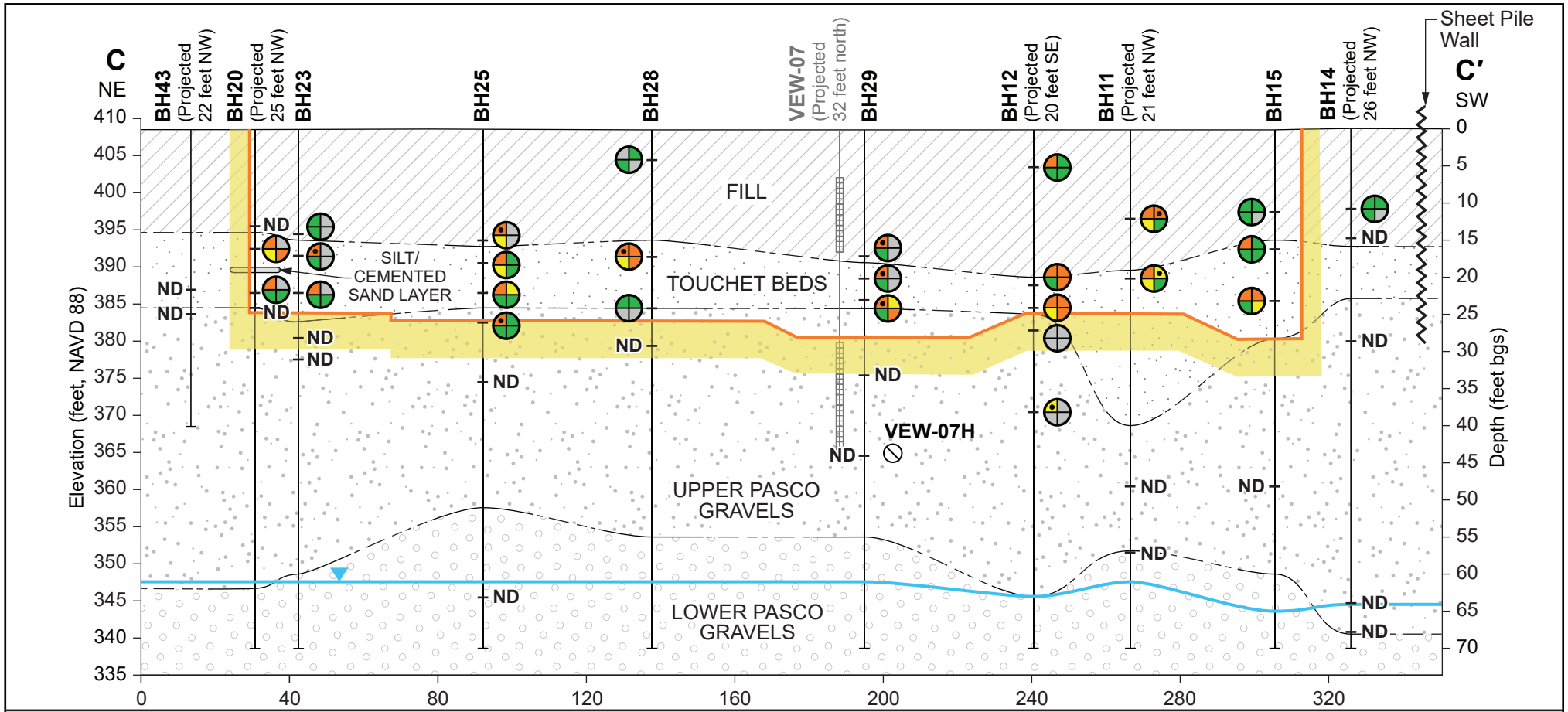
Figure 7.3
Cross Section B-B′
Extent of REL Exceedances

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 7.3 Cross Section B-B' Extent of REL Exceedances.ai
5/1/2023



Legend

REL Analytes or Analyte Sums in Soil

ND	All Results Non-Detect
•	ND Exceedances
Gray	≤SL
Green	>SL to ≤REL
Yellow	>REL to ≤2x REL
Orange	>2x REL

GRO & DRO | Total cVOCs | Total Naph | Total BTEX

Remediation Levels

Total BTEX = 250 mg/kg
Total cVOCs = 1.0 mg/kg
Total Naph = 65 mg/kg
GRO = 1,000 mg/kg
DRO = 2,000 mg/kg

Vertical Thermal Treatment Boundary
Thermal Treatment Halo
Horizontal Vapor Extraction Screen
Boring
Water Table
Removed Vapor Extraction Well

Contact Boundary Between Lithologies (dashed where inferred)

Horizontal Scale in Feet 0' 20' 40' 80'
Vertical Scale in Feet 0' 10' 20' 40'

Notes:
- Only the intermediate and deep screened zones for vapor extraction well VEW-07 are shown. The shallow screened zone was above the current grade.
- Refer to Table 4.4 for VOC analytes and data.
- Heat will radiate approximately 5 to 8 feet laterally and vertically from the edges of the treatment area. This will result in a halo of reduced contaminant concentrations surrounding the treatment area.

Abbreviations: bgs = Below ground surface, BTEX = Benzene, toluene, ethylbenzene, and xylenes, cVOC = Chlorinated volatile organic compound, DRO = Diesel-range organics, GRO = Gasoline-range organics, mg/kg = Milligrams per kilogram, Naph = Naphthalenes, NAVD 88 = North American Vertical Datum of 1988, ND = Non-detect, REL = Remediation level, SL = Screening level

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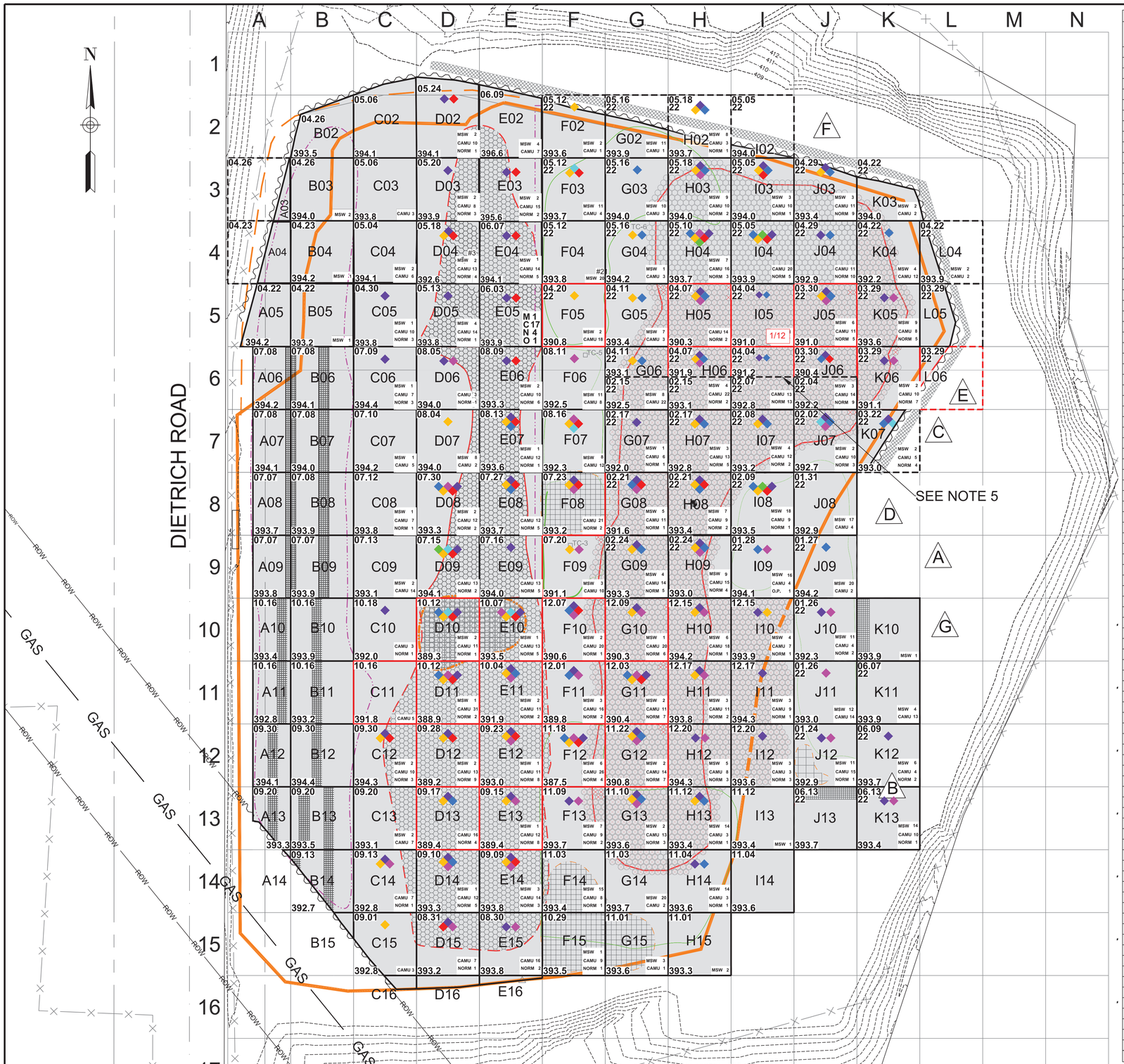
Figure 7.4
Cross Section C-C′
Extent of REL Exceedances

I:\GIS\Projects\IWAG-Pasco\AI\Zone A Post-Excavation EDR\Figure 7.4 Cross Section C-C′ Extent of REL Exceedances.ai
5/1/2023

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix A
Zone A Removal Action Key Figures



RCRA/TSCA WASTE ROLL-OFF COUNT						
GRID	LEAD	CHROMIUM	CADMIUM	MERCURY	PCBs >50 mg/kg	VOCs >500 mg/kg
C12	2	1	0	0	0	0
C14	3	0	0	0	0	2
C15	3	0	0	0	0	0
D04	0	2	0	0	0	0
D06	0	0	0	0	0	1
D07	1	0	0	0	0	0
D08	4	1	0	0	1	1
D09	0	2	2	1	0	0
D10	2	1	1	0	8	0
D11	15	1	0	0	2	11
D12	3	1	0	0	0	0
D13	4	0	0	0	1	0
D14	3	0	0	0	1	1
D15	0	2	0	0	0	1
E03	0	1	0	0	0	0
E04	0	3	0	0	0	0
E05	0	2	0	0	0	0
E06	0	1	0	0	0	0
E07	0	2	0	0	2	0
E08	0	1	0	0	4	0
E09	0	0	0	0	1	0
E10	3	1	3	0	0	3
E11	4	0	0	0	1	2
E12	1	1	0	0	0	3
E13	5	0	0	0	0	1
E14	0	1	0	0	0	1
E15	0	0	0	0	0	1
F02	1	0	0	0	0	0
F03	4	1	1	0	0	0
F04	0	0	0	0	0	0
F05	1	0	0	0	0	0
F06	0	0	0	0	0	1
F07	0	1	0	0	0	2
F08	6	1	0	0	0	2
F09	2	0	0	0	0	2
F10	1	2	0	0	3	7
F11	0	0	0	0	6	11
F12	3	1	0	0	7	18
F13	0	0	0	0	0	2
G02	0	0	0	0	0	0
G03	0	0	0	0	3	0
G04	1	0	0	0	3	0
G05	1	0	0	0	3	0
G06	1	0	0	0	10	0
G07	0	0	0	0	0	0
G08	0	1	0	0	5	2
G09	1	0	0	0	1	0
G10	2	0	0	0	0	6
G11	1	1	0	0	2	7
G12	1	0	0	0	1	7
G13	7	0	0	0	3	5
G15	0	0	0	0	0	0
H02	1	0	0	0	1	0
H03	1	0	0	0	1	1
H04	14	5	0	6	16	1
H05	2	0	0	0	3	2
H06	3	0	0	0	17	1
H07	2	0	0	0	3	0
H08	2	1	0	0	1	0
H09	1	0	0	0	14	2
H10	2	0	0	0	0	2
H11	1	0	0	0	0	1
H12	0	0	0	0	0	1
H13	4	0	0	0	7	0
H14	0	0	0	0	3	0
I02	0	0	0	0	0	0
I03	1	2	0	0	3	0
I04	7	5	0	1	20	0
I05	0	0	0	0	8	0
I06	0	0	0	0	13	0
I07	1	0	0	0	1	0
I08	1	1	0	1	1	0
I09	0	0	0	0	4	2
I10	1	0	0	0	0	0
J03	1	0	0	0	2	0
J04	0	0	0	0	11	0
J05	1	0	0	0	11	1
J06	0	1	0	0	5	0
J07	0	0	1	0	1	2
J08	0	0	0	0	0	0
J09	0	0	0	0	2	0
J10	0	0	0	0	0	1
J11	0	0	0	0	0	2
J12	0	0	0	0	0	6
J13	0	0	0	0	0	0
K03	0	0	0	0	0	0
K04	0	0	0	0	1	0
K05	0	0	0	0	0	1
K06	0	0	0	0	0	1
K07	0	0	2	0	2	0
K10	0	0	0	0	0	0
K11	0	0	0	0	0	0
K12	0	0	0	0	0	0
K13	0	0	0	0	0	1
L04	0	0	0	0	0	0
TOTAL	132	47	10	9	219	128

LEGEND

- GRADING CONTOURS
- GRADING BOUNDARY
- PRE-CONSTRUCTION CONTOURS
- EXISTING FENCE LINE
- INITIAL EXCAVATION EXTENT
- EXCAVATION EXTENT BEYOND DRUM WASTE LIMIT
- SHEET PILE
- MSW/COMBUSTIBLE MATERIAL (6-8FT THICK) EXTENT
- OBSERVED BURN LINE LOCATION
- MAGNETIC ANOMALY BOUNDARY LINE
- APPROXIMATE LOCATION OF STACKED DRUMS
- GAS LINE
- GAS LINE RIGHT-OF-WAY
- INFERRED STACKED DRUM LOCATIONS WITHIN MAGNETIC SURVEY ANOMALY
- CONFIRMED STACKED DRUM LOCATION WITH DRUMS NOT FOUND INTACT
- LEAD
- CHROMIUM
- CADMUIM
- MERCURY
- PCBs >50 mg/kg
- VOCs >500 mg/kg
- ZIRCON CASTING SANDS
- EXPLORATORY TRENCHING
- SUSPECTED HERBICIDE/PESTICIDE 5 GALLON PAIL DEBRIS
- EXISTING BARRIER WALL

EXCAVATED GRID KEY

X.XX — DATE OF APVD EXCAVATION
A01 — # OF ROLLOFFS
M= MSW
C= CAMU
N= NORM
O= OVERPACK
XXX.X — BOTTOM OF EXCAVATION

NOTES

1. WASTE STREAM IDENTIFICATION DETERMINED BY FIELD INSTRUMENT MEASUREMENTS, ON SITE HAZCAT ANALYSIS PERFORMED BY ENTACT, AND BY PACE ANALYTICAL, LLC AND EUROFINS TEST AMERICA ANALYTICAL RESULTS.
2. RCRA AND PCB WASTE DESIGNATIONS WITHIN ZONE A ARE BASED ON PACE ANALYTICAL, LLC ANALYTICAL RESULTS.
3. EXISTING SITE FEATURES AND TOPOGRAPHIC INFORMATION BASED ON PBS SURVEY DATA DRAWING SET NO. 64180.020-"ZONE A REMOVAL ACTION DESIGN DRAWINGS" DATED JUNE 2020.
4. THE ELEVATIONS DEPICTED HEREON ARE BASED ON GEODETIC VERTICAL DATAM SYSTEM OF 1998 (NAVD 88).
5. PORTION OF GRIDS G06, H06, I06 AND J06 WERE EXCAVATED DURING BOTH TEMPORARY STRUCTURE POSITIONS 5 AND 6.
6. THE RCRA AND TSCA DATA PROVIDED IN THIS DRAWING IS FOR INFORMATION PURPOSES ONLY AND DID NOT NECESSARILY INFORM WASTE DISPOSAL END POINTS.

0 10 20 40
SCALE:1"=20'

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION
A	1/7/22	J.S.	J.H.	M.F.	ADDED GRID DATA FROM TS POSITION 4, ADDED MODIFIED TS POSITION 5 LOCATION & GRAYED OUT FORMER LOCATION. MOVED ROLL-OFF TABLE. ADDED ITEMS IN LEGEND.
B	3/8/22	J.S.	M.M.	M.F.	ADDED GRID LABELS FOR J13 & K13. MODIFIED EXTENT OF DRUM WASTE OUTSIDE BOUNDARY LINE.
C	2/4/22	D.K.	M.M.	M.F.	DIVIDED ROW 6 GRIDS WITHIN TEMPORARY STRUCTURE POSITION 5 WITH NORTH AND SOUTH SECTION TO REFLECT IN-FIELD EXCAVATION SEQUENCING (I.E. J06.S & J06.N)
D	3/8/22	J.S.	M.M.	M.F.	ADDED GRID DATA FROM TEMPORARY STRUCTURE POSITION 5. REMOVED COMPLETED TEMPORARY STRUCTURE POSITION FOOTPRINTS.
E	4/25/22	J.S.	M.M.	M.F.	MERGED ROLL-OFF COUNTS OF GRIDS G06, H06, I06 AND J06.
F	6/6/22	J.S.	M.M.	M.F.	ADDED GRID DATA FROM TEMPORARY STRUCTURE POSITION 6. REMOVED COMPLETED TEMPORARY STRUCTURE 6 FOOTPRINT.
G	6/21/22	J.S.	M.M.	M.F.	ADDED GRID DATA FROM K-GRIDLINE EXCAVATION. REMOVED "DRUM WASTE BEYOND BOUNDARY LINE" DELINEATION.

Figure 16

Zone A Removal Action Construction Completion Technical Memorandum

PREPARED FOR:

FLOYD | SNIDER
601 Union Street, Suite 600 | Seattle, WA 98101
office: 206.292.2078 | direct: 206.805.2194 | fax: 206.682.7867

PBS
PBS Engineering and Environmental Inc.
400 Bradley Blvd, Site 300
Richland, WA 99352
509.942.1600
pbsusa.com

ENTACT

DRAWING NAME: ZONE A WASTE DESCRIPTIONS, QUANTITIES AND LOCATIONS BY GRID

PROJECT NAME & LOCATION: PASCO SANITARY LANDFILL NPL SITE - ZONE A REMOVAL ACTION
PASCO, WASHINGTON

DRAWN BY	D. BATES	APPROVED BY	M.FLERI	DRAWING NO.	6
DATE	10-17-22	DATE	10-17-22	PROJECT NO.	E8749

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix B
Post-Excavation Characterization Soil Boring Logs

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH01

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH01 LOCATION:
Boundary of Excavation Cells C2 and C3

Ground Surface Elevation
408.696

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Gray-brown, silty SAND (SM) with trace gravel; non-plastic; fine to medium sand; fine, subrounded gravel; damp.		0.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed plastic bag containing soil from depicted depth. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
			0.0				
	[FILL]		0.0			100	
			0.0				
5.0	- Trash/debris encountered.		0.1				
			0.0				
	- 4-inch cobble encountered.		3.2			100	
				BH01-10	■		
10.0			5.9				
			0.2				
			0.3				
	- 3-inch lens of green soil encountered.		0.3				
			0.5	BH01-14	■		
15.0	Gray, silty SAND (SM); non-plastic; fine sand; slight cementation; damp.		0.4			100	
			0.4				
	[TOUCHET BEDS]		0.3				
			0.2				
			0.2				
20.0			0.2				
	- Becomes gray-brown with fine to medium sand.		0.0				
			0.0				
			0.0.				
			0.0				
25.0			0.0			100	
			0.0				
	Gray-brown, well-graded SAND (SW); fine to coarse sand; moist.		0.0				
			0.0				
	[UPPER PASCO GRAVELS]		0.1				
30.0			0.1				
			0.0				
			0.0				
			0.1				
35.0			0.2	BH01-35	■	90	
			4.3				Driller notes very dense drilling conditions.
			0.0				
	- Becomes moist.		0.0				
			1.3				
40.0							

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 1/25/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH01** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH01 LOCATION: Boundary of Excavation Cells C2 and C3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.696	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray-brown, well-graded SAND (SW) with silt and trace gravel; fine to coarse sand; damp. [UPPER PASCO GRAVELS]		3.6				End drilling at 40 feet bgs on 1/24; resume drilling on 1/25.
45.0							50	No recovery from 45 to 50 feet bgs.
50.0		- No gravel.					—	
55.0				11.3			100	
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; no cobbles. [LOWER PASCO GRAVELS]	1/24/2022 ▽	3.5	BH01-60 BH01-61	▮ ▮	—	
65.0				1.8			20	No recovery from 62 to 70 feet bgs.
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.7 feet.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 1/25/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH02

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH02 LOCATION:
Excavation Cell C4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.980	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Light brown, silty SAND (SM) with gravel; non-plastic; fine to medium sand; fine, subrounded to subangular gravel; damp. [FILL]						ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed plastic bag containing soil from depicted depth. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0				7.1			50	
10.0				10.2	BH02-11		100	
				5.8 3.6				
15.0		Gray-brown, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]			BH02-14 BH02-15		80	Contact inferred from surveyed elevations of total excavation depth and current ground surface. BH02-14 sample collected of Touchet Beds immediately beneath contact with overlying fill. Depth in sample ID reflects depth estimate in field based on limited recovery from 14 to 20'. Moisture/Porosity sample collected from 16 to 19'.
20.0				7.6	BH02-22		100	
25.0				1.7			100	Rig failure on 1/26/22. Boring terminated at 25 feet bgs. Borehole logging resumed 1 foot north of original location with new drilling rig on 1/31/22. Logging resumed at 25 feet bgs in adjacent boring.
30.0		Gray-brown, well-graded SAND (SW) with silt and trace gravel; non-plastic; fine to coarse sand; fine to coarse, subrounded gravel; damp. [UPPER PASCO GRAVELS] - Cemented sand nodules.		1.2				
35.0							30	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 1/31/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH02** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH02 LOCATION: Excavation Cell C4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.980	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray-brown, well-graded SAND (SW) with silt; non-plastic; fine sand; damp. [UPPER PASCO GRAVELS]						
45.0				17.1			70	
50.0								
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; cobbles up to 5" in diameter. [LOWER PASCO GRAVELS]		1.3	BH02-54		50	Sample Duplicate collected: PLF-PEC-DUP1-013122. Sample submitted for Matrix Spike/Matrix Spike duplicate.
60.0		- Distinct "salt and pepper" appearance; gravel becomes subrounded; becomes wet.	1/31/22					
65.0		- Gravels up to 2 inches in diameter. - Cobbles up to 5 inches in diameter.			BH02-62 BH02-63		100	Water Table Archive Sample collected at 62'. Moisture/Porosity sample collected from 63 to 65'.
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 339.0 feet.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 1/31/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH03**
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH03 LOCATION: Excavation Cell D4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.864	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Gray-brown, silty SAND (SM) with gravel; non-plastic; fine to medium sand; fine, subrounded to subangular gravel; damp. [FILL]		0.0 0.0 8.3 12.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
5.0		- Becomes highly cemented and rippable.		14.1	BH03-5	■	55	
10.0				7.4 9.1 3.0 5.6				
15.0				12.2			60	Contact and sample depth based on survey data of excavation base and current ground surface. BH03-14 sample collected of Touchet Beds immediately beneath contact with overlying fill. Depth in sample ID reflects depth estimate in field based on limited drill core recovery. Sample duplicate collected: PLF-PEC-DUP2-020722.
		Light brown, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS] - 6-inch lens of dark brown SILT (ML) with sand; non plastic; fine sand; dry.			BH03-14	■		
20.0		- Becomes brown.		13.2 18.2 14.7 15.4	BH03-22	■		Moisture/Porosity sample collected from 22 to 24'.
25.0		- Becomes gray-brown; decreased fines percentage; sand becomes fine to medium.		24.8 17.8	BH03-25	■	100	
		Light brown, well-graded SAND (SW) with silt and trace gravel; non-plastic; fine to coarse sand; fine to coarse, subrounded gravel; damp. [UPPER PASCO GRAVELS]		0.0 0.5 6.6 5.4				
30.0		- Sand becomes fine to medium; minor cementation. - Subrounded cobbles observed up to 4 inches in diameter.		0.0 0.0 1.9				
35.0		- 6-inch lens of rippable, highly cemented dark brown SILT (ML) with sand at 33 feet bgs; non-plastic; fine sand.					30	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/07/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH03** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH03 LOCATION: Excavation Cell D4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.864	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light brown, well-graded SAND (SW) with silt; non-plastic; fine sand; damp.		17.6				
		[UPPER PASCO GRAVELS]		5.3				
				19.4				
		- Becomes gray-brown; sand becomes fine to coarse.		14.8				
45.0		- Trace fine to coarse gravel with subrounded cobbles up to 3 inches in diameter.		17.9			70	
				14.6				
50.0		- Becomes light gray-brown; sand becomes fine to medium; no gravel.						
				11.3				
				2.6				
				1.8				
				3.3				
55.0				2.1			100	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 3 inches in diameter.		1.5	BH03-56 BH03-57			Moisture/Porosity sample collected from 57 to 58.5'.
				3.5				
				3.3				
				3.1				
60.0		[LOWER PASCO GRAVELS]						
		- Cobbles observed up to 3 inches in diameter.		12.1				
		- Becomes wet.		12.5				
				3.4				
		- No cobbles; distinct "salt and pepper" appearance.		1.5				
65.0				7.1			100	
				7.9				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.9 feet.						Casing pulled to 50 feet bgs to attempt measurement of groundwater. Boring caved at 53 feet bgs; groundwater not detected.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/07/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH04

BORING BH04 LOCATION:
Excavation Cell C6

Ground Surface Elevation
408.487

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Brown, silty SAND (SM) with gravel; non-plastic; fine to medium sand; fine to coarse, subrounded gravel; damp. [FILL]						ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed plastic bag containing soil from depicted depth. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
			0.3				
5.0						45	
10.0							
			1.2	BH04-11			
			2.3	BH04-14			
15.0	Gray, silty SAND (SM); non-plastic; fine sand; cemented nodules; damp. [TOUCHET BEDS]					100	
20.0	- Becomes gray-brown.						
25.0			7.1	BH04-25		70	
30.0							
35.0	Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; trace cobbles up to 4.5 inches in diameter; damp. [UPPER PASCO GRAVELS]					90	
			2.6	BH04-38			
40.0							

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/01/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH04** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH04 LOCATION: Excavation Cell C6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.487	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]						
45.0				9.0			70	
50.0							—	
				3.6				
55.0							80	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles. [LOWER PASCO GRAVELS]						
60.0							—	
65.0		- Becomes brown-gray; no visible fines; no cobbles; distinct "salt and pepper" appearance. - Cobbles up to 5 inches in diameter observed. - Becomes wet.		0.4 0.4	BH04-66	▮	100	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.5 feet.					—	No groundwater detected in borehole with casing in place to 70 feet bgs immediately after reaching TD. Free water observed in 60- to 70-foot sample.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/01/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH05

BORING BH05 LOCATION:
Excavation Cell D6

Ground Surface Elevation
408.519

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM); non-plastic; fine to medium sand; damp. [FILL]		4.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
			1.4				
			5.4				
5.0						35	
							No recovery from 3.5 to 10 feet bgs.
10.0							
			78.3	BH05-11			
			64.9				
			216.3				
			895				
15.0	Light brown, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS] - Cemented sand nodules.		1,614			70	
			4,002				
			15,000	BH05-17			PID out of range; indicated reading is maximum reported by device.
20.0							
			317.3				
			237.1				
			143.6	BH05-23			
			57.2				
25.0			41.3			90	
			54.9				
			91.3				
			66.1				
			30.1				
30.0	Gray, well-graded SAND (SW); fine to coarse sand; damp. [UPPER PASCO GRAVELS] - 4-inch piece of bent steel rebar at encountered 31 feet bgs.						
			32.5				
			30.9				Moisture/Porosity sample collected from 32 to 34'.
			32.5	BH05-32			
35.0	- 5-inch piece of bent steel rebar encountered at 36 feet bgs. - Distinct "salt and pepper" appearance.		12.8			70	
			7.1				
			2.5	BH05-36			
40.0							

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/04/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH05** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH05 LOCATION: Excavation Cell D6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.519	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; fine, subrounded gravel; minor cementation; damp. [UPPER PASCO GRAVELS]		299.7				
				53.6				
				128.2				
				314.2	BH05-44			
45.0				20.0			80	
				25.6				Moisture/Porosity sample collected from 46 to 48'.
				20.5	BH05-46			
				19.3				
50.0								
				21.9				Top of sample run interpreted as slough; no recovery from 50 to 53.5 feet bgs.
				8.4				
				8.6				
				7.6				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 4 inches in diameter. [LOWER PASCO GRAVELS]		8.6			65	
				4.4				
60.0		- Becomes wet.						
					BH05-61			
				5.3				
65.0				6.4			60	
				2.9				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.5 feet.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/04/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH06

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH06 LOCATION:
Excavation Cell C8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.470	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Brown, silty SAND (SM); non-plastic; fine to medium sand; fine subangular gravel; abundant artificial debris and glass fragments; damp. [FILL]		0.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed plastic bag containing soil from depicted depth, reported in parts per million (ppm). Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0							40	
10.0								
				1.2	BH06-12			Sample bag failure during retrieval of core run; depth and recovery in 10- to 20-foot bgs core run are estimates.
				0.3	BH06-14			
15.0		Light brown, silty SAND (SM); non-plastic; fine sand; partially cemented into nodules; damp. [TOUCHET BEDS]					60	
20.0								
				8.6	BH06-24			
25.0							65	
								Boring paused at end of day, 2/1/22. Boring resumed on 2/2/22.
30.0								
		Dark gray, well-graded SAND (SW); fine to coarse sand; damp. [UPPER PASCO GRAVELS] - Subrounded, coarse gravel with cobbles up to 3 inches in diameter from 32 to 36 feet bgs.		5.0				
35.0							80	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/01/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH06** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH06 LOCATION: Excavation Cell C8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.470	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp.		0.0				
		[UPPER PASCO GRAVELS]		0.0				
				0.0				
		- Distinct "salt and pepper" appearance.		0.0	BH06-44	▮		
45.0				0.0			70	
				0.0				
				0.0				
50.0							—	
		- Becomes partially cemented.		0.0				
				0.0				
		- Becomes moist.		0.0				
				0.0				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles.		0.4			65	
				0.3				Water level measured at 56.05 feet bgs after 50- to 60-foot core run. Soil sample not saturated. Continue drilling to 70 feet bgs for saturated soils.
		[LOWER PASCO GRAVELS]						
60.0		- Becomes wet; no visible fines; no gravel observed.					—	
				0.0	BH06-61	▮		
				0.0				
				0.0				
				0.0				
65.0				0.0			100	
				0.0				
		- Gravel observed; fine to coarse, subrounded gravel with subrounded cobbles up to 5 inches in diameter.		0.0				
				0.0				
				0.0				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.5 feet.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/01/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH07

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH07 LOCATION:
Excavation Cell D8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.444	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Brown, silty SAND (SM); non-plastic; fine to medium sand; fine subangular gravel; damp. [FILL]		0.0 0.0 0.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
5.0							30	
10.0								
		- Includes subrounded cobbles up to 5 inches in diameter.		75.5 48.0 34.3 60.0 76.9 89 5,005	BH07-12 BH07-14 BH07-15			
15.0		Light brown, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS] - 3-inch layer of dark brown, highly cemented silty SAND (SM).					100	
20.0		Gray, well-graded SAND (SW); fine to medium sand; no cementation; damp. [UPPER PASCO GRAVELS]		741 402 600 325	BH07-22			
25.0				651 453 684 421 104	BH07-27		100	
		- Cemented sand nodules.						
30.0				1,586 1,223 121 172	BH07-30			
		- Coarse, subrounded gravel and cobbles up to 3 inches in diameter from 32 to 36 feet bgs.						
35.0		- Becomes highly cemented and rippable.		60 90			60	
40.0		- Sand becomes fine to coarse.						

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/02/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH07** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH07 LOCATION: Excavation Cell D8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.444	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray-brown, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; cemented sand nodules; trace subrounded, fine to coarse gravel; damp. [UPPER PASCO GRAVELS]		4.7 17.7 48.0				
45.0				14.6 20.5 16.7			50	Partial sample loss during retrieval of 40- to 50-foot bgs core run. No recovery from 43 to 45 feet bgs and 47 to 50 feet bgs.
50.0								
		- Becomes dark gray; distinct "salt and pepper" appearance; moist.		1.6 2.8 3.2 8.4	BH07-53			
55.0		- Trace fines and trace fine to coarse, subrounded gravel.		5.5 10.0 6.4			100	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles.		9.7 8.5				
60.0		[LOWER PASCO GRAVELS] - Becomes wet; observed cobbles up to 4 inches in diameter.		7.6 1.9 3.2 10.6	BH07-63			
65.0				3.2 2.2 3.5 4.8 3.2	BH07-64		100	Moisture/Porosity sample collected from 64 to 65.5'.
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.4 feet.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/02/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH08

BORING BH08 LOCATION:
Excavation Cell B9

Ground Surface Elevation
408.564

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM) with gravel; non-plastic; fine to coarse sand; fine to coarse, subangular gravel; abundant glass fragments and artificial debris; damp. [FILL]		5.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
			2.9				
			5.9				
			15.7				
5.0			21.5	BH08-05	■	50	
10.0							
15.0	Light gray, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; fine, subrounded gravel; damp. [TOUCHET BEDS]					40	Depth and recovery from 10 to 17 feet bgs are estimates; full recovery from 17 to 20 feet bgs. Contact inferred from BH06 and BH10.
			26.1				
			74.8	BH08-18	■		
			43.7				
20.0	- No cementation.		15.2				
			28.4				
			15.4				
			5.7				
			25.3	BH08-24	■		
25.0			15.4			65	
			27.0				
	- Minor cementation.						
30.0							
			62.1				
			28.4				
			34.3				
			24.6				
35.0	Light gray, well-graded SAND (SW) with silt and gravel; non-plastic; fine to coarse sand; fine to coarse, subrounded gravel; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS] - No gravel at 36 feet bgs.		26.1			90	
			20.3				
			35.7	BH08-37	■		
			20.5				
			43.7				
40.0							

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/12/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH08** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH08 LOCATION: Excavation Cell B9

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.564	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; increased fines content; damp. [UPPER PASCO GRAVELS]		20.1 22.3 72.9 41.1				
45.0				19.0			55	
50.0								
				8.7 36.6 18.4 9.4				
		- Becomes gray; fine to coarse sand; fine to coarse, subrounded gravel; distinct "salt and pepper" appearance.						
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles. [LOWER PASCO GRAVELS]		14.0 16.4			65	
60.0		- Becomes wet. - No visible fines.		3.0 1.3 3.0 1.9	BH08-61			Duplicate sample collected: PLF-PEC-DUP5-021221 Sample submitted for Matrix Spike/Matrix Spike duplicate.
65.0		- Fining upward sequence; increased percent gravel by volume with increased depth; cobbles up to 3.5 inches in diameter.		1.8 2.5 1.6 0.5 1.5			100	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.6 feet.		1.0				
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/12/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH09

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH09 LOCATION:
Boundary of Excavation Cells C10 and D10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		0.0 0.3 0.4 0.4				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0							40	
10.0								
15.0		Light brown, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS] - Dark brown silt lens at 17.5 feet bgs.		0.4 0.9 0.4 0.1 0.0 0.1	BH09-15 BH09-16	■ ■	65	
20.0		- Sand becomes fine to medium.		1.2 5.5 2.3 4.2	BH09-23	■		
25.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; dry. [UPPER PASCO GRAVELS] - Slight increase in fines.		1.0 0.3 0.3 1.6			90	
30.0				0.7 0.9 0.0 0.0	BH09-32	■		
35.0				0.0 0.0 0.0 0.0 0.0			100	End drilling at 35 feet on 6/6; resume drilling on 6/7. ~50 gallons of water added downhole to retreive sheared rod section.
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/07/22

BORING LOG-ENV CORE 64180.022 PEC2 20220615.GPJ DATATMPL.GDT PRINT DATE: 1/24/23:

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH09** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH09 LOCATION: Boundary of Excavation Cells C10 and D10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS] - No visible fines.		0.0 0.0 0.0 0.0 0.0				Moisture likely due to added water; top 1.5 feet of core wet.
45.0				0.0 0.0			60	
50.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3.5 inches in diameter. [LOWER PASCO GRAVELS]		0.0 0.2 0.0 0.1				
55.0				0.0 0.1 0.0 0.0			85	
60.0		Final depth 60.0 feet bgs; boring backfilled with bentonite chips.						
65.0								
70.0								
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/07/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH10

BORING BH10 LOCATION:
Excavation Cell B12

Ground Surface Elevation 408.700

DEPTH FEET	MATERIAL DESCRIPTION	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM) with gravel; non-plastic; fine to coarse sand; fine to coarse, subangular gravel; damp. [FILL]	10.4				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
		19.6				
		37.0	BH10-03	■		
		29.7				
5.0					40	
10.0						
		29.1				
		4.6				
		5.8			90	
		20.4				
15.0	Light brown, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS]	18.2	BH10-14|H10-12	■		Contact and sample depths based on surveyed elevations of excavation base and current ground surface. BH10-12 sample collected of Touchet Beds immediately beneath contact with overlying fill. BH10-14 collected for moisture/porosity analysis 1.5' below contact at 15.5' bgs. Depths in sample IDs reflect depth estimates in field. Driller notes dense drilling; stop core run at 16 feet bgs.
				■		
		7.2				
		19.0			100	
		16.1				
20.0	- Highly cemented and rippable.	22.8				
		20.9				
		22.5	BH10-22	■		
		6.0				
		21.3				
25.0		27.0			90	
		21.6				
		14.2				
		2.2				
30.0	- Minor cementation.					
		9.0				
		3.9			100	Driller notes very dense drilling from 30 to 35 feet bgs.
		6.8				
		1.2				
35.0						
		25.6				
		33.1			100	
		79.5				
	Light gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; damp. [UPG]	143.9	BH10-39	■		
40.0						

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/10/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH10
(continued)

BORING BH10 LOCATION:
Excavation Cell B12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.700	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; damp. [UPPER PASCO GRAVELS]		77.1 19.7 16.8 28.0 36.1				
45.0		- Fine to medium sand with trace coarse sand.		7.0 4.4			70	
50.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles. [LOWER PASCO GRAVELS]		3.5 1.3 29.4 51.8	BH10-52 BH10-54			Moisture/Porosity sample collected from 52 to 54'.
55.0							45	
60.0		- Cobbles up to 4 inches in diameter encountered; no visible fines.		13.1 7.2 8.3 6.9	BH10-66			
65.0		- Becomes wet.		5.0 13.6 11.1			70	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.7 feet.						Casing pulled to 50 feet bgs to attempt measurement of groundwater. Boring caved to 59 feet bgs; groundwater not detected.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/10/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH11

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH11 LOCATION:
Excavation Cell D12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.468	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM); non-plastic; fine to coarse sand; fine to coarse, subangular gravel; abundant glass fragments and artificial debris; damp. [FILL]		4.3 10.7 40.7 5.7			80	ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
5.0							80	
10.0				108.7				
				>15,000	BH11-12	■		PID out of range; indicated readings (>15,000) are maximum reported by device.
				>15,000				
15.0				>15,000			20	Field observations indicate significant disturbance of recovered soil in 10- to 30-foot bgs core runs. Contact inferred from surveyed elevations of excavation depth and current ground surface.
				>15,000				
20.0		Gray, silty SAND (SM); non-plastic; fine to medium sand; damp. [TOUCHET BEDS]		>15,000	BH11-20	■		
				>15,000				
				>15,000				
25.0				>15,000			95	
				>15,000				
				143.7				
30.0				>15,000				
				20.2				
35.0							25	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/08/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH11** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH11 LOCATION: Excavation Cell D12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.468	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light brown, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; cemented sand nodules; damp. [UPPER PASCO GRAVELS] - Becomes unconsolidated with no cementation.		34.2				
				18.0				
				12.5				
				8.1				
45.0				13.5			100	
				8.3				
				13.6				
				72.8	BH11-48	▮		Sample submitted for Matrix Spike/Matrix Spike duplicate.
				33.1				
50.0							—	
				8.4				
				7.0				
				7.2				
				12.6				
55.0		- Becomes moist.		6.4			100	
				5.5				
				2.2				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3.5 inches in diameter.		6.3	BH11-57	▮		
				2.7				
60.0				3.1			—	
		[LOWER PASCO GRAVELS] - Becomes wet; no visible fines; cobbles up to 4 inches in diameter.		0.1				
				0.0				
				0.8				
65.0				0.0			100	
				0.0				
				1.4				
				0.8				
				7.5				
70.0				0.2			—	
		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.5 feet.						Casing pulled to 50 feet bgs to attempt measurement of groundwater. Boring caved to 54 feet bgs; groundwater not detected.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/08/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH12

BORING BH12 LOCATION:
Excavation Cell F12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		0.9				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				6.3				
				12.3				
				20.5				
5.0				441.8	BH12-05	■	50	
10.0								
				327.5				
				1,693				
15.0							25	
20.0		gravel/trash/debris						
		Light gray, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		2,861	BH12-21	■		
				1,998				
				2,254				
				3,544	BH12-24	■		Sample Duplicate collected: PLF-DUP12-060722
25.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp. [UPPER PASCO GRAVELS] - Sand becomes fine to medium.		1,554			100	
				534.2				
				747.6	BH12-27	■		
				535.2				
				628.0				
30.0								
				97.4				
				86.0				
				434.0				
				366.2				
35.0		- Highly cemented from 34 to 35 feet bgs.		282.2			100	
				296.5				
				236.3				
				92.5	BH12-38	■		
				62.9				
40.0		- Sand becomes fine to coarse.						

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/07/22

BORING LOG-ENV CORE 64180.022 PEC2 20220615.GPJ DATATMPL.GDT PRINT DATE: 1/24/23:

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH12** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH12 LOCATION: Excavation Cell F12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		44.8				
				111.1				
				20.2				
				9.2				
				16.5				
45.0				15.2			70	
				17.2				
				12.1				
50.0								
				8.7				
				55.1				
				11.8				
				8.2				
55.0		- Trace, fine to coarse, subrounded gravel.		3.6			65	
				1.9				
60.0		- Becomes dry to damp; gravel becomes fine.						
				7.8				
				1.8				
				4.4				
65.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet. [LOWER PASCO GRAVELS]					35	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/07/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH13

BORING BH13 LOCATION:
Excavation Cell H12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Light gray, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine, subangular gravel; damp. [FILL]		60.2				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				61.5				
				41.1	BH13-04			
				104.3		■		
5.0				20.0			60	
				26.8				
10.0								Sample recovery from 13 to 19.5 feet bgs.
				73.3				
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		79.2			65	
				84.3				
				53.8				
				>15,000	BH13-18	■		PID out of range; indicated readings (>15,000) are maximum reported by device.
20.0		- Becomes dark brown; damp.						
				24.1				
				13.5				
				36.5	BH13-23	■		
		Gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; damp.		73.5				
25.0		[UPPER PASCO GRAVELS] - Trace, fine, subrounded gravel.		>15,000			100	
				>15,000				
				347.5				
30.0		- Gravel becomes fine to coarse. - No gravel.						
				3,470	BH13-33	■		
35.0							100	
				>15,000				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/13/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH13** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH13 LOCATION: Excavation Cell H12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		429.0				
45.0							75	
				82.4				
50.0							—	PID out of range; indicated readings (>15,000) are maximum reported by device.
55.0		- Becomes moist.		>15,000	BH13-55	■	100	
				>15,000				
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet. [LOWER PASCO GRAVELS]		10.6			—	
65.0		- Gravel becomes trace, fine.		44.5			70	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/13/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH14

BORING BH14 LOCATION:
Excavation Cell B14

Ground Surface Elevation
408.897

DEPTH FEET	MATERIAL DESCRIPTION	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM); non-plastic; fine to coarse sand; fine to coarse, subangular gravel; damp. [FILL]	9.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
		17.7				
		22.1				
5.0					30	
10.0						
		329.5				
		17.5	BH14-11	■	50	Duplicate sample collected: PLF-PEC-DUP4-020822. Sample submitted for Matrix Spike/Matrix Spike Duplicate.
15.0		126.1				
	Light brown, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS] - Becomes moist; highly cemented and rippable.		BH14-15	■		Contact and sample depths based on surveyed elevations of total excavation depth and current ground surface. BH14-15 sample collected of Touchet Beds immediately beneath contact with overlying fill. Depth in sample ID reflects depth estimate in field based on limited recovery.
		13.2				
		11.7				
20.0		5.2				
		2.9				
		2.9				
		12.2				
	Light gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; minor cementation; damp. [UPPER PASCO GRAVELS]	6.8				
25.0		12.2			95	
		15.9				
		19.1				
		23.8				
		28.2	BH14-29	■		
30.0						
		1.1				
		8.6				
35.0					30	
40.0						

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/09/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH14** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH14 LOCATION: Excavation Cell B14

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.897	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; no cementation; damp. [UPPER PASCO GRAVELS]		4.5 16.8 18.8 35.3				Driller notes dense drilling conditions.
45.0							50	
				9.8				
50.0							—	
				47.3 21.1 32.9				
55.0							30	
60.0							—	
				24.3 4.8 26.2 12.6				
65.0		- Becomes dark gray; distinct "salt and pepper" appearance; moist.		5.6 10.9 9.2	BH14-64	▮	100	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 4 inches in diameter. [LOWER PASCO GRAVELS]		11.8 9.8 6.8	BH14-68	▮		
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.9 feet.					—	Casing pulled to 50 feet bgs to attempt measurement of groundwater. Boring caved to 56 feet bgs; moist soil present on probe upon retrieval.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/09/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH15

BORING BH15 LOCATION:
Excavation Cell D14

Ground Surface Elevation
408.408

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM); non-plastic; fine to coarse sand; fine to coarse, subangular gravel; abundant glass fragments and artificial debris; damp. [FILL]		20.5				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging, reported in parts per million (ppm)
			10.6				
			10.2				
			43.2				
5.0			59.0			65	
			676.4				
10.0			3,160	BH15-11			
			3,012			50	
15.0	Light gray, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS]		4,169				Driller notes dense drilling; stop core run at 15 feet bgs. Moisture/Porosity sample collected from 17 to 19'.
			2,426	BH15-16		40	
20.0			1,726				
			3,360				
			4,785	BH15-23			
25.0						35	
							No recovery; contact inferred from adjacent borings.
	Light brown, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp. [UPPER PASCO GRAVELS]		75.3				
30.0			265.2				
35.0						20	
40.0			22.1				PID measured in core shoe.

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/11/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH15** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH15 LOCATION: Excavation Cell D14

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.408	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light brown, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; cemented sand nodules; damp. [UPPER PASCO GRAVELS]		28.6				
				24.9				
				36.2				
				49.0				
45.0				12.3			80	
				12.6				
				18.8				
		- Becomes dark gray; distinct "salt and pepper" appearance; moist.		32.1	BH15-48			
50.0								
				13.1				
				21.7				
				25.5				
				70.9				
55.0				25.0			70	
				44.4				
				31.8				
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 4.5 inches in diameter. [LOWER PASCO GRAVELS]		24.2				
				16.0				
				10.5				
				7.2				
65.0		- Cobbles up to 4.5 inches in diameter encountered; no visible fines.		3.7			100	
				6.0.				
				8.7				
				5.9				
				42.0				
70.0				33.9				
		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.4 feet.						Casing pulled to 50 feet bgs to attempt measurement of groundwater. Boring caved to 55 feet bgs; groundwater not detected.
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/11/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH16

BORING BH16 LOCATION:
Excavation Cell F14

Ground Surface Elevation
408.160

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM); non-plastic; fine to medium sand; fine to coarse, subangular gravel; abundant glass fragments and artificial debris; damp. [FILL]		4.5				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
			23.8				
			45.9				
			139.7				
5.0			31.3			75	
			146.9				
			124.5				
10.0							
			445.3				
			384.8	BH16-12	■		
	Light brown, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS]		283.4				
			265.3				
15.0			477.0			70	
			358.8				
			783.7	BH16-17	■		
20.0							
			690.5				
			2,341	BH16-22	■	70	
			1,705				
25.0							
			1,729				
			795.7			80	
			468.4				
30.0							
			977.2				
			4,860	BH16-32	■		
	Gray, well-graded SAND (SW); fine to medium sand; fine to coarse, subrounded gravel; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS] - Sand becomes fine to coarse.		4,571				
			2,955				
35.0			2,248			90	
			1,650	BH16-36	■		
			651.7				
			449.2				
40.0			394.4				

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/13/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH16** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH16 LOCATION: Excavation Cell F14

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.160	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS]						Sample bag failure during retrieval of core run; no recovery from 40 to 43 feet bgs and 47.5 to 50 feet bgs.
				3,662	BH15-44			
45.0		- Minor cementation between 43 and 45 feet bgs; no cementation from 45 to 70 feet bgs.		2,751			45	
				1,479				
				156.3				
50.0								
				139.0				
				31.7				
				25.5				
				14.7				
55.0				25.0			80	
				23.4				
				25.6				
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3.5 inches in diameter. [LOWER PASCO GRAVELS]		74.3	BH16-62			
				95.4				
				47.2				
				9.5				
65.0				20.0			80	
				11.5				
				13.5				
				8.8				
				6.6				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.2 feet.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/13/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH17

BORING BH17 LOCATION:
Excavation Cell H14

Ground Surface Elevation 408.078

DEPTH FEET	MATERIAL DESCRIPTION	PID (PPM)	SAMPLE NUMBER	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Light brown, silty SAND (SM); non-plastic; fine sand; fine to coarse, subrounded to subangular gravel; cobbles to 4 inches in diameter; abundant glass fragments and artificial debris; damp. [FILL]	129.2			ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
		473.8			
		1,458	BH17-03	100	
		544.4			
5.0		666.2			
		44.9			
		30.3		100	
		76.0			
		268.4			
10.0		468.0			
		220.36			
		330.6			
	trash/debris	442.1			
	Light brown, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS]	98.9			
15.0		169.2	BH17-14	90	
		58.2			
		83.8			
		42.7			
		190.3			
20.0					
		39.0			
		64.9			
		52.0			
		71.8			Moisture/Porosity sample collected from 24 to 26'.
25.0	- Becomes unconsolidated; no cementation.	38.6		80	
		83.8	BH17-26 BH17-24		
		53.9			
		57.8			
30.0					
		7.1			
		11.4			
		6.9			
	Light brown, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; no cementation; damp. [UPPER PASCO GRAVELS]	7.5			
35.0		16.6		70	
		16.9			
		18.4			
40.0					

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/13/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH17** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH17 LOCATION: Excavation Cell H14

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.078	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light brown, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; no cementation; damp. [UPPER PASCO GRAVELS]		2.5 1.5 1.1				
45.0				1.2 1.6 1.4 0.9			70	Sample bag failure during retrieval of core run; no recovery from 43 to 46 feet bgs.
50.0		- Becomes gray; distinct "salt and pepper" appearance; moist.		0.5 27.2 18.7 14.2 12.5	BH17-51			
55.0				7.2 8.7 3.6	BH17-56		75	Moisture/Porosity sample collected from 55 to 57'.
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 4 inches in diameter. [LOWER PASCO GRAVELS]		3.9 5.5 2.2 2.3				
65.0				3.0 2.2 0.7 3.5 3.0			100	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.1 feet.		1.2				
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/13/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH18

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH18 LOCATION:
Boundary of Excavation Cells D15, D16, E15, and E16

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 408.410	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM); non-plastic; fine to medium sand; fine to coarse, subangular gravel; damp. [FILL]		44.9 5.4 17.2				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. PID detections of headspace within sealed sonic drilling sample bag prior to opening for sampling and logging.
5.0							35	
10.0				152.5 81.3	BH18-12	■		
		Brown-gray, silty SAND (SM); non-plastic; fine sand; cemented sand nodules; damp. [TOUCHET BEDS]		324.4 163.8				
15.0		- Becomes moderately cemented; increased proportion of fines.		550.7 482.7 6,061 4,558	BH18-17	■	85	
20.0				353.1 57.7 173.0	BH17-22	■		
25.0		Brown-gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; no cementation; damp. [UPPER PASCO GRAVELS]		50.6			55	
30.0				21.4 18.8 87.5 28.0				
35.0		- Becomes gray; distinct "salt and pepper" appearance; moist.		11.0 14.5 19.2 40.4 52.2	BH18-39	■	100	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/14/22

BORING LOG-ENV CORE 64180.022 PEC 20220131.GPJ DATATMPL.GDT PRINT DATE: 1/24/23

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH18
(continued)

BORING BH18 LOCATION:
Boundary of Excavation Cells D15, D16, E15, and E16

Ground Surface Elevation
408.410

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; no visible fines; moist.		45.2				
				33.5				
				28.3				
		[UPPER PASCO GRAVELS]		12.5				
				14.3				
45.0		- Subrounded cobbles up to 4 inches in diameter.		126.7	BH18-45	▮	90	
				39.8				
				90.2				
				49.8				
				36.0				
50.0							—	
				63.6				
				20.4				
				12.9				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles.		122.7			70	
				41.8				
				113.2				
		[LOWER PASCO GRAVELS]						
60.0		- No visible fines; becomes wet.		40.1	BH18-60	▮	—	
				38.0				
				16.6				
				6.2				
				8.2				
65.0				8.8			95	
				10.9				
		- Subrounded cobbles up to 3 inches in diameter.		7.1				
				2.2				
				46.0				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips. Bottom elevation 338.4 feet.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 2/14/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH19**
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH19 LOCATION: Boundary of Excavation Cells G2 and G3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark gray, silty SAND (SM) with trace gravel and occasional debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		8.1 8.7 2.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0							35	
10.0				11.3 44.3 12.4 40.5	BH19-14	■		
		- Becomes tan-gray.						
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		>15,000 >15,000	BH19-16	■	60	PID out of range; indicated readings (>15,000) are maximum reported by device. Broken sample bag; lost sample from 13 to 18 feet bgs.
20.0				396 343.7				
25.0							50	
30.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; minor cementation; damp. [UPPER PASCO GRAVELS]		2,140 876.1 >15,000 475.3	BH19-33	■		
35.0				331.3 288.9 399.6 442.9 425.1	BH19-39	■	90	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 5/31/22

BORING LOG-ENV CORE 64180.022 PEC2 20220615.GPJ DATATMPL.GDT PRINT DATE: 1/24/23:

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH19** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH19 LOCATION: Boundary of Excavation Cells G2 and G3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; damp.		84.3	BH19-42	■		
				72.7				
		[UPPER PASCO GRAVELS]		77.7				
				86.4				
45.0				82.8			80	
		- Increased fines.		70.4				
				40.1				
				41.0				
50.0							—	
		- No visible fines; becomes moist.		18.6				
				20.7				
				21.6				
				19.3				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 3.5 inches in diameter.		14.7			60	
				13.5				
		[LOWER PASCO GRAVELS]						
		- Becomes moist to wet.						
60.0		- Becomes dark gray; wet.					—	
				7.7				
				5.1				
				4.8				
				4.7				
65.0		- Fine to coarse, subrounded gravel with cobbles.		6.2			90	
				8.3				
		- Gravel becomes trace, fine.		6.5				
				11.4				
				59.7				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 5/31/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH20

BORING BH20 LOCATION:
Boundary of Excavation Cells I3, I4, J3, and J4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine, subangular gravel; damp.		3.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				2.1				
				1.0				
		[FILL]		1.0				
5.0							50	
10.0								
				57.9				
				187.4	BH20-13	■		
		Light brown, silty SAND (SM); non-plastic; fine sand; damp.						Contact interpreted as 14 feet bgs based on known excavation depth.
15.0							80	
		[TOUCHET BEDS]		1,157				
		- Minor cementation.		1,592	BH20-16	■		Sample Duplicate collected: PLF-DUP11-060222
				1,059				
		- 6-inch sandy SILT (ML) lens.		1,389				
				576.1				
				546.2				
20.0								
				732.5				
				538.2	BH20-22	■		
				373.6				
		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; minor "salt and pepper" appearance; dry.		110.7				
25.0				85.0	BH20-24	■	80	
		[UPPER PASCO GRAVELS]		64.4				
				51.9				
				53.0				
		- Trace fines.						
30.0								End drilling at 30 feet on 6/2; resume drilling on 6/3.
				28.2				
				40.5				
				61.5				
				80.4				
		- Minor cementation; increased fines.						
35.0				46.5			85	
				37.1				
				25.9				
		- Grades with trace, fine to coarse, subrounded gravel.		28.2				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/03/22

BORING LOG-ENV CORE 64180.022 PEC2 20220615.GPJ DATATMPL.GDT PRINT DATE: 1/24/23:

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH20** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH20 LOCATION: Boundary of Excavation Cells I3, I4, J3, and J4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt and trace gravel; non-plastic; fine to coarse sand; fine to coarse, subrounded gravel; "salt and pepper" appearance; damp.		32.1				
				18.1				
				7.6				
		[UPPER PASCO GRAVELS]		6.4				
45.0		- Becomes moist; decreased fines; no cementation. - Minor cementation.		5.7			65	
50.0		- Becomes damp to dry; increased fines; no cementation.						
				17.4				
				9.6				
				15.1				
				13.1				
55.0				9.9			60	
60.0								
				8.1				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3.5 inches in diameter.		5.7				
				5.6				
				4.6				
65.0				4.9			70	
		[LOWER PASCO GRAVELS]		7.4				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/03/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH21

BORING BH21 LOCATION:
Excavation Cell F4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trash and debris, occasional cobbles to 3.5 inches in diameter, and clasts of rippable silt; non-plastic; fine to medium sand; damp.		0.2				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. No recovery from 3 to 10 feet bgs.
				3.7				
				27.0				
		[FILL] - 6-inch or larger cobble encountered.						
5.0							30	
10.0								
				49.0				5' PID reading suspect. Slow climb to max reading.
				38.6				
				46.5	BH21-13	■		
				42.0				
15.0		Light gray, silty SAND (SM); non-plastic; fine to medium sand; minor cementation; damp.		60.3	BH21-15	■	100	
				39.6				
		[TOUCHET BEDS] - Sand is predominantly fine-grained.		91.0				
				80.7				
				99.3				
20.0								
				560.3				
				83.5				
				70.1				
				69.9				
25.0		- Fine to medium sand in even distribution.		252.0	BH21-25	■	80	
		Dark brown, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; damp.		13.7				
				14.7				
				19.0				
		[UPPER PASCO GRAVELS] - Becomes dark gray.						
30.0								
				80.3	BH21-31	■		
				35.4				
		- Becomes silty; dry.		27.4				
				51.2				
35.0		- Becomes dark brown; highly cemented; rippable sand clasts; decreased fines.		16.7			60	
				16.3				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH21** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH21 LOCATION: Excavation Cell F4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; dry. [UPPER PASCO GRAVELS] - Becomes dark gray; with trace fines; "salt and pepper" appearance.						PID of headspace from 40 to 47 feet bgs is <0.5 ppm.
45.0							75	
		- Becomes light gray; silty						
50.0								
				4.1				
				4.4				
				1.0				
				2.2				
55.0				5.2			90	
				0.5				
				0.8				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3 inches in diameter. [LOWER PASCO GRAVELS]		0.3				
60.0								
				5.8				
				1.2				
65.0							20	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH22

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH22 LOCATION:
Boundary of Excavation Cells H4 and H5

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded gravel; damp. [FILL]		5.1				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				11.6				
				30.4				
				71.8				
5.0							50	
10.0								
				649.1				
				742.3	BH22-12	■		
				1,133				
				849.1				
15.0		Light brown, silty SAND (SM); non-plastic; fine to medium sand; damp. [TOUCHET BEDS]		3,128	BH22-15	■	70	
				2,931				
				1,786				
20.0								
				2,383				
				3,376				
				3,556				
				3,211	BH22-24	■		
25.0		Dark gray, well-graded SAND (SW) with trace silt and gravel; fine to coarse sand; fine, subrounded gravel; damp. [UPPER PASCO GRAVELS] - Increased fines. - Decreased fines.		482.4			100	
				511.7				
				535.1				
				219.1	BH22-28	■		
				94.5				
30.0		- Trace, fine, subrounded to subangular gravel from 32 to 35 feet bgs.						End drilling at 30 feet bgs on 6/1; resume drilling on 6/2.
				68.2				
				37.2				
				12.5				
				11.1				
35.0				5.9			90	
				7.5				
				5.9				
				6.6				
				5.2				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH22** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH22 LOCATION: Boundary of Excavation Cells H4 and H5

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW) with silt and trace gravel; non-plastic; fine to coarse sand; fine to coarse, subrounded gravel; minor cementation; moist. [UPPER PASCO GRAVELS]		32.3				
				14.2				
				7.4				
				3.8				
45.0				3.8			70	
				2.9				
				3.5				
50.0		- Becomes damp.					—	
				11.9				
				10.7				
				8.1				
				7.2				
55.0				4.0			100	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles. [LOWER PASCO GRAVELS]		2.9				
				3.2				
				3.5				
				3.9				
60.0				6.1			—	No recovery from 60 to 70 feet bgs; 2 feet of slough in top of sample.
65.0							0	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH23

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH23 LOCATION:
Boundary of Excavation Cells J4 and J50

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		2.6				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				3.3				
				1.6				
				5.7				
5.0							40	
10.0								
15.0		Dark brown, silty SAND (SM); non-plastic; fine sand; minor cementation; damp. [TOUCHET BEDS]		138.2	BH23-14	■	70	Contact interpreted as 15 feet bgs based on known excavation depth.
				456.8	BH23-17	■		
				418.3				
				399.1				
				1,148				
20.0								
				1,338				
				>15,000				PID out of range; indicated readings (>15,000) are maximum reported by device.
				>15,000				
				>15,000				
25.0		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp to dry. [UPPER PASCO GRAVELS] - Minor cementation.		1,024			80	
				>15,000				
				>15,000	BH23-28	■		
30.0								
				389.9	BH23-31	■		
				201.7				
				104.0				
				126.9				
35.0				64.6			80	
				22.8				
				4.7				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH23** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH23 LOCATION: Boundary of Excavation Cells J4 and J50

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		6.6				
				5.2				
				7.5				
				7.8				
45.0				7.6			60	
50.0								
				12.9				
				11.7				
				7.5				
				8.4				
55.0		- Becomes silty and moist; trace, fine to coarse, subrounded gravel and cobbles to 4 inches in diameter.		9.8			70	
				8.1				
60.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; no cobbles. [LOWER PASCO GRAVELS]		18.1				
				10.9				
				7.6				
				7.4				
65.0				5.8			70	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH24

BORING BH24 LOCATION:
Excavation Cell F6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trash and debris; non-plastic; fine to medium sand; damp. [FILL]		1.7				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				2.4				
				19.3				
5.0							35	
10.0								
				34.7				
				34.7				
				49.5	BH24-13	■		
				35.6				
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		33.4			80	
				45.2				
				52.3	BH24-18	■		
20.0		- Moderate cementation.						
				27.9				
				30.6				
				101.3	BH24-23	■		
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; slight "salt and pepper" appearance; dry. [UPPER PASCO GRAVELS]		51.1	BH24-24	■		Moisture/Porosity sample collected from 23.5 to 25 feet.
25.0				28.2			90	
				31.4				
				19.4				Gradational contact from 23 to 38 feet, fining upward sequence with interbedding.
30.0								
				91.9				
				37.5	BH24-32	■		
				30.4				
				30.5				
35.0		- Becomes dark gray; with fine to coarse, subrounded gravel and cobbles to 3 inches in diameter.		14.9			90	
				10.0				
		- Becomes light gray; minor cementation; resembles Touchet Beds formation.		5.3				
				6.2				
		- Becomes dark gray; no visible fines; moist; distinct "salt and pepper" appearance.						
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH24** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH24 LOCATION: Excavation Cell F6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS] - Becomes damp.		12.1 5.2 6.4 7.0				
45.0				8.1			50	
50.0								
				6.5 2.1 2.6 3.4				
		- Becomes moist.						
55.0				3.5			70	
		- Increased fines; trace, fine, subrounded gravel.		4.2 3.9	BH24-55			Moisture/Porosity sample collected from 55.5 to 57 feet.
60.0		- Gravel becomes fine to coarse; no fines.			BH24-60			
				2.0 1.5 0.4				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 5 inches in diameter. [LOWER PASCO GRAVELS] - Decreased gravel; no cobbles.		0.9				
65.0				0.0 1.5 0.0			80	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH25

BORING BH25 LOCATION:
Excavation Cell H6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, cobbles to 3.5 inches in diameter, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded gravel; damp. [FILL]		3.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				3.4				
				4.2				
				3.3				
5.0				14.6			60	
				6.9				
10.0								
				66.4				
				80.0				
		- Becomes light gray, silty; fine sand; no gravel; dry.		217.7				
				413.8				
15.0				439.6	BH25-15	■	80	
		Light gray, silty SAND (SM); non-plastic; fine sand; minor cementation; damp. [TOUCHET BEDS]		467.3				
				447.2	BH25-18	■		
				547.0				
20.0								
				1,020				
				898.4	BH25-22	■		
				1,058				
				874.0				
25.0		Gray-brown, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; slight "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		1,166			90	
				899.2	BH25-26	■		
				273.2				
				694.7				
30.0								
				335.2				
		- Becomes gray.		774.7				
				712.3				
		- Trace, fine, subrounded gravel.		139.0		■		
35.0				84.6	BH25-34		70	
				67.9				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH25** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH25 LOCATION: Excavation Cell H6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW); fine to coarse sand; slight "salt and pepper" appearance; damp.		65.3				
				37.4				
		[UPPER PASCO GRAVELS]		36.6				
		- Distinct "salt and pepper" appearance.		26.5				
45.0				17.3			80	
				19.1				
				29.8				
50.0							—	
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 5 inches in diameter.		15.0				
				9.3				
				15.8				
				11.7				
55.0		[LOWER PASCO GRAVELS]		10.0			80	
				26.8				
		- Increased fines.		14.7				
				20.2				
60.0		- Becomes wet.					—	
				12.6				
		-No visible fines		3.4				
				3.0	BH25-63	■		
				3.6				
65.0		- Cobbles to 3 inches in diameter.		2.6			75	
				1.1				
				1.0				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/01/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH26

BORING BH26 LOCATION:
Excavation Cell J6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine, subrounded to subangular gravel; damp. [FILL]		1.4				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				1.4				
				1.1				
				1.3				
5.0							50	
10.0								
				15.7				
				38.4				
15.0				30.6			50	
				34.9	BH26-19-26-17	■ ■		Contact interpreted as 18 feet bgs based on known excavation depth.
		Light brown, silty SAND (SM); non-plastic; fine sand; minor cementation; damp to dry. [TOUCHET BEDS]						
20.0								
				247.6				
				149.2				
				87.7				
				161.4	BH26-24	■		
25.0		Dark gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; slight "salt and pepper" appearance; damp to dry. [UPPER PASCO GRAVELS]		181.2			80	
				169.0				
				42.4	BH26-27	■		
				21.5				
30.0								
				20.2				
				5.9				
				46.6				
				24.2				
35.0		- Trace, fine to coarse, subrounded gravel and cobbles to 4 inches in diameter; distinct "salt and pepper" appearance; moist.		18.6			70	
				17.7				
				14.9				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH26** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH26 LOCATION: Excavation Cell J6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS]		15.7				
				12.7				
				7.5				
				5.7				
45.0				12.7			65	
				7.5				
50.0								
				6.9				
				5.2				
				5.0				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 3.5 inches in diameter. [LOWER PASCO GRAVELS] - Increased fines; no gravel; moist to wet.		5.5			70	
				3.3				
				5.2				
60.0		- No visible fines; becomes wet.						
				4.0				
		- Trace, fine, subrounded gravel from 62 to 70 feet bgs.		2.8				
				2.4				
				2.4				
65.0				0.9			70	
				1.0				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/02/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH27

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH27 LOCATION:
Excavation Cell F8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subangular gravel; damp. [FILL]		2.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				0.8				
				2.1				
				1.3				
5.0							50	
10.0								
				23.9	BH27-14	■		Interpreted sample recovery from 13 to 20 feet bgs.
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS] - Becomes dark brown; minor cementation.		52.2			70	Contact interpreted as 15 feet bgs based on known excavation depth.
				64.2				
				20.5				
				92.7				
				155.2	BH27-19	■		
20.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; slight "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS] - 9-inch, gray-brown, sandy SILT (ML) lens; appears stained. - Trace, fine to coarse, subrounded gravel.		1,170				
				2,638				
				5,148	BH27-22	■		
				128.0				
25.0				73.1			80	
				202.8				
				42.0				
				60.8	BH27-28	■		
30.0		- No gravel.						
				35.9				
				68.5				
				65.9	BH27-33	■		
				32.1				No recovery from 34.5 to 36.5 feet bgs.
35.0							70	
				28.3				
				35.0	BH27-38	■		
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/03/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH27** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH27 LOCATION: Excavation Cell F8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; moist. [UPPER PASCO GRAVELS]		74.2 56.3 19.1				
45.0				12.8 43.8			55	
50.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; no cobbles. [LOWER PASCO GRAVELS]		7.2 8.8 10.5 3.5				
55.0				2.9 1.9			65	
60.0		- Increased fines; becomes wet.		8.4 4.2	BH27-61	■		
65.0				8.4 4.2			60	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/03/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH28

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH28 LOCATION:
Excavation Cell H8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine, subangular gravel; damp. [FILL]		6.9				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				2.6				
				33.6				
				265.5	BH28-04	■		
5.0							40	
10.0								
15.0		Tan, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		1,265			45	Sample recovery from 14.5 to 19 feet bgs.
				1,113				
				1,312	BH28-17	■		
				1,163				
20.0								
				895.6				
				1,371				
				2,826				
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS] - Trace, fine to coarse, subrounded gravel.		524.1		■		
25.0				326.5	BH28-24		100	
				495.3				
				141.2				
				103.4				
				49.3	BH28-29	■		
30.0								
				76.0				
				48.0				
				39.8				
35.0		- Sand becomes fine to coarse.		36.3			65	
				24.3				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH28** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH28 LOCATION: Excavation Cell H8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW); fine to coarse sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		69.8				
				25.1				
				17.2				
				10.9				
45.0				5.4			90	
				6.5				
				6.3				
				6.8				
50.0								
				1.6				
				4.5				
				2.0				
				2.7				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; no cobbles. [LOWER PASCO GRAVELS]		1.4			85	
				1.8				
				2.0				
				1.8				
60.0								
		Final depth 61.0 feet bgs; boring backfilled with bentonite chips.						
65.0								
70.0								
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH29

BORING BH29 LOCATION:
Excavation Cell F10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded gravel; damp. [FILL]		0.1 0.0 2.9				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0							30	
10.0								
15.0				49.8 89.5	BH29-17		45	Sample recovery from 15.5 to 20 feet bgs.
		Tan, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		792.1 1,106 906.1 1,549	BH29-20			
20.0								
				1,801 1,574	BH29-23			
		Gray, well-graded SAND (SW) with trace silt; non-plastic; fine to medium sand; damp. [UPPER PASCO GRAVELS]		828.0 965.5 1,775 334.7			85	
25.0								
30.0				589.1 349.8 726.0 262.0	BH29-33 BH29-34			
		- Trace, fine to coarse, subrounded gravel.						Moisture/Porosity sample collected from 33.5 to 34.5 feet.
35.0							45	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH29** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH29 LOCATION: Excavation Cell F10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp. [UPPER PASCO GRAVELS]		310.8				
				87.8				
				75.6				
				112.4	BH29-44	■		
45.0				7.6			95	
				15.8				
				12.3				
				4.8				
				3.8				
50.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; no cobbles. [LOWER PASCO GRAVELS]					—	
				1.2				
				1.0				
				0.8				
				1.1				
55.0				1.6			85	
				1.7				
				1.3				
				0.6				
60.0		- Distinct "salt and pepper" appearance.					—	
				3.7				
				2.4	BH29-62	■		Moisture/Porosity sample collected from 61.5 to 63 feet.
				1.6				
				1.7				
65.0		- Decreased gravel.		1.1			90	
				1.0				
				0.6				
				0.8				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.					—	
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH30

BORING BH30 LOCATION:
Excavation Cell H10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with gravel; non-plastic; fine to medium sand; fine to coarse, subrounded gravel; damp. [FILL]		0.3 0.2 2.7	BH30-03	■		ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
5.0							30	
10.0								
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		1,255 1,255 1,412 603.5 580.2	BH30-16	■	55	Sample recovery from 14 to 19.5 feet bgs; no fill observed in 10- to 20-foot run.
20.0				1,773				
25.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; damp. [UPPER PASCO GRAVELS] - Trace, fine to coarse, subrounded gravel.		560.0 547.3 1,052 466.5 181.2 98.1 54.3 29.1	BH30-24	■	95	
30.0		- No gravel.		104.8 172.4 27.7 12.1	BH30-32	■		
35.0		- Sand becomes fine to coarse; trace, fine, subrounded gravel.		9.9 9.6			65	
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH30** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH30 LOCATION: Excavation Cell H10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW) with trace gravel; fine to coarse sand; fine, subrounded gravel; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		301.6				
				77.2				
				19.5				
				16.1				
45.0				26.3			65	
				20.6				
50.0								
				108.3				
				14.8				
				12.1				
				22.8				
55.0				19.1			70	
				16.4				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; no cobbles. [LOWER PASCO GRAVELS]						
60.0								No recovery from 60 to 70 feet bgs.
65.0							0	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH31

BORING BH31 LOCATION:
Boundary of Excavation Cells J11 and J12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trace gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		27.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
				6.2				
				14.2				
5.0							35	
10.0								
				24.2				
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS] - 6-inch sandy SILT (ML) lens; no staining observed.		24.5			70	
				5.9				
				4.5	BH31-17	■		
				3.0				
20.0								
				2.0				
				1.9				
				0.8	BH31-23	■		
				0.2				
25.0		Gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; distinct "salt and pepper" appearance; damp. [UPPER PASCO GRAVELS]		0.1			90	
				0.8				
				1.9				
				1.2				
				1.0				
30.0								
				0.8				
		- Sand becomes fine to coarse.		1.1	BH31-32	■		
				49.4				
				12.9				
35.0				15.1			90	
				20.3				
				17.0				
				13.9				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH31** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH31 LOCATION: Boundary of Excavation Cells J11 and J12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Gray, well-graded SAND (SW) with trace silt; fine to coarse sand; distinct "salt and pepper" appearance; dry.		3.1				
				7.9				
		[UPPER PASCO GRAVELS]		8.7				
				2.8				
45.0				5.0			75	
				11.6				
		- Trace, fine to coarse, subrounded gravel.		10.1				
50.0								
				12.2				
				9.4				
				17.9				
				10.4				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 4 inches in diameter.		2.7			75	
				2.1				
				4.5				
		[LOWER PASCO GRAVELS]						
60.0		- Becomes wet; no visible fines; no gravel.						
				1.6				
				1.3				
		- Trace, fine to coarse, subrounded gravel.		1.4				
		- Begin transition into Lower Pasco Gravels		0.8				
65.0							40	
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH32

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH32 LOCATION:
Boundary of Excavation Cells J9 and J10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trash and debris; non-plastic; fine to medium sand; damp.		0.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
				2.2				
		[FILL]		1.0	BH32-03	■		
5.0							30	
10.0								
				2.1				
				1.1				
				2.1				
				2.2				
15.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp.		2.6	BH32-15	■	90	
		[TOUCHET BEDS]		2.3				
		- 4-inch SILT (ML) lens.		1.8				
				2.5				
				2.4				
20.0								Core Barrel: 102°F Soil Sample: 157°F
				2.8				
				4.6				
		- Blue-gray SILT (ML) lens at 22 feet bgs; appears stained.		5.7				
				4.6				
25.0		Gray, well-graded SAND (SW); fine to medium sand; distinct "salt and pepper" appearance; damp.		5.1			100	
				5.8				
				12.1				
		[UPPER PASCO GRAVELS]		398.5	BH32-28	■		
				62.8				
30.0				21.2				Soil Sample: 121°F
				1.5				
				2.5	BH32-32	■		
				1.9				
				0.0				
35.0		- Becomes dark gray, with silt; fine to coarse sand.		5.9			90	
		- 6-inch SILT (ML) lens.		2.3				
				4.7				
				7.6				
				7.6				
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH32** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH32 LOCATION: Boundary of Excavation Cells J9 and J10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Dark gray, well-graded SAND (SW) with silt; fine to coarse sand; distinct "salt and pepper" appearance; damp.		11.1				End drilling at 40 feet bgs on 6/15; resume drilling on 6/16. Soil Sample: 125°F
				2.3				
		[UPPER PASCO GRAVELS]		4.0				
				2.3				
45.0		- Increased fines; sand becomes fine to medium.		0.4			75	
				23.8				
				14.6				
50.0								Soil Sample: 128°F
				17.6				
				17.6				
		- Sand becomes fine to coarse; with trace, fine, subrounded gravel.		14.8				
		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; moist; subrounded cobbles to 3.5 inches in diameter.		9.9				
55.0				8.5			75	
				9.4				
				12.5				
		[LOWER PASCO GRAVELS] [Lower Pasco Gravels]						
60.0		- No visible fines; decreased gravel; no cobbles; becomes wet.						Core Barrel: 90°F Soil Sample: 73°F
				6.1				
				7.4				
				7.6				
				0.0				
65.0				0.0			60	
				0.0				
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH33

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH33 LOCATION:
Excavation Cell C8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Brown-gray, silty SAND (SM) with trash and debris; non-plastic; fine to medium sand; damp. [FILL]		0.0				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
				1.1				
				1.5				
				2.5				
5.0							40	
10.0								Soil Sample: 98.6°F
				41.7				Interpreted sample recovery from 12.5 to 18.5 feet bgs.
		Light gray, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		124.6				
15.0				54.0	BH33-15	■	60	
				147.1				
				66.9				
				15,000				
20.0		- Sandy SILT (ML) lens at 20 feet bgs; sample collected from lens.			BH33-20	■		Soil Sample: 172°F
				53.4				
				4.0				
		Dark gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; damp. [UPPER PASCO GRAVELS]		42.6				
				33.2				
25.0				13.9			85	
				35.7				
				1,181				
				2,217	BH33-28	■		
30.0		- Grades with fine to coarse, subrounded gravel and cobbles to 5 inches in diameter.						Soil Sample: 173°F
				26.7				
				5.3				
				43.7	BH33-33	■		
				38.0				
35.0		- Becomes moist; with trace fines.		28.2			75	
				30.8				
				203.6	BH33-37	■		
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/06/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH34

BORING BH34 LOCATION:
Boundary of Excavation Cells E16 and F16

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Light brown, silty SAND (SM); non-plastic; fine to medium sand; damp.		7.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
		[TOUCHET BEDS]		4.7				
				9.7				
		- Minor cementation.		50.1				
5.0				15,000			55	
10.0					BH34-10	■		5' PID reading suspect. Slow climb to max reading
				15,000				
		- 4-inch, dark brown SILT (ML) lens.		45.0				
				48.6				
				78.4				
15.0		- 3-inch, gray stained SILT (ML) lens; sample collected from lens.		337.3	BH34-15	■	85	
				78.3				
				50.1	BH34-18	■		
20.0								
				41.4				
				52.1				
				15.8				
				16.0				
25.0		- 3-inch, brown-gray SILT (ML) lens.		51.6			80	
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; dry.		16.8				
				33.9				
		[UPPER PASCO GRAVELS]						
30.0		- Sand is predominantly fine to medium grained.						
				104.0				
		- Minor cementation.		31.4				
				23.2				
				23.9				
35.0		- Fine to coarse sand in even distribution; distinct "salt and pepper" appearance; becomes damp.		24.5			50	
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/06/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH35

BORING BH35 LOCATION:
Excavation Cell F3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with trash and debris; non-plastic; fine to medium sand; damp. [FILL]		3.8				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise. Soil Sample: 91.0°F
				2.1				
				1.2				
5.0							35	
10.0								
				508.1	BH35-12			
				446.5		■		
				420.1				
		Tan-gray, silty SAND (SM); non-plastic; fine to medium sand; minor cementation; damp. [TOUCHET BEDS]		533.6				
15.0				442.5			60	
				531.3	BH35-16	■		
20.0								
				225.3				
				424.4				Soil Sample: 177°F
				399.0	BH35-23	■		
				457.2				Broken sample bag; no recovery from 24 to 27 feet.
25.0							75	
		Light gray, well-graded SAND (SW) with gravel and cobbles; fine to coarse sand; fine to coarse, subrounded gravel; cobbles to 4 inches in diameter; damp. [UPPER PASCO GRAVELS]						
30.0								End drilling at 30 feet bgs on 5/31; set casing at 40 feet. Resume drilling 30 to 40 foot run on 6/1.
				85.1				
				77.4				
				84.0	BH35-33	■		Core Barrel: 119°F Soil Sample: 148°F
				75.8				
35.0				81.1			100	
				54.3				
				25.1				
				22.1				
40.0				12.5				

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 5/31/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH35** (continued)
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH35 LOCATION: Excavation Cell F3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
40.0		Light gray, well-graded SAND (SW) with gravel and cobbles; fine to coarse sand; fine to coarse, subrounded gravel; cobbles to 4 inches in diameter; damp. [UPPER PASCO GRAVELS] - Becomes dark gray; medium to coarse sand; no gravel or cobbles; distinct "salt and pepper" appearance; moist.						Core Head: 146°F Soil Sample: 111°F
45.0							85	
50.0								
				10.1				
				8.9				
				8.3				
				7.8				
55.0		Dark gray, well-graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subrounded gravel; "salt and pepper" appearance; wet; subrounded cobbles to 3 inches in diameter. [LOWER PASCO GRAVELS]		13.2				Soil Sample: 122°F
				9.5				
60.0							30	No recovery from 53 to 70 feet bgs.
65.0								
70.0		Final depth 70.0 feet bgs; boring backfilled with bentonite chips.						
75.0								
80.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 5/31/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH36

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH36 LOCATION:
Boundary of Excavation Cells K5 and L5

DEPTH FEET	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Dark brown, silty SAND (SM) with gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		43.7				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
			13.8				
			163.7				
			166.8				
5.0			135.7	BH36-06		60	
			222.3		■		
10.0							
			126.7				
			188.7				
15.0	Light gray, silty SAND (SM); non-plastic; fine to medium sand; minor cementation; damp to dry. [TOUCHET BEDS]		83.9	BH36-16		70	
			82.1		■		
			36.5				
			35.4				
			42.6				
20.0	- Becomes dark gray; increased fines; moist.						
			18.1				
			23.2				
			24.7	BH36-23	■		
			23.1				
25.0	Gray, well-graded SAND (SW); fine to medium sand; damp. [UPPER PASCO GRAVELS]		17.4			85	
			12.6				
			20.1				
			25.5				
30.0							Soil Sample: 157°F
			6.9				
	- Sand becomes fine to coarse grained; distinct "salt and pepper" appearance.		4.6				
			1.8				
			1.5				
35.0	- Trace, fine to coarse, subrounded gravel and cobbles to 4 inches in diameter.		2.1			60	
40.0	Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0							

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/06/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH37

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH37 LOCATION:
Boundary of Excavation Cells G15 and G16

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Light tan, silty SAND (SM) with trash and debris; non-plastic; fine sand; minor cementation; damp. [FILL]		3.3 14.4 6.4				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise. Soil Sample: 177°F BH37-5 collected of sloughed fill material observed at top of 10- to 20-foot run. Depth estimated as 5 feet bgs. Core Barrel: 111°F Soil Sample: 117°F
5.0							30	
10.0		- Becomes red-brown.		16.6 24.0	BH37-11	■		
		Light tan, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		5.8 4.7 8.1 5.7 38.1 11.7	BH37-16	■		
15.0							100	
		- Becomes damp; increased fines from 18 to 20 feet bgs.						
20.0				112.7 7.6				
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; damp. [UPPER PASCO GRAVELS]						
25.0				13.5			100	
30.0		- Sand becomes fine to coarse sand; moist.		7.0 12.7				
		- Sand becomes fine to medium grained; increased fines from 33 to 35 feet bgs.						
35.0				19.5 10.7			75	
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH38

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH38 LOCATION:
Boundary of Excavation Cells J13 and J14

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Brown, silty SAND (SM); non-plastic; fine to medium sand; dry. [FILL]		3.8				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
				1.0				
				1.6				
				4.5				
5.0		Light gray, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		1.7			55	
10.0								Soil Sample: 144°F Soil Sample: 119°F
				22.6				
				67.4				
				108.4				
				360.0	BH38-15			
15.0				525.0		■	100	
				290.1				
				266.8				
				371.6				
				386.2				
20.0				282.0				Core Barrel: 116°F
				379.7				
				273.1				
				392.3	BH38-24			
				147.8		■		
25.0				116.8			80	
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; dry. [UPPER PASCO GRAVELS]		75.5				
				46.0	BH38-28			
				88.7		■		
30.0								Soil Sample: 160°F
				32.2				
				21.9				
				21.3				
				14.0				
35.0		- Sand becomes fine to medium grained; increased fines.		77.9			65	
				102.9				
		- Sand becomes fine to coarse grained; decreased fines.						
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH39

BORING BH39 LOCATION:
Boundary of Excavation Cells K11 and L11

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Gray, silty SAND (SM); non-plastic; fine to medium sand; damp.		1.3				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
		[FILL]		2.4				
		- Primarily trash and debris from 2 to 3.5 feet bgs.		2.9				
5.0							30	
10.0								
		- 6 inches of bituminous material at 12 feet bgs.		3,833	BH39-13	■		Sample recovery from 12 to 19 feet bgs.
		- Sand, gravel, bituminous, and charred material at 12.5 feet bgs.		4,558				
15.0		Light gray to tan, silty SAND (SM); non-plastic; fine sand; damp.		171.3			70	
				33.4				
				20.5				
		[TOUCHET BEDS]		50.1	BH39-18	■		
				199.5				
20.0								
				1,044				
				237.1				
				537.1	BH39-23	■		
				274.3				
		- Blue-gray staining at 24 feet bgs.						
25.0		- Sand becomes fine to medium grained; distinct "salt and pepper" appearance.		378.2			90	
				64.7				
		Gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; damp.		43.9				
				30.3				
				28.7	BH39-29	■		
30.0		[UPPER PASCO GRAVELS]						
				37.3				
				16.7				
				13.9				
				11.6				
35.0				23.1			65	
		- Becomes moist.		12.3				
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH40

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH40 LOCATION:
Boundary of Excavation Cells K12 and L12

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subangular gravel; damp. [FILL]		2.4				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
				0.4				
				0.2				
5.0							35	
10.0								
				0.5	BH40-13	■		Sample recovery from 13 to 17.5 feet bgs.
		Light brown, silty SAND (SM); non-plastic; fine sand; dry. [TOUCHET BEDS]		0.4				
15.0				0.5			45	
				0.5				
				0.7				
20.0								Soil Sample: 165°F
				2.1				
				4.1				
				6.1				
				7.9	BH40-24	■		
25.0				3.1			95	
		dark gray, well-graded SAND (SW) with silt and trace gravel; non-plastic; fine to medium sand; fine, subrounded gravel; damp. [UPPER PASCO GRAVELS]		2.9				
				4.2				
				1.5				
				2.5				
30.0								
				2.7				
				1.8				
				2.5				
				0.2				
35.0		- Sand becomes fine to coarse grained; distinct "salt and pepper" appearance.		0.4			80	
				3.1				
				3.6				
				2.9				
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/15/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

BORING BH41

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH41 LOCATION:
Excavation Cell J8

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Dark brown, silty SAND (SM) with gravel, trash, and debris; non-plastic; fine to medium sand; fine to coarse, subrounded to subangular gravel; damp. [FILL]		275.8				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
				514.9				
				144.1				
				24.0				
5.0				67.5			65	
				279.4				
10.0								
				190.1				
				263.7				
				597.5	BH41-13	■		
				323.5				
15.0		Tan, silty SAND (SM); non-plastic; fine sand; damp. [TOUCHET BEDS]		71.4			90	
				65.4				
				123.5	BH41-17	■		
				119.8				
				134.1				
20.0								Soil Sample: 126°F
				97.9				
		- Blue-gray staining from 21.5 to 22.5 feet bgs.		71.2	BH41-22	■		
				37.8				
				21.4				
25.0		Brown, well-graded SAND (SW) with silt; non-plastic; fine to medium sand; damp. [UPPER PASCO GRAVELS] - Becomes gray-brown; fine to coarse sand; trace, fine to coarse, subrounded gravel. - Sand becomes fine to medium grained; no gravel. - Sand becomes fine to coarse grained.		35.9			90	
				32.9				
				40.3				
				96.5				
				122.1				
30.0								
				26.7				
				41.7	BH41-32	■		
				11.2				
				10.2				
35.0				16.2			90	
				5.3				
				4.2				
				3.8				
				3.1				
40.0		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PBS	PASCO LANDFILL NPL SITE POST EXCAVATION CHARACTERIZATION PASCO, WASHINGTON	**BORING BH42**
	PBS PROJECT NUMBER: 64180.022 Phase 5, Task 2	BORING BH42 LOCATION: Excavation Cell D16

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Tan, silty SAND (SM); non-plastic; fine sand; damp.		1.7				ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag. Core barrel exterior and soil sample temperatures measured with FLIR E6 Thermal Camera. Reported temperatures are maximum observed after core run. Recovery assumed to be from top of core run unless noted otherwise.
		[TOUCHET BEDS]		0.0				
				0.5				
5.0							30	
10.0					BH42-10	■		
		- 6-inch, dark brown lens with fine to medium sand and trace, fine, subangular gravel.		0.1				
				0.0				
				0.3				
				0.7				
15.0				0.6			90	
				0.8				
				0.6				
				1.5				
				0.8				
20.0		Final depth 20.0 feet bgs; boring backfilled with bentonite chips.						
25.0								
30.0								
35.0								
40.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: J. Welles, LHG
COMPLETED: 6/16/22

PASCO LANDFILL NPL SITE
POST EXCAVATION CHARACTERIZATION
PASCO, WASHINGTON

PBS PROJECT NUMBER:
64180.022 Phase 5, Task 2

BORING BH43

BORING BH43 LOCATION:

Lat: 46.250560 Long: -119.053912

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Ground Surface Elevation 409.26	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	RECOVERY (%)	COMMENTS
0.0		GRAVEL SURFACE; coarse, angular gravel; dry.						ft bgs = feet below ground surface. ppm = parts per million. Field Meter: MiniRAE 3000 PID, 100ppm Isobutylene Standard. Depth interval for headspace test selected based on maximum PID detection within 10' core run, as measured at soil core surface immediately after opening sonic drilling sample bag.
		Dark brown, silty SAND (SM) with trace gravel; non-plastic; fine to medium sand; fine, subrounded gravel; damp.		0.4				
5.0		[FILL]		0.7			30	
				1.0				
10.0		- Surface gravel sluff in hole		1.0				
		- Becomes tan to brown, with debris, trash, rubber pieces, and small cemented pieces of green material; occasional fine, subangular gravel						
15.0				1.7			25	
				7.7				
20.0		Tan, silty SAND (SM); non-plastic; fine sand; minor cementation; damp.		1.5				
				0.6				
		[TOUCHET BEDS]		0.9	BH43-22	■		
				0.4				
		- SILT (ML) lens at 23.5 feet bgs.						
		Light gray, well-graded SAND (SW) with silt; non-plastic; fine to coarse sand; distinct "salt and pepper" appearance; damp.		1.2	BH43-25	■		
25.0				1.8			85	
				3.2				
		[UPPER PASCO GRAVELS]		1.3				
				2.7				
30.0				1.0				
				0.0				
				0.1				
				0.1				
35.0				0.1			65	
				0.0				
				0.0				
				0.0				
40.0		- Fine to coarse, subrounded gravel and small cobble at 39 feet bgs						
		Final depth 40.0 feet bgs; boring backfilled with bentonite chips.						
45.0								

BORING METHOD: Sonic Drilling
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 6-inch

LOGGED BY: P. Brice
COMPLETED: 9/22/22

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix C
Thermal Treatability Bench Test Report

PASCO Landfill NPL Site
Pasco, WA

DRAFT - Thermal Treatability Bench Test Report

December 2022

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APPENDICES

Appendix A – Chain of Custody
Appendix B – Sieve Analyses
Appendix C – Laboratory Analytical Reports

Abbreviations and Acronyms

°C	degrees Celsius
ASTM	American Society for Testing and Materials
BTEX	benzene, toluene, ethylbenzene and xylenes
COC	constituents of Concern
DRO	diesel-range organics
ERH	electrical resistance heating
ft bgs	feet below ground surface
GRO	gasoline-range organics
ISTR	In-situ thermal remediation
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
MIBK	methyl isobutyl ketone or 4-methyl-2-pentanone
NPL	National Priorities List
Ω-m	ohm-meter
PAHs	polynuclear aromatic hydrocarbons
Pace	Pace National Laboratories in Mt. Juliet, Tennessee
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
PID	photo-ionization detector
ppm	parts per million
RRO	residual-range organics
scfh	standard cubic feet per hour
TCE	trichloroethylene
TCH	thermal conduction heating
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TRS	TRS Group, Inc.
VOC	volatile organic compounds

EXECUTIVE SUMMARY

TRS Group, Inc. received two soil samples from the Pasco Landfill National Priorities List Site (Site) for testing to determine the most appropriate method of *in situ* thermal remediation for the remediation and to identify an optimal target temperature for heating. The samples contained elevated concentrations of volatile and semi-volatile compounds as confirmed by preliminary analyses of the samples. The samples consisted of silty, fine sand with a low percent moisture in the range of 4.6 to 6.4 percent. Resistivity testing as a function of moisture showed that the soils were at the critical percent moisture where further drying would significantly impact the resistivity of the soil. Based on this testing, thermal conductance heating is the most appropriate heating technology for the Pasco Landfill Site.

Results of the bench test showed significant removal of volatile and semi-volatile organics when the soils were heated to 100 degrees Celsius (°C) and all of the soil moisture was removed from the soil. This heating is anticipated to provide between 93 to 96 percent removal of the volatile and semi-volatile organic constituents in the soil. It will be necessary to heat the soil to a temperature greater than 100°C to confirm that all the moisture is removed from the soil. TRS recommends heating to a temperature in the range of 105°C to 120°C. This will provide assurance that all soil moisture has been boiled from the soils while minimizing the breakdown of natural organic materials in the soil. The natural soil organic matter is important for the adsorption of heavier compounds that currently have low mobility risk due to low vapor pressure and high soil adsorption coefficients.

1.0 INTRODUCTION

The objective of using *in situ* thermal remediation (ISTR) at the Industrial Waste Area Zone A (Zone A) at the Pasco Sanitary Landfill National Priorities List (NPL) Site (the Site) is to achieve site-specific remediation levels that are protective of groundwater quality. TRS Group, Inc. (TRS) completed bench testing to develop a basis for an ISTR design that provides contaminant reduction to achieve the project objectives for specific constituents of concern (COC), including volatile organic compounds (VOCs), lower boiling point semi-volatile organic compounds (SVOCs) and total petroleum hydrocarbons (TPH). In particular, the technical objectives of the treatability testing were to:

- Evaluate COC removal efficiencies as a function of steam production for ISTR at temperatures of 100 degrees Celsius (°C), and
- Evaluate COC removal efficiencies as a function of temperature at soil desiccation temperatures of 150°C and 200°C.
- Identify a target moisture removal and temperature that can reduce total VOC concentrations to levels protective of groundwater.

The bench-scale test was completed in general accordance with the Bench-Scale Treatability Testing Plan included as Appendix B.5 of the Zone A Removal Action Engineering Design Report (August 2020) to support design of ISTR subsurface heating and vapor recovery systems.

2.0 SAMPLE COLLECTION, PRELIMINARY TESTING AND PREPARATION

2.1. Sample Collection and Shipment

TRS and Floyd|Snider collected ISTR bench test samples on September 22, 2022, from the Touchet Beds at locations identified as BH12a and BH30a which were positioned at previously sampled locations BH12 and BH30, respectively. Two, one-gallon paint cans were collected from each location at a depth of 22 to 24 feet below ground surface (ft bgs). The soils were screened during sampling with a photoionization detector (PID) and the samples had readings in excess of 5,000 parts per million (ppm) which indicated the presence of sufficient VOCs for bench testing. The paint cans were packed with soil to the top with minimal headspace to avoid volatilization losses during shipment. After sealing the cans, the cans were placed inside coolers for shipment with ice inside the coolers. The samples remained refrigerated at the Site over the weekend and were shipped via Federal Express to TRS on Monday, September 26, 2022, for next-day delivery. TRS received the soil samples at 10:36 A.M. eastern standard time on September 27, 2022. The samples were still preserved on ice at the time of receipt, prior to being placed into a sample refrigerator at a temperature of 4°C (±2°C) for testing. The chain-of-custody for sample shipment is included in **Appendix A**. A description of the samples is provided below in **Table 1.** Photographs of the soil samples are provided in **Figures 1** and **2**.

Table 1: Soil Sample Descriptions

Sample I.D.	Sample Depth (ft bgs)	Description
BH12a	22 to 24	Olive gray, silty, fine sand
BH30a	22 to 24	Gray, silty fine sand

Figure 1: BH30a Soil Sample

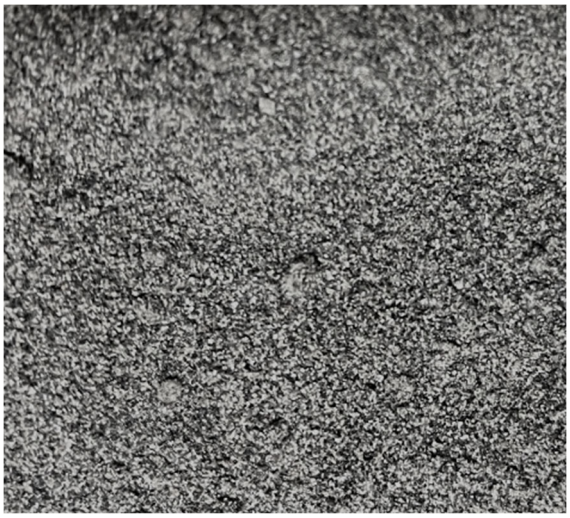

Figure 2: BH12a Soil Sample

2.2. Sample Homogenization

TRS removed the BH12a soil sample from the sample refrigerator for homogenization on September 29, 2022. The BH12a sample was passed through a Tyler #4 sieve under a fume hood in its native condition to remove any debris or gravel that might introduce high variability to the test results. The sample passed through the sieve into a 10-liter, stainless-steel mixing bowl where the sample was then further mixed and homogenized by hand in preparation for testing. Some loss of VOCs occurs during homogenization, but the higher degree of sample consistency is more important for the testing than the actual starting concentration of COCs. Furthermore, any losses in homogenization do not impact the test results because the control samples representing non-treatment are collected for analyses after the homogenization. A similar procedure for homogenization of the BH30a soil sample was completed on October 3, 2022. Both samples were noted to contain chunks of silt prior to homogenization which suggests that the soil consisted primarily of fine sand with silt lenses.

2.3. Geotechnical Testing

In preparation for the bench test, the BH12a and BH30a soil samples were tested to determine the geotechnical properties of the soil. The testing performed on the samples is summarized in **Table 2**.

Table 2: Geotechnical Testing Parameters

Testing Parameter	Method
Wet bulk density	ASTM D7263 – Method B
Dry bulk density	ASTM D7263 – Method B
Soil porosity	ASTM D7263 – Appendix X1[1]
Percent moisture	ASTM D2216
Total organic carbon	ASTM 2974 – Method C
Particle size distribution	ASTM D422

[1] Calculated using a soil solid specific gravity of 2.6 g/cc

2.4. Soil Resistivity Testing

Resistivity testing was conducted on both soil samples using the two-electrode soil box method outlined in American Society for Testing and Materials (ASTM) Method G187-12a (**Figure 3**).

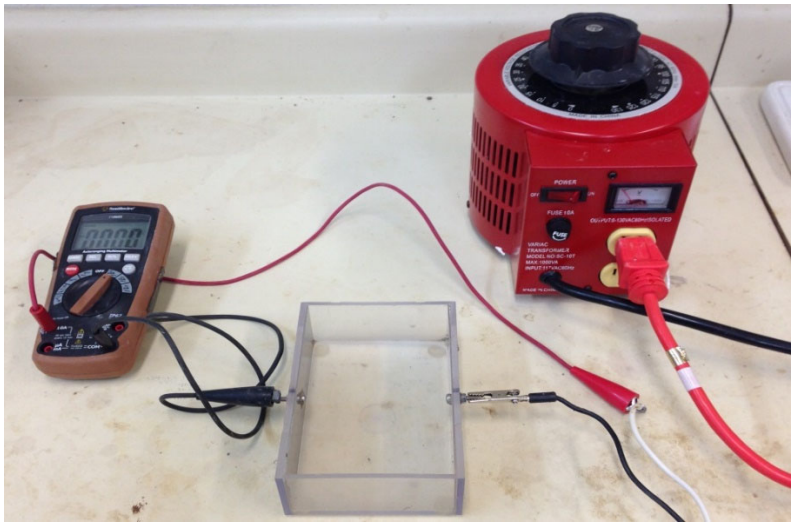

Figure 3: Two-Electrode Soil Box Test

Testing was performed on both soil samples at voltage potential levels in the range of 20 to 130 volts alternating current. In addition, testing was performed on each sample at differing moisture levels to understand how the resistivity of the soil changes as a function of moisture.

2.5. Sub-Sample Preparation

The homogenized soil samples were each divided into eight subsamples for the bench test. The weight and purpose for each of the eight subsamples were as follows:

- One 1,500-gram subsample designated for the geotechnical testing described in **Table 1**.
- One 400-gram subsample designated as a control sample was immediately placed into two 4-ounce jars and one 40-milliliter vial containing methanol preservation.
- Three 400-gram subsamples designated for testing at 100°C, at differing steam production rates (50%, 75% and 100% moisture removal).
- Two 700-gram subsamples designated for high-temperature testing at 150°C and 200°C in desiccated soil.
- One 400-gram method control, subjected to the same homogenization and preparation procedures as in the 100°C testing, but without heat.

3.0 BENCH TEST OBJECTIVES AND PROCEDURE

3.1. Testing Objectives

The 100°C temperature threshold represents a key treatment threshold for all ISTR technologies, as steam stripping is the dominate clean-up mechanism at this temperature. The percent of pore water removal is a reference to the quantity of steam stripping achieved. For example, 50 percent pore water removal is twice the amount of steam stripping as 25 percent pore water removal. To achieve temperature values in excess of 100°C, all the water must be removed from the matrix. Heating the sample to 150 or 200°C provides data that represents clean-up of the sample beyond the steam stripping threshold which then occurs by evaporation or distillation. This variety of testing represents the anticipated range of possible treatment temperatures that may be used for ISTR at the Site.

3.2. Procedure for Steam Stripping Bench Test at 100°C

The steam stripping test was performed on three subsamples from samples BH12a and BH30a. Three 400-gram subsamples were isolated from each sample for testing. The subsamples were gently pressed into Pyrex trays for testing and covered with perforated, plastic cling wrap. A fourth subsample was subjected to the same preparation procedure but was not subjected to heating. The fourth sample was then set aside to serve as the method control for the heating test.

A microwave was used to heat the individual subsamples to simulate steam stripping that occurs during ISTR. Use of a microwave provides the most uniform and rapid heating method possible for small soil samples to minimize other volatilization losses. TRS has used microwave heating for dozens of bench evaluations and successfully extrapolated the data for design of both pilot- and full-scale field applications. The test samples were prepared on the Pyrex trays using a flat geometry with a slight concavity in the center. This geometry, with the media in the center of the trays about half as thick as media near the edges, is designed to heat samples as even as possible.

The three subsamples for each sample were microwaved for 30-second intervals until pre-determined amounts of water were removed from the samples to hit percent water removal targets. After each heated interval, the dish was weighed to determine the amount of water that had evaporated. Heating for the subsamples was continued until approximately 50, 75 and 100 percent of the moisture was evaporated from the subsamples. It is not necessary to remove a precise percentage of the moisture, provided the final weight of each sample is accurately measured to allow calculation of the steam produced from heating.

3.3. Procedure for Thermal Testing at 150°C and 200°C

The testing conducted on soil samples at temperatures higher than 100°C evaluates removal efficiencies for contaminants by thermal conduction heating (TCH). The removal mechanism for contaminants at temperatures greater than 100°C is driven by evaporation and boiling rather than steam stripping. Contaminated soil is placed inside a soil cell inside a temperature-controlled oven for heating to specified temperatures. The specified temperatures for testing were 150°C and 200°C. A rotary vane air pump was used to pull approximately 5 standard cubic feet per hour (scfh) of airflow through the soil cell to remove volatilized contaminants. The contaminants and air passed through a condenser that was chilled with ice-bath water to condense the steam and contaminants. A temperature probe inside the oven and one inside the soil cell were used to measure temperature during the testing. A data logger was used to record the temperatures over the period of the test which is approximately three days. An example of the testing set-up is shown in **Figure 4**.

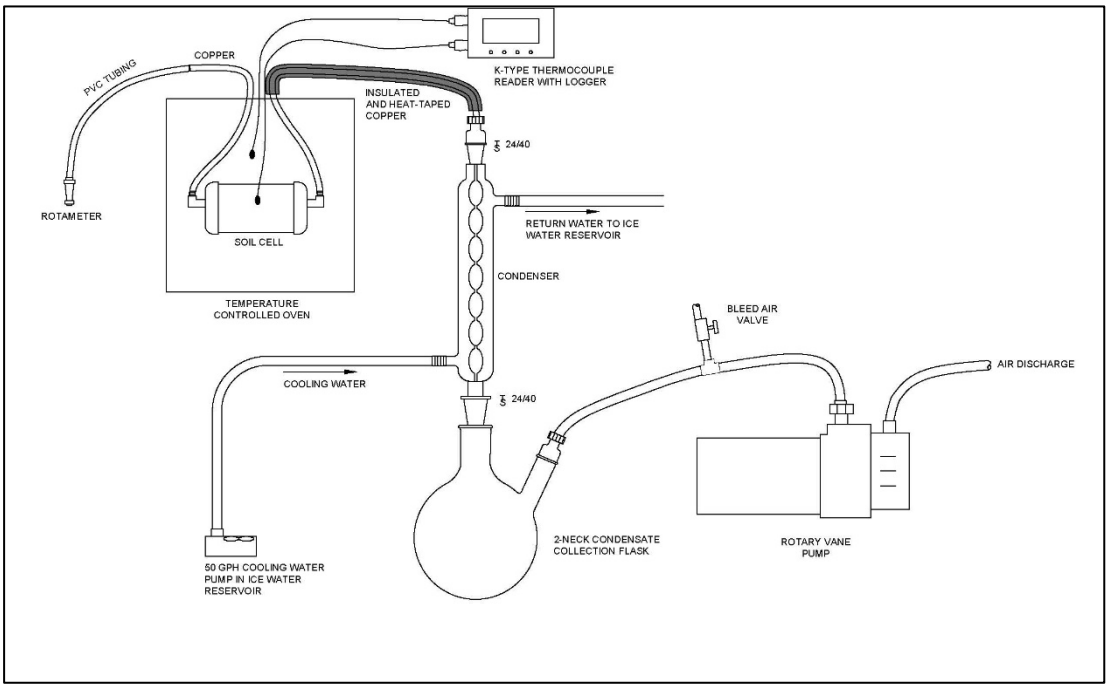

Figure 4: Test Set-up for Soil Testing above 100°C

4.0BENCH TEST RESULTS

4.1. Geotechnical Test Results

Results for the geotechnical testing of the two soil samples are summarized below in **Table 3**.

Table 3: Geotechnical Testing Parameters

Testing Parameter	BH12a (22'-24')	BH30a (22'-24')
Wet bulk density (g/cc)	1.55	1.57
Dry bulk density (g/cc)	1.48	1.47
Soil porosity[1] (%)	44.2	44.5
Percent moisture	6.4	4.6
Total organic carbon (%)	0.719	0.696

[1] Calculated using a soil solid specific gravity of 2.6 g/cc

4.2. Particle Size Distribution Results

The particle size distribution of soil sample BH12a and BH30a were tested by running samples of the material through a stack of sieves as described in ASTM Method D422. The test results identified both soil samples as a silty, fine sand. A summary of the particle size data is provided in **Table 4**. Particle distribution graphs are provided in **Appendix B**.

Table 4: Percent Particle Size Distribution Results

Soil Fraction	Size Range	BH30a (22'-24')	BH12a (22'-24')
Gravel	75mm to 4.75mm	0.0	0.0
Coarse Sand	4.75mm to 2.00mm	1.2	0.6
Medium Sand	2.00mm to 0.425mm	6.3	5.5
Fine Sand	0.425mm to 0.075mm	75.9	86.0
Silt-Clay	Smaller than 0.075mm	16.6	7.9

4.3. Soil Resistivity Results

Soil resistivity testing was performed on soil samples BH12a and BH30a. The results from the testing are shown below in **Tables 5 and 6**.

Table 5: Soil Resistivity Data for BH12a

TRS Accelerating Value

G187 – 12a

Soil Resistivity Test using the Two-Electrode Soil Box Method

10/6/2022 A/d (cm) = 2.8

Sample Description	Sample Temperature (°C)	Voltage	Amps	Measured Resistance (Ω)	Calculated Resistivity (Ω-m)
BH12a (22'-24')	10	20	0.045	444	12.4
		30	0.069	435	12.2
		40	0.094	426	11.9
		50	0.119	420	11.8
		60	0.140	429	12.0
		70	0.165	424	11.9
		80	0.187	428	12.0
		90	0.211	427	11.9
		100	0.238	420	11.8
		110	0.261	421	11.8
		120	0.287	418	11.7
		130	0.311	418	11.7

Table 6: Soil Resistivity Results for BH30a

TRS Accelerating Value

G187 – 12a

Soil Resistivity Test using the Two-Electrode Soil Box Method

10/6/2022 A/d (cm) = 2.8

Sample Description	Sample Temperature (°C)	Voltage	Amps	Measured Resistance (Ω)	Calculated Resistivity (Ω-m)
BH30a (22'-24')	10	20	0.095	211	5.9
		30	0.148	203	5.7
		40	0.210	190	5.3
		50	0.265	189	5.3
		60	0.319	188	5.3
		70	0.371	189	5.3
		80	0.416	192	5.4
		90	0.468	192	5.4
		100	0.520	192	5.4
		110	0.580	190	5.3
		120	0.644	186	5.2
		130	0.697	187	5.2

The testing shows that the BH12a soil sample has a resistivity of approximately 12 ohm-meter (Ω-m) at 10°C and that sample BH30a has a soil resistivity of approximately 5 to 6 Ω-m at 10°C. As the soil heats to 100°C, the soil resistivity value will drop by about a factor of 3 if the moisture remains unchanged. Therefore, the range of soil resistivity of the soil at its current moisture is expected to range from about 1.7 to 12.4 Ω-m during thermal treatment. This value is slightly more electrically

conductive for what might be expected for sandy soil. A typical soil resistivity for moist sand is in the range of 20 to 30 Ω-m.

As the soil dries during heating, the resistivity value will increase. When the soil dries to a point called the "critical moisture," the resistivity of the soil will increase substantially and exponentially as it dries further. Testing was performed on soil samples from BH12a and BH30a to identify the critical moisture values. Results of the testing are summarized in **Figures 5** and **6 below.**

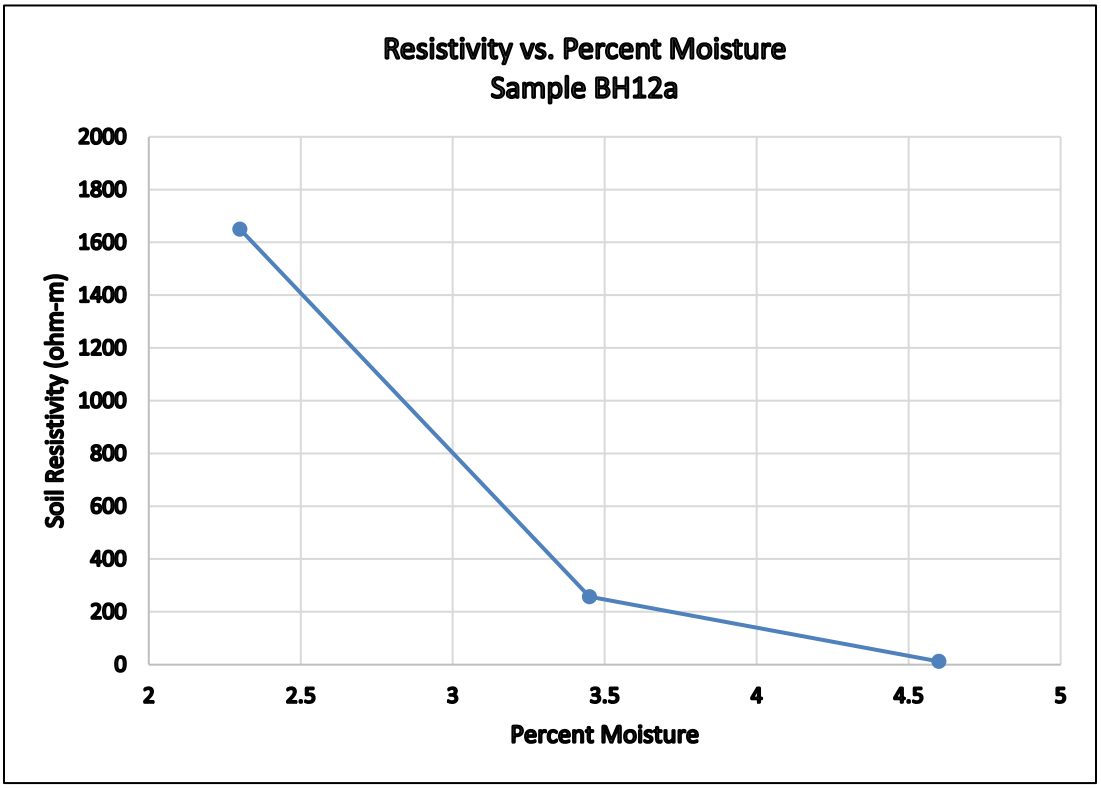

Figure 5: BH12a Soil Resistivity versus Percent Moisture

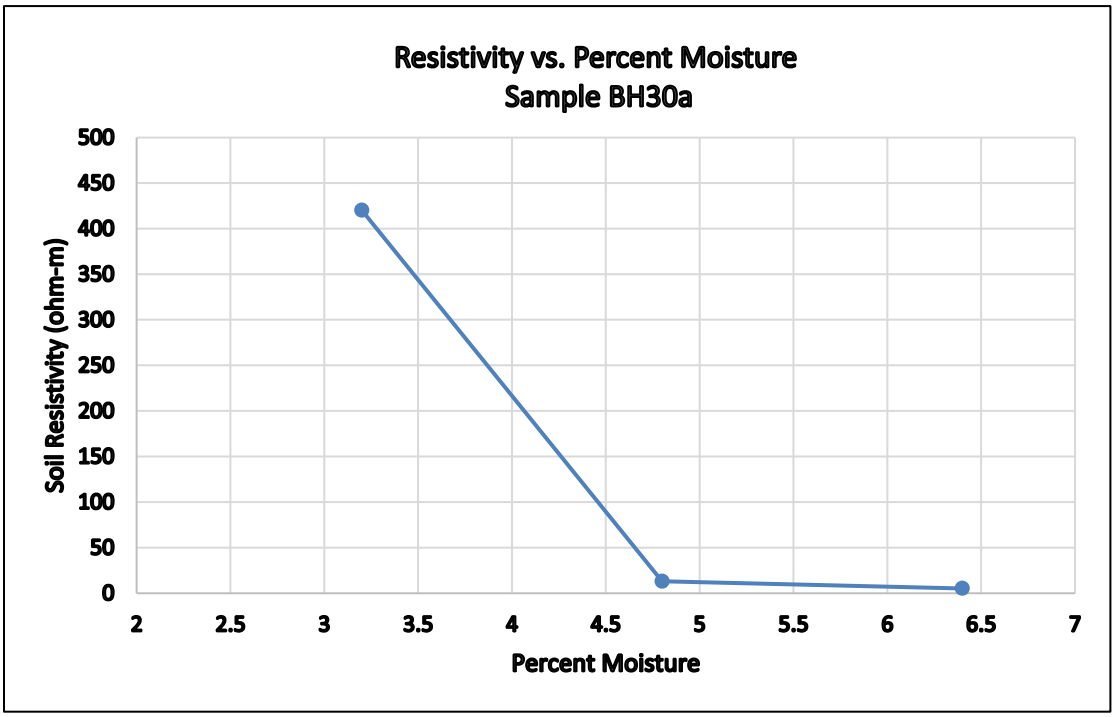

Figure 6: BH30a Soil Resistivity versus Percent Moisture

The soil resistivity curves identified the critical moisture content in the range of about 3.5 to 4.5 percent moisture. When moisture levels fell below this value, the resistivity value for the soil began to increase exponentially. The accepted soil resistivity range for electrical resistance heating (ERH) is typically reported in the range of 1 to 500 Ω-m. The graphs indicate that ERH may become ineffective as a heating technology when the soil moisture falls below 3 percent.

4.4. Results for Steam Stripping Bench Test at 100°C

Tables 7 and **8** provide a summary of the moisture analysis for the two samples (3 subsamples per sample) during the steam stripping part of the bench test at 100°C. The percent moisture measured in Sample BH12a prior to thermal testing was 6.4 percent which is equivalent to 25.6 grams of water in a 400-gram sample of undried soil. Percent moisture removal values shown in **Table 7** are based on this value.

Table 7: BH12a Sample Moisture Loss Data

ERH Bench Test Data	Sub-Sample BH12a-1	Sub-Sample BH12a-2	Sub-Sample BH12a-3
Initial Mass (g)	400	400	400
Mass after Heating (g)	386.2	380.5	374.4
Mass of Water Removed (g)	13.8	19.5	25.6
% Water Removed from soil	53.9	76.2	100
% Moisture in Post-Heated Soil	2.95	1.52	0

The percent moisture measured in Sample BH30a prior to thermal testing was 4.6 percent which is equivalent to 18.4 grams of water in a 400-gram sample of undried soil. Percent moisture removal values shown in **Table 8** are based on this value.

Table 8: BH30a Sample Moisture Loss Data

ERH Bench Test Data	Sub-Sample BH30a-1	Sub-Sample BH30a-2	Sub-Sample BH30a-3
Initial Mass (g)	400	400	400
Mass after Heating (g)	390.8	386.2	381.6
Mass of Water Removed (g)	9.2	13.8	18.4
% Water Removed	50.0	75.0	100
% Moisture Post-Heating	2.3	1.15	0

After completing the heating process, the heated sub-samples were refrigerated. Once cool, the samples were packed on ice and submitted to Pace National Laboratories in Mt. Juliet, Tennessee (Pace) for next-day delivery for the analyses described in **Table 9**.

Table 9: Summary of Analytical Methods

Parameter	Method
VOCS	8260
SVOC (including PAHs)	8270
PCBs	8082
Herbicides	8321
TPH	NWTPH-GX and NWTPH-DX-SGT

Results of the laboratory analyses are included in **Appendix C**. Relevant data from the testing are summarized below in **Tables 10** and **11.**

Table 10: Relevant Analytical Results (mg/kg) for BH12a Control Samples and 100°C Samples

Constituent	Control	53.9% water boil-off (BH12a-1)	76.2% water boil-off (BH12a-2)	100% water boil-off (BH12a-3)
Gasoline Range Organics (GRO)	3,090	48.8	28.5	40
Diesel Range Organics (DRO)	1,290	459	370	159
Residual Range Organics (RRO)	925	508	443	183
VOCs				
2-Butanone	<4.34	<8.69	<8.82	<1.02
4-Methyl-2-pentanone	12.3	2.86	0.279	0.349
Benzoic acid	<8.7	6.85	5.37	5.69
Acetone	2.19	<4.34	<4.41	1.06
Benzene	<0.0434	<0.0869	0.0882	0.0368
Ethylbenzene	51.9	1.93	0.263	0.0647
Isopropylbenzene	9.56	0.562	0.0456	0.107
Styrene	4.14	<1.1	<0.127	<0.107
Tetrachloroethylene	1.27	<0.22	<0.0254	<0.026
Toluene	38.9	<0.441	0.173	0.0521
Trichlorethylene	0.224	0.0882	<0.0102	<0.0104
Total Xylenes	300.1	3.585	1.699	4.67
1,2-dichlorobenzene	<1.74	<0.337	<0.336	<0.333
1,2,4-trichlorobenzene	<1.74	<0.337	<0.336	<0.333
SVOCs				
3&4-methylphenol	2.37	0.936	0.522	<0.333
Bis(2-ethylhexyl)phthalate	10.2	8.2	6.07	6.18
Benzylbutyl phthalate	<1.74	1.53	0.663	<0.333
Dimethyl phthalate	<1.74	2.63	0.725	0.899
Di-n-octyl phthalate	<1.74	<0.337	0.369	0.417
Di-n-butyl phthalate	2.49	2.63	1.76	2.3
Isophorone	12.8	3.11	2.37	3.18
Phenol	<1.79	0.632	0.401	<0.333
Anthracene	0.011	<0.006	<0.006	<0.006

Constituent	Control	53.9% water boil-off (BH12a-1)	76.2% water boil-off (BH12a-2)	100% water boil-off (BH12a-3)
Acenaphthene	0.056	0.047	0.0488	<0.006
Acenaphthylene	0.018	<0.006	<0.006	<0.006
Benzo(b)fluoranthene	<0.006	0.00768	0.00815	<0.006
Chrysene	0.0125	0.0132	0.0148	<0.006
Fluoranthene	0.0566	0.0523	0.0609	0.0167
Fluorene	0.105	0.0622	0.0685	<0.006
Naphthalene	12.9	0.642	0.535	0.101
Phenanthrene	0.33	0.268	0.301	0.0983
Pyrene	0.0418	0.0459	0.0507	0.006
1-methynaphthalene	4.1	0.369	0.384	0.0584
2-methynaphthalene	4.28	0.665	0.714	0.111
PCBs				
PCB 1242	0.994	0.501	0.446	0.344
PCB 1254	0.501	0.142	0.131	0.118
Total Constituent Removal Compared to Control	**0%**	**81.7%**	**85%**	**92.9%**

Table 11: Relevant Analytical Results (mg/kg) for BH30a Control Samples and 100°C Samples

Constituent	Control	50.0% water boil-off (BH30a-1)	75.0% water boil-off (BH30a-2)	100% water boil-off (BH30a-3)
Gasoline Range Organics (GRO)	1370	16.7	14.2	15.4
Diesel Range Organics (DRO)	795	314	148	36.3
Residual Range Organics (RRO)	475	344	150	36.4
VOCs				
2-Butanone	<4.57	<0.105	0.127	0.617
4-Methyl-2-pentanone	2.28	0.0306	0.0487	0.152
Benzoic acid	<8.93	3.49	5.97	<8.41
Acetone	3.72	0.0599	0.23	1.65
Benzene	<0.0457	<0.00105	0.00886	0.0306
Ethylbenzene	12.8	0.0659	0.166	0.144
Isopropylbenzene	2.09	0.019	0.0277	0.0712
Tetrachloroethylene	24	<0.00263	<0.0027	<0.00353
Toluene	6.11	0.0226	0.0773	0.09
Trichlorethylene	0.304	<0.000105	0.00148	<0.00141
Total Xylenes	74.2	0.4	0.956	0.573
1,2-Dichlorobenzene	18.4	<0.339	<0.337	<1.68
1,2,4-Trichlorobenzene	<1.79	<0.339	<0.337	<1.68
SVOCs				
3&4-methylphenol	2.03	0.526	0.413	<1.68
Bis(2-ethylhexyl)phthalate	6.43	3.95	2.92	<1.68
Benzylbutyl phthalate	<1.79	0.836	0.514	<1.68
Di-n-octyl phthalate	<1.79	<0.339	<0.337	<1.68
Di-n-butyl phthalate	<1.79	0.781	0.756	<1.68
Isophorone	<1.79	<0.339	<0.337	<1.68
Phenol	61.8	15.9	12.2	2.42
Anthracene	<0.00642	<0.00612	<0.00608	<0.00605

Constituent	Control	50.0% water boil-off (BH30a-1)	75.0% water boil-off (BH30a-2)	100% water boil-off (BH30a-3)
Acenaphthene	0.175	<0.00612	<0.00608	<0.00605
Acenaphthylene	<0.00642	<0.00612	<0.00608	<0.00605
Benzo(b)fluoranthene	<0.00642	<0.00612	<0.00608	<0.00605
Chrysene	0.0105	0.008	<0.00608	<0.00605
Fluoranthene	8.32	7.49	6.29	1.44
Fluorene	0.184	0.0837	0.0642	0.0115
Naphthalene	15.4	0.413	0.256	0.0858
Phenanthrene	0.00894	0.227	0.153	0.0463
Pyrene	<0.006	0.0821	<0.006	<0.006
1-methynaphthalene	11	0.941	0.467	0.12
2-methynaphthalene	21.4	1.68	0.881	0.261
PCBs				
PCB 1242	3.41	1.67	.904	0.365
PCB 1254	0.93	0.611	0.34	0.145
Total Constituent Removal Compared to Control	**0%**	**75.5%**	**88.1%**	**96.7%**

4.5. Results for Thermal Testing at 150°C and 200°C

Subsamples from samples BH12a and BH30a were each subjected to testing as described in Section 3.2 over a period of three days (approximately 4,200 minutes). The subsamples were placed inside a stainless-steel soil cell and heated inside a temperature-controlled Model EX1 oven manufactured by Sheldon Manufacturing, Inc. (see **Figure 7**). The temperature of the oven and of the sample were monitored during heating using a Gain Express AZ Instruments 4-channel data logger with PerfectPrime Type-K thermocouples rated for high temperature. A small amount of air was passed across the soil during heating and the off-gas was cooled with a condensing system. Temperature graphs for each of the four tests are shown in **Figures 8** through **11**.

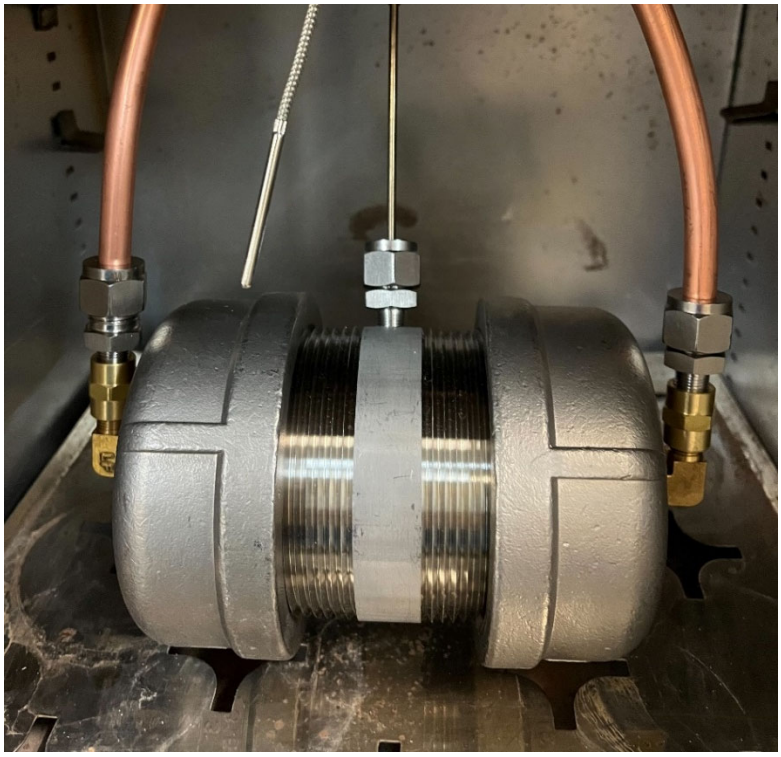

Figure 7: Soil cell inside oven for high-temperature testing

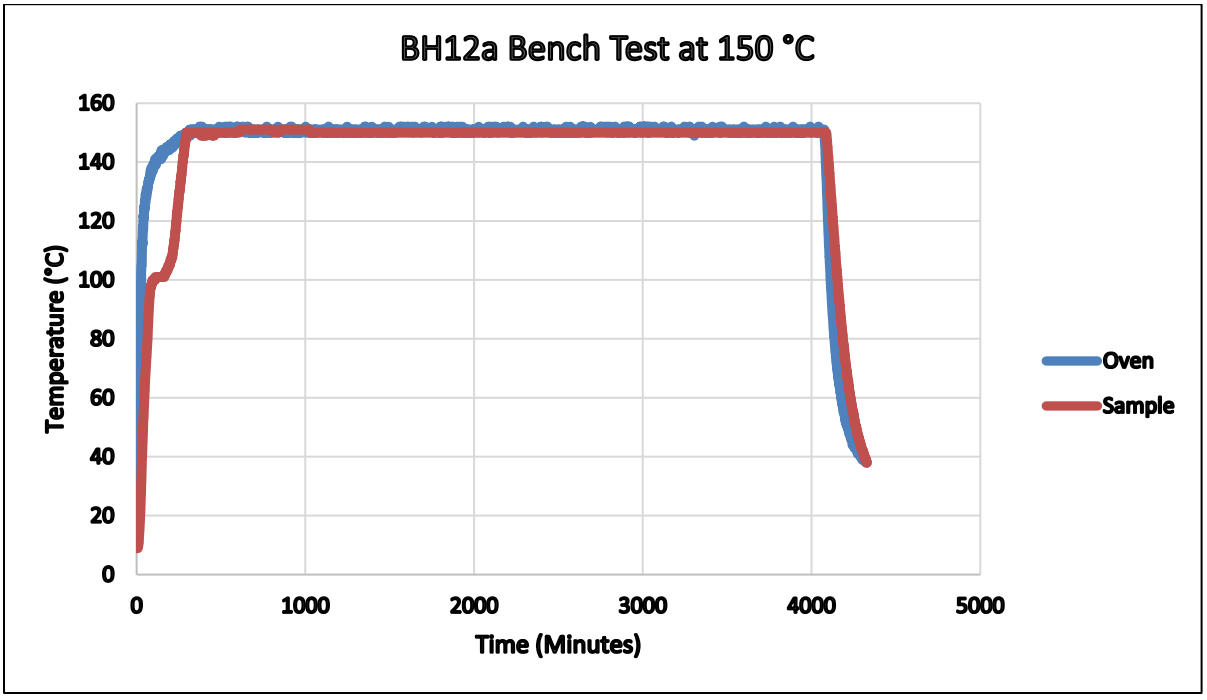

Figure 8: Temperature Graph for Subsample BH12a-TCH-150

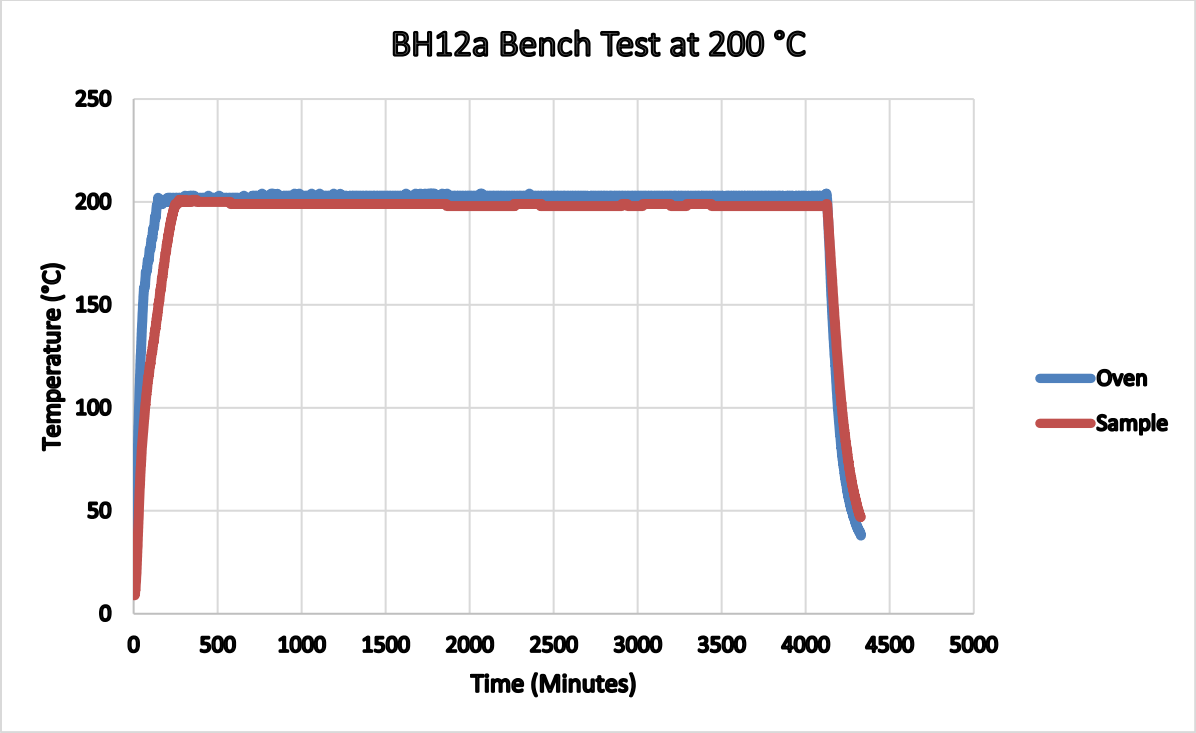

Figure 9: Temperature Graph for Subsample BH12a-TCH-200

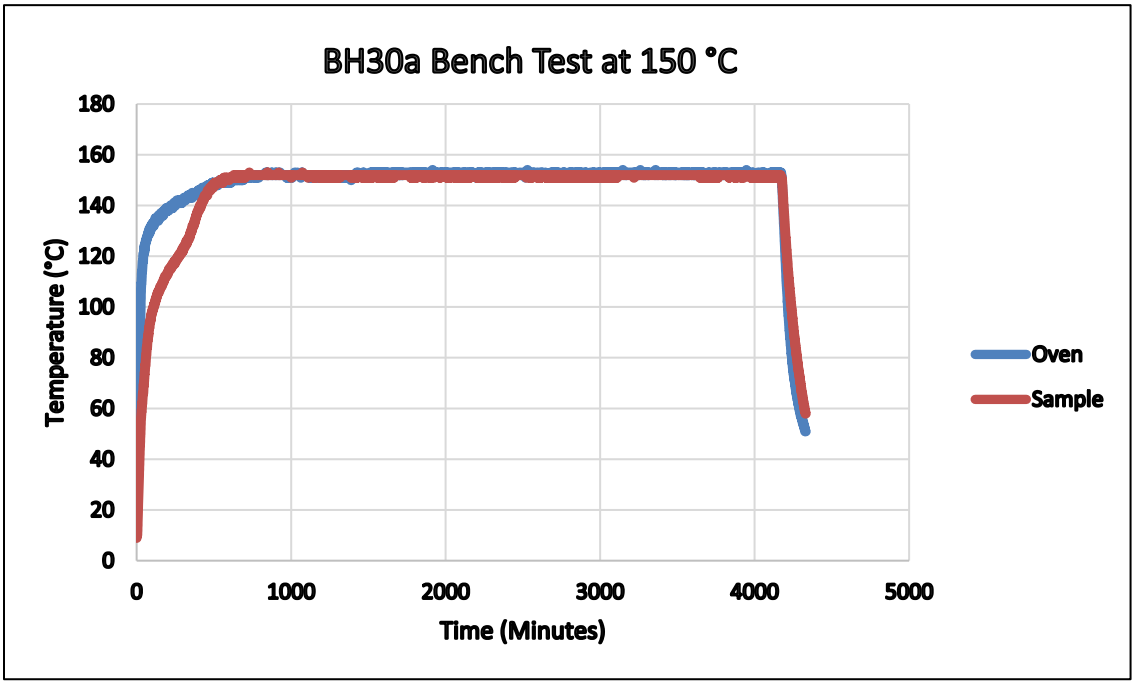

Figure 10: Temperature Graph for Subsample BH30a-TCH-150

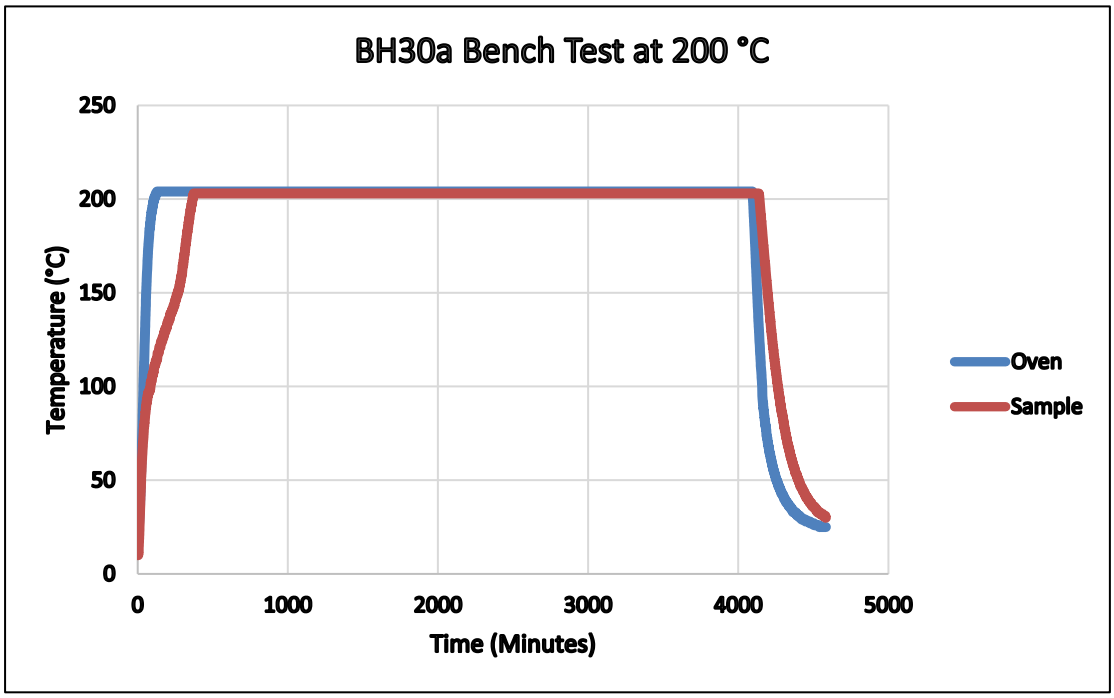

Figure 11**: Temperature Graph for Subsample BH30a-TCH-200**

During the testing, the soil moisture was removed from the soil as steam and collected as condensate in a two-neck flask. An infrared thermal sensor indicated the condenser was cooling the vapors to a temperature of 6°C. A photo of the condensing flask is shown in **Figure 12**.

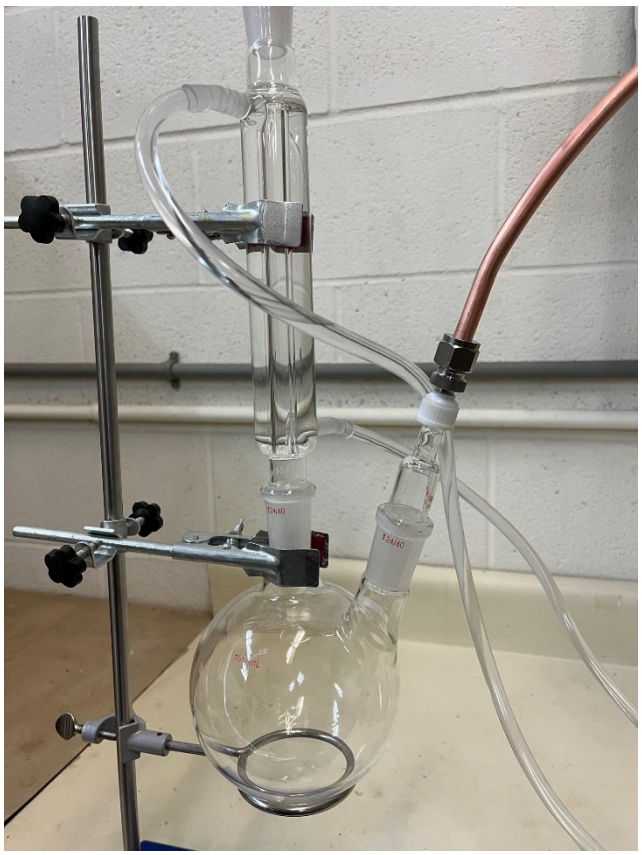

Figure 12**: Condensate Collection Flask**

The condensate was clear in all tests with no indication of free product or oily sheen. The pH of the condensate ranged from 5.3 to 5.7. The volume of condensate collected during the test ranged from 19 to 21 milliliters in the testing for BH12a and 27 to 29 milliliters in the testing for BH30a. A photograph of condensate collected from the BH12a testing is shown in **Figure 13**.

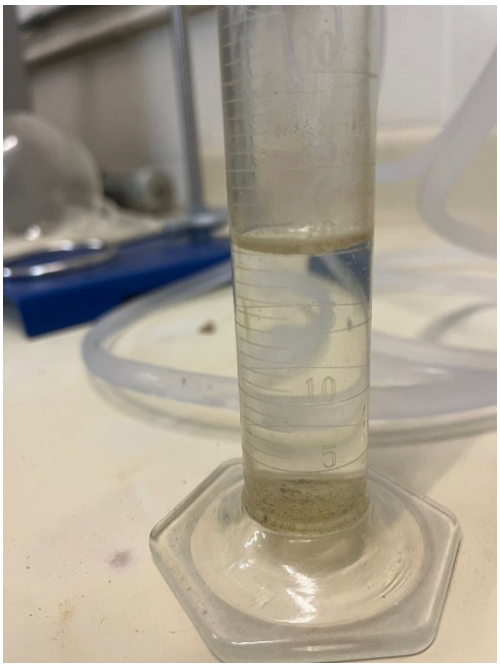

Figure 13**: Condensate from Thermal Testing of BH12a**

After completing the heating tests, the heated sub-samples were refrigerated. Once cool, the samples were placed into the appropriate sample containers and submitted to Pace for the analyses described in **Table 9**. Results of the laboratory analyses are included in **Appendix C**. Relevant data from the testing are summarized below in **Tables 12** and **13.**

Table 12: Relevant Analytical Results (mg/kg) for BH12a at Differing Temperatures

Constituent	Control	100% water boil-off at 100°C	100% water boil-off at 150°C	100% water boil-off at 200°C
Gasoline Range Organics (GRO)	3,090	40	33	7.73
Diesel Range Organics (DRO)	1,290	159	143	7.22
Residual Range Organics (RRO)	925	183	80.6	<10
VOCs				
2-Butanone	<4.34	<1.02	1.64	0.813
4-Methyl-2-pentanone	12.3	0.279	0.498	0.132
Acetone	2.19	1.06	3.23	1.59
Benzene	<0.0434	0.0368	0.0257	0.0323
Ethylbenzene	51.9	0.0647	0.0196	0.00686
Isopropylbenzene	9.56	0.107	0.0079	<0.007
Styrene	4.14	<0.107	<0.0136	<0.0125
Tetrachloroethylene	1.27	<0.026	0.0152	0.0261
Toluene	38.9	0.0521	0.0323	0.0261
Trichlorethylene	0.224	<0.0104	0.00109	<0.001
Total Xylenes	300.1	4.67	0.0999	0.0822
1,2-Dichlorobenzene	<1.74	<0.333	<0.00546	<0.00502
1,2,4-Trichlorobenzene	<1.74	<0.333	<0.0136	<0.0125
SVOCs				

Constituent	Control	100% water boil-off at 100°C	100% water boil-off at 150°C	100% water boil-off at 200°C
Bis(2-ethylhexyl)phthalate	10.2	6.18	2.17	<0.334
Benzylbutyl phthalate	<1.74	<0.333	<0.333	<0.334
Dimethyl phthalate	<1.74	0.899	0.764	<0.334
Di-n-octyl phthalate	<1.74	0.417	<0.333	<0.334
Di-n-butyl phthalate	2.49	2.3	1.13	<0.334
Isophorone	12.8	3.18	6.77	1.25
Phenol	<1.79	<0.333	<0.333	<0.334
Anthracene	0.011	<0.006	<0.0333	<0.0334
Acenaphthene	0.056	<0.006	<0.0333	<0.0334
Acenaphthylene	0.018	<0.006	<0.0333	<0.0334
Benzo(b)fluoranthene	<0.006	<0.006	<0.0333	<0.0334
Chrysene	0.0125	<0.006	<0.0333	<0.0334
Fluoranthene	0.0566	0.0167	<0.0333	<0.0334
Fluorene	0.105	<0.006	<0.0333	<0.0334
Naphthalene	12.9	0.101	0.129	0.0177
Phenanthrene	0.33	0.0983	0.0383	<0.0334
Pyrene	0.0418	0.006	<0.0333	<0.0334
PCBs				
PCB 1242	0.994	0.344	0.315	0.0436
PCB 1254/1260	0.501	0.118	0.0953	0.0332
Total Constituent Removal Compared to Control	**0%**	**92.9%**	**95.3%**	**99.7%**

Table 13: Relevant Analytical Results (mg/kg) for BH30a at Differing Temperatures

Constituent	Control	100% water boil-off at 100°C	100% water boil-off at 150°C	100% water boil-off at 200°C
Gasoline Range Organics (GRO)	1370	15.4	12.6	3.62
Diesel Range Organics (DRO)	795	36.3	50.2	9.11
Residual Range Organics (RRO)	475	36.4	24.9	<10
VOCs				
2-Butanone	<4.34	<1.02	1.64	0.813
4-Methyl-2-pentanone	12.3	0.279	0.498	0.132
Acetone	2.19	1.06	3.23	1.59
Benzene	<0.0434	0.0368	0.0257	0.0323
Ethylbenzene	12.8	0.144	0.0136	0.00591
Isopropylbenzene	2.09	0.0712	<0.0101	<0.0027
Styrene	4.14	<0.107	<0.0136	<0.0125
Tetrachloroethylene	0.24	<0.00353	<0.0101	<0.0011
Toluene	6.11	0.09	0.0236	0.0194
Trichlorethylene	0.304	<0.00141	<0.004	<0.001
Total Xylenes	74.2	0.573	0.0941	0.05
1,2-Dichlorobenzene	<1.74	<0.333	<0.00546	<0.00502
1,2,4-Trichlorobenzene	<1.74	<0.333	<0.0136	<0.0125
SVOCs				
3&4-methylphenol	2.03	<1.68	<1.67	<0.334
Bis(2-ethylhexyl)phthalate	6.43	<1.68	<1.67	<0.334
Benzylbutyl phthalate	<1.79	<1.58	<1.67	<0.334

Constituent	Control	100% water boil-off at 100°C	100% water boil-off at 150°C	100% water boil-off at 200°C
Di-n-octyl phthalate	<1.79	0.417	<0.333	<0.334
Di-n-butyl phthalate	<1.79	<1.68	<1.67	<0.334
Isophorone	12.8	3.18	6.77	1.25
Phenol	61.8	2.42	<1.67	<0.334
Anthracene	<0.00642	<0.00605	<0.0333	<0.0334
Acenaphthene	0.175	<0.006	<0.006	<0.006
Acenaphthylene	<0.00642	<0.00605	<0.0333	<0.0334
Benzo(b)fluoranthene	<0.00642	<0.00605	<0.0333	<0.0334
Chrysene	0.0105	<0.006	<0.006	<0.006
Fluoranthene	8.32	1.44	0.226	0.0123
Fluorene	0.184	0.0115	<0.006	<0.006
Naphthalene	15.4	0.0858	<0.02	<0.02
Phenanthrene	0.00894	0.0463	<0.006	<0.006
Pyrene	<0.006	<0.006	<0.006	<0.006
1-methynaphthalene	11	0.12	<0.02	<0.02
2-methynaphthalene	21.4	0.261	0.0244	<0.02
PCBs				
PCB 1242	3.41	0.365	0.379	0.127
PCB 1254	0.93	0.145	0.155	0.0603
Total Constituent Removal Compared to Control	**0%**	**96.7%**	**96.1%**	**99.0%**

4.6. Herbicides

Each soil subsample was tested for herbicides by Method SW-846-8321. The list of herbicides included the following constituents:

- 2,4-D
- Dalapon
- 2,4-DB
- Dicamba
- Dichloroprop
- Dinoseb
- MCPA
- MCPP
- 2,4,5-T
- 2,4,5-TP

Herbicides were below detection limits in all of the tested soil samples. The detection limits ranged from 0.02 milligrams per kilogram (mg/kg) to 0.0216 mg/kg.

4.7. Total Organic Carbon

Samples of soil from BH12a and BH30a were subjected to temperatures of 100°C, 150°C and 200°C and shipped to Pace for TOC analyses by ASTM 2974 – Method C. The results of the laboratory analyses are included in **Appendix C** and are summarized below in **Table 14.**

Table 14: TOC Values (mg/kg) After Heating

Temperature	BH12a (22'-24')	BH30a (22'-24')
100°C	8,470	7,020
150°C	7,560	7,310
200°C	6,240	6,040

Due to sample variability, it is not unusual to see TOC data fall within a plus or minus 30% range when taking duplicate samples. The data are suggestive of some TOC degradation at 200°C, but overall the data fell within plus or minus 20% of the TOC observed in the control samples so it is difficult to distinguish variability in the samples from TOC degradation.

5.0 INTERPRETATION OF THE TEST RESULTS

5.1. Geotechnical Testing

Geotechnical testing shows the soil samples consisted of a silty, fine sand with low percent moisture in the range of 4.6 to 6.4 percent. Density and porosity values were typical of what should be expected for a fine sand and generally consistent with post-excavation characterization data collected in Zone A. The total organic carbon (TOC) was slightly higher than the national average of 0.25 percent. Sample BH12a had a TOC value of 0.72 percent and BH30a had a TOC value of 0.70 percent. These higher TOC values reduce the mobility of contaminants within the treatment zone as it allows for constituents to adsorb more readily to the soil.

5.2. Soil Resistivity Testing

Soil resistivity tests showed the soil to be more electrically conductive than typical sands. This would typically indicate the soil is highly suitable for treatment by ERH. However, the resistivity testing also showed that the critical moisture percent (the percent moisture where soil resistivity increases exponentially below that value) was in the range of 3.5 to 4.5 percent. This suggests that soil dry-out could limit the effectiveness of ERH in consideration of the already low starting soil moisture values. The low moisture content, and its proximity in value to the critical moisture percent, indicate that TCH would be the preferred thermal heating technology for this project.

5.3. Steam Stripping Bench Test at 100°C

During the steam stripping portion of the testing, constituent removal percentage increased as expected based on the volume of steam generated from within the sample. At 50 percent moisture removal, the percent reductions in total constituents were in the range of 75.5 to 81.7 percent This increased to the range of 85 to 88 percent removal at 75 percent moisture removal. The percent reduction for total constituents increased to the range of 92.9 to 96.7 percent removal by evaporating all the water from the soil sample. VOC concentrations in soil, as measured by Method 8260, were reduced to less than 10 mg/kg at the 50% moisture boil-off.

5.4. Thermal Testing Comparison at 100°C, 150°C and 200°C

Due to the low moisture content of the soil, TCH is recommended as the best-suited ISTR technology for this remediation. The question is what is the best temperature to target with TCH. The best target temperature is one that will remediate constituents that have a potential for mobility while not over-heating the soil to the point of breaking down the organic carbon that helps to retard the mobility of heavy molecular weight constituents strongly adsorbed to the soil matrix. The bench test results are therefore analyzed below as both a function of their constituent classification and treatment temperature. The bench test results were compared to the soil screening levels for the protection of groundwater developed in the Zone A Removal Action Engineering Design Report.

5.4.1. Chlorinated Alkenes

Chlorinated alkenes identified in the treatability test soils include tetrachloroethylene (PCE) and trichloroethylene (TCE). The maximum PCE concentration was 0.24 mg/kg and the maximum TCE concentration was 0.304 mg/kg. These constituents were quickly removed to below detection limits in the first stage of heating to 100°C. A temperature no higher than 100°C is therefore required to reduce PCE and TCE to below the soil screening levels for protection of groundwater.

5.4.2. Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)

The concentration of benzene in the control subsample was below detection limits, but the detection limits were elevated due to the high concentrations of TPH in the subsample. This is consistent with post-excavation characterization sampling and drum removal sampling which had limited benzene detections. As the TPH was driven from the soils with steam removal, low concentrations of benzene were observed in the soil subsamples in the range of 0.01 to 0.03 mg/kg. The reduction in benzene concentration did not show significant improvement at heating temperatures above 100°C, which indicates that the very low concentrations of benzene remaining in the subsample were likely fixed by chemisorption rather than physical adsorption.

The BH12a control subsample had an initial toluene concentration of 38.9 mg/kg and the BH30a control subsample had an initial toluene concentration of 6.11 mg/kg. The toluene concentrations were reduced into the range of 0.09 to 0.408 mg/kg at a temperature of 100°C with complete moisture removal. This is below the soil screening level for protection of groundwater. Very low concentrations of toluene were detected in the subsamples heated to 150°C and 200°C in the range of 0.02 to 0.03 mg/kg. A graph of toluene removal as a function of temperature is shown in **Figure 14**.

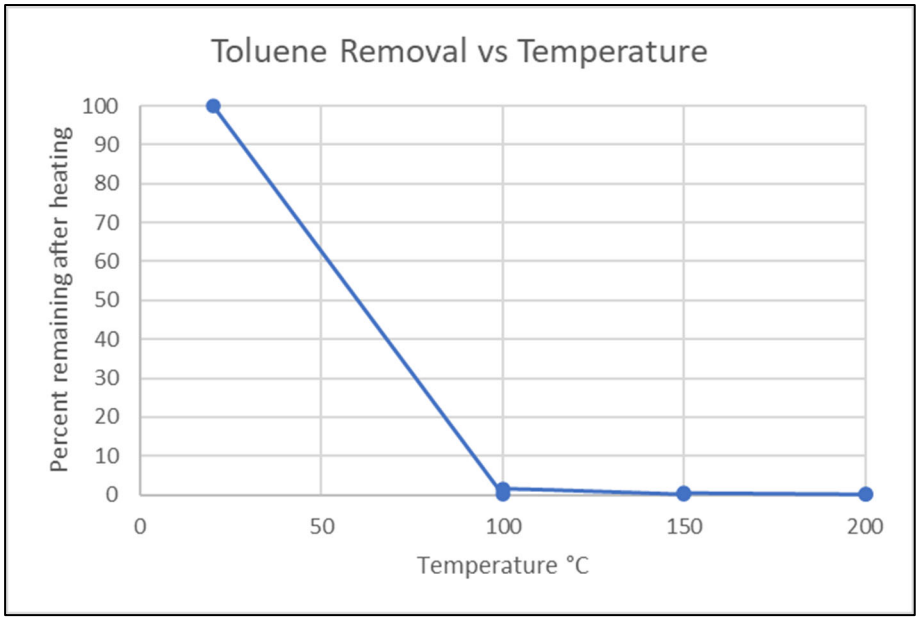

Figure 14: Toluene Removal vs Temperature

The BH12a control subsample had an initial ethylbenzene concentration of 51.9 mg/kg and the BH30a control subsample had an initial toluene concentration of 12.8 mg/kg. The ethylbenzene concentrations were reduced into the range of 0.144 to 0.647 mg/kg at a temperature of 100°C with complete moisture removal. This is below the soil screening level for protection of groundwater. Low concentrations of ethylbenzene were detected in the subsamples heated to 150°C and 200°C in the range of 0.005 to 0.02 mg/kg. A graph of ethylbenzene removal as a function of temperature is shown in **Figure 15**.

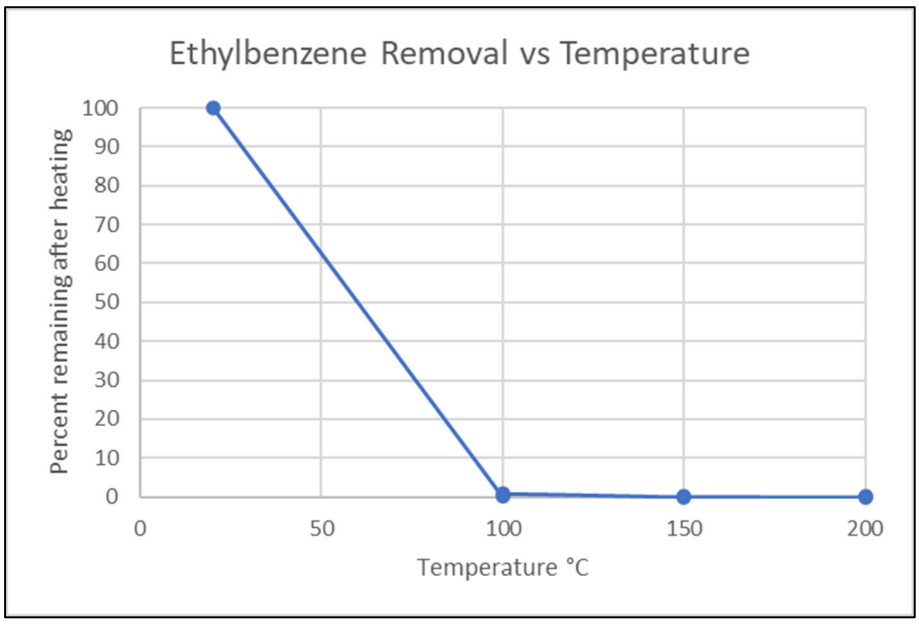

Figure 15: Ethylbenzene Removal vs Temperature

The BH12a control subsample had an initial total xylene concentration of 300.1 mg/kg and the BH30a control subsample had an initial xylene concentration of 74.2 mg/kg. The xylene concentrations were reduced into the range of 0.573 to 4.67 mg/kg at a temperature of 100°C with complete moisture removal. This is below the soil screening level for protection of groundwater. Concentrations of xylenes were detected in the subsamples heated to 150°C and 200°C in the range of 0.05 to 0.1 mg/kg. A graph of xylene removal as a function of temperature is shown in **Figure 16**.

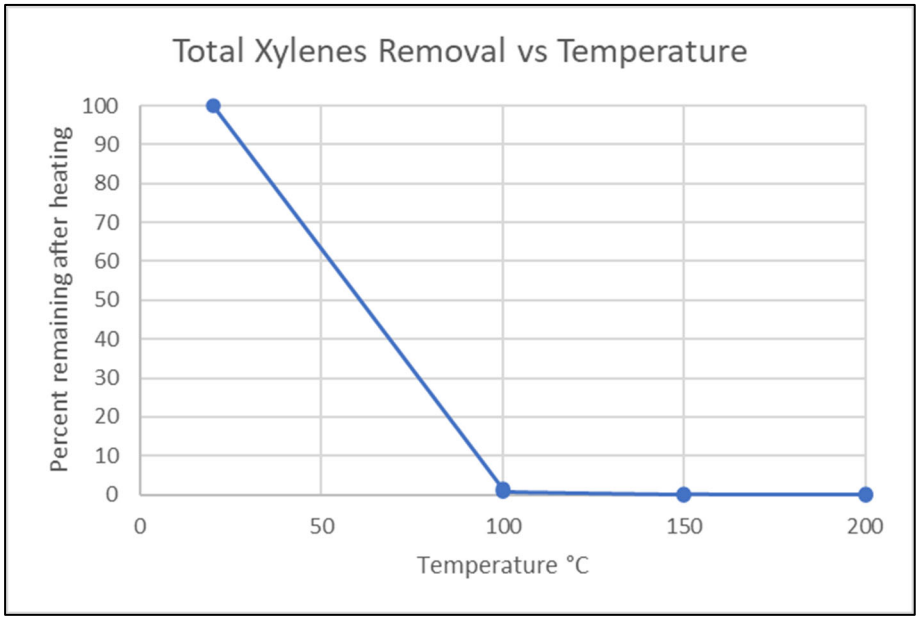

Figure 16: Total Xylenes Removal vs Temperature

5.4.3. Gasoline-Range Organics (GRO)

Gasoline-range organics (GRO) made up a significant portion of the volatile constituent mass in the soils. The BH12a control subsample had an initial GRO value of 3,090 mg/kg and the BH30a control subsample had an initial GRO concentration of 1,370 mg/kg. The GRO concentrations were reduced into the range of 15.4 to 40 mg/kg at a temperature of 100°C with complete moisture removal. The soil screening level for protection of groundwater is 30 mg/kg. Residual concentrations of GRO were detected in the subsamples heated to 150°C and 200°C in the range of 3.6 to 33 mg/kg. A graph of GRO removal as a function of temperature is shown in **Figure 17.**

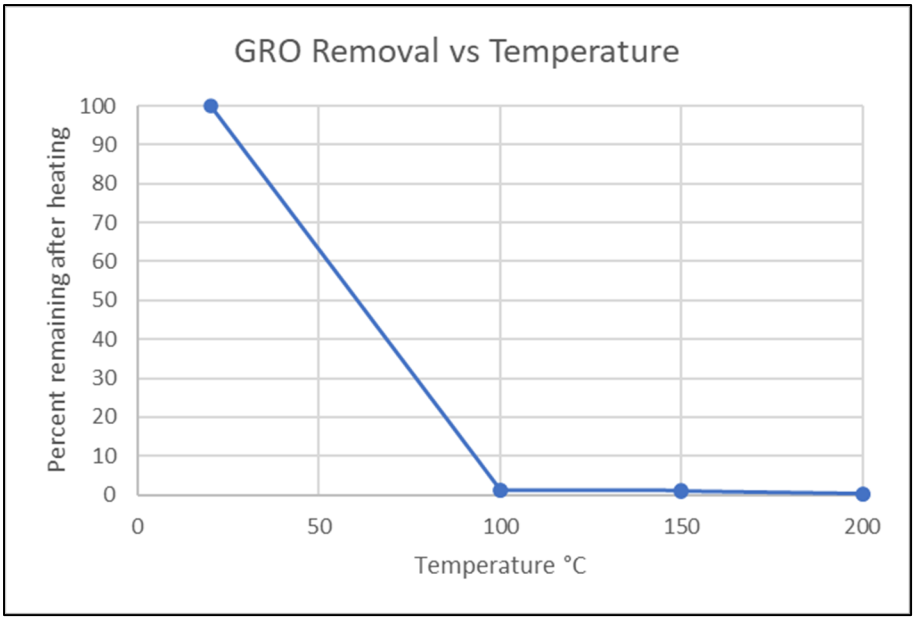

Figure 17: GRO Removal vs Temperature

5.4.4. Diesel-Range Organics (DRO)

Diesel-range organics (DRO) also made up a significant portion of the constituent mass in the soils. The BH12a control subsample had an initial DRO value of 1,290 mg/kg and the BH30a control subsample had an initial DRO concentration of 795 mg/kg. The DRO concentrations were reduced to concentrations in the range of 36.3 to 159 mg/kg at a temperature of 100°C with complete moisture removal. Concentrations of DRO in the subsamples heated to 150°C and 200°C were in the range of 7 to 143 mg/kg. The DRO in the soil was less than the 2,000 mg/kg soil screening level for protection of groundwater before any heating occurred. A graph of DRO removal as a function of temperature is shown in **Figure 18**.

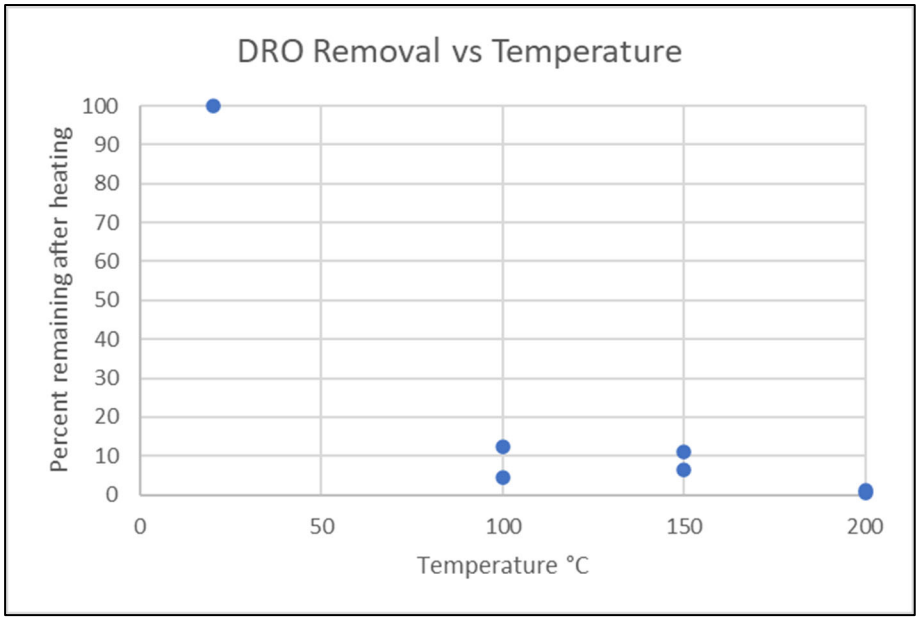

Figure 18: DRO Removal vs Temperature

5.4.5. Residual-Range Organics (RRO)

Constituents in the residual-range organics (RRO) range of hydrocarbons have low risk potential for exposure due to inhalation or mobilization due to their low vapor pressure and high soil adsorption coefficients. However, RRO values were measured as part of the testing. The BH12a control subsample had an initial RRO value of 925 mg/kg and the BH30a control subsample had an initial RRO concentration of 475 mg/kg. The RRO concentrations were reduced into the range of 36.4 to 183 mg/kg at a temperature of 100°C with complete moisture removal. Residual concentrations of RRO in the subsamples heated to 150°C and 200°C ranged from less than 10 mg/kg to 80.6 mg/kg. The RRO in the soil was less than the 2,000 mg/kg soil screening level for protection of groundwater before any heating occurred. A graph of RRO removal as a function of temperature is shown in **Figure 19**.

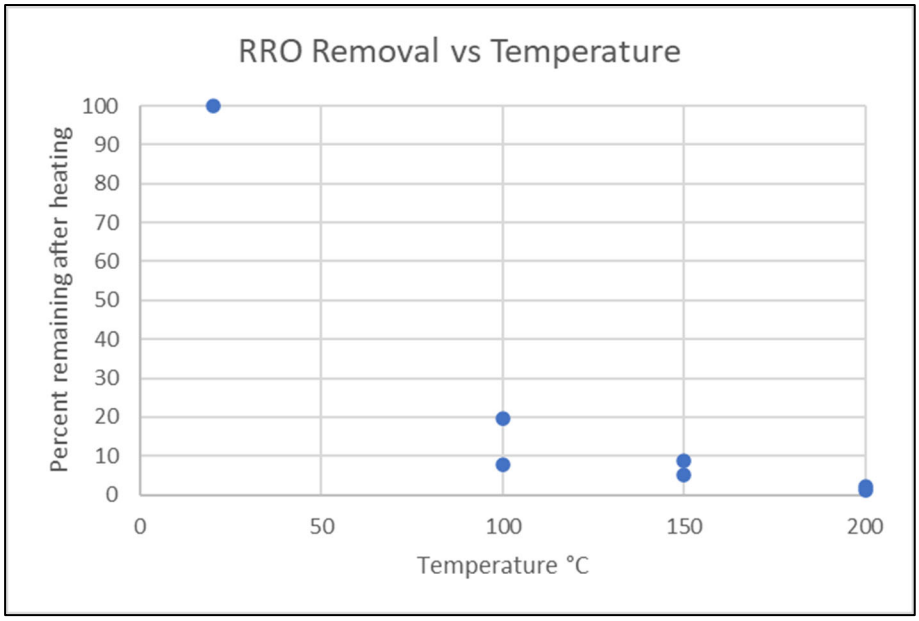

Figure 19: RRO Removal vs Temperature

5.4.6. Other VOCs

Other VOCs identified in the control subsamples besides PCE, TCE and BTEX are 1,2,4-trichlorobenzene (1.42 mg/kg in BH30a), styrene (4.14 mg/kg in BH12a), isopropylbenzene (9.56 mg/kg in BH12a and 2.09 mg/kg in BH30a), 4-methyl-2-pentanone and 1,2-dichlorobenzene. These five constituents are discussed in further detail below.

<u>1,2,4-Trichlorobenzene</u>

The BH30a control subsample had an initial total 1,2,4-trichlorobenzene concentration of 1.42 mg/kg. This was reduced to 0.02 mg/kg by heating to 100°C and driving off all the soil moisture. This is below the 0.56 mg/kg soil screening level for protection of groundwater. Heating the soil to temperatures of 150°C and 200°C did not show significant reductions in the residual concentrations, likely due to chemisorption effects. A graph of 1,2,4-trichlorbenzene removal as a function of temperature is shown in **Figure 20.**

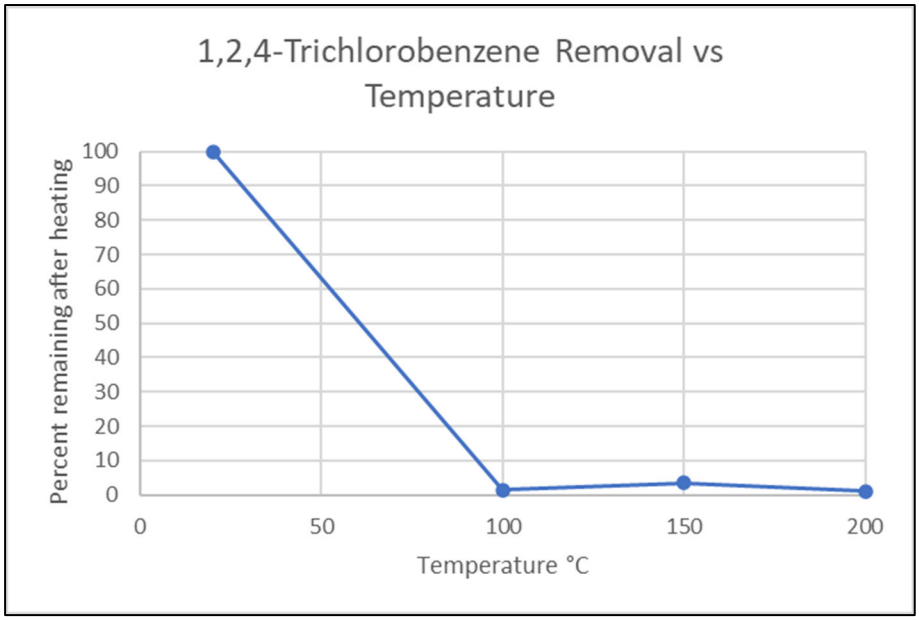

Figure 20: 1,2,4-Trichlorobenzene Removal vs Temperature

Isopropylbenzene

The BH12a control subsample had an initial isopropylbenzene concentration of 9.56 mg/kg and the BH30a control subsample had an initial isopropylbenzene concentration of 2.09 mg/kg. Isopropylbenzene was below the 15 mg/kg soil screening level for protection of groundwater before the samples were heated. The isopropyl benzene concentrations were reduced into the range of 0.0712 to 0.107 mg/kg at a temperature of 100°C with complete moisture removal. Very low residual concentrations of isopropylbenzene were detected in the subsamples heated to 150°C and 200°C in the range of 0.007 to 0.01 mg/kg. A graph of isopropylbenzene removal as a function of temperature is shown in **Figure 21.**

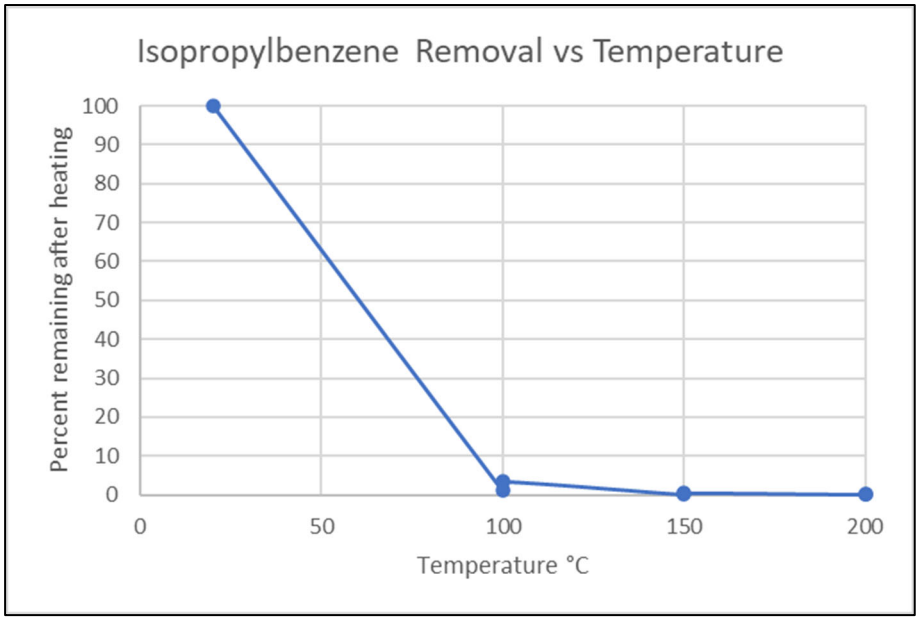

Figure 21: Isopropylbenzene Removal vs Temperature

4-methyl-2-pentanone

4-methyl-2-pentanone, also called methyl isobutyl ketone (MIBK), was detected in the BH12a control subsample at an initial MIBK concentration of 12.3 mg/kg and the BH30a control subsample had an initial MIBK concentration of 2.09 mg/kg. The MIBK concentrations were reduced into the range of 0.279 to 0.349 mg/kg at a temperature of 100°C with complete moisture removal. This is below the 2.7 mg/kg soil screening level for protection of groundwater. No additional removal was observed by heating to higher temperatures. This is likely due, in part, to the potential formation of MIBK by the breakdown of soil organics when heated to higher temperatures. This effect is explained in more detail in Section 5.4.9. The concentration range of MIBK in the subsamples heated to 150°C and 200°C were in the range of 0.12 to 0.5 mg/kg. The MIBK removal versus temperature is shown in **Figure 22.**

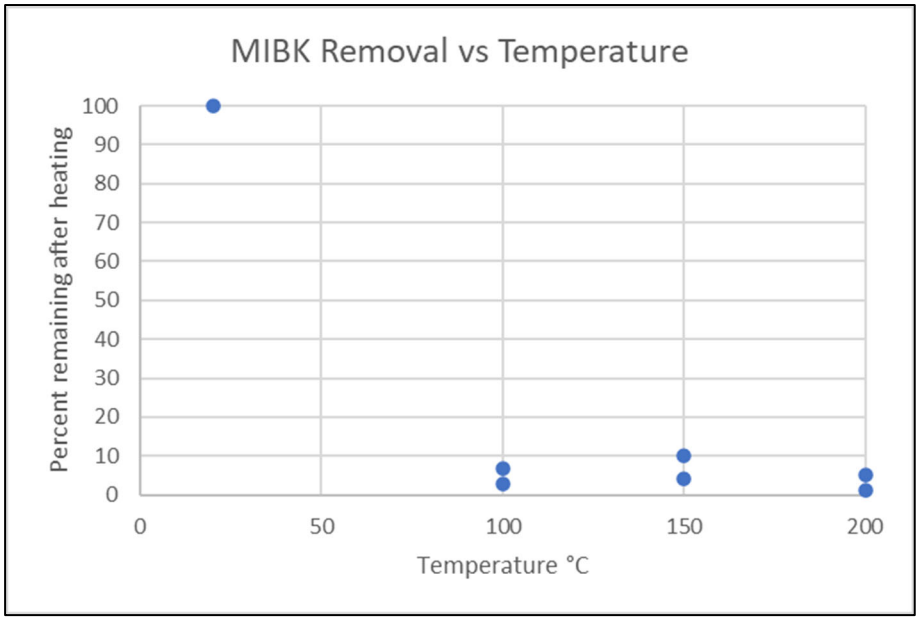

Figure 22: MIBK Removal vs Temperature

<u>1,2-dichlorobenzene</u>

1,2-dichlorobenzene was detected in the BH30a control subsample at 184 mg/kg but it was less than the detection limits in the BH12a control subsample. The concentrations were reduced to below detection limits when heated to a temperature of 100°C with complete moisture removal. The 1,2-dichlorobenzene removal versus temperature is shown in **Figure 23.**

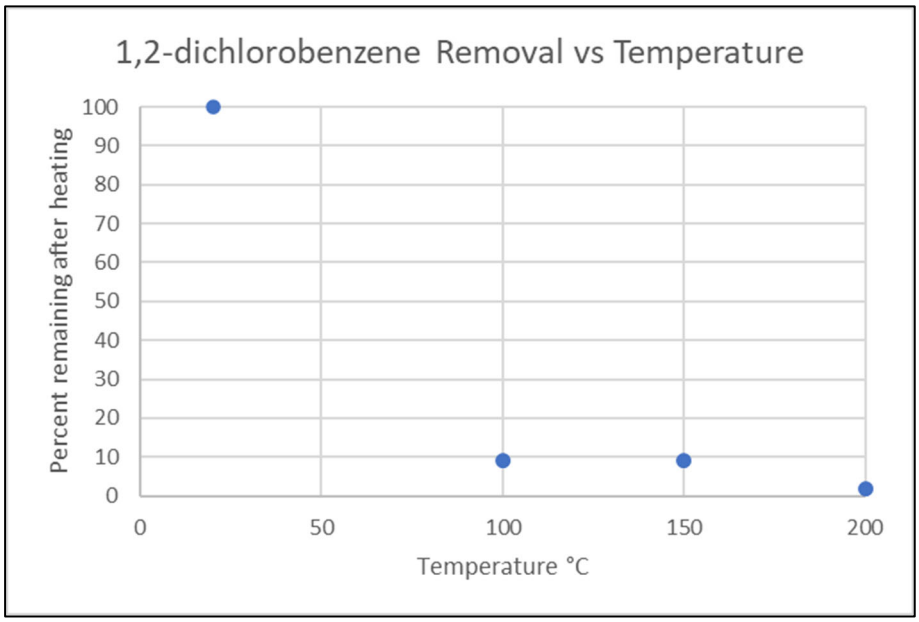

Figure 23: 1,2-dichlorobenzene Removal vs Temperature

5.4.7. Semi-volatile Organic Compounds

A small number of SVOCs were identified in the soil subsamples at concentrations near or above the soil screening level for protection of groundwater. Polynuclear aromatic hydrocarbons (PAHs) and bis(2-ethylhexyl)phthalate were present at low concentrations below soil screening levels. Phenol was identified in one subsample above the soil screening levels for protection of groundwater.

Polycyclic Aromatic Hydrocarbons

PAHs that were identified at low concentrations in the soil subsamples included anthracene, acenaphthene, acenaphthylene, benzo(b)fluoranthene, chrysene, fluorene, phenanthrene, pyrene, naphthalene, 1-methylnaphthalene and 2-methylnaphthalene. Most of these compounds were identified at concentrations close to detection limits. Heating the soil to 100°C with complete moisture removal reduced the concentrations to below detection limits. Exceptions to this include fluoranthene, naphthalene, phenanthrene, 1-methylnaphthalene and 2-methylnaphthalene. However, the concentrations of these compounds were reduced to below the soil screening levels for protection of groundwater when the soil was heated to 100°C with complete soil moisture removal.

Naphthalene

The BH-12a sample had an initial naphthalene concentration of 12.9 mg/kg and the BH-30a sample had an initial naphthalene concentration of 15.4 mg/kg. Very low residual concentrations of naphthalene were detected in the samples heated to 150°C and 200°C in the range of 0.018 to 0.129 mg/kg. The results were well below the screening level of 5 mg/kg. A graph of naphthalene removal as a function of temperature is shown in **Figure 24.**

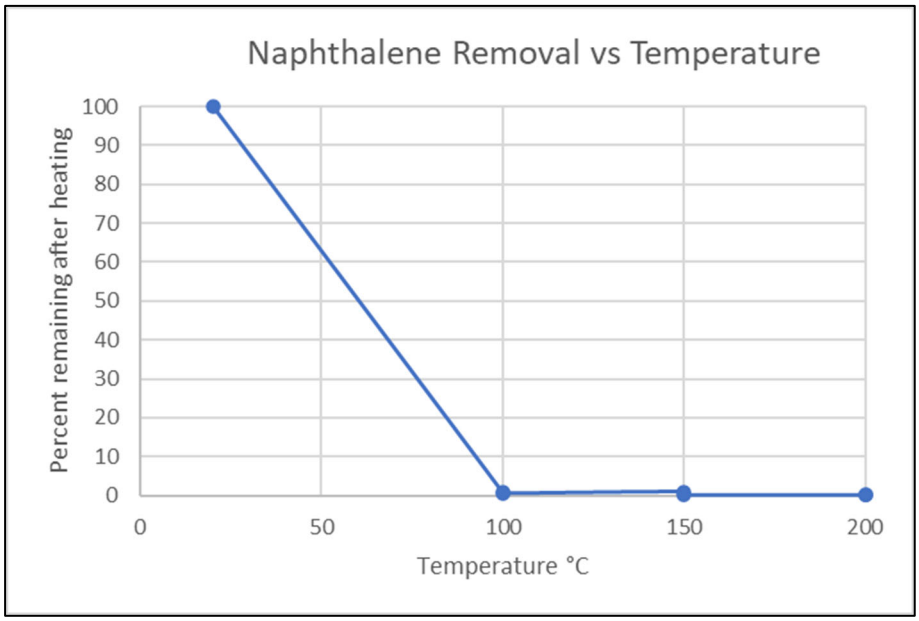

Figure 24: Naphthalene Removal vs Temperature

1-methylnaphthalene

The BH12a sample had an initial 1-methylnaphthalene concentration of 4.1 mg/kg and the BH30a

sample had an initial 1-methylnaphthalene concentration of 11 mg/kg. The 1-methylnaphthalene concentrations were reduced to 0.0584 and 0.12 mg/kg respectively at a temperature of 100°C with complete moisture removal. Concentrations of 1-methylnaphthalene in the samples heated to 150°C and 200°C were near or at detection limits. A graph of 1-methylnaphthalene removal as a function of temperature is shown in **Figure 25.**

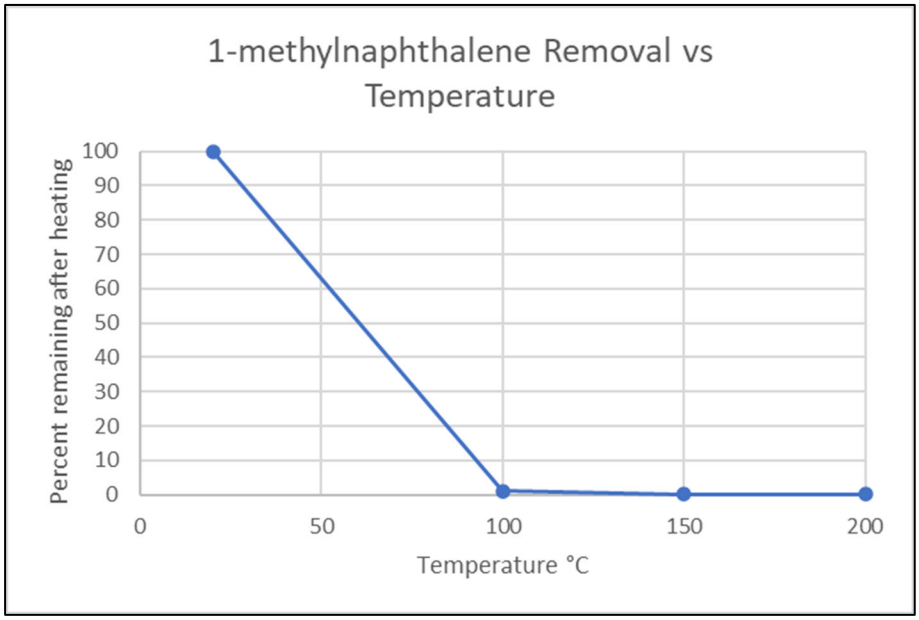

Figure 25: 1-methylnaphthalene Removal vs Temperature

<u>2-methylnaphthalene</u>

The BH12a sample had an initial 2-methylnaphthalene concentration of 4.28 mg/kg and the BH30a sample had an initial 2-methylnaphthalene concentration of 21.4 mg/kg. The 2-methylnaphthalene concentrations were reduced to 0.111 and 0.261 mg/kg respectively at a temperature of 100°C with complete moisture removal. Concentrations of 2-methylnaphthalene in the samples heated to 150°C and 200°C were near or at detection limits. A graph of 2-methylnaphthalene removal as a function of temperature is shown in **Figure 26.**

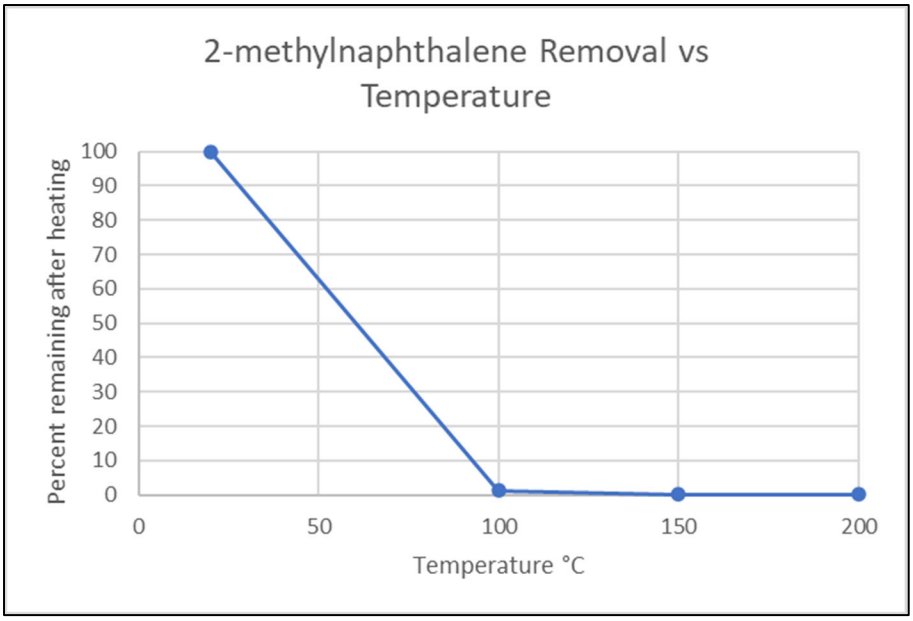

Figure 26: 2-methylnaphthalene Removal vs Temperature

Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate was detected at concentrations near the 13 mg/kg soil screening levels for protection of groundwater. The BH12a control subsample had an initial bis(2-ethylhexyl) phthalate concentration of 10.2 mg/kg and the BH30a control subsample had an initial concentration of 6.43 mg/kg. The bis(2-ethylhexyl) phthalate concentrations were reduced to 6.18 and to less than a detection limit of 1.68 mg/kg in the subsamples, respectively, at a temperature of 100°C with complete moisture removal. The concentrations were further reduced to 2.17 mg/kg or less at the 150°C to 200°C temperature range. This compound has a very low volatility and is strongly adsorbed to soils, making it an unlikely candidate for mobility. A graph of bis(2-ethylhexyl) phthalate removal as a function of temperature is shown in **Figure 27.**

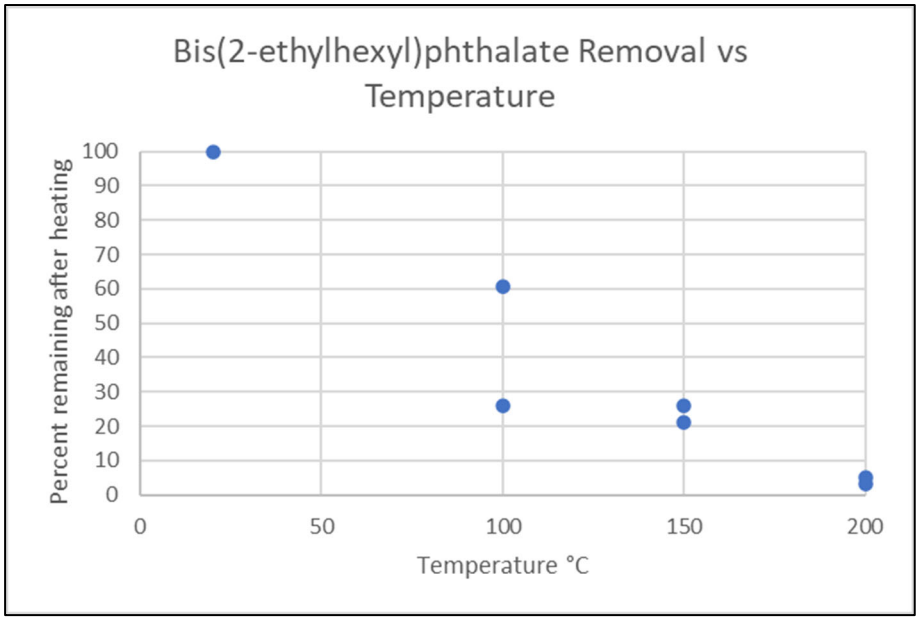

Figure 27: Bis(2-ethylhexyl)phthalate Removal vs Temperature

Phenol

Phenol was detected in the BH12a control subsample at an initial concentration of 61.8 mg/kg and was below detection limits in the BH30a control subsample. The phenol concentration was reduced to 2.42 mg/kg at a temperature of 100°C with complete moisture removal. This is below the 37 mg/kg soil screening level for protection of groundwater. The concentration was further reduced to 1.67 mg/kg when heated to 150°C. The final concentration at 200°C was below detection limits of 0.334 mg/kg. A graph of phenol removal as a function of temperature is shown in **Figure 28.**

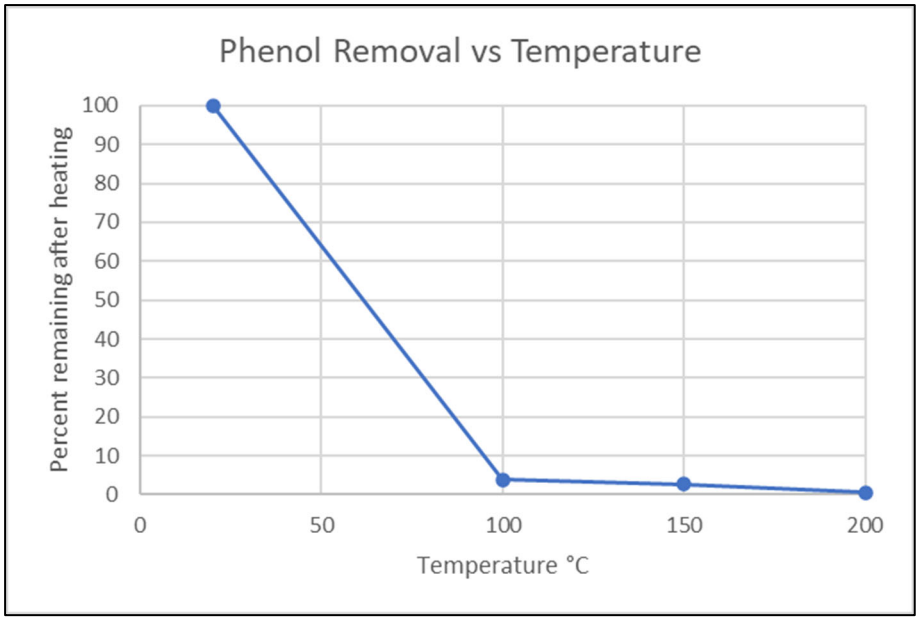

Figure 28: Phenol Removal vs Temperature

5.4.8. Polychlorinated Biphenyls

The BH12a and BH30a control subsamples were analyzed for the different Arochlor ranges of polychlorinated biphenyls (PCBs). The results showed that both subsamples contained PCBs in the Arochlor ranges of 1242 and 1254. The 1254 range for the BH12a control subsample shifted into the 1260 range during the last stage of testing. Therefore, the PCB analyses for the 1254 and 1260 values are summed for the analysis.

PCB 1242

The BH12a control subsample had an initial PCB 1242 concentration of 0.994 mg/kg and the BH30a control subsample had an initial concentration of 3.41 mg/kg. The PCB 1242 was reduced into the range of 0.344 to 0.365 at a temperature of 100°C with complete moisture removal. The concentrations achieved by heating to 150°C and 200°C ranged from 0.0436 to 0.379 mg/kg. PCBs have very low volatility and are strongly adsorbed to soils, making them an unlikely candidate for mobility.

PCB 1254/1260

The BH12a control subsample had an initial PCB 1254/1260 concentration of 0.501 mg/kg and the BH30a control subsample had an initial concentration of 0.93 mg/kg. The PCB 1254/1260 concentrations were reduced into the range of 0.118 to 0.145 mg/kg at a temperature of 100°C with complete moisture removal. This is less than two times the screening level for PCB 1254 and less than the screening level for PCB 1260. The concentrations achieved by heating to 150°C and 200°C ranged from 0.0603 to 0.155 mg/kg. PCBs have very low volatility and are strongly adsorbed to soils, making them an unlikely candidate for mobility. A graph of total PCB removal as a function of temperature is shown in **Figure 29.**

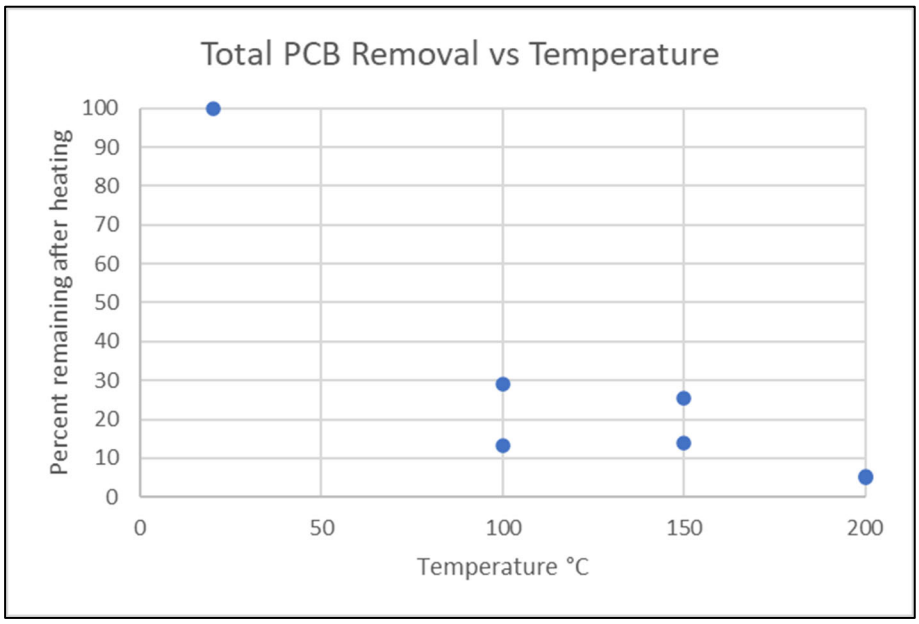

Figure 29: Total PCB Removal vs Temperature

5.4.9. Breakdown of Soil Organics by Heat

When soil is heated, the natural organic matter in the soil will begin to break down into smaller oxygenated compounds such as carboxylic acids, ketones, and alcohols. The breakdown occurs slowly at temperatures around 100°C and occurs more rapidly as temperature increases. As temperatures move beyond 200°C, the breakdown begins to occur exponentially faster as a function of temperature. Common products observed in analytical data from the breakdown of soil organic matter include acetone, methyl ethyl ketone (MEK), MIBK, 2-hexanone and benzoic acid. These compounds were identified in the soil subsamples during testing at highly variable concentrations throughout the test as a result of soil breakdown. These compounds are highly biodegradable and do not tend to persist long in the environment after they are produced.

6.0 QUALITY CONTROL COMMENTS

Control subsamples were collected prior to running testing and a method control sample was collected during sample preparation to understand potential losses due to volatilization from handling during the testing. The relative difference in the concentrations for constituents identified above detection limits in the BH12a control and method control subsamples averaged 17.8 percent for all constituents with some concentrations being higher and some being lower in the method control versus the control. The relative difference in the concentrations for constituents identified above detection limits in the BH30a subsamples averaged 7.6 percent for all constituents with some concentrations being higher and some being lower in the method control versus the control. Compounds having a relative difference greater than 30 percent are addressed below.

- The BH12a control subsample had a TCE concentration of 0.224 mg/kg in the control sample and the TCE concentration was below the detection limit of 0.0869 mg/kg in the method control subsample. This is a relative difference of 88 percent. This at first suggests that high volatilization losses may have occurred by methodology during testing. However, the control subsamples from BH30a only experienced a 11.4 percent relative difference between the control subsample and method control subsample for TCE analyses. Therefore, the relative difference in TCE for the BH12a control subsamples may be associated with soil variability.

- The BH12a control subsample had a PCB 1242 concentration of 0.994 and the PCB 1242 concentration in the method control subsample was 1.39 mg/kg. This is a relative difference of 33 percent. The concentration of PCB 1242 was therefore higher in the method control. This could be due to variability in the sample. It is not uncommon to see this higher variability for heavier molecular weight compounds.

Laboratory quality control and quality assurance data are included in the laboratory report.

7.0 CONCLUSIONS AND RECOMMENDATIONS

- TCH is the most suitable technology for ISTR for soils tested from the Pasco Landfill NPL Site due to the very low initial moisture content of the soil.

- Heating the soil to 100°C can remove 93 to 97 percent of the total constituents from the soil with removal efficiencies around 99 percent for the chlorinated VOCs of greatest concern if the soil moisture is completely removed from the soil.

- Heating to a temperature greater than 100°C is recommended to ensure that all the soil moisture is removed from the soil within the treatment volume.

- Heating below a temperature of 150°C is recommended since significant improvement in removal of COCs was not observed at higher temperatures and the risk of mobilizing heavier compounds is minimized.

- A target temperature in the range of 105°C to 120°C is recommended.

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix D
RTO Permit Modification

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Eastern Region Office
4601 North Monroe St., Spokane, WA 99205-1295 • 509-329-3400

September 19, 2023

Patrick Brice
PBS Engineering and Environmental, Inc.
400 Bradley Blvd. No. 106
Richland, WA 99352

Re: Industrial Waste Area Generators Group III (IWAG)
Pasco Sanitary Landfill NPL Site
Approval Order No. 23AQ-E033
AQPID No. A0210183

Dear Mark Leece:

The Department of Ecology's Air Quality Program (Ecology) approves the in-situ thermal remediation project at Paco Sanitary Landfill NPL Site located at 1901 Dietrich Rd, Pasco, Washington in Franklin County.

Ecology's approval is based on the Notice of Construction application and supplemental information submitted on April 6, 2023. The 15-day web notification required per Washington Administrative Code (WAC) 173-400-171, was completed. No requests for a 30-day comment period were received.

Enclosed is Approval Order No. 23AQ-E023 for Pasco Sanitary Landfill NPL Site.

Thank you for your patience while we processed your application. If you have any questions, please contact me at jenny.filipy@ecy.wa.gov or 509-405-2487.

Sincerely,

Jenny Filipy

Jenny Filipy, P.E.
Commercial/Industrial Unit
Regional Air Quality Program

JF:sg

Enclosures: Approval Order No. 23AQ-E033

Certified Mail: 7019 0140 0000 6498 1875

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

Notice of Construction Approval Order

In the matter of approving a new contaminant source for PASCO LANDFILL ZONE A THERMAL REMEDIATION under agreed Order No. DE 9240	)))	Approval Order No. 23AQ-E033 AQPID NO. A0210183

Project Summary

Industrial Waste Area Generators Group III - Pasco Sanitary Landfill NPL Site, herein referred to as the Permittee, is an existing cleanup site located 1901 Dietrich Rd, Pasco, Washington, in Franklin County.

The Permittee is classified as a Synthetic Minor Source for Volatile Organic Compounds.

Equipment evaluated for this determination of approval consists of the following:

1- Anguil Environmental Systems, Inc. (Anguil) 2,500 SCFM 2-Canister Regenerative Thermal Oxidizer (RTO): Anguil Model 25 RTO.

Legal Authority

The emissions from the proposed modification have been reviewed under the legal authority of RCW 70A.15.2210 and the applicable rules and regulations adopted thereunder. The proposed modification, if operated as specified, will be in accordance with applicable rules and regulations, as set forth in Chapters 173-400 WAC and 173-460 WAC and the operation thereof, at the location proposed, will not result in ambient air quality standards being exceeded.

This Notice of Construction (NOC) Approval Order rescinds and replaces NOC Approval Order Nos. 16AQ-E031 and 14AQ-E571. NOC Approval Order Nos. 16AQ-E031 and 14AQ-E571 are no longer in effect.

Therefore, it is ordered that the project as described in the NOC application and more specifically detailed in plans, specifications, and other information submitted to the Washington State Department of Ecology (Ecology) is approved for construction and operation, provided the following conditions are satisfied:

Approval Conditions

1. Regenerative Thermal Oxidizer Operational Limitations

a. The RTO must be equipped with an interlock with the recovered vapor system blowers, such that no recovered vapor is introduced to the RTO unless the combustion chamber is equal to or greater than 1600 degrees Fahrenheit.

b. The maximum volume of soil vapor routed to the RTO must not exceed 1000 standard cubic feet per minute.

c. There must be no condensate, removed from the recovered vapor, that is returned to be treated by the RTO.

2. Regenerative Thermal Oxidizer Emission Limitations

a. The opacity of the RTO exhaust must not exceed 5 percent, measured in accordance with Condition 4.c.i.

b. Hydrochloric Acid (HCl) emissions in the exhaust of the RTO must not exceed 10 tons in any 12-month period. HAP emissions in the exhaust of the RTO must not exceed 25 tons in any 12-month period. The composition of the recovered vapor must be determined in accordance with Condition 3.c.

c. Hydrofluoric Acid (HF) emissions in the exhaust of the RTO must not exceed 0.12 pounds per hour, measured in accordance with Condition 4.c.ii.

d. The VOC destruction efficiency must be no lower than 98 percent or must result in an exhaust concentration no greater than 20 ppmv as methane whichever is less stringent, measured in accordance with Condition 4.c.iii.

e. The RTO destruction efficiency for the following compounds must be measured in accordance with Condition 4.d.vii and must be 98 percent for the exhaust concentrations or must be reduced to the compound practical quantitation limit (PQL) or 3 ppmv (as the compound), whichever is higher:

i. 1,1,1-Trichloroethane

ii. 1,2,4-Trimethylbenzene

iii. 2-Butanone (MEK)

iv. 4-Methyl-2-Pentanone (MIBK)

v. Ethanol

vi. Ethylbenzene

vii. Isopropylbenzene

viii. Total Xylenes (o,m,p)

ix. Methylene Chloride (dichloromethane)

x. N-Propylbenzene

xi. Naphthalene

xii. Toluene

xiii. Tetrachloroethene

xiv. Trichloroethene

3. Monitoring Requirements

a. The combustion chamber of the RTO must be equipped with properly maintained and operated continuous-recording temperature measurement instruments and data

loggers and the temperatures reduced to 15-minute averages (quarter hour block averages) for demonstrating compliance with Condition 1.a.

b. The soil vapor flow rate to the RTO must be monitored continuously with properly operated and maintained flow measurement instrumentation and continuous data loggers.

c. Once every two weeks, the recovered vapor from Zone A subsurface must be sampled and analyzed in accordance with Condition 4.d.vii. The flows must be determined at locations and using methodology approved by Ecology. The analytical results must be summed to determine the total flows of 8260 target organic species introduced to the RTO. The total VOC (TVOC=Targets plus TICs) introduced to the RTO must be calculated as 1.67 times the summed mass of the 26 target analytes identified in the Anguil RTO proposal. The HCl emission rate must be calculated as 0.059 times the TVOC. The Total HAPs emission rate must be calculated as 0.734 times TVOC times (1-0.98) plus the HCl emission rate. The data collected every two weeks must be reduced to two 12-month rolling totals of calculated HCl emissions and calculated HAP emissions. The 8260 results, the recovered vapor flows, treatment phase, and depths from which the flows are extracted, and the calculated rolling 12-month averages must be reported to Ecology once per month. The permittee may request changes to the frequency of the 8260 data collection, or changes to other ratios (TICs/TVOC, CI/TVOC, HAPs/TVOC) in this condition after collection of sufficient data to make that showing to Ecology in writing.

4. Testing Requirements

a. During In-situ thermal remediation (ISTR) performance testing of the RTO must be conducted during each operating phase and target the period of highest expected mass recovery in each phase (approximately 60 to 80 days after phase startup) to determine compliance with emission and destruction efficiency limits in Condition 2. Sampling must be conducted simultaneously at the inlet and the outlet of the RTO to determine destruction efficiency. Performance testing must be conducted for HCl, and the target compounds listed in Condition 2.e.

b. Performance testing must be performed at such times and frequencies specified in a condition of approval in this Order and at other times in accordance with WAC 173-400-105(4).

c. Performance testing must utilize the following test methods unless an alternative method is requested by the permittee and approved by Ecology in writing:

i. Visual determination of the opacity emissions from stationary sources per Title 40 Code of Federal Regulations, Part 60, Appendix A, Method 9. (Referenced as Method 9).

ii. HCl per 40 CFR 60, Appendix A, Method 26 or 26A.

iii. Speciated VOC per EPA Method 8260. All method target analytes measured above their PQL must be included in the test report.

d. Testing Logistics - The permittee must provide testable emission points, sampling ports, safe access to sampling points and ports, and utilities for sampling and testing.

e. Number of Test Runs - Performance or compliance testing of each piece of pollution control equipment must consist of three separate runs of at least 60-minutes each.

f. Throughput during Testing - During testing, the process must be operated at a minimum of 90 percent of rated capacity for equipment with less than 12-months operating history, or 90 to 110 percent of the maximum process rate recorded during the preceding 12-month period for equipment operated for 12-months or more. Operation of the process during testing outside of the specified range may be proposed but may result in an operational restriction that will be amended to this Approval Order. The Pasco Landfill RTO testing may use the recovered vapor flow to the RTO (SCFM) as the throughput to satisfy this requirement.

g. Submittal of Performance Test Plan - A written test protocol that includes a description of the equipment to be tested, the process and control device operating information to be collected during the test, and the sampling and analytical method(s) proposed, must be submitted to Ecology at least 30 calendar days prior to the start of any performance test. The test plan must include a data quality assurance and data validation plan to ensure that all sampling and analytical procedures produce data that satisfies data quality objectives. One test plan may be submitted for both of the ISTR performance testing events.

h. Notification of Inability to Conduct Performance Test - If the permittee is unable to conduct any performance test as scheduled, Ecology must be notified at least 24-hours before the test at the address under "Submittals", Condition 6, or via telephone at (509) 329-3400.

i. Plant Operator during Testing - The plant process equipment must be operated and controlled by normal plant operators during the period when the performance testers are on-site to conduct testing and during actual testing.

j. Performance or Compliance Testing Results - The results of all initial performance testing and all other periodic performance testing must be sent to the address at Approval Condition 6. One copy of the completed test report must be submitted no later than 60-days after the last day of the testing.

5. Operation and Maintenance Manuals (O&M)

A site-specific O&M manual for the Regenerative Thermal Oxidizer (RTO) must be prepared and followed. Manufacturers' operating instructions and design specifications for the RTO and recovered vapor systems may be included in the manual. This O&M manual may be the existing manual currently in place for the RTO, modified as needed for ISTR operations.

The O&M manual(s) must be updated to reflect any modifications of the equipment or operating or maintenance or monitoring procedures. Emissions that result from failure to follow the operating procedures contained in the O&M manual or manufacturer's

operating instructions may be considered proof that the equipment was not properly installed, operated, and/or maintained. The RTO O&M manual shall at a minimum include:

a. Normal equipment operating parameters and design specifications.

b. Maintenance schedules.

c. Monitoring procedures and schedules.

d. Actions to be taken in the event of an RTO temperature excursion below 1600 degrees Fahrenheit.

e. Actions to be taken in the event of a recovered vapor system shut-down due to a 40 percent LEL exceedance.

f. Details of the pair of in-series carbon canisters to be used in the event of an RTO and recovered vapor system shut-down. Details shall include the procedures to be followed including timely reporting of the upset and purge, and replacement of the first canister after each purging event.

g. Actions to be taken in the event of visible emission observations greater than 5% opacity.

6. Submittals

All notifications, reports, and other submittals shall be sent to:

Washington State Department of Ecology
Air Quality Program
4601 N. Monroe Street
Spokane, WA 99205-1295

OR AS DIRECTED.

7. Reporting

a. Any purge of recovered vapor through the carbon canisters must be reported to Ecology within 24 hours of its occurrence and must be listed in the annual summary of site activities required in Condition 7.c.

b. Written notification that the O&M manual has been developed and completed must be submitted to Ecology at the address in Condition 6 above within 90 days of the last day of testing during the initial performance test required in Condition 4.a.

The following information will be submitted to the AQP at the address in Condition 6 above, by January 31 of each calendar year.

c. Annual summary of rolling 12-month air contaminant emissions, annual total of RTO fuel consumed, annual total volume of soil vapor delivered to the RTO inlet, and the rolling 12-month mass of halogenated and other volatile and semi-volatile organic compounds (SVOCs estimated) collected by the SVE system and delivered to the RTO

for treatment. List of any use of the carbon canisters for purging with the reason for the shutdown, the date, and the duration.

8. General Conditions

a. **Activities Inconsistent with this Order** - Any activity undertaken by the Permittee, or others, in a manner that is inconsistent with the data and specifications submitted as part of the NOC application or this NOC Approval Order, must be subject to Ecology enforcement under applicable regulations.

b. **Availability of Order** - Legible copies of this NOC Approval Order and any O&M manual(s) must be available to employees in direct operation of the equipment described in the NOC application and must be available for review upon request by Ecology.

c. **Compliance Assurance Access** - Access to the source by representatives of Ecology or the United States Environmental Protection Agency (EPA) must be permitted upon request. Failure to allow access is grounds for enforcement action under the federal Clean Air Act or the Washington State Clean Air Act and may result in revocation of this NOC Approval Order.

d. **Discontinuing Construction or Operation** – Approval to construct or modify a stationary source becomes invalid if construction is not commenced within eighteen months after receipt of the approval, or if construction is discontinued for a period of eighteen months or more. The permitting authority may extend the eighteen-month period upon a satisfactory showing by the permittee that an extension is justified.

e. **Equipment Operation** - Operation of the facility must be conducted in compliance with all data and specifications submitted as part of the NOC application and in accordance with O&M manuals, unless otherwise approved in writing by Ecology.

f. **Violation Duration** - If the Permittee violates an approval condition in this NOC Approval Order, testing, recordkeeping, monitoring, or credible evidence will be used to establish the starting date of the violation. The violation will be presumed to continue until testing, recordkeeping, monitoring, or other credible evidence indicates compliance. A violation of an approval condition includes, but is not limited to, failure of air pollution control equipment, failure of other equipment resulting in increased emissions, or a failed source test indicating an exceedance of an emission limit.

g. **Obligations Under Other Laws or Regulations** - Nothing in this NOC Approval Order must be construed so as to relieve the Permittee of its obligations under any state, local, or federal laws or regulations.

h. **Maintaining Compliance** - It must not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the operations in order to maintain compliance with the conditions of this NOC Approval Order.

i. **Visible Emissions** - No visible emissions from the source are allowed beyond the property line, as determined by 40 C.F.R. Part 60, Appendix A, Test Method 22.

j. **Changes in Operations** - Any changes in operation, discontinued operation or inadequate maintenance plans or restart plans (see "Reporting" requirements), may require a new or amended NOC Approval Order.

Authorization may be modified, suspended, or revoked in whole or part for cause, including, but not limited to, the following:

- Violation of any terms or conditions of this authorization.
- Obtaining this authorization by misrepresentation or failure to disclose full all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization or application of any provision to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this authorization, must not be affected thereby.

Your Right to Appeal

You have a right to appeal this NOC Approval Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this NOC Approval Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this NOC Approval Order:

- File your appeal and a copy of this NOC Approval Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this NOC Approval Order on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information

Street Addresses:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Pollution Control Hearings Board
1111 Israel Rd SW
STE 301
Tumwater, WA 98501

Mailing Addresses:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

E-mail Address:

Department of Ecology
Not currently available (see WAC 371-08)

Pollution Control Hearings Board
Pchb-shbappeals@eluho.wa.gov

Americans with Disabilities Act Information

Accommodation Requests

To request ADA accommodation including materials in a format for the visually impaired, call Ecology at 360-407-7668 or visit http://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

Dated on this 19th Day of September 2023.

Prepared by:

Jenny Filipy, PE
Air Quality Program
Department of Ecology
State of Washington

Approved by:

Karin Baldwin, Section Manager
Air Quality Program
Department of Ecology
State of Washington

Pollution Control Hearings Board
1111 Israel Rd SW
STE 301
Tumwater, WA 98501

Mailing Addresses:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Pollution Control Hearings Board
PO Box 40903
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E-mail Address:

Department of Ecology
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Dated on this 19th Day of September 2023.

Prepared by:

Jenny Filipy, PE
Air Quality Program
Department of Ecology
State of Washington

JENNY MAY FILIPY
STATE OF WASHINGTON
54393
REGISTERED
PROFESSIONAL ENGINEER

Approved by:

Karin Baldwin, Section Manager
Air Quality Program
Department of Ecology
State of Washington

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix E
Design Package

THERMAL CONDUCTION HEATING 90% DESIGN PACKAGE

90% DESIGN

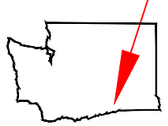
Not Approved for Construction

PASCO ZONE A
PASCO, WA

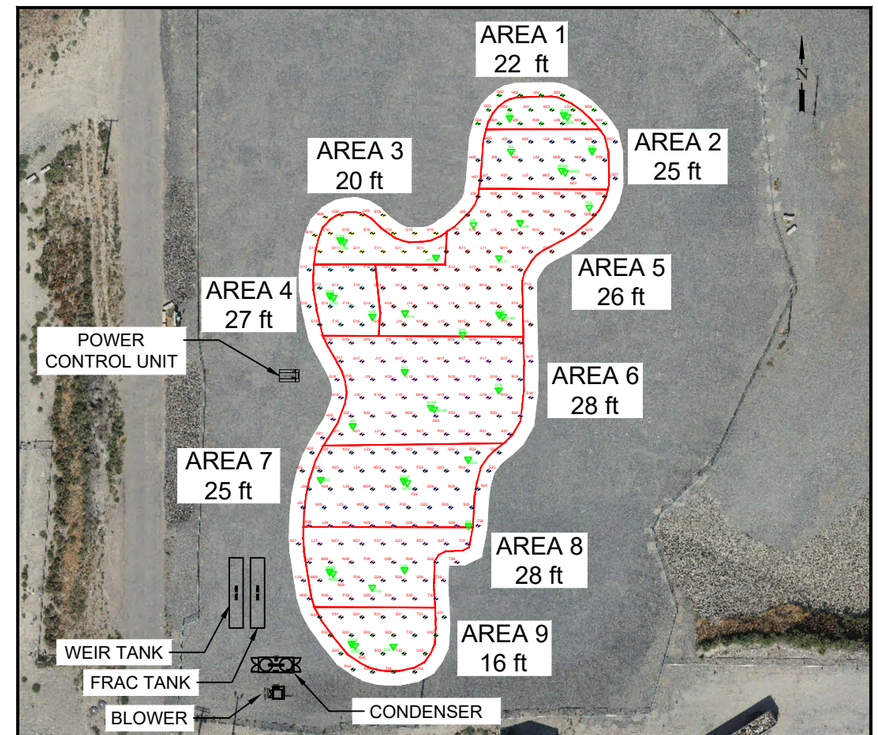
JULY 2023

Prepared by:

TRS
Accelerating Value



SITE LOCATION MAP



SITE PLAN

SHEET INDEX

SHEET NUMBER	TITLE AND DESCRIPTION
Y-1	SITE PLAN
Y-2	SURFACE CAP AND VAPOR RECOVERY
Y-3	TREATMENT DEPTHS
Y-4	POWER DROP LAYOUT
Y-5	VAPOR RECOVERY PIPING PLAN
M-1	AREA 1 AND TRANSITION ZONE FOR AREA 9 HEATER DETAIL
M-2	AREA 1 DEEP VAPOR RECOVERY HEATER DETAIL
M-3	AREA 2 AND 7 HEATER DETAIL
M-4	AREA 2 AND 7 DEEP VAPOR RECOVERY HEATER DETAIL
M-5	AREA 3 HEATER DETAIL
M-6	AREA 3 DEEP VAPOR RECOVERY HEATER DETAIL
M-7	AREA 4 AND TRANSITION ZONE FOR AREA 7 HEATER DETAIL
M-8	AREA 4 DEEP VAPOR RECOVERY HEATER DETAIL
M-9	TRANSITION ZONES FOR AREAS 1 AND 3 HEATER DETAIL
M-10	AREA 5 HEATER DETAIL
M-11	AREA 5 DEEP VAPOR RECOVERY HEATER DETAIL
M-12	AREA 6 AND 8 HEATER DETAIL
M-13	AREA 6 AND 8 DEEP VAPOR RECOVERY HEATER DETAIL
M-14	AREA 9 HEATER DETAIL
M-15	AREA 9 DEEP VAPOR RECOVERY HEATER DETAIL
M-16	TRANSITION ZONE FOR AREA 9 HEATER DETAIL
M-17	AREA 1 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-18	AREA 1 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-19	AREA 2 AND 7 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-20	AREA 2 AND 7 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-21	AREA 3 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-22	AREA 3 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-23	AREA 4 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-24	AREA 4 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

THERMAL CONDUCTION HEATING 90% DESIGN PACKAGE

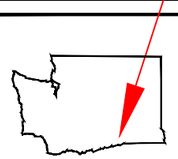
90% DESIGN

Not Approved for Construction

PASCO ZONE A
PASCO, WA

Prepared by:

TRS
Accelerating Value

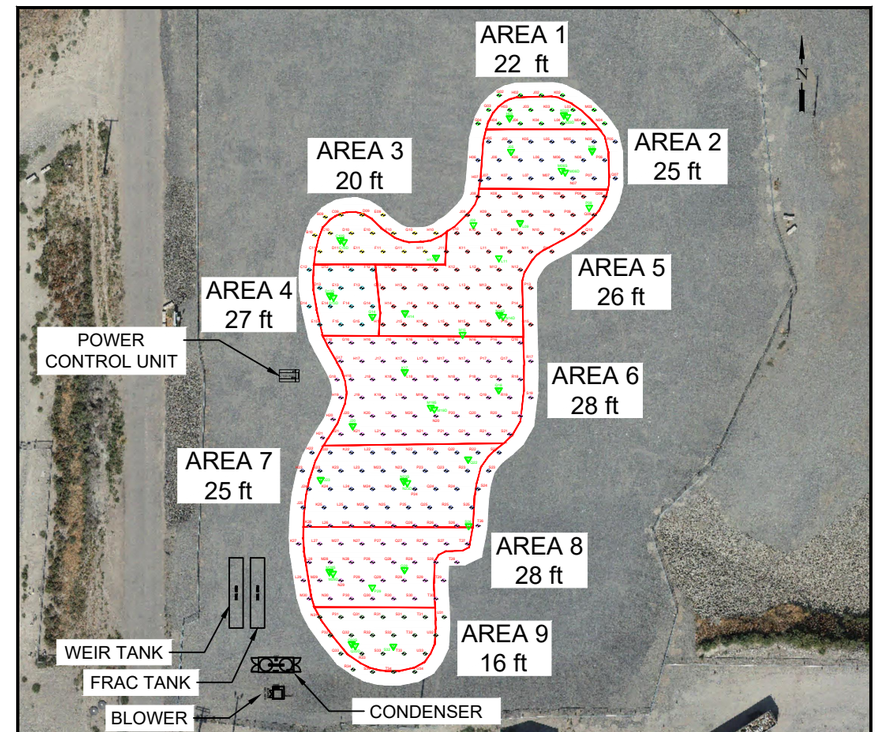


SITE LOCATION MAP

JULY 2023

SHEET INDEX

SHEET NUMBER	TITLE AND DESCRIPTION
M-25	AREA 5 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-26	AREA 5 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-27	AREA 6 AND 8 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-28	AREA 6 AND 8 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-29	AREA 9 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL
M-30	AREA 9 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL
M-31	INTERIM COVER CONCEPTUAL DESIGN
P-1	LEGEND PROCESS AND INSTRUMENTATION DIAGRAM
P-2	LEGEND PROCESS AND INSTRUMENTATION DIAGRAM
P-3	PROCESS FLOW DIAGRAM
P-4	FIELD PROCESS AND INSTRUMENTATION DIAGRAM
P-5	CONDENSER PROCESS AND INSTRUMENTATION DIAGRAM
P-6	COOLING TOWER PROCESS AND INSTRUMENTATION DIAGRAM
P-7	VAPOR TREATMENT PROCESS AND INSTRUMENTATION DIAGRAM
P-8	WEIR TANK PROCESS AND INSTRUMENTATION DIAGRAM
P-9	WATER TREATMENT PROCESS AND INSTRUMENTATION DIAGRAM
P-10	HOLDING TANK PROCESS AND INSTRUMENTATION DIAGRAM
E-1	ELECTRICAL ONE-LINE DIAGRAM



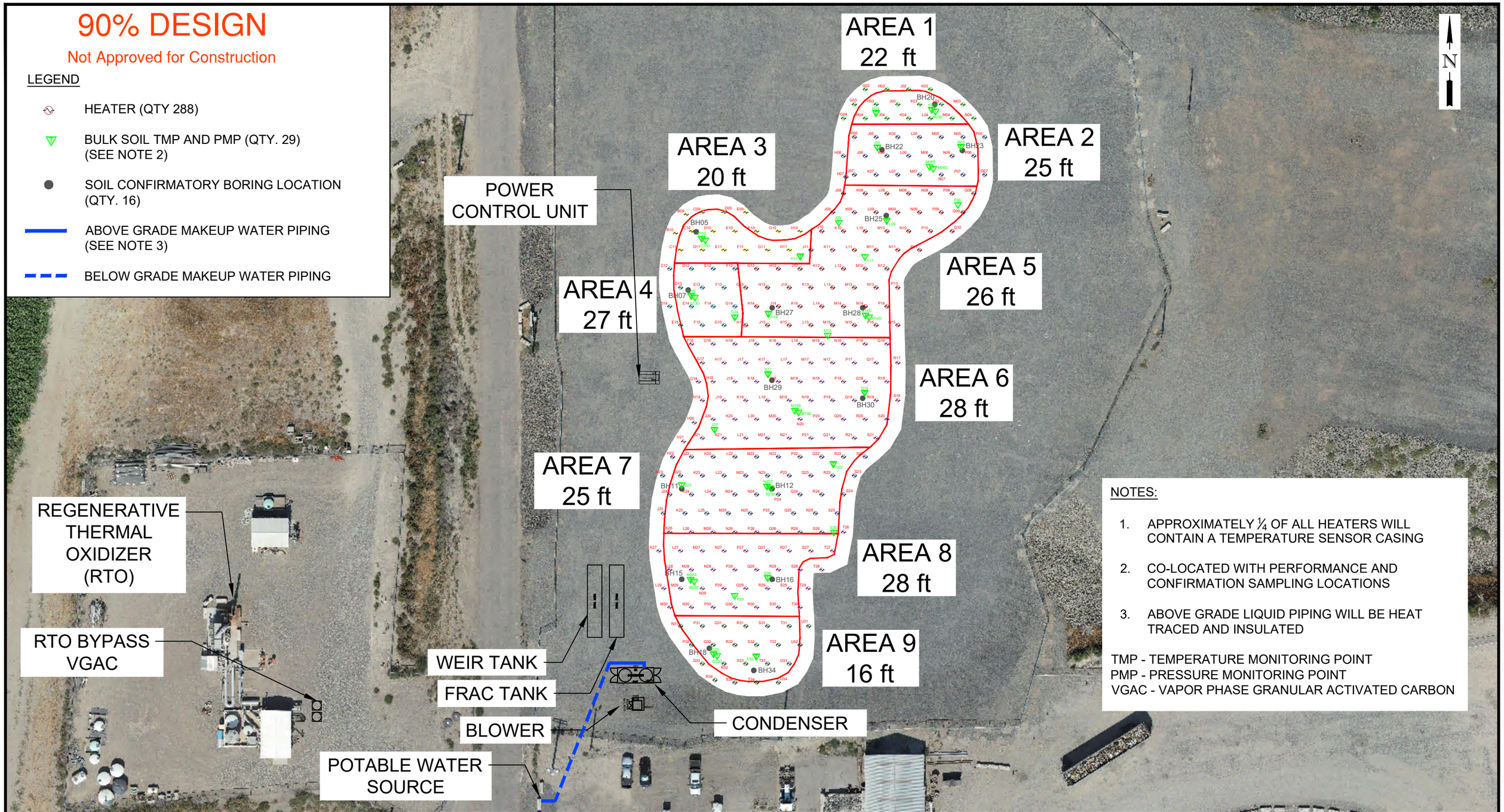
SITE PLAN

90% DESIGN

Not Approved for Construction

LEGEND

- HEATER (QTY 288)
- BULK SOIL TMP AND PMP (QTY. 29) (SEE NOTE 2)
- SOIL CONFIRMATORY BORING LOCATION (QTY. 16)
- ABOVE GRADE MAKEUP WATER PIPING (SEE NOTE 3)
- BELOW GRADE MAKEUP WATER PIPING



NOTES:

1. APPROXIMATELY ¼ OF ALL HEATERS WILL CONTAIN A TEMPERATURE SENSOR CASING
2. CO-LOCATED WITH PERFORMANCE AND CONFIRMATION SAMPLING LOCATIONS
3. ABOVE GRADE LIQUID PIPING WILL BE HEAT TRACED AND INSULATED

TMP - TEMPERATURE MONITORING POINT
PMP - PRESSURE MONITORING POINT
VGAC - VAPOR PHASE GRANULAR ACTIVATED CARBON

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0 25 50 100
SCALE IN FEET

TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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DESIGNED BY	C. CROWNOVER
DRAWN BY	A. PEABODY
CHECKED BY	PENDING APPROVAL
PROJECT MANAGER	S. AVRITT
QSAT REVIEW	QSAT PERSONNEL

SITE	PASCO ZONE A
LOCATION	PASCO, WA
CLIENT	IWAG

SITE PLAN

APPROVED FOR CONSTRUCTION
BY
DATE

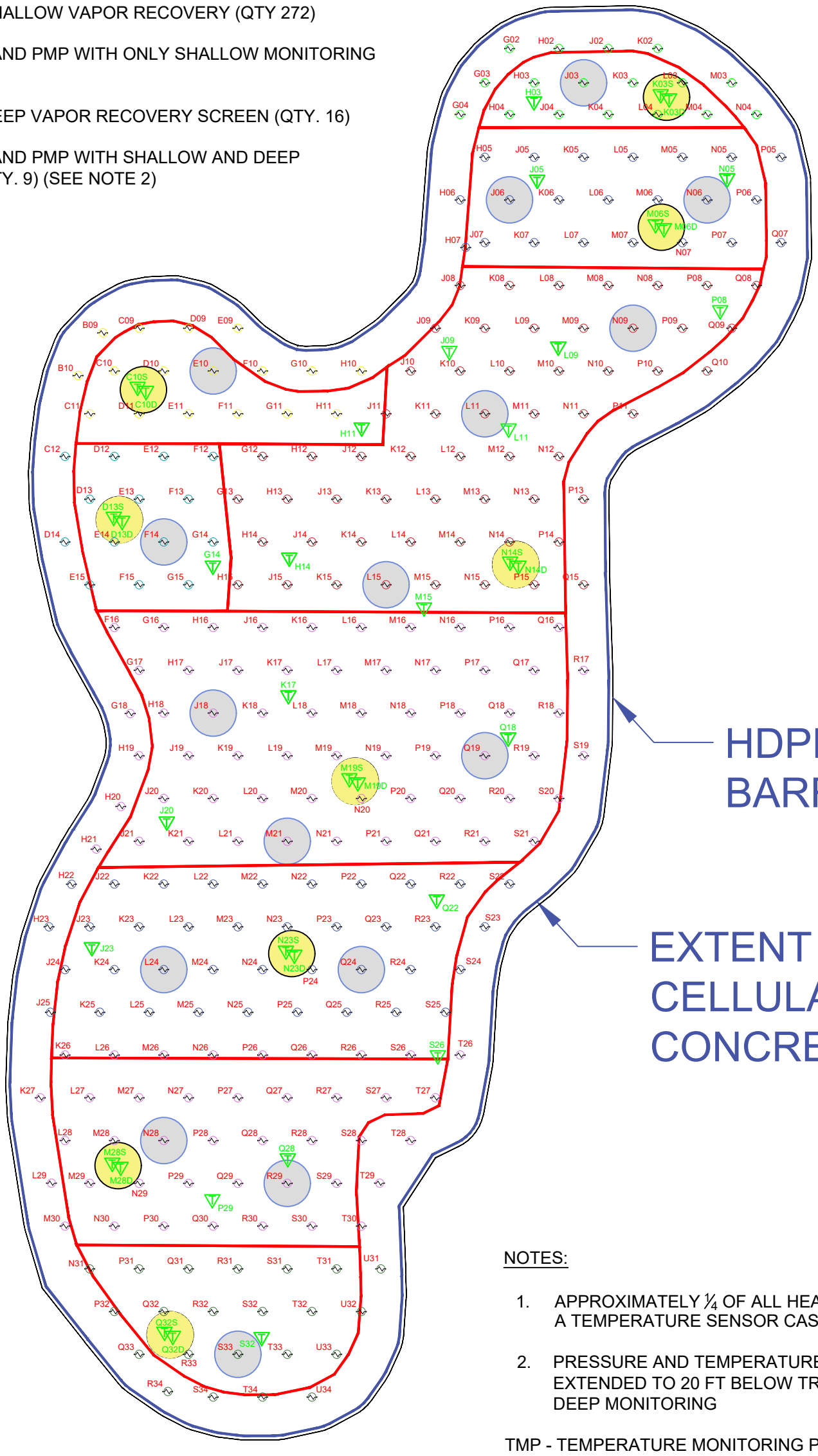
DATE 2023.MAR.08
PROJECT WA.1707
SHEET Y-1

90% DESIGN

Not Approved for Construction

LEGEND

- HEATER WITH SHALLOW VAPOR RECOVERY (QTY 272)
- BULK SOIL TMP AND PMP WITH ONLY SHALLOW MONITORING (QTY. 20)
- HEATER WITH DEEP VAPOR RECOVERY SCREEN (QTY. 16)
- BULK SOIL TMP AND PMP WITH SHALLOW AND DEEP MONITORING (QTY. 9) (SEE NOTE 2)



NOTES:

1. APPROXIMATELY ¼ OF ALL HEATERS WILL CONTAIN A TEMPERATURE SENSOR CASING
2. PRESSURE AND TEMPERATURE MONITORING POINT EXTENDED TO 20 FT BELOW TREATMENT DEPTH FOR DEEP MONITORING

TMP - TEMPERATURE MONITORING POINT
PMP - PRESSURE MONITORING POINT
HDPE - HIGH DENSITY POLYETHYLENE

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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0 15 30 60
SCALE IN FEET

DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

SURFACE CAP AND VAPOR RECOVERY

APPROVED FOR CONSTRUCTION
BY
DATE

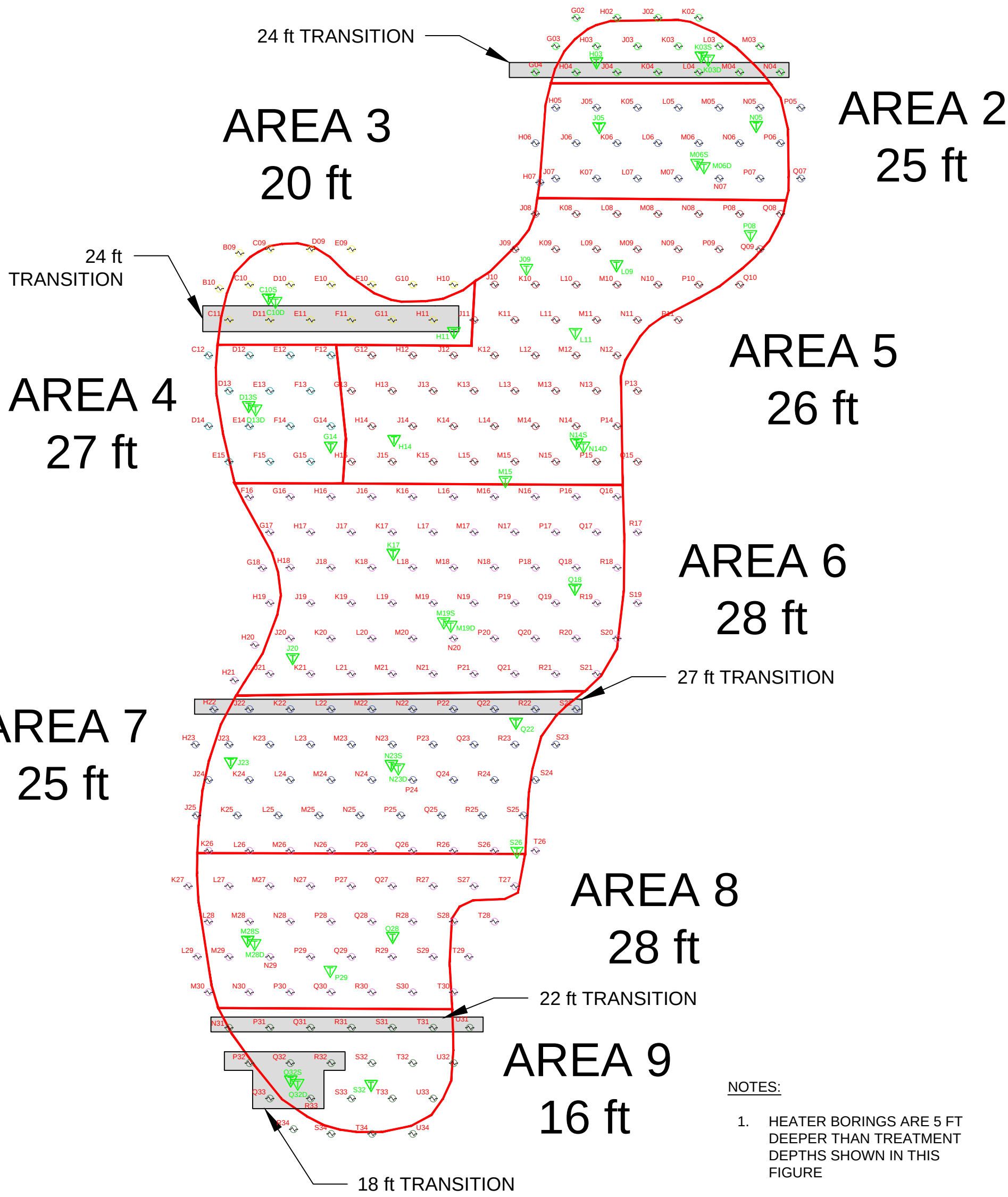
DATE 2023.MAR.08
PROJECT WA.1707
SHEET Y-2

90% DESIGN

Not Approved for Construction

LEGEND

- HEATER (QTY 288) (SEE NOTE 1)
- BULK SOIL TMP AND PMP (QTY. 29)
- HEATER DEPTH TRANSITION AREA (SEE CALLOUT FOR DEPTH)



NOTES:

1. HEATER BORINGS ARE 5 FT DEEPER THAN TREATMENT DEPTHS SHOWN IN THIS FIGURE

TMP - TEMPERATURE MONITORING POINT
PMP - PRESSURE MONITORING POINT

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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0 15 30 60
SCALE IN FEET

DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

TREATMENT DEPTHS

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET Y-3

90% DESIGN

Not Approved for Construction

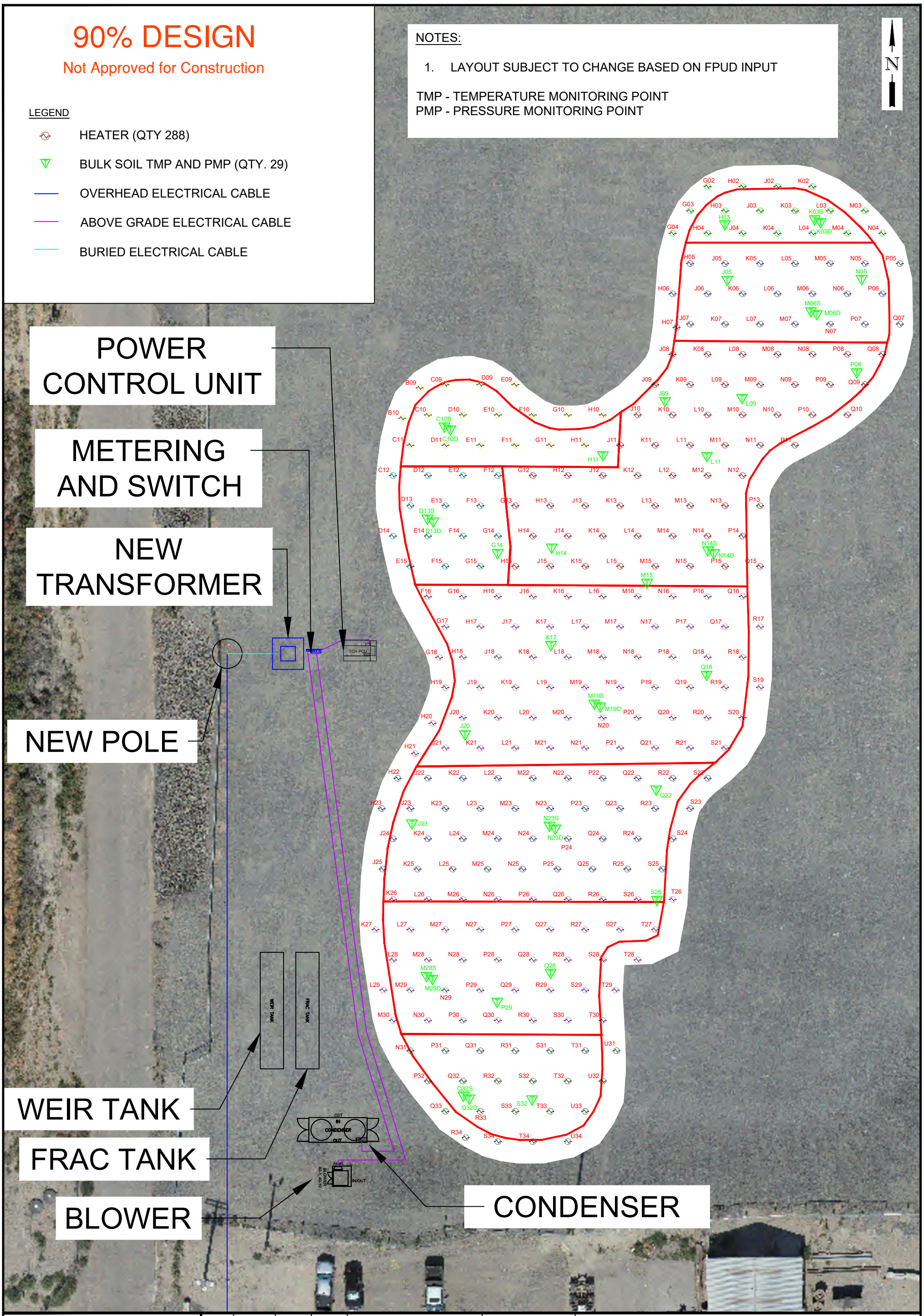
LEGEND

- HEATER (QTY 288)
- BULK SOIL TMP AND PMP (QTY. 29)
- OVERHEAD ELECTRICAL CABLE
- ABOVE GRADE ELECTRICAL CABLE
- BURIED ELECTRICAL CABLE

NOTES:

1. LAYOUT SUBJECT TO CHANGE BASED ON FPUD INPUT

TMP - TEMPERATURE MONITORING POINT
PMP - PRESSURE MONITORING POINT



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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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SCALE IN FEET

DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

POWER DROP LAYOUT

APPROVED FOR CONSTRUCTION
BY
DATE

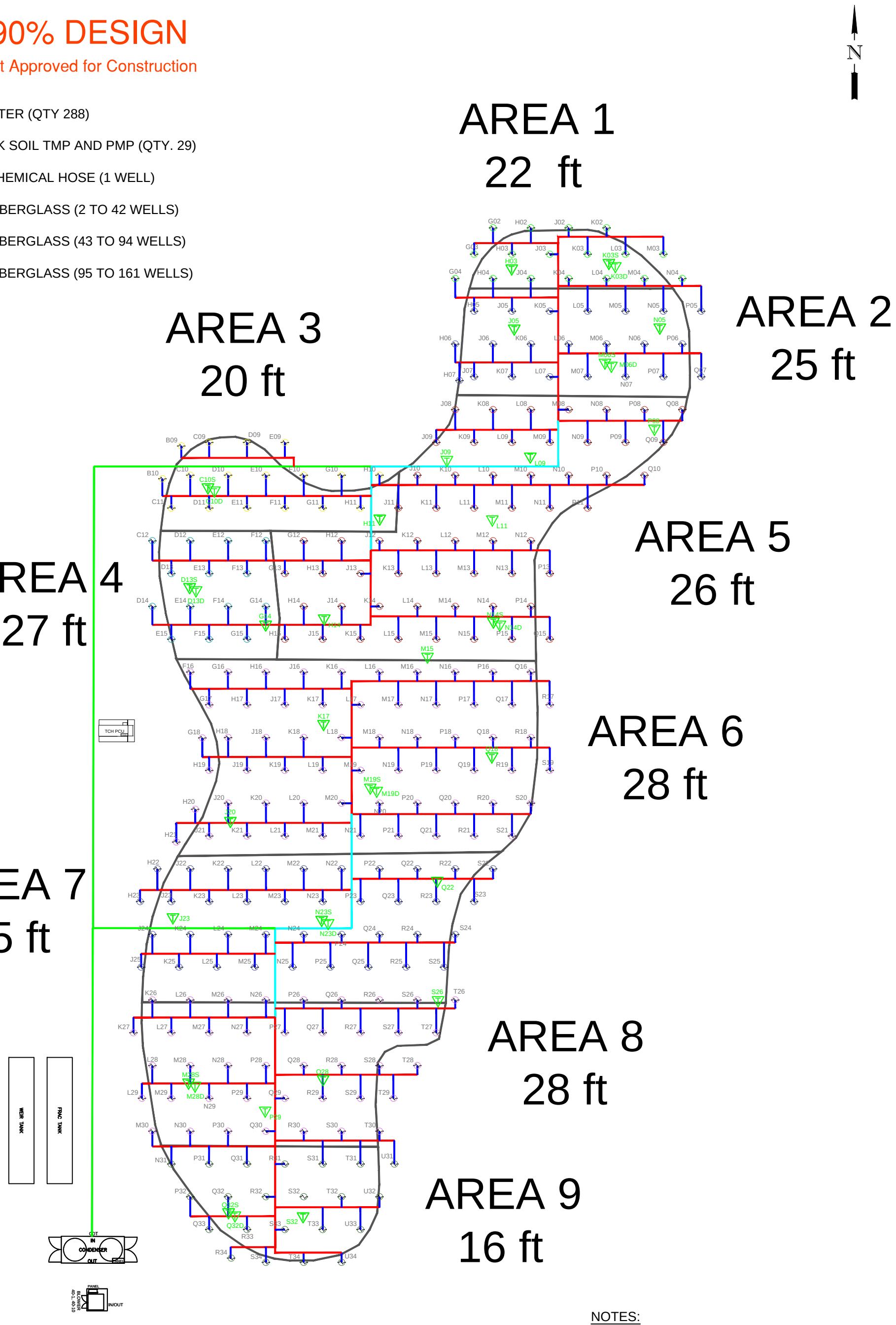
DATE 2023.MAR.08
PROJECT WA.1707
SHEET Y-4

90% DESIGN

Not Approved for Construction

LEGEND

- HEATER (QTY 288)
- BULK SOIL TMP AND PMP (QTY. 29)
- 1" CHEMICAL HOSE (1 WELL)
- 4" FIBERGLASS (2 TO 42 WELLS)
- 6" FIBERGLASS (43 TO 94 WELLS)
- 8" FIBERGLASS (95 TO 161 WELLS)



NOTES:

TMP - TEMPERATURE MONITORING POINT
PMP - PRESSURE MONITORING POINT

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
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0 15 30 60
SCALE IN FEET

DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

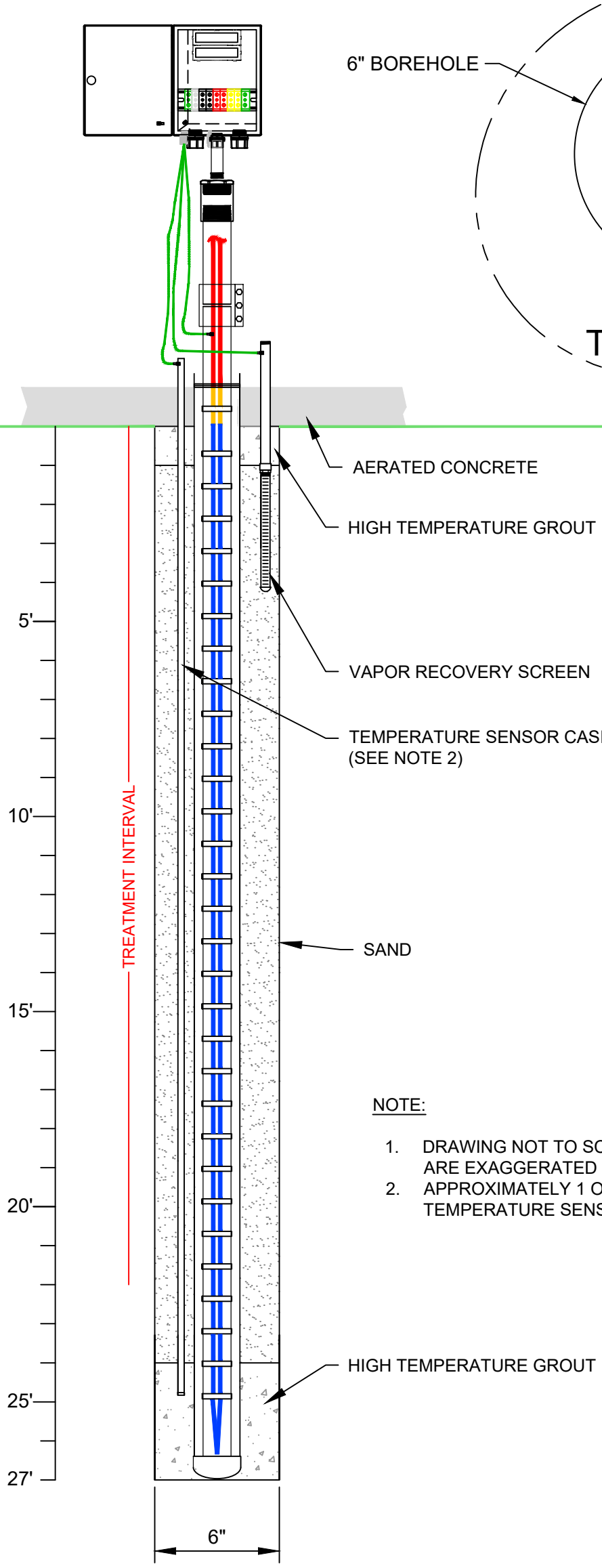
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

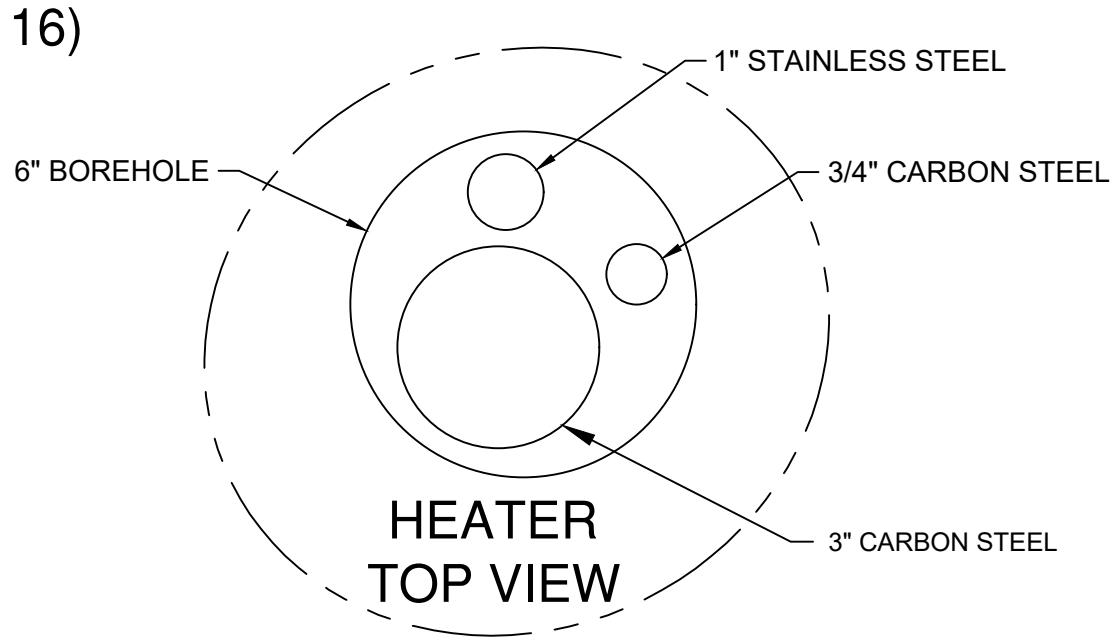
VAPOR RECOVERY PIPING PLAN

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: Y-5

AREA 1 AND TRANSITION ZONE FOR AREA 9
HEATER DETAIL
(QTY. 16)





NOTE:

1. DRAWING NOT TO SCALE. THE WIDTH OF PIPE AND BOREHOLE ARE EXAGGERATED IN DRAWING TO SHOW DETAIL.
2. APPROXIMATELY 1 OUT OF EVERY 4 HEATERS WILL HAVE A TEMPERATURE SENSOR CASING

90% DESIGN

Not Approved for Construction

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

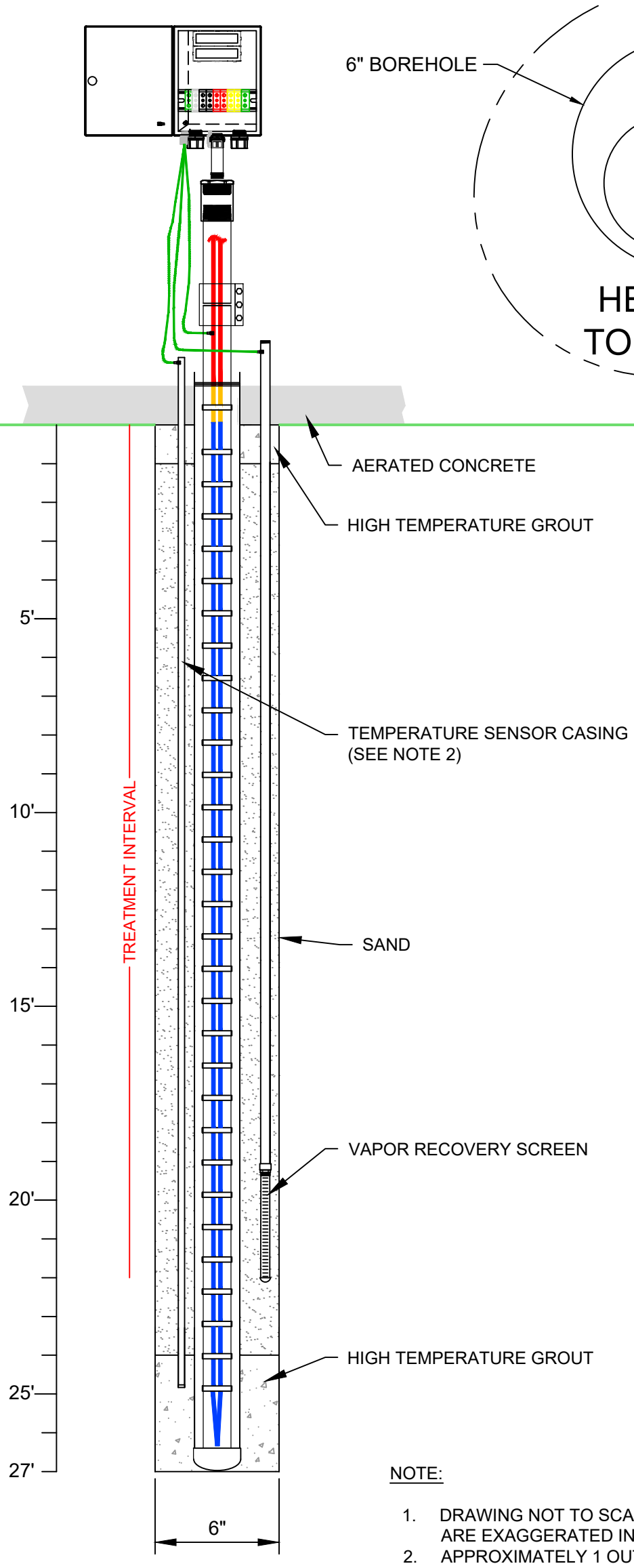
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

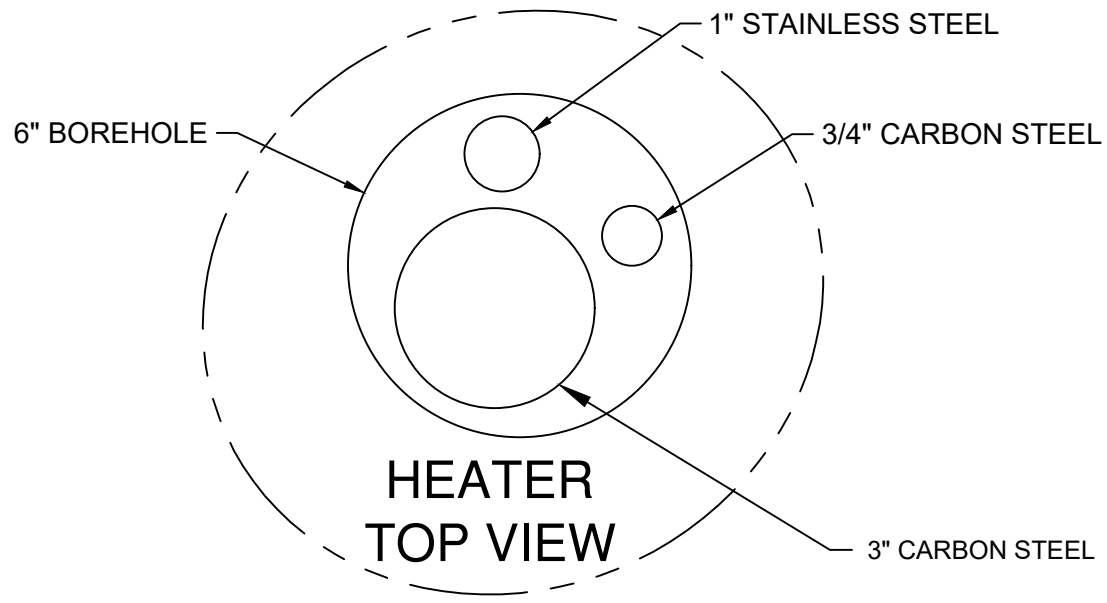
AREA 1 AND TRANSITION ZONE FOR AREA 9 HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-1

AREA 1 DEEP VAPOR RECOVERY HEATER DETAIL (QTY. 1)





NOTE:

1. DRAWING NOT TO SCALE. THE WIDTH OF PIPE AND BOREHOLE ARE EXAGGERATED IN DRAWING TO SHOW DETAIL.
2. APPROXIMATELY 1 OUT OF EVERY 4 HEATERS WILL HAVE A TEMPERATURE SENSOR CASING

90% DESIGN

Not Approved for Construction

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

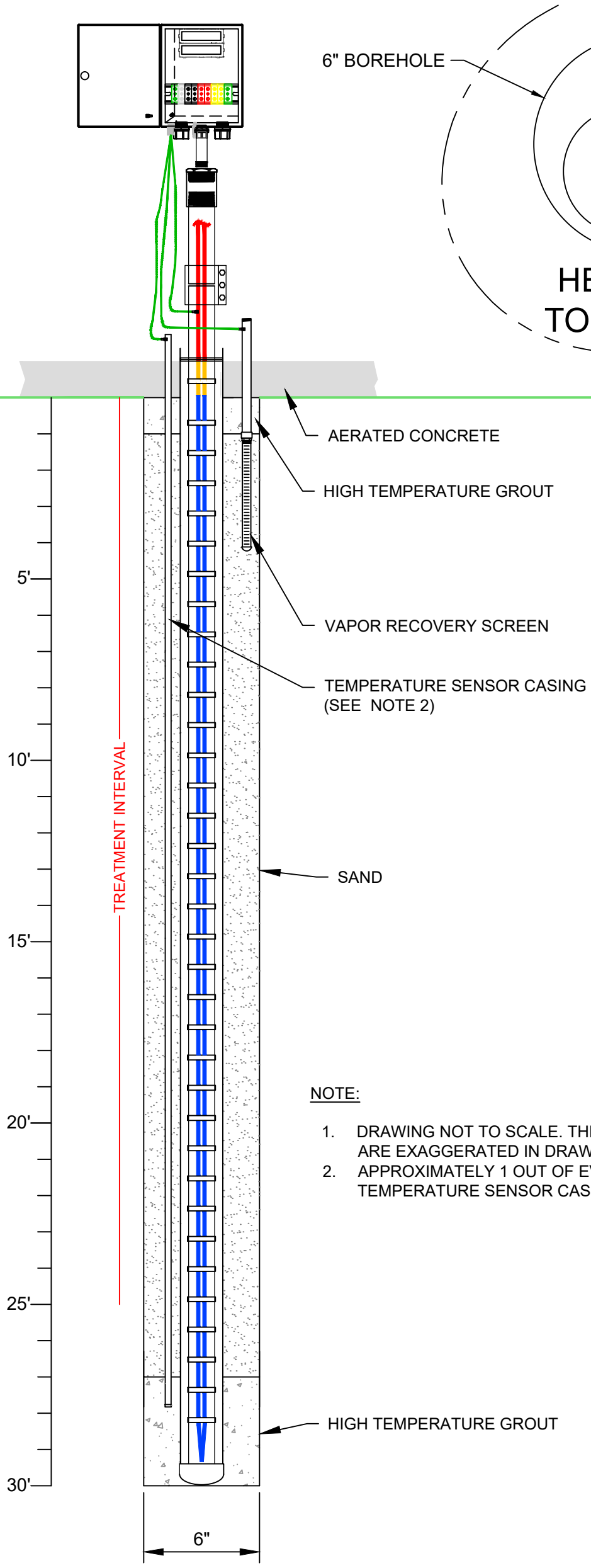
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

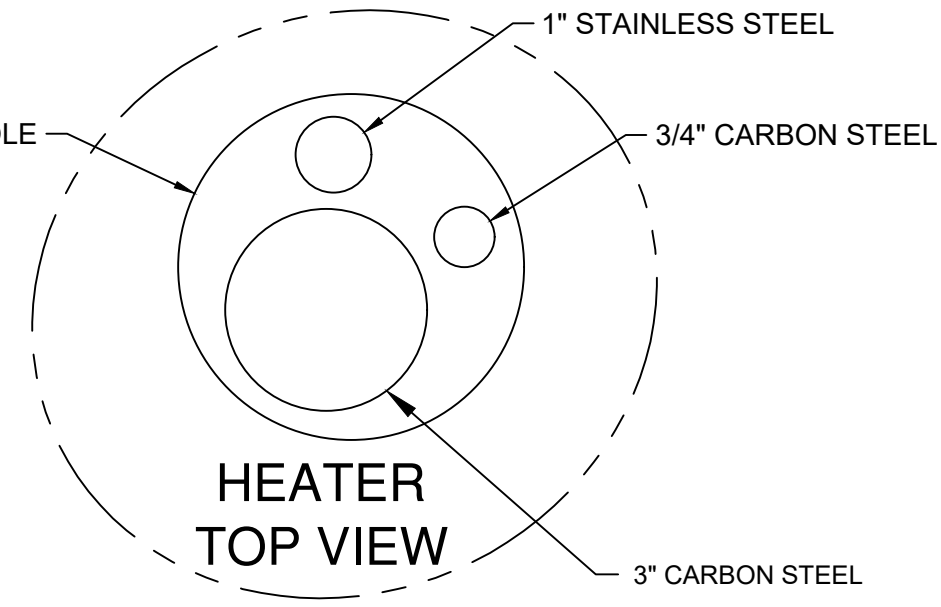
AREA 1 DEEP VAPOR RECOVERY HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-2

AREA 2 AND 7
HEATER DETAIL
(QTY. 46)





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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

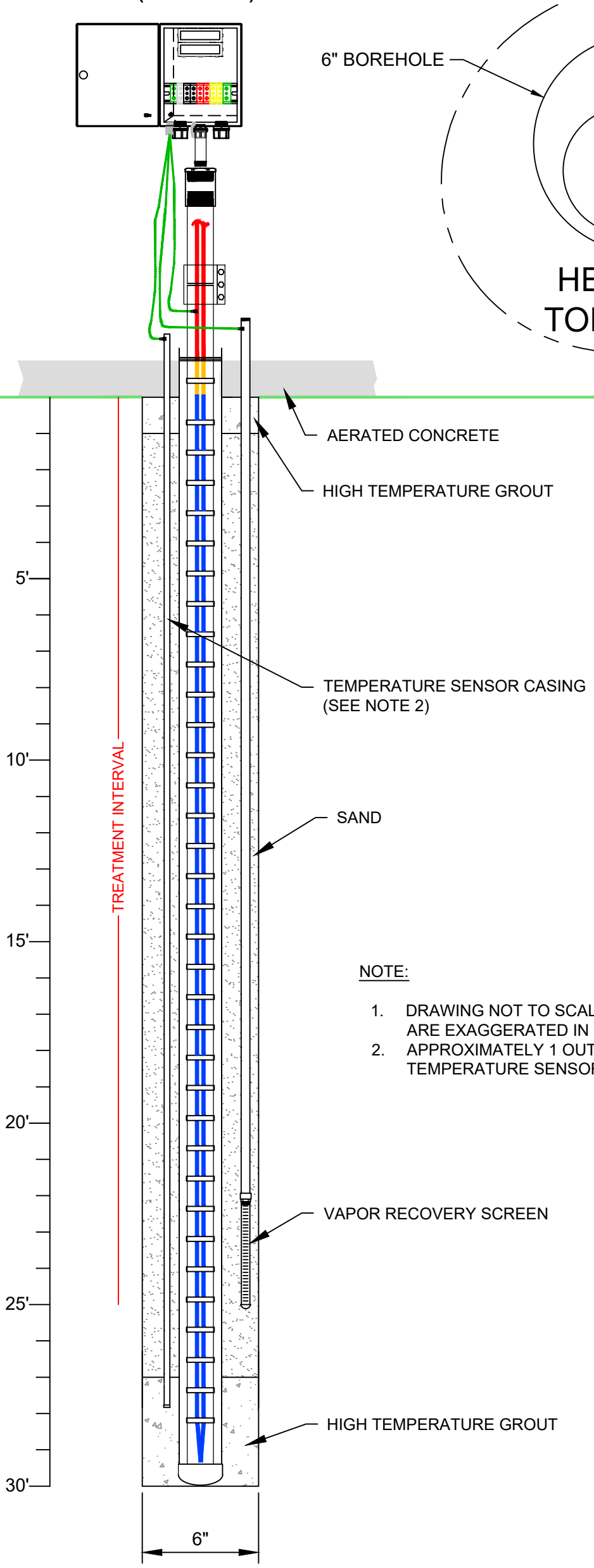
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

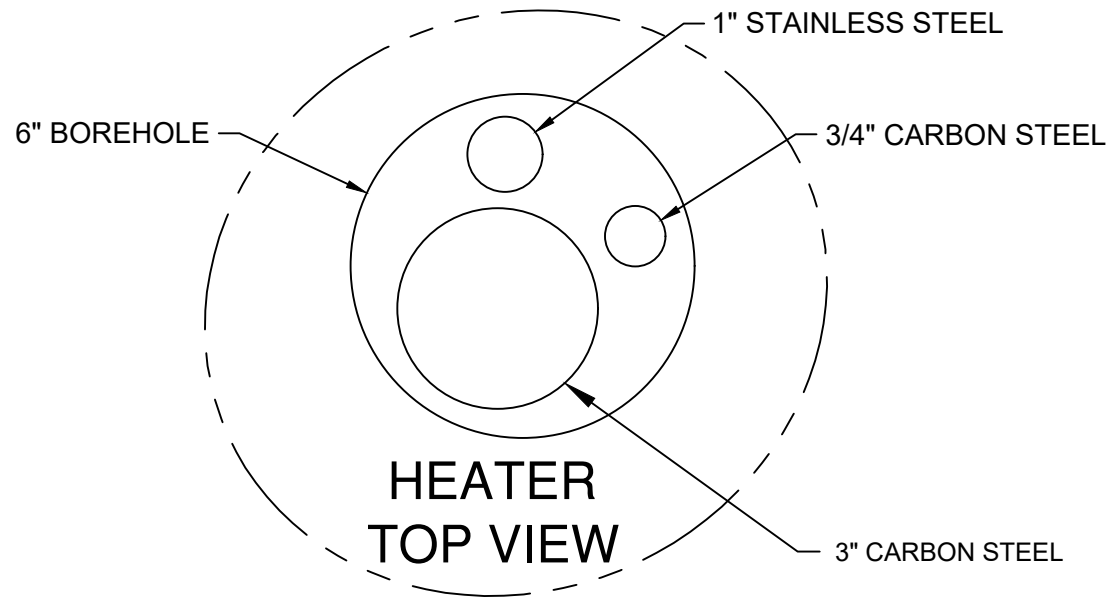
AREA 2 AND 7
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-3

AREA 2 AND 7 DEEP VAPOR RECOVERY HEATER DETAIL (QTY. 4)





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90% DESIGN

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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

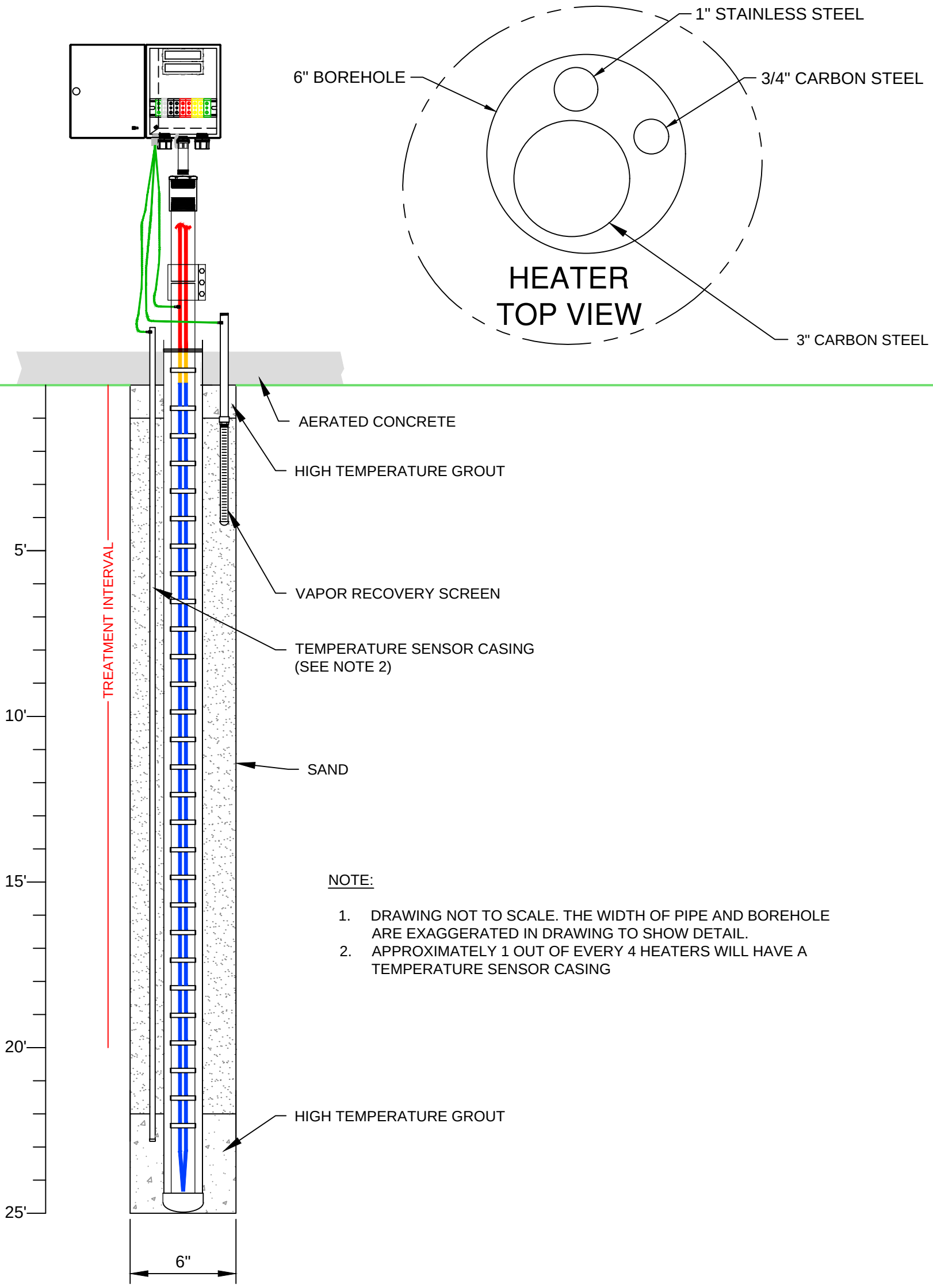
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 2 AND 7 DEEP VAPOR RECOVERY HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-4

AREA 3
HEATER DETAIL
(QTY. 10)



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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
1	8/1/2023	ES	CC	H10 REMOVED FROM TRANSITION ZONE
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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

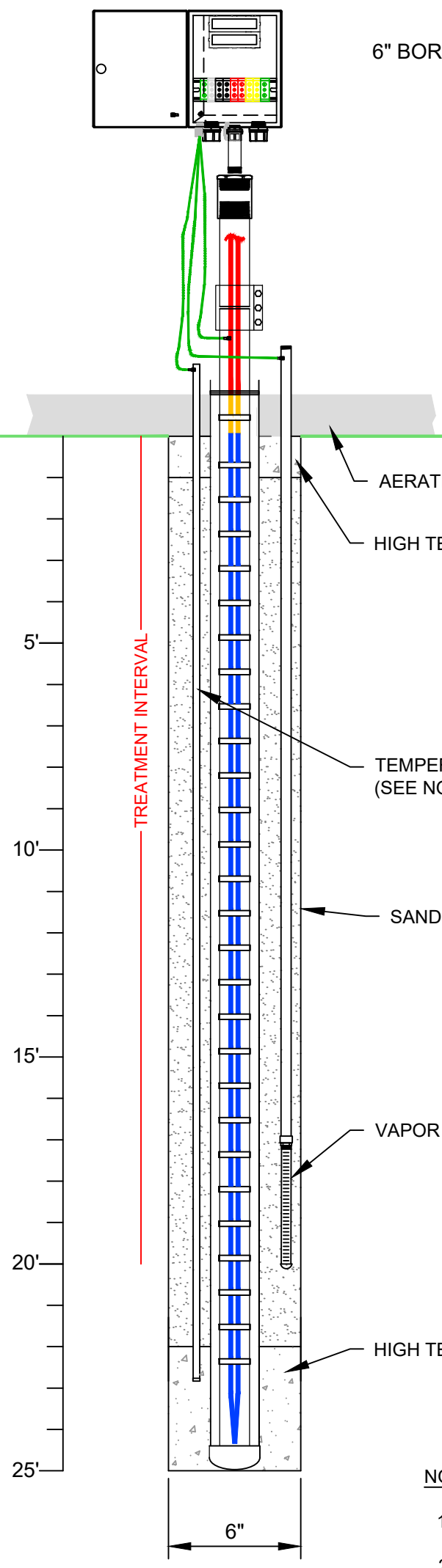
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

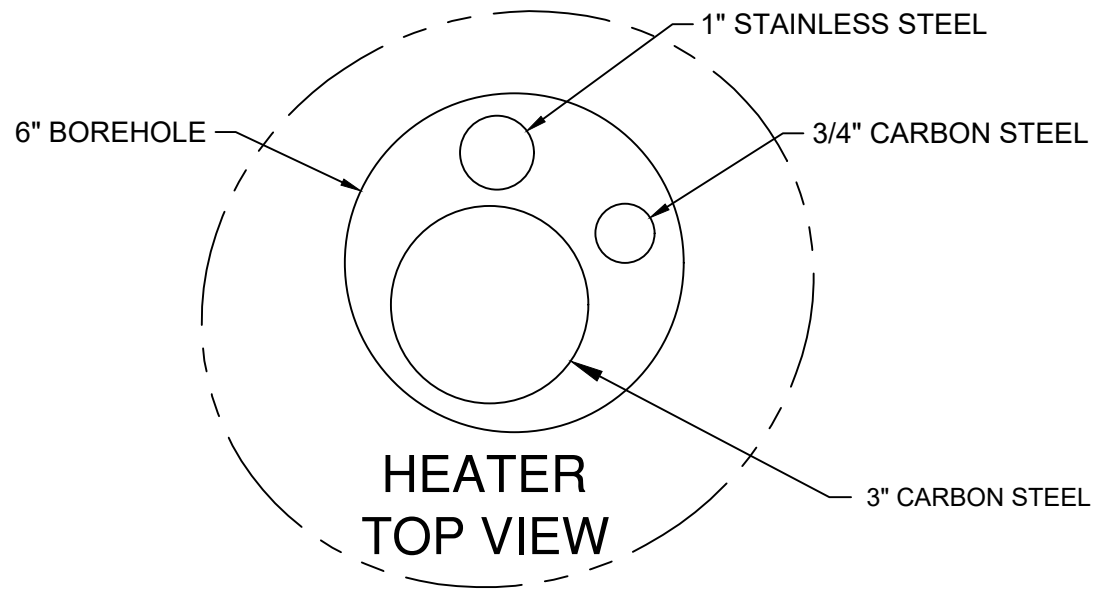
AREA 3 HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-5

AREA 3 DEEP VAPOR RECOVERY
HEATER DETAIL
(QTY. 1)





AERATED CONCRETE

HIGH TEMPERATURE GROUT

TEMPERATURE SENSOR CASING
(SEE NOTE 2)

SAND

VAPOR RECOVERY SCREEN

HIGH TEMPERATURE GROUT

NOTE:

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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

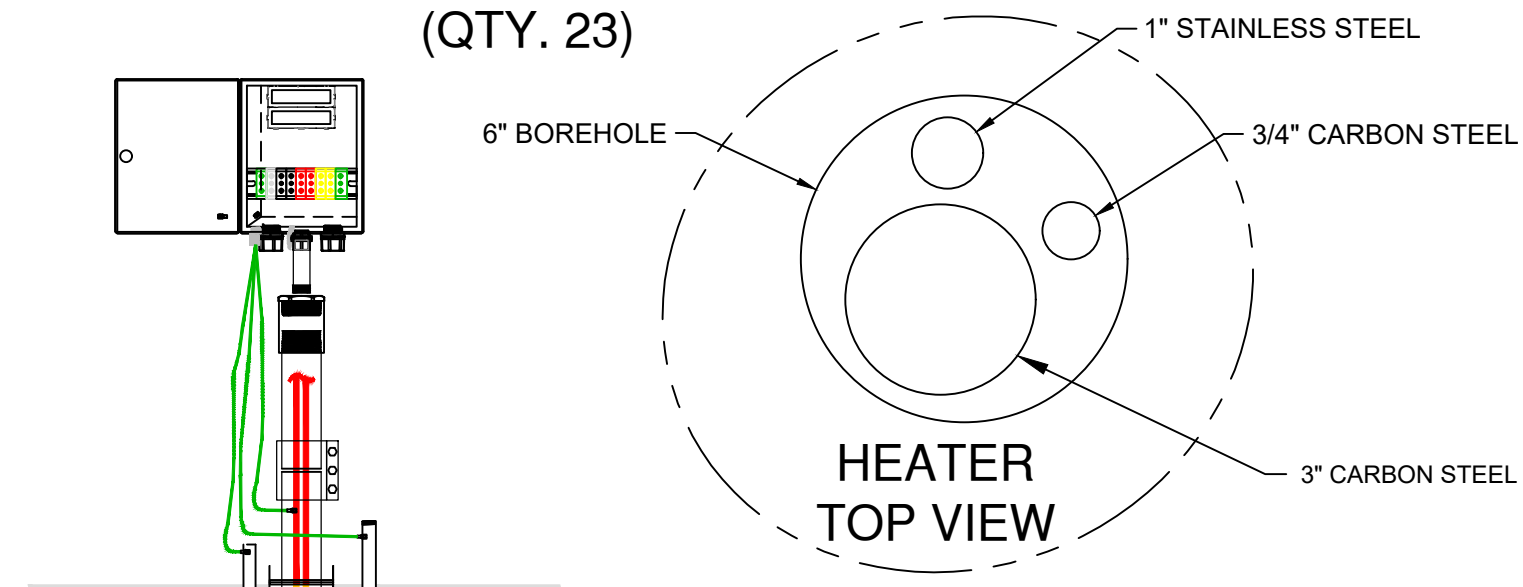
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

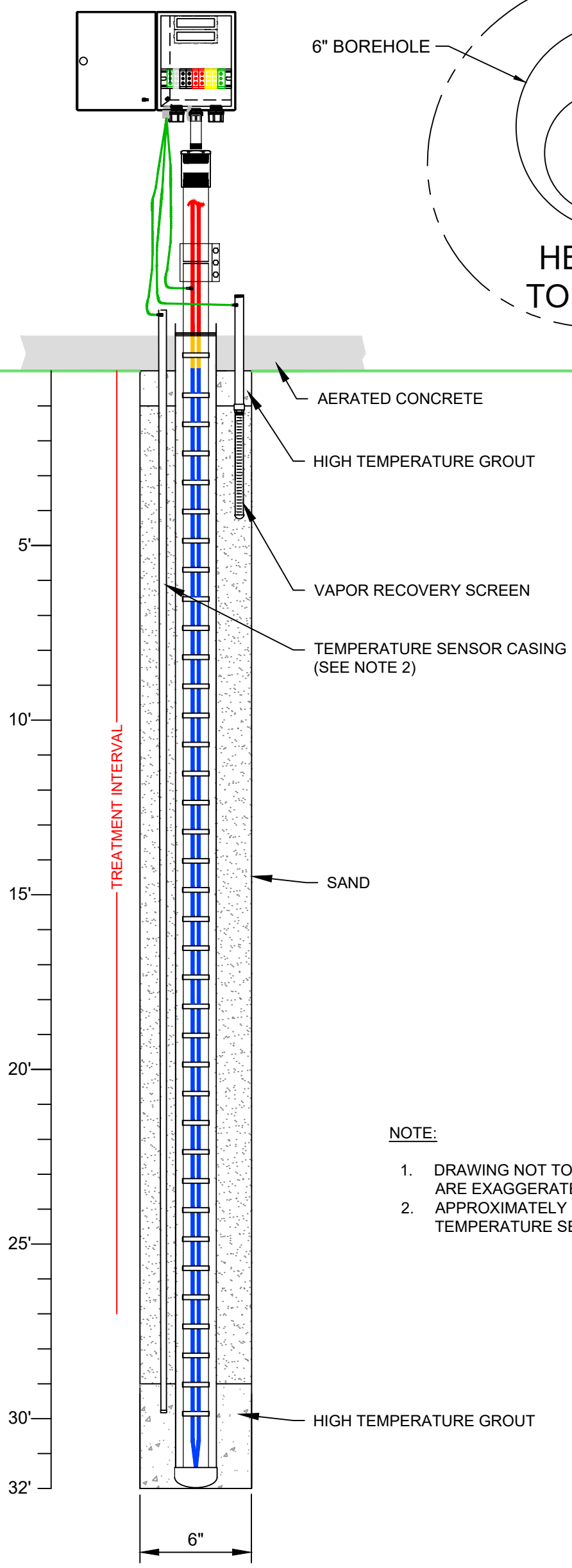
AREA 3 DEEP VAPOR RECOVERY
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-6

AREA 4 AND TRANSITION ZONE FOR AREA 7
HEATER DETAIL
(QTY. 23)





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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

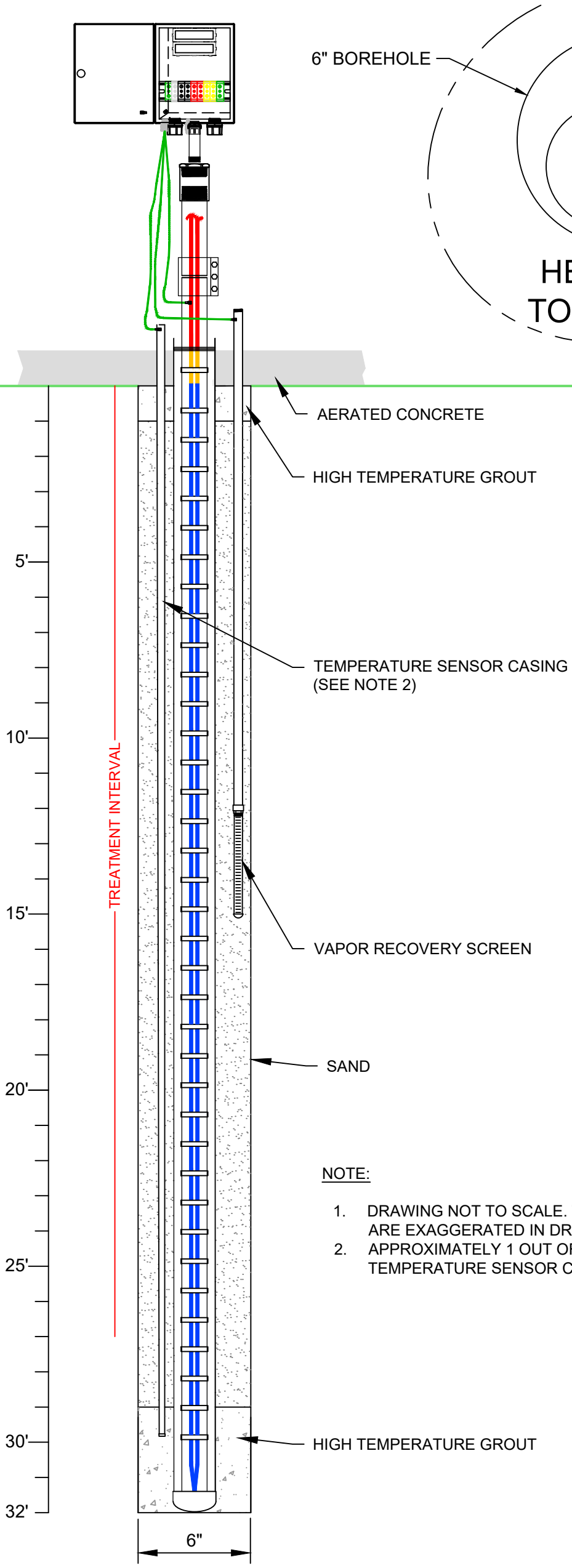
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

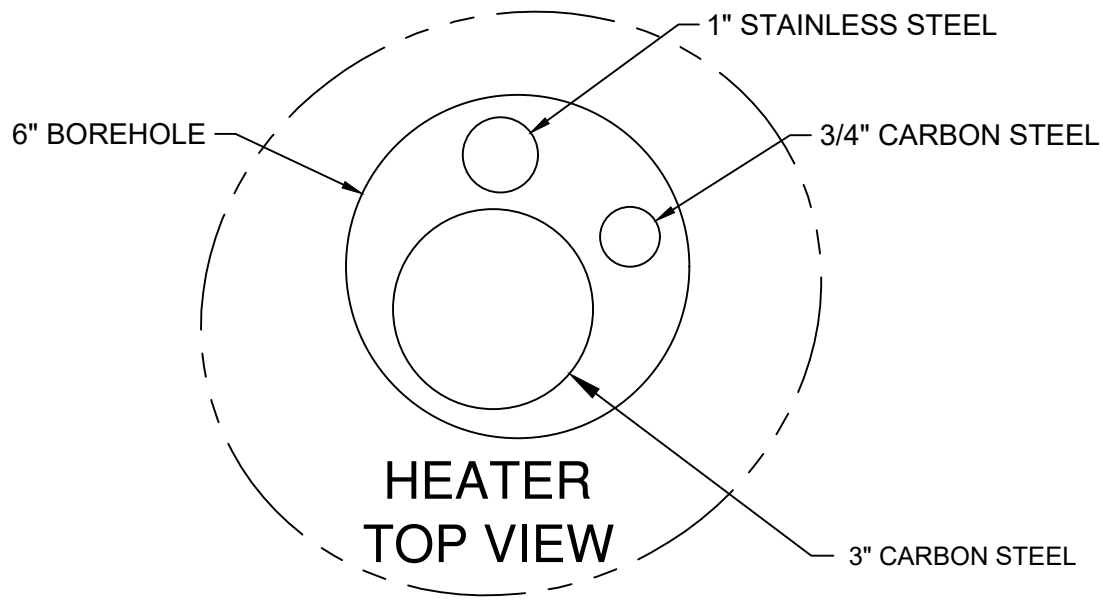
AREA 4 AND TRANSITION ZONE FOR AREA 7
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-7

AREA 4 DEEP VAPOR RECOVERY
HEATER DETAIL
(QTY. 1)





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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

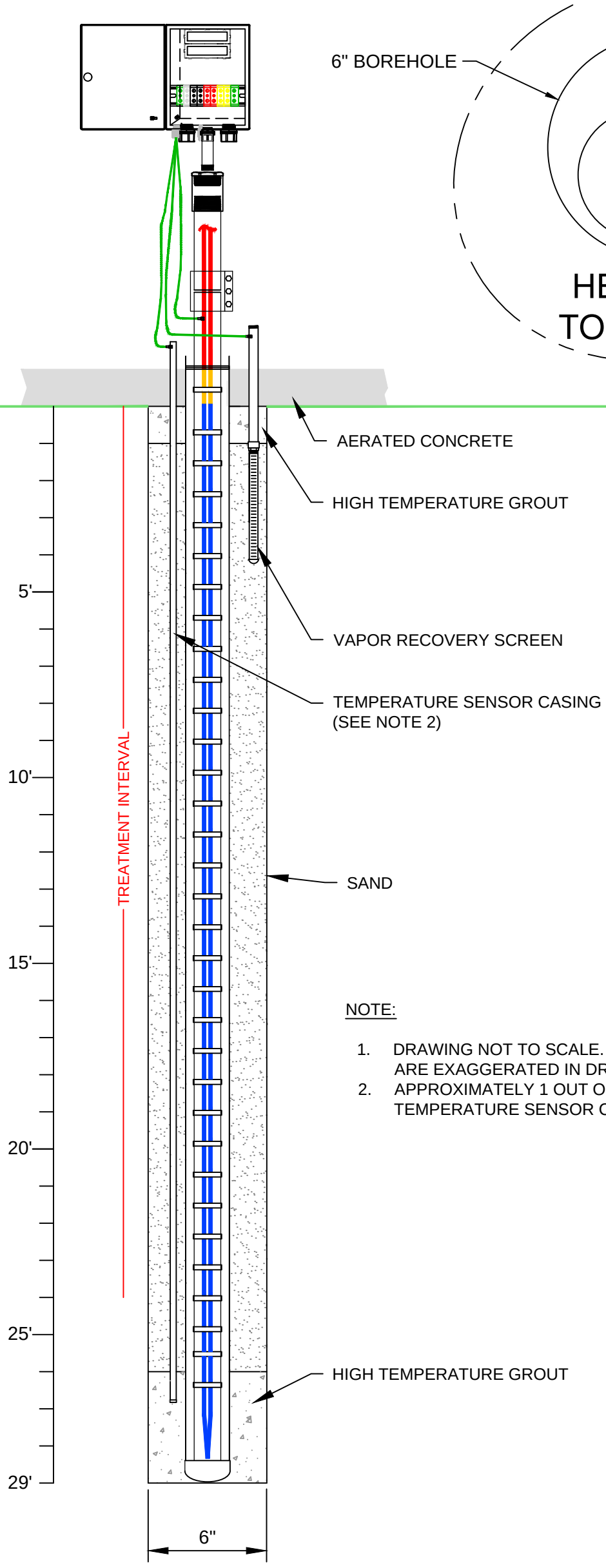
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

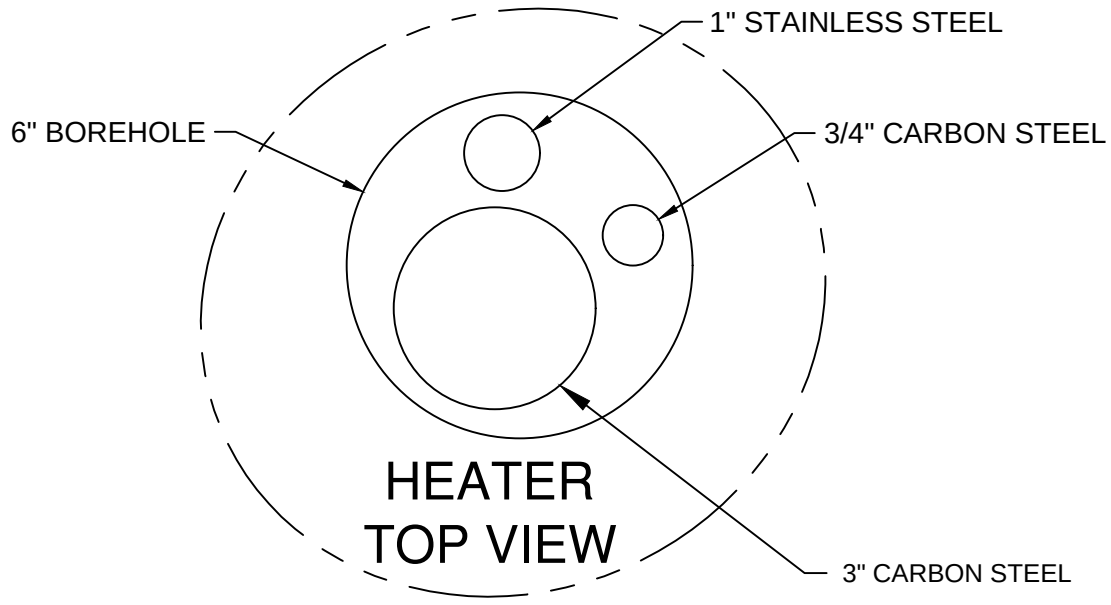
AREA 4 DEEP VAPOR RECOVERY
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-8

TRANSITION ZONES FOR AREAS 1 AND 3
HEATER DETAIL
(QTY. 13)





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90% DESIGN

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
1	8/1/2023	ES	CC	H10 REMOVED FROM TRANSITION ZONE
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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

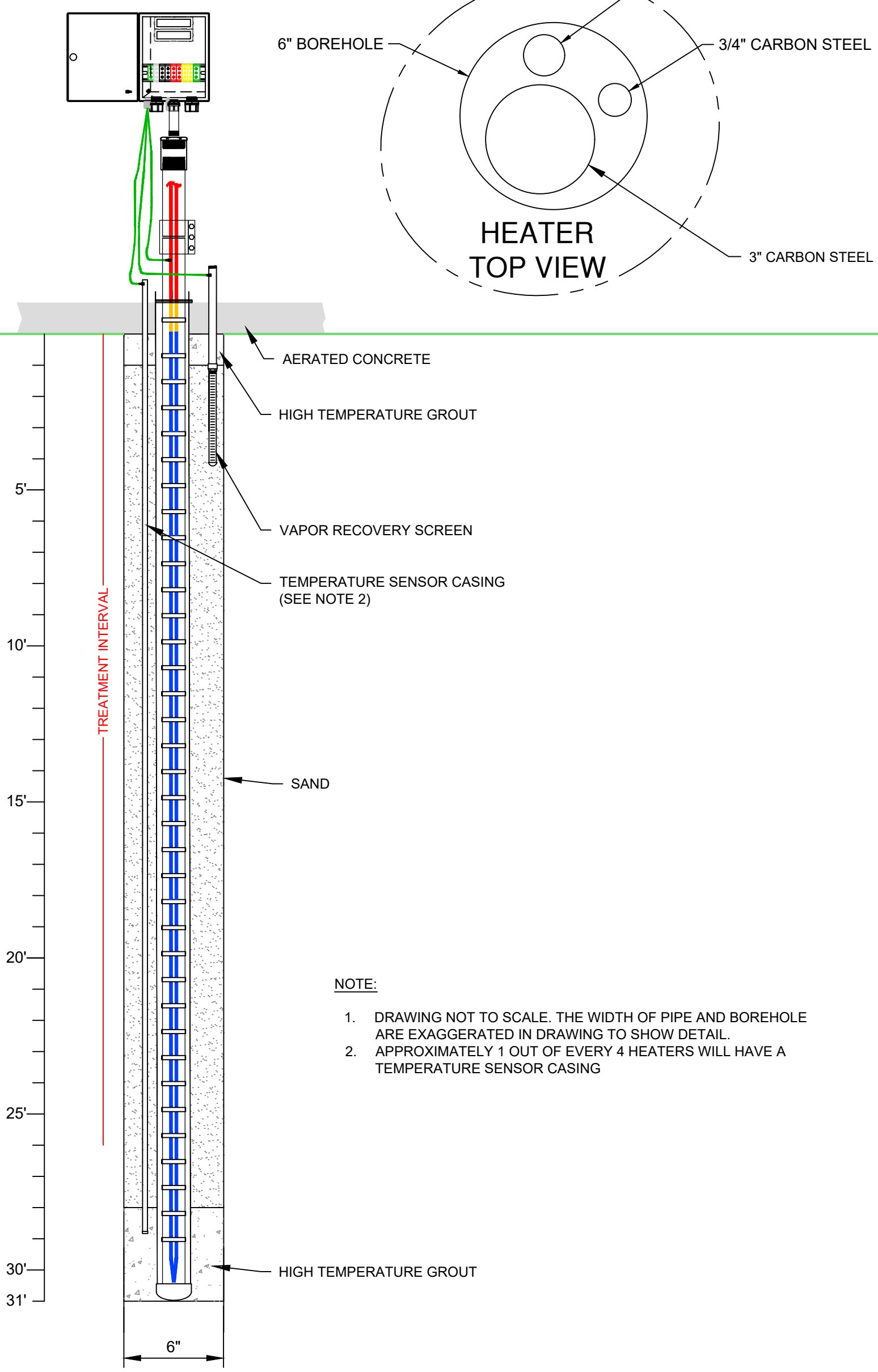
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

TRANSITION ZONES FOR AREAS 1 AND 3
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-9

AREA 5
HEATER DETAIL
(QTY. 54)



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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

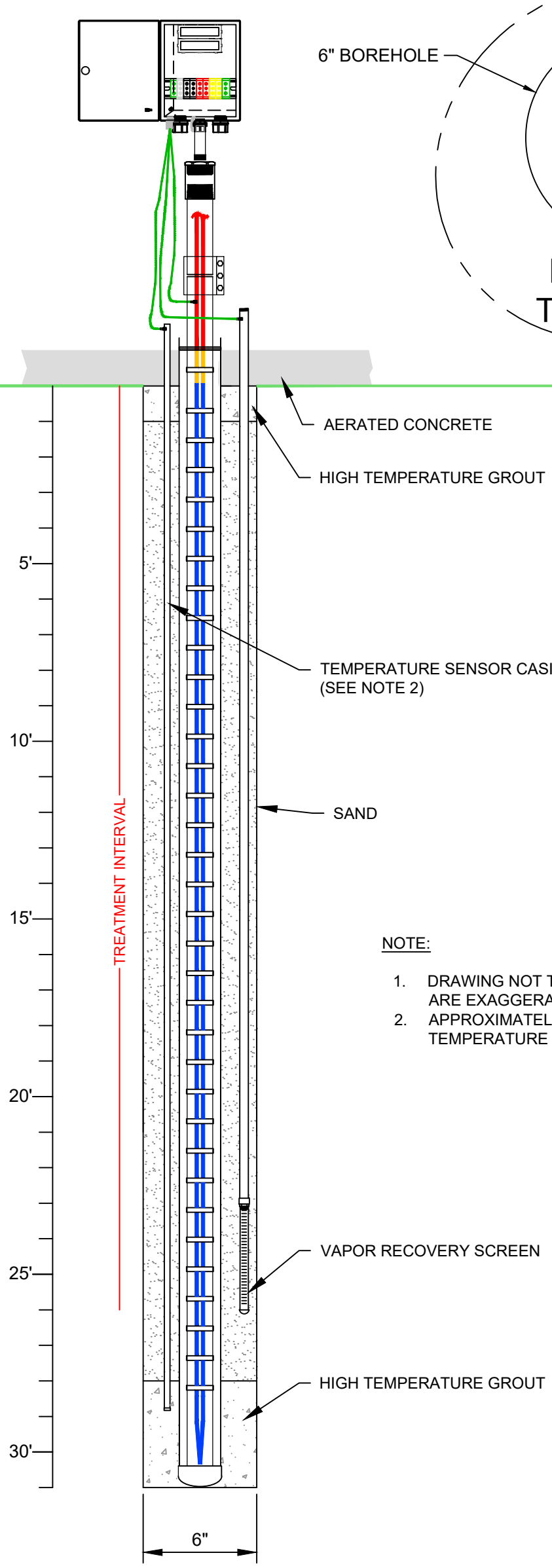
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

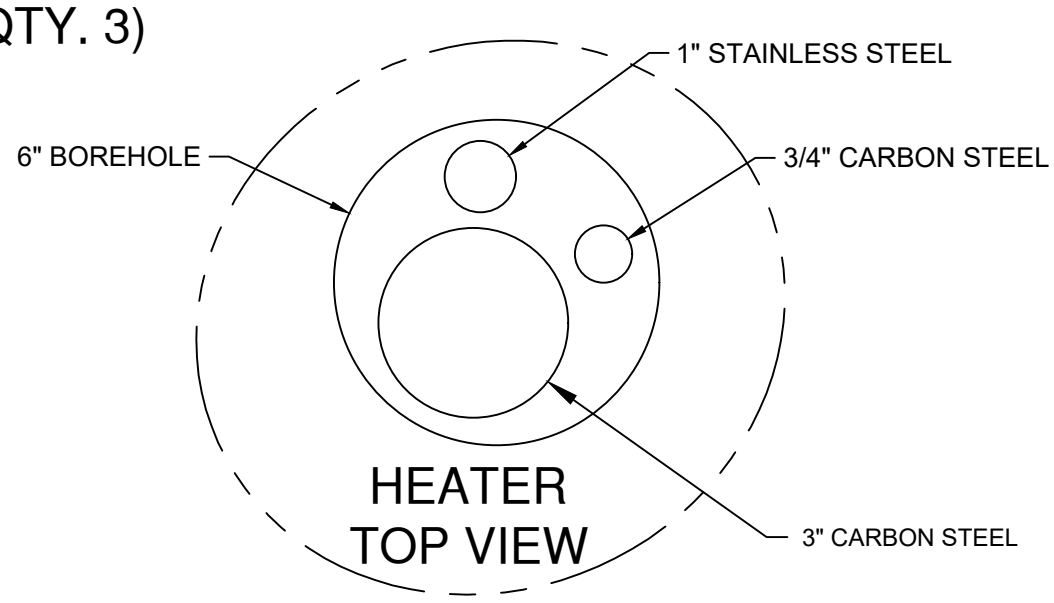
AREA 5
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-10

AREA 5 DEEP VAPOR RECOVERY HEATER DETAIL (QTY. 3)





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TRS Accelerating Value

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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

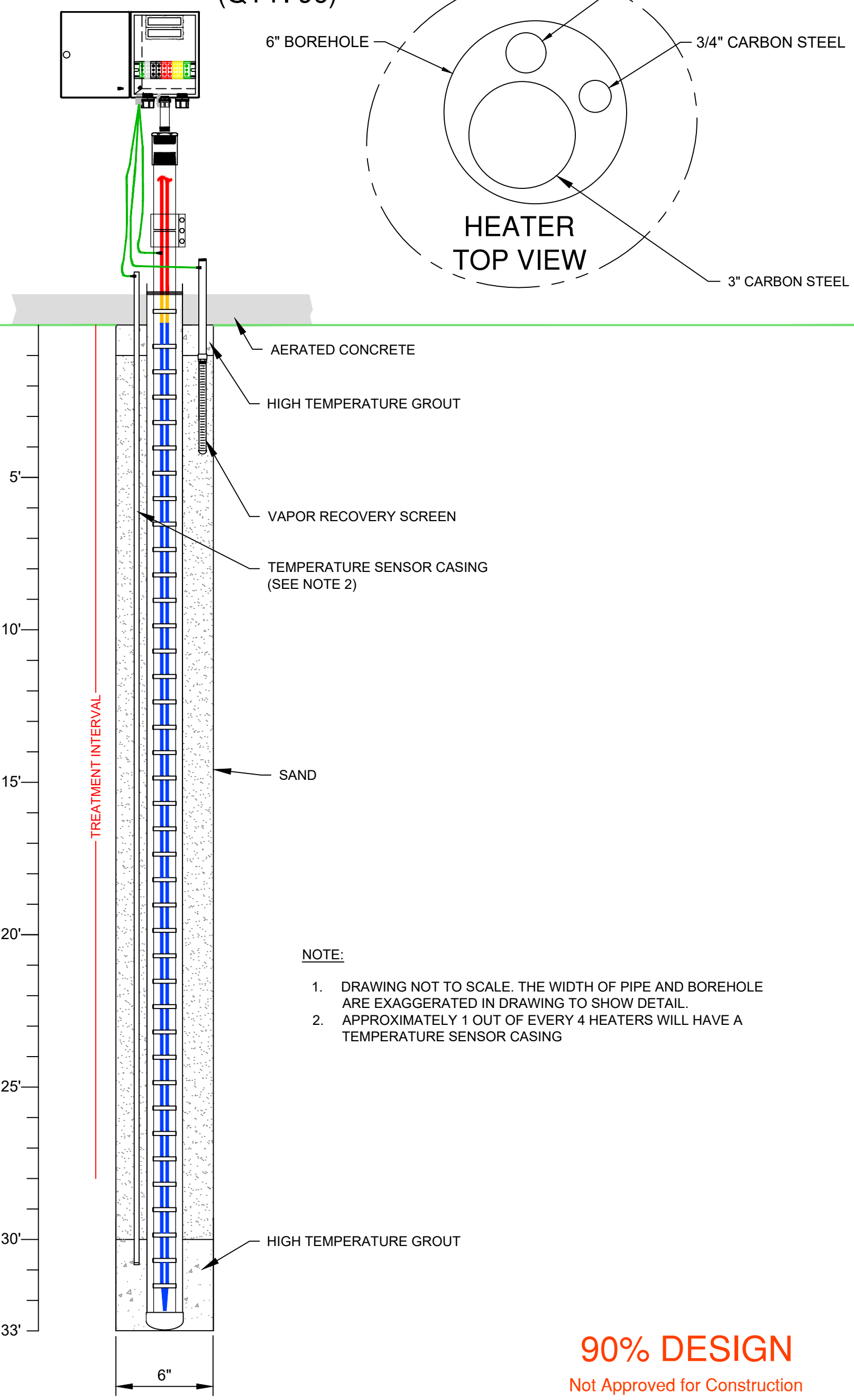
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 5 DEEP VAPOR RECOVERY HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-11

AREA 6 AND 8
HEATER DETAIL
(QTY. 96)



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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

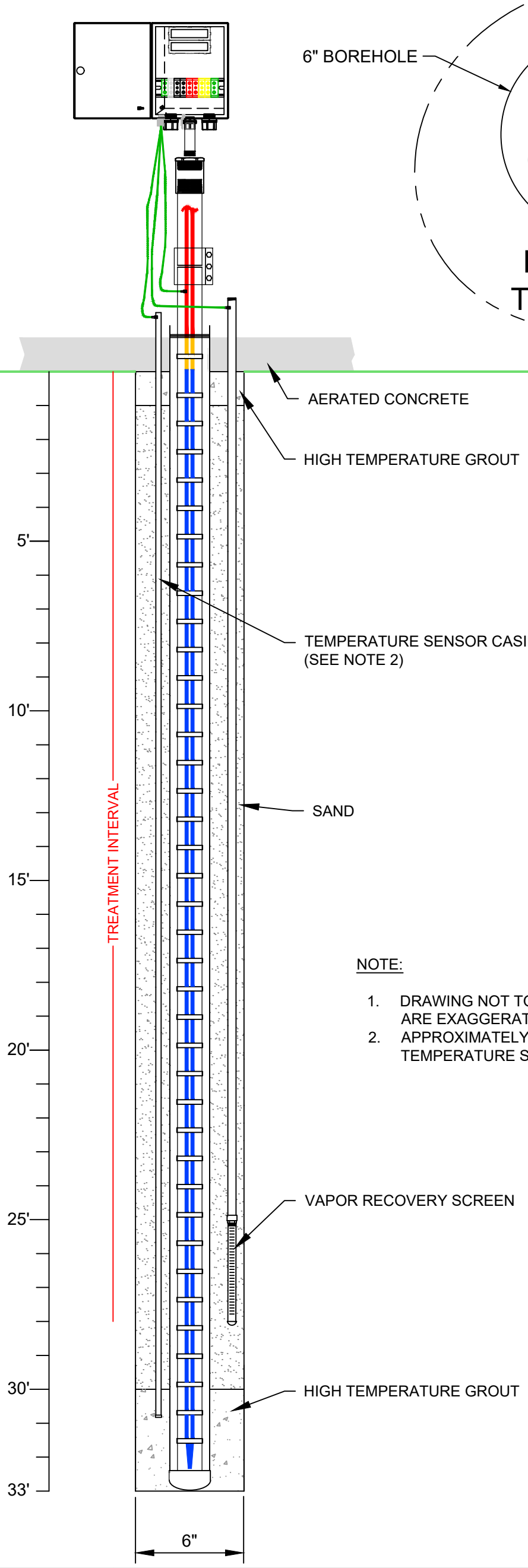
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

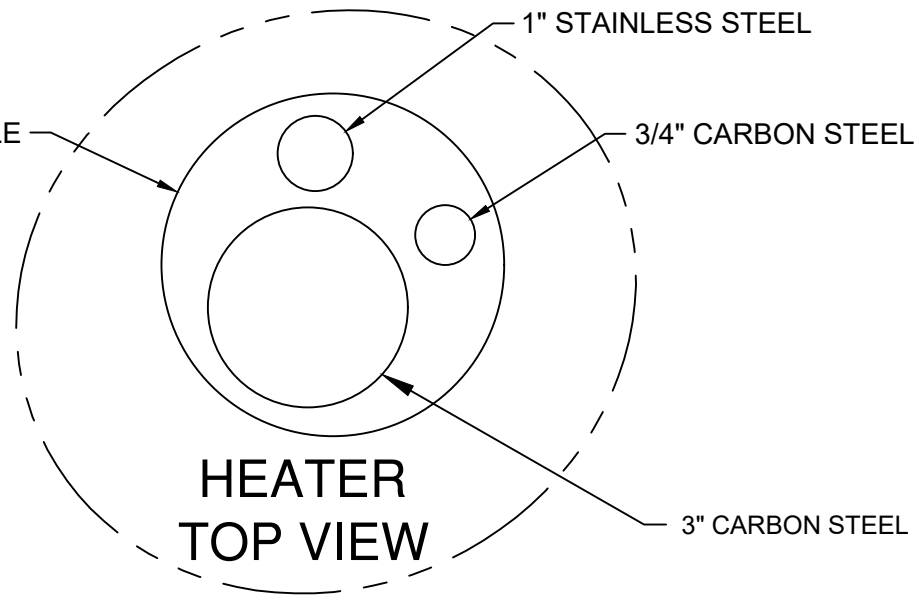
AREA 6 AND 8
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-12

AREA 6 AND 8 DEEP VAPOR RECOVERY HEATER DETAIL (QTY. 5)





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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

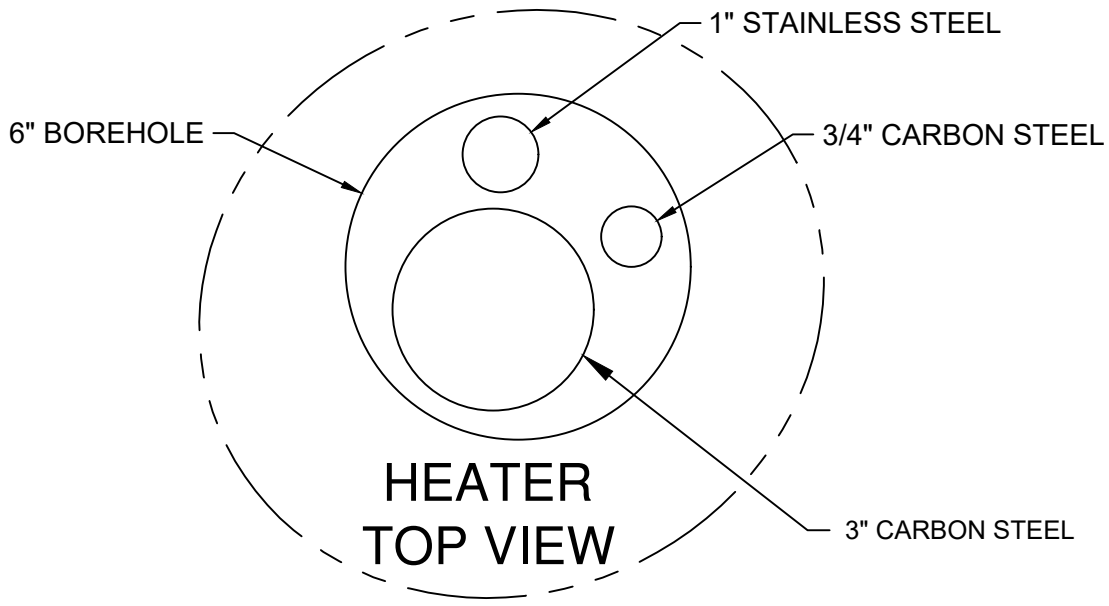
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

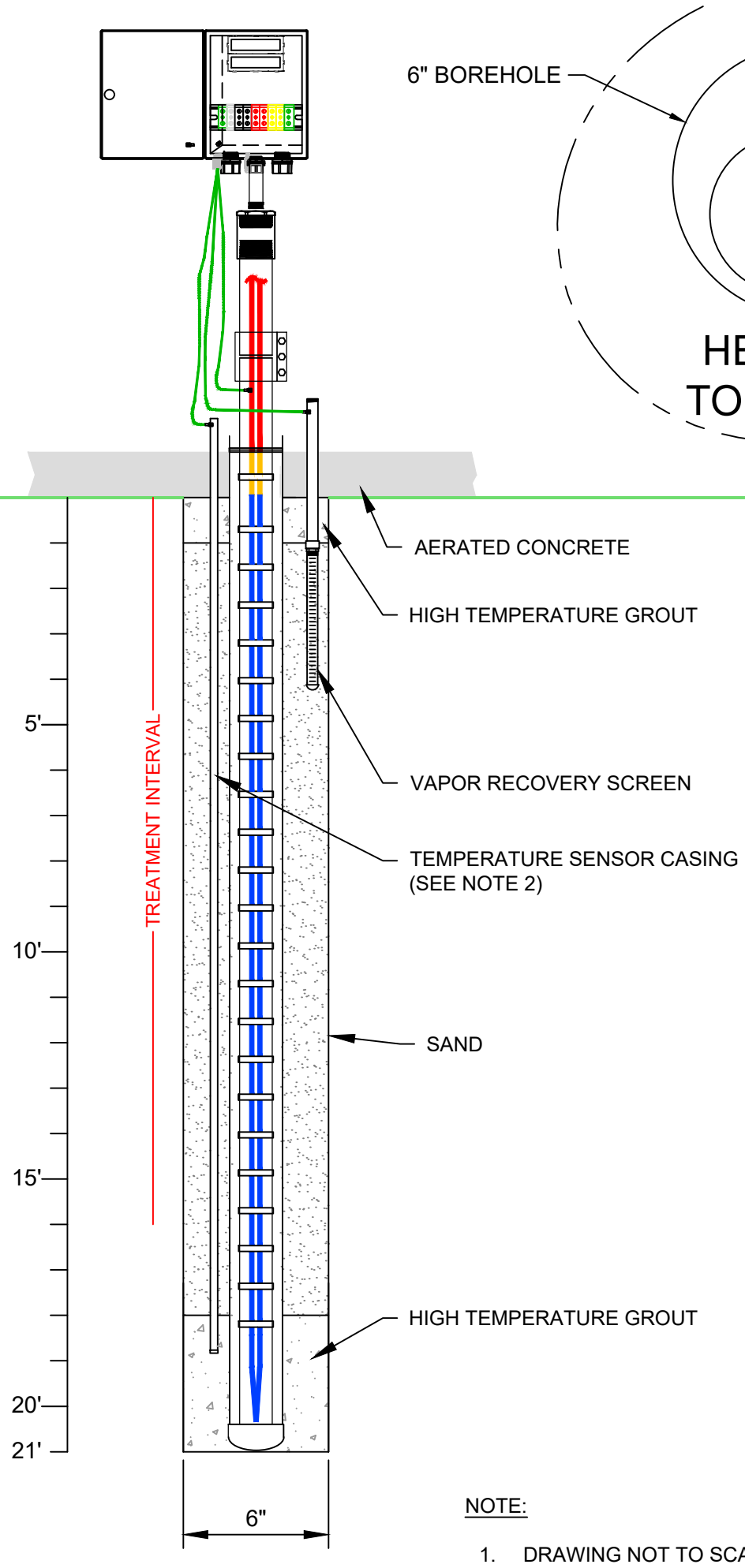
AREA 6 AND 8 DEEP VAPOR RECOVERY HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-13

AREA 9
HEATER DETAIL
(QTY. 9)





NOTE:

1. DRAWING NOT TO SCALE. THE WIDTH OF PIPE AND BOREHOLE ARE EXAGGERATED IN DRAWING TO SHOW DETAIL.
2. APPROXIMATELY 1 OUT OF EVERY 4 HEATERS WILL HAVE A TEMPERATURE SENSOR CASING

90% DESIGN

Not Approved for Construction

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
1				
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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

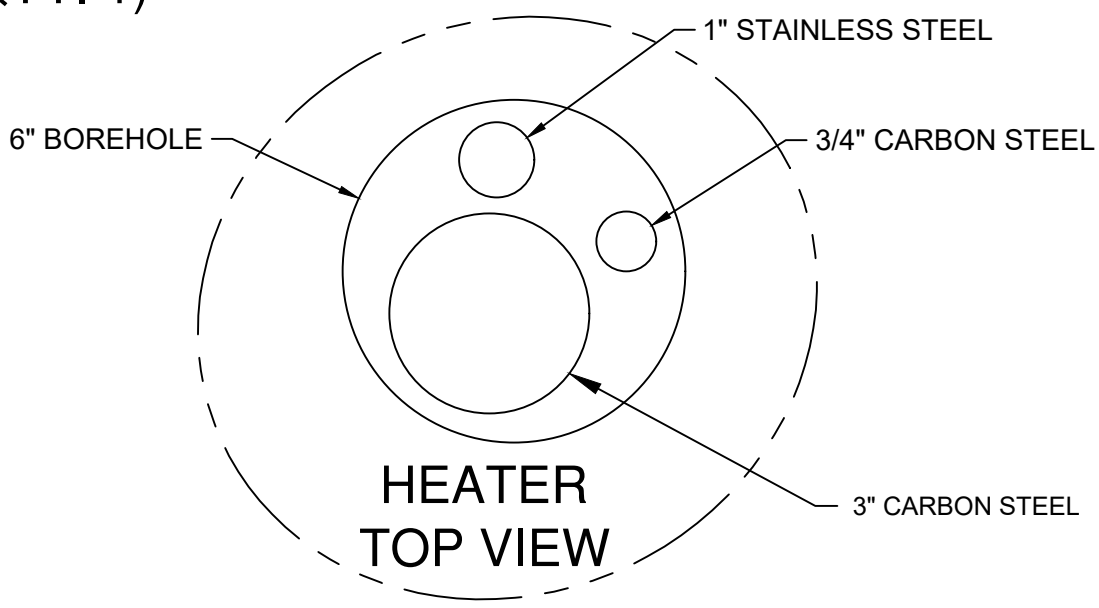
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

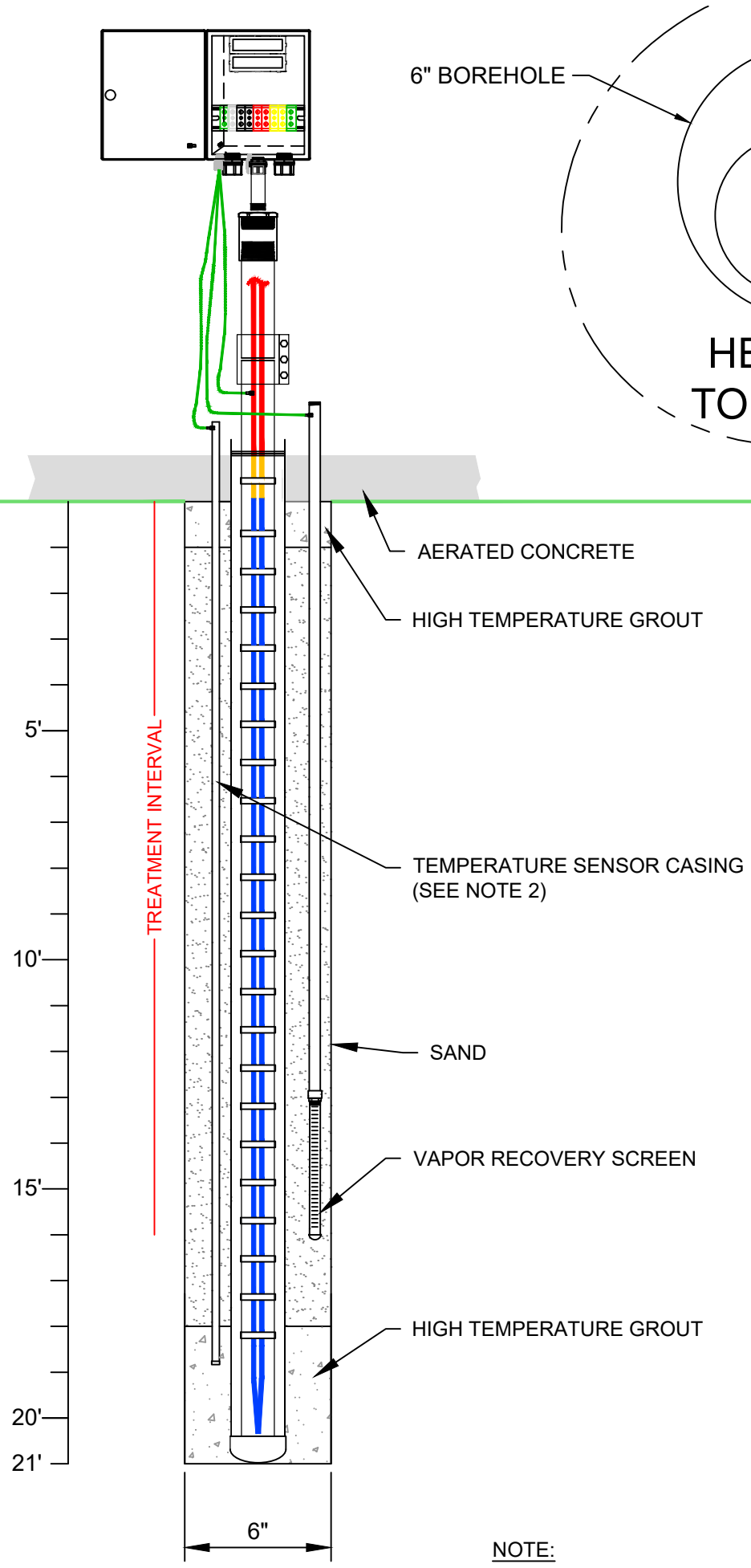
AREA 9
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-14

AREA 9 DEEP VAPOR RECOVERY
HEATER DETAIL
(QTY. 1)





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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

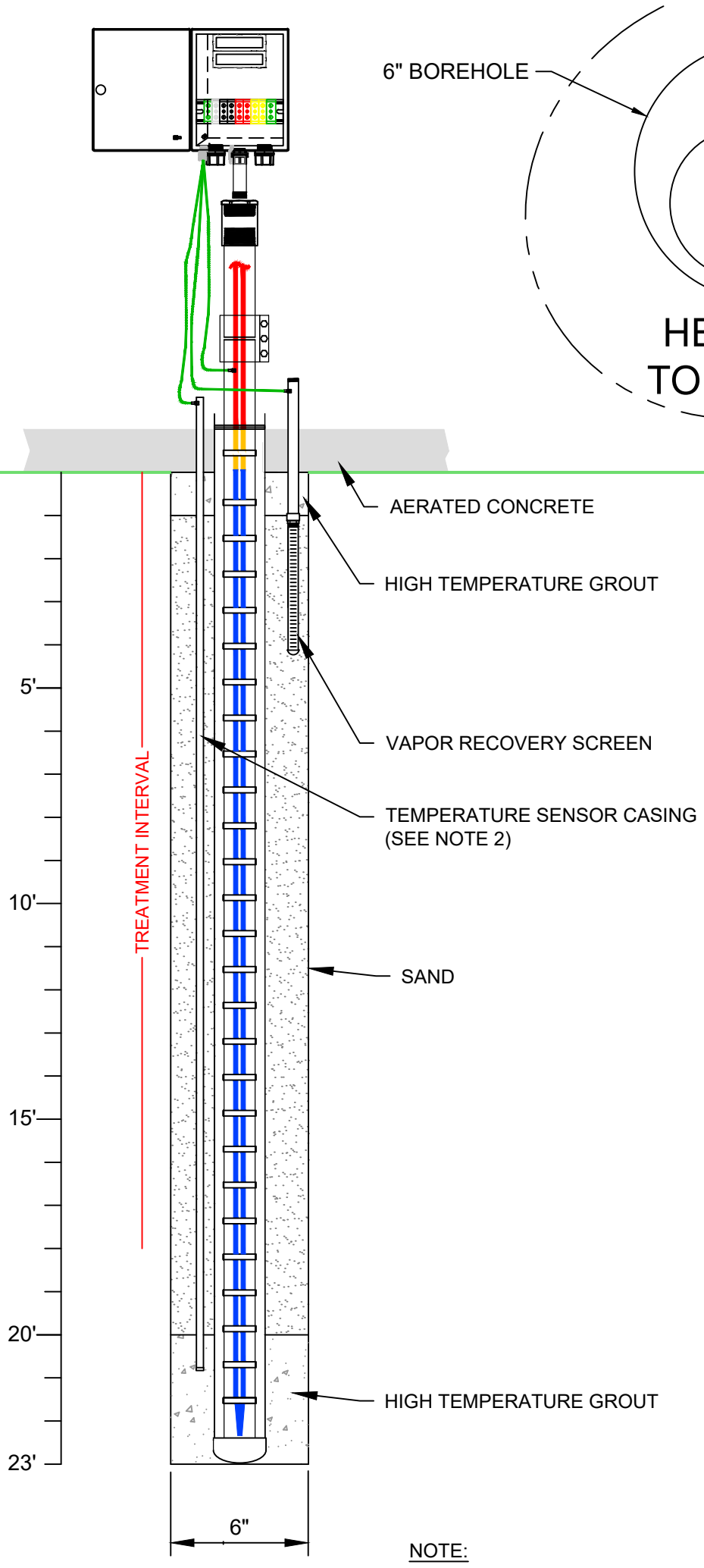
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

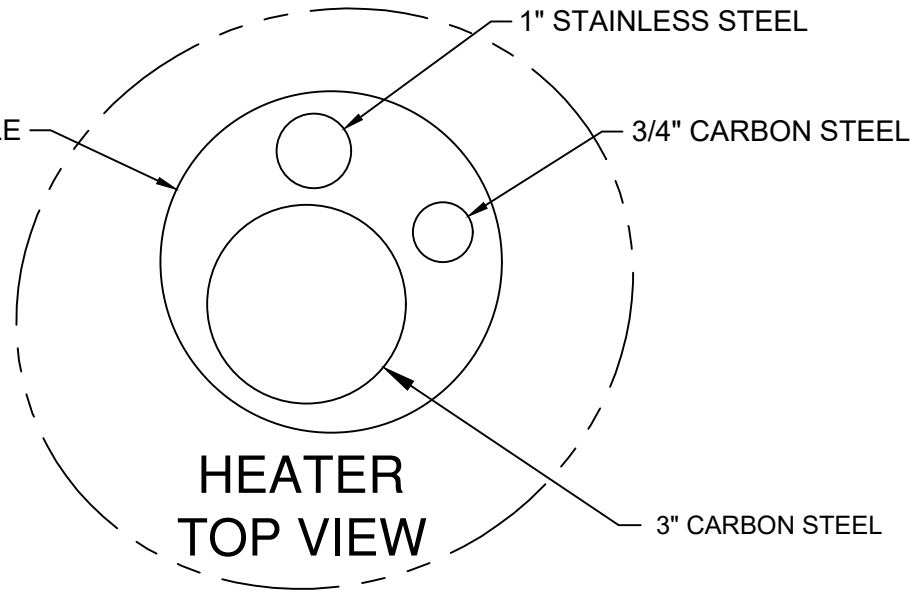
AREA 9 DEEP VAPOR RECOVERY
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-15

TRANSITION ZONE FOR AREA 9
HEATER DETAIL
(QTY. 5)





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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

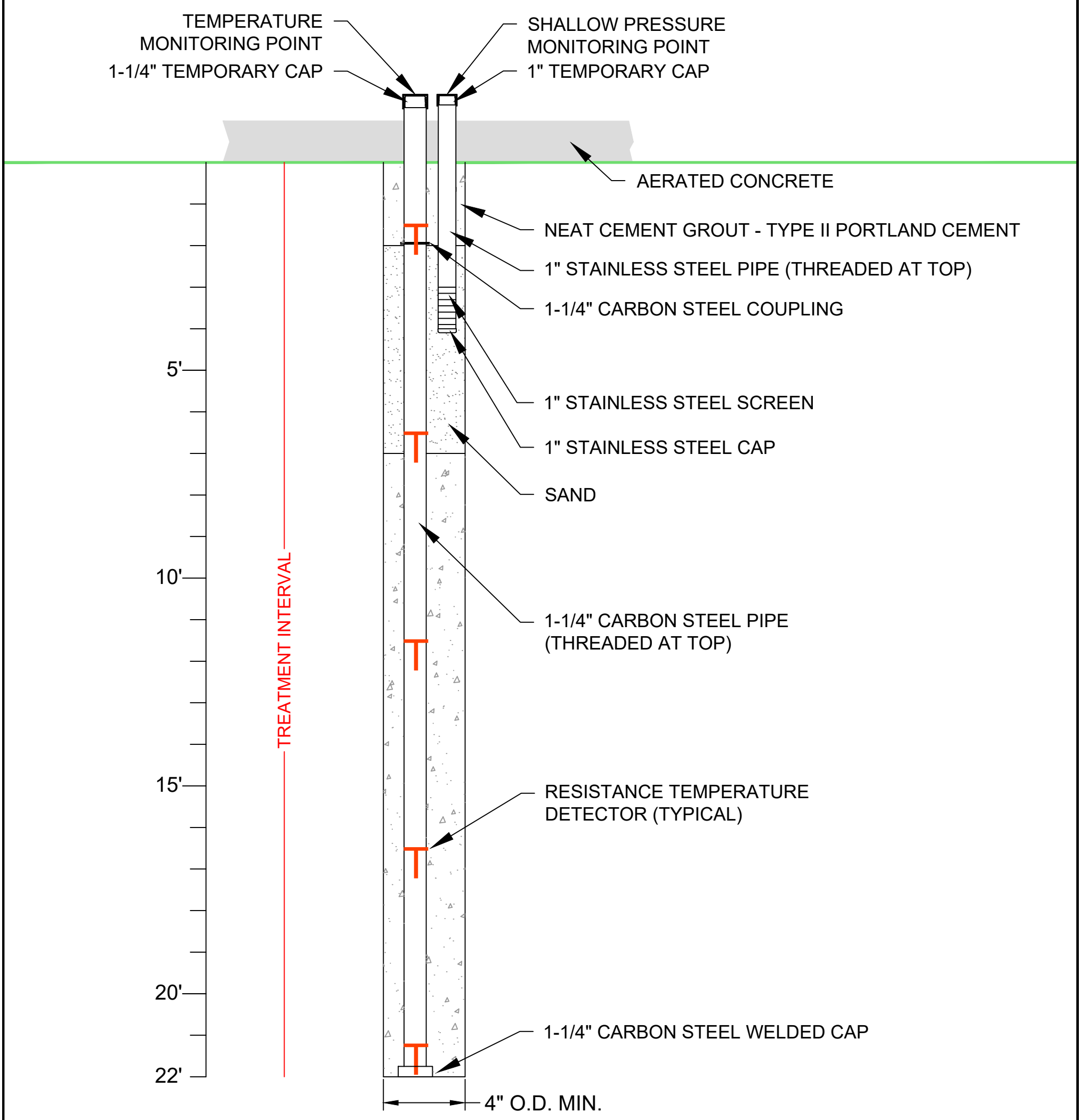
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

TRANSITION ZONE FOR AREA 9
HEATER DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-16

AREA 1
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 1)



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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

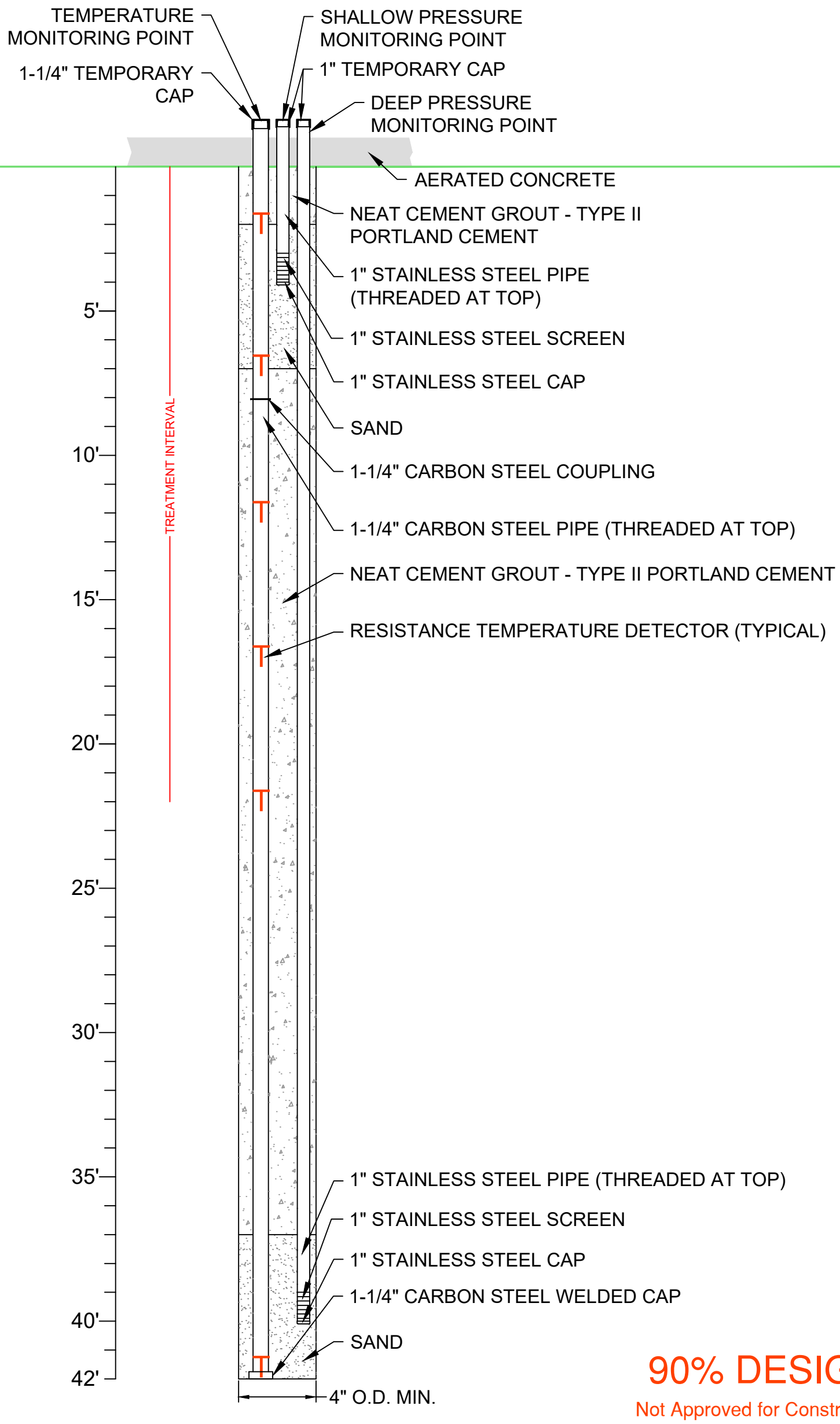
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 1 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-17

AREA 1 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 1)



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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

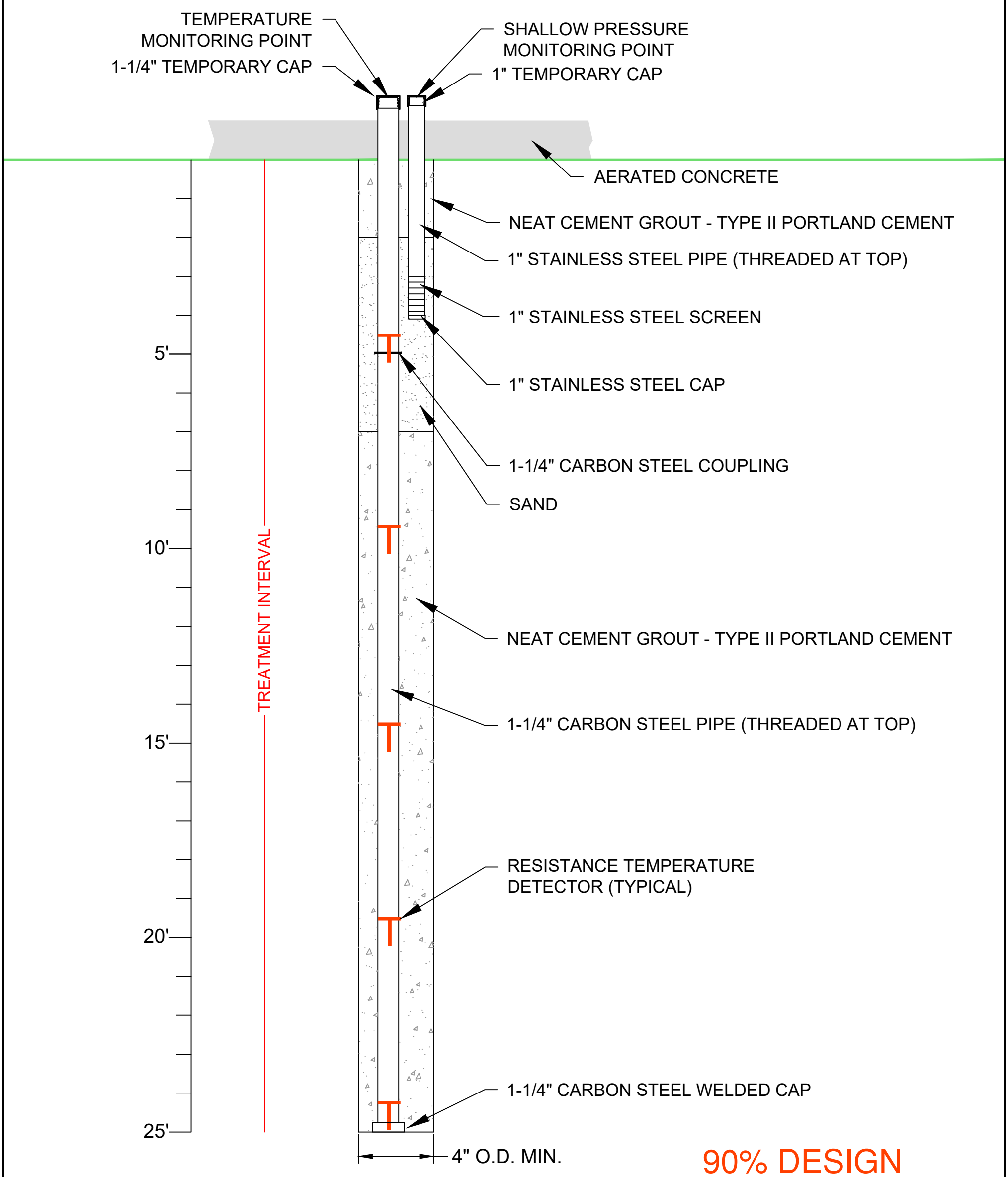
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA1 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-18

AREA 2 AND 7
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 5)



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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

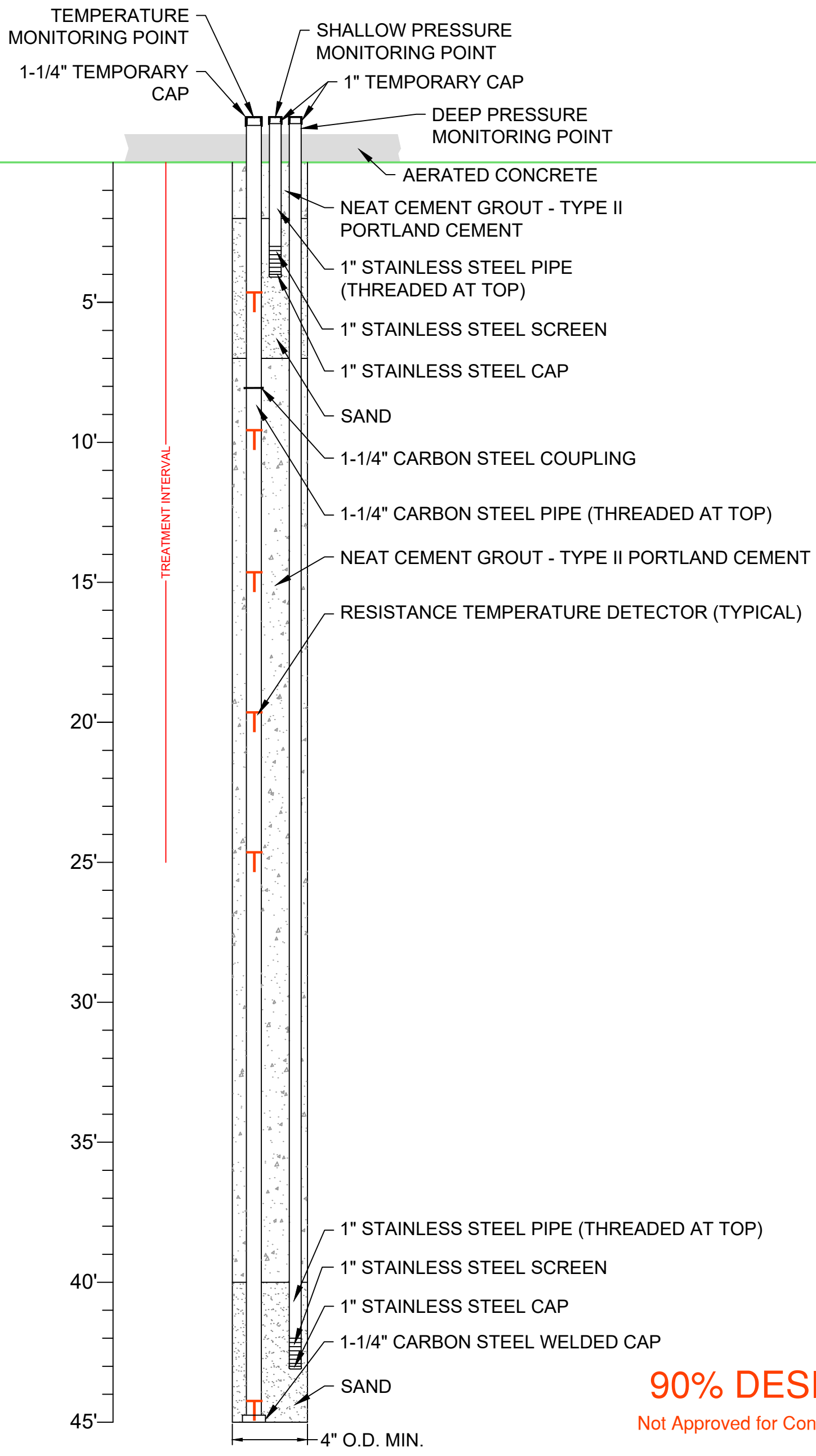
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 2 AND 7
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.FEB.24
PROJECT: WA.1707
SHEET: M-19

AREA 2 AND 7 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 2)



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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

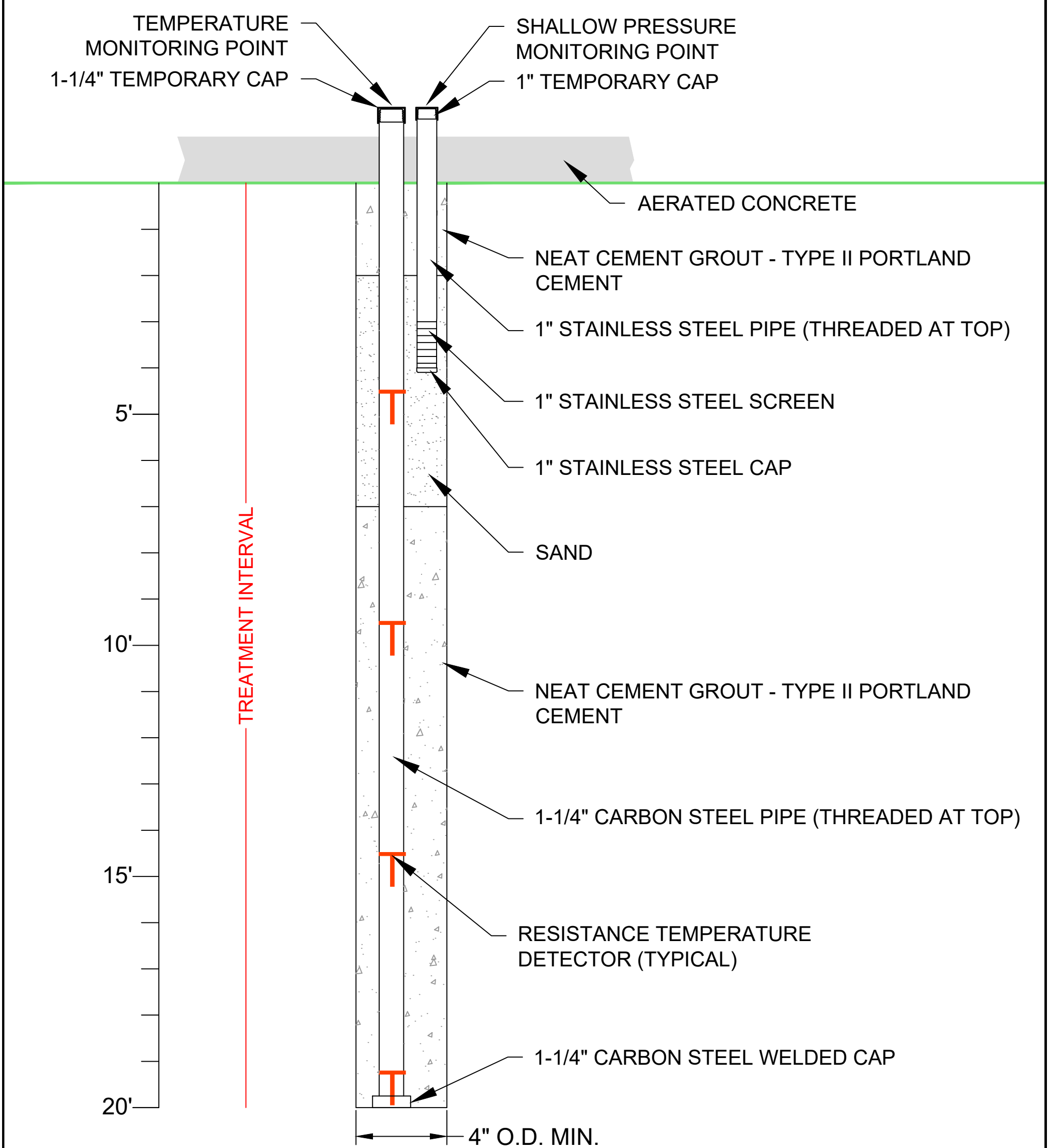
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 2 AND 7
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-20

AREA 3
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 1)



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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

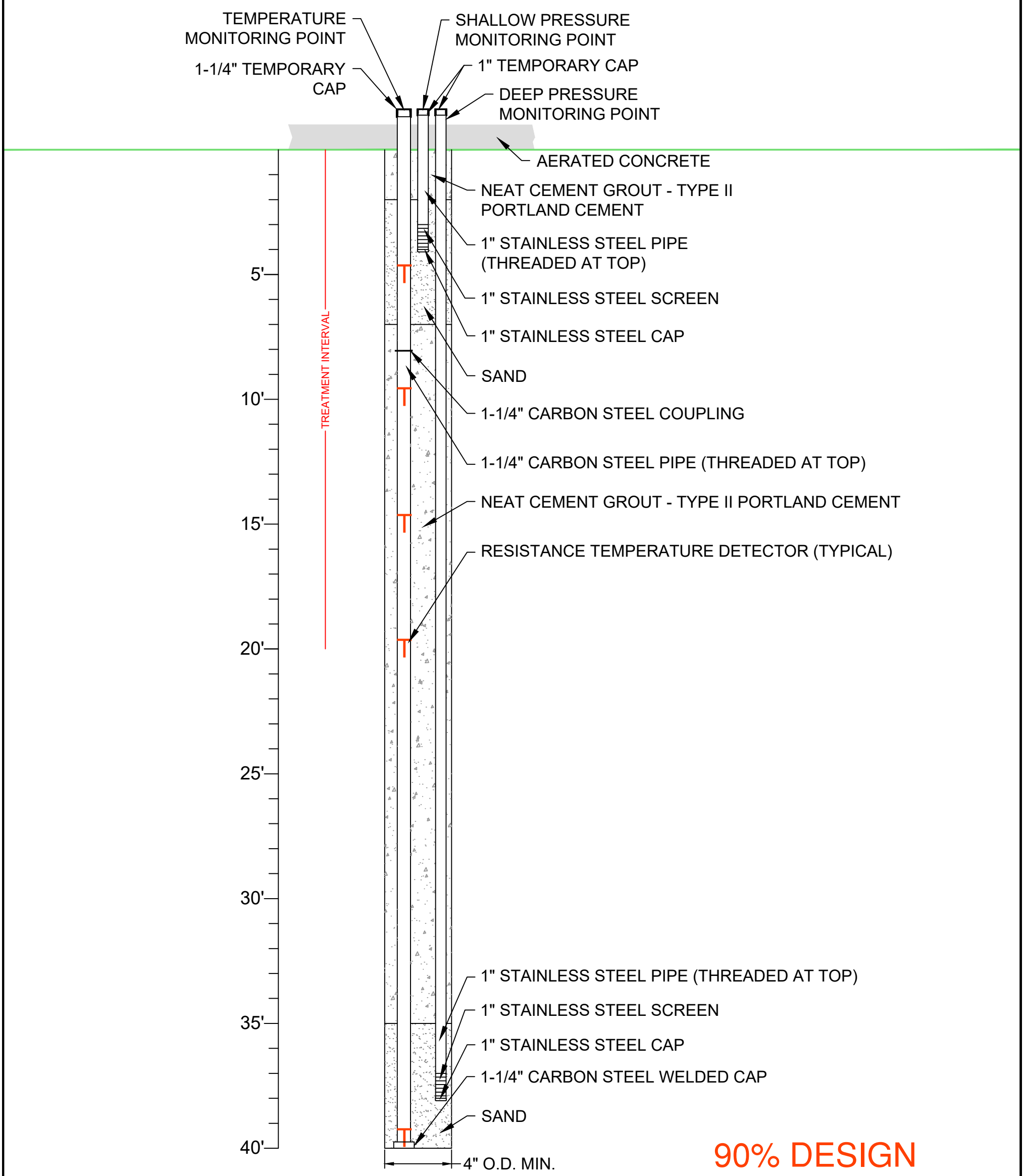
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 3
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-21

AREA 3
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 1)



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TRS Accelerating Value

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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

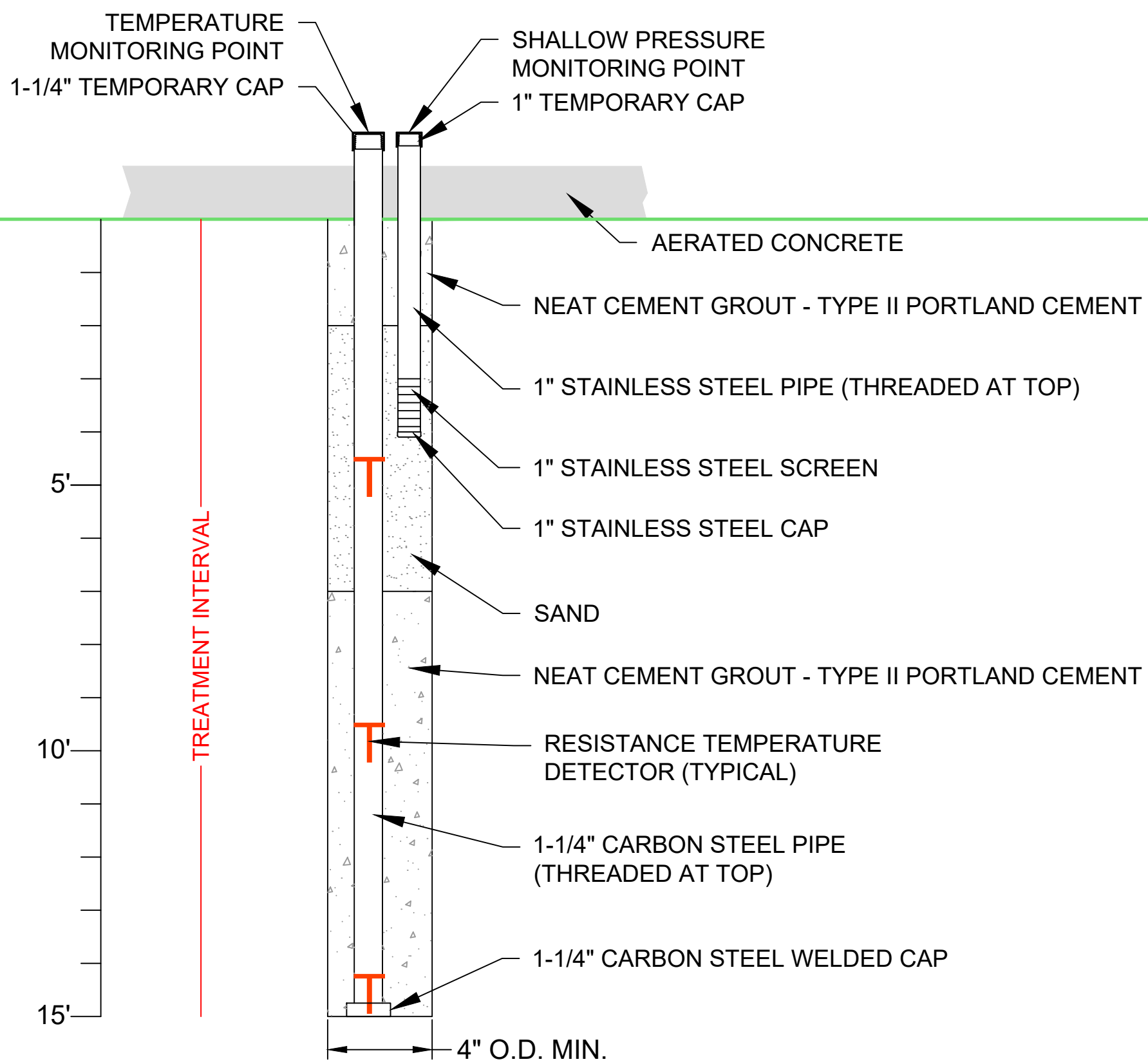
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 3 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-22

AREA 4
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 1)



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TRS Accelerating Value

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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

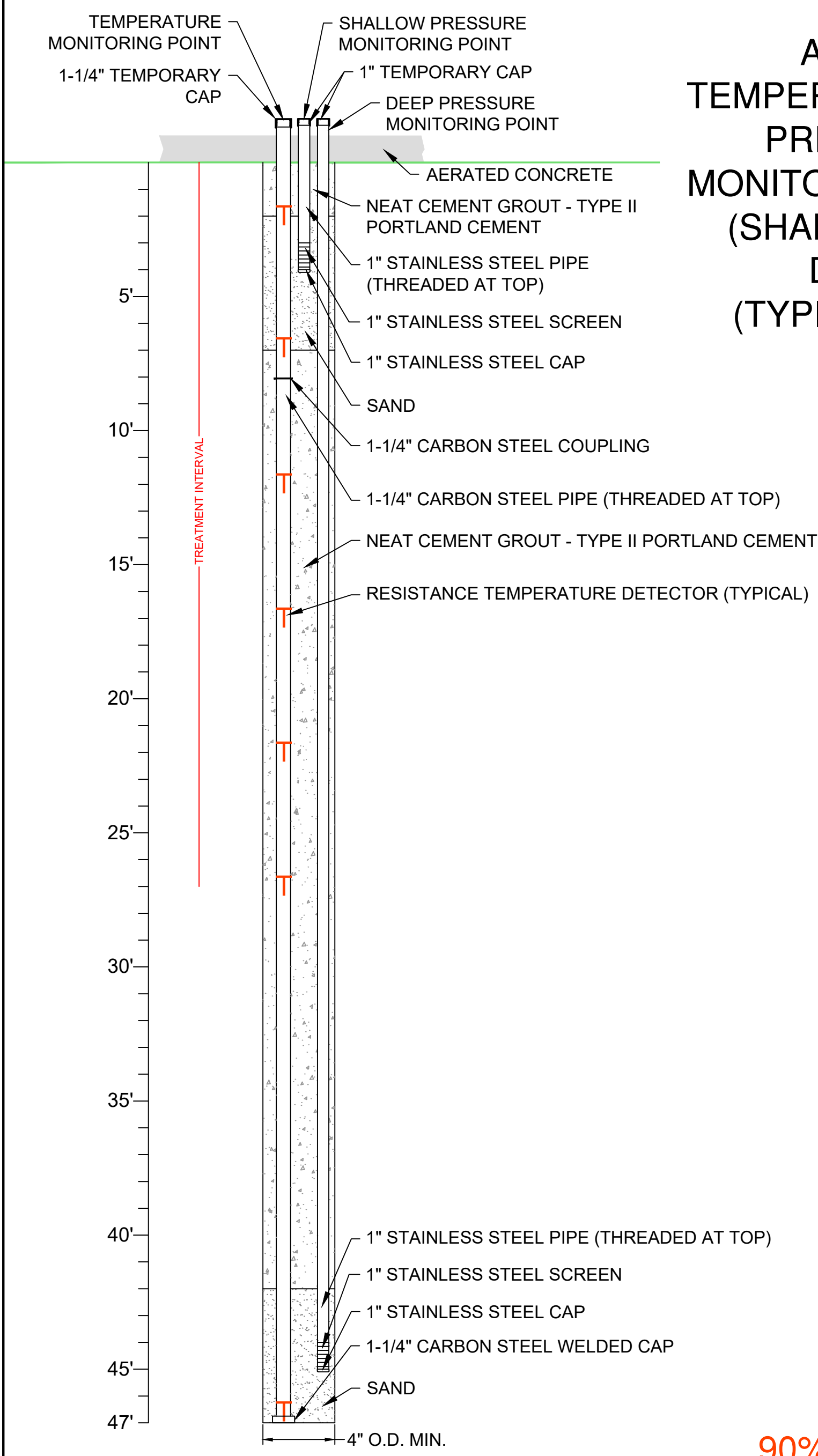
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 4
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-23

AREA 4 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 1)



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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

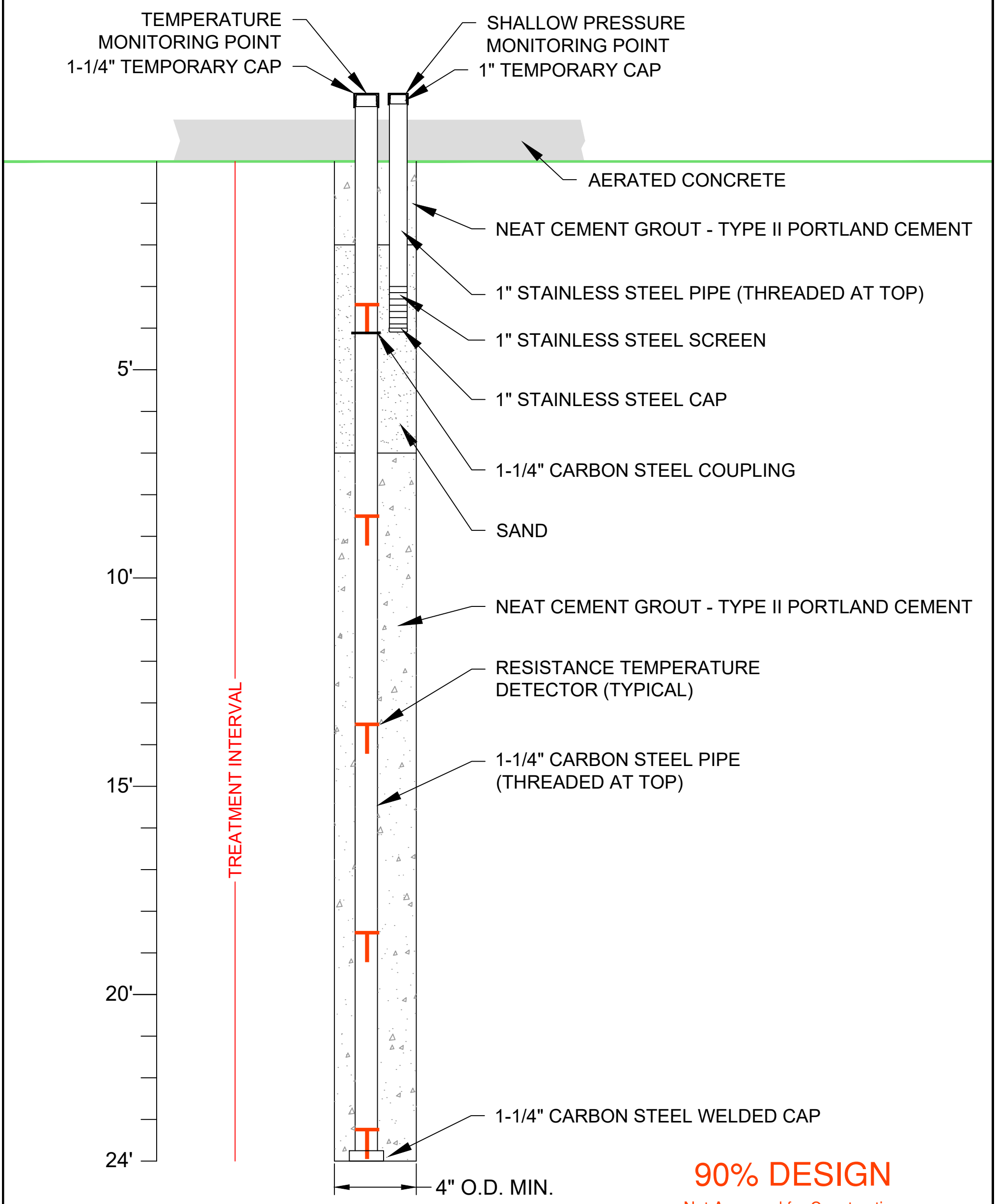
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 4 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-24

AREA 5 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 6)



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DESIGNED BY C. CROWNOVER

DRAWN BY A. PEABODY

CHECKED BY PENDING APPROVAL

PROJECT MANAGER S. AVRITT

QSAT REVIEW QSAT PERSONNEL

SITE PASCO ZONE A

LOCATION PASCO, WA

CLIENT IWAG

AREA 5
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION

BY _____

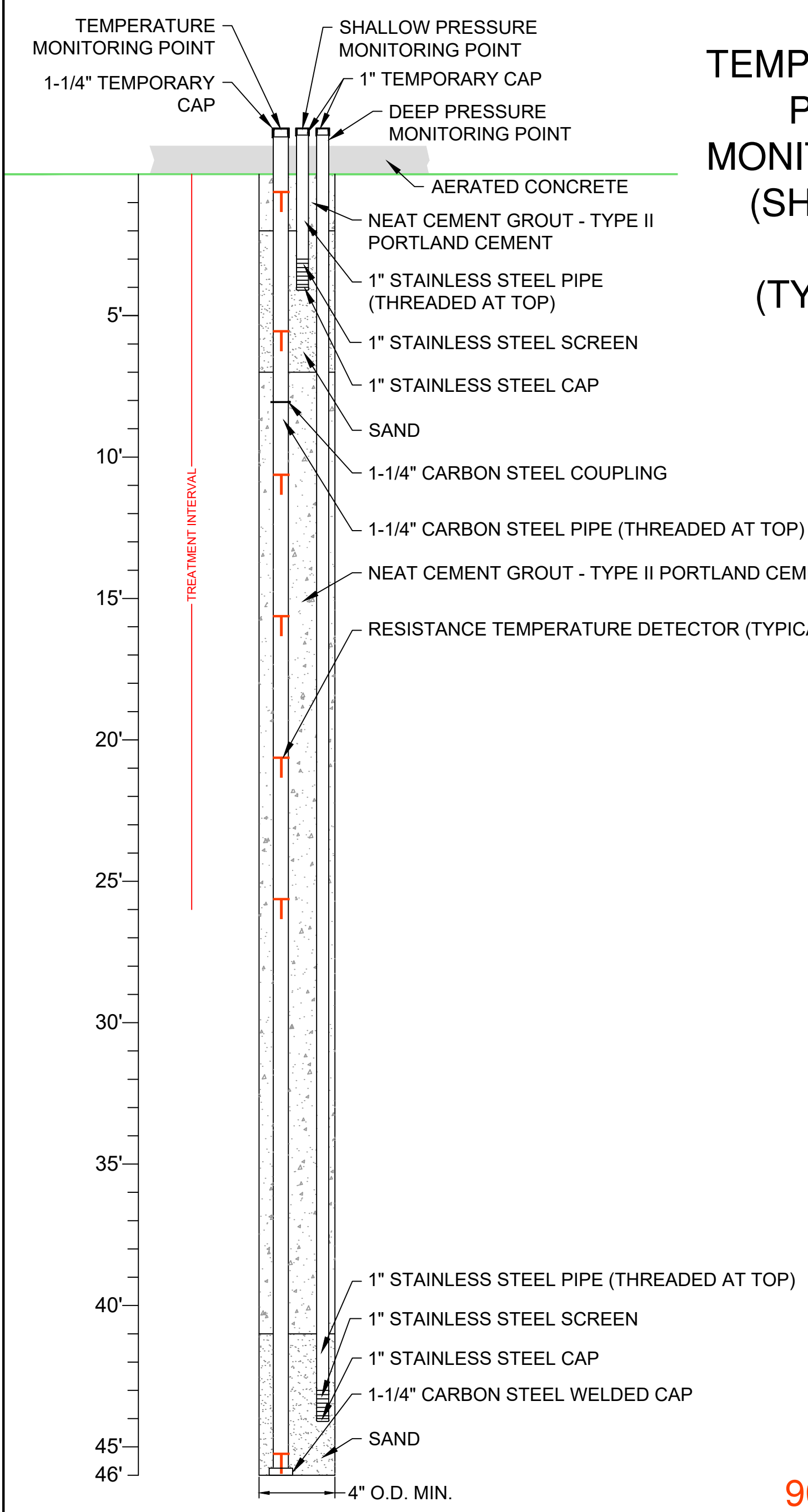
DATE _____

DATE 2023.MAR.08

PROJECT WA.1707

SHEET M-25

AREA 5 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 1)



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DESIGNED BY C. CROWNOVER
DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

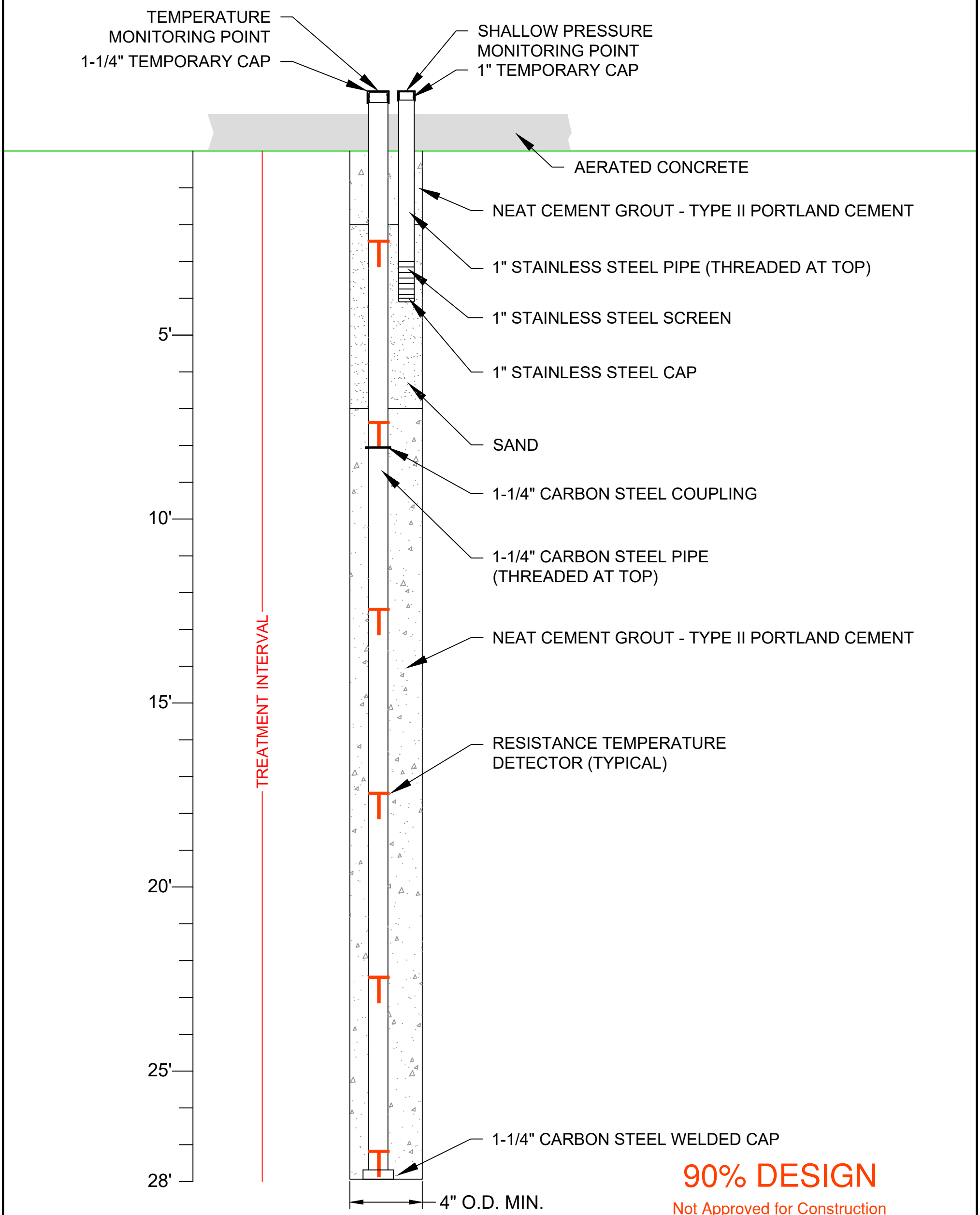
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 5
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-26

AREA 6 AND 8 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) (TYPICAL OF 5)



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PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

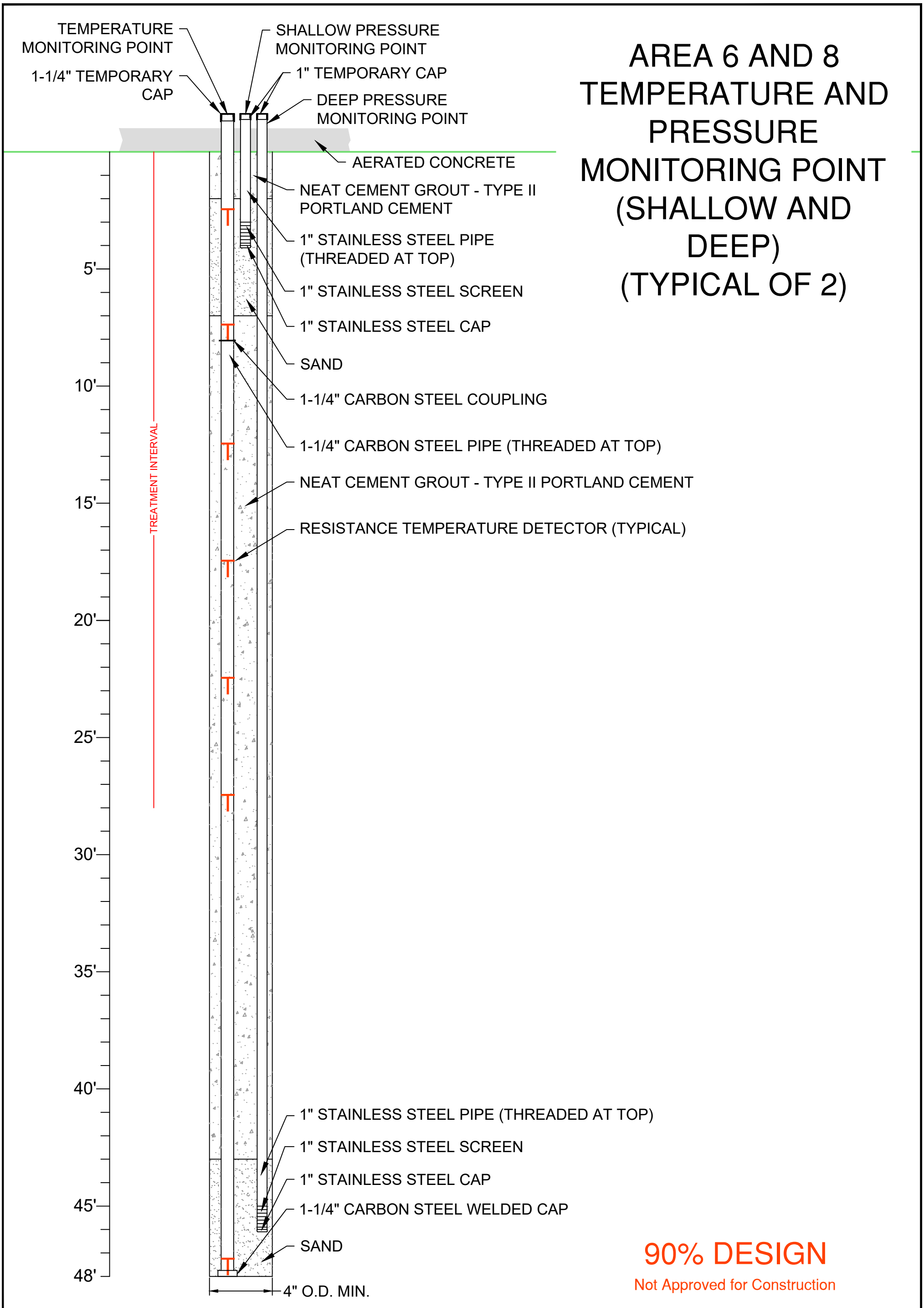
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 6 AND 8
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-27

AREA 6 AND 8 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 2)



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DRAWN BY A. PEABODY
CHECKED BY PENDING APPROVAL
PROJECT MANAGER S. AVRITT
QSAT REVIEW QSAT PERSONNEL

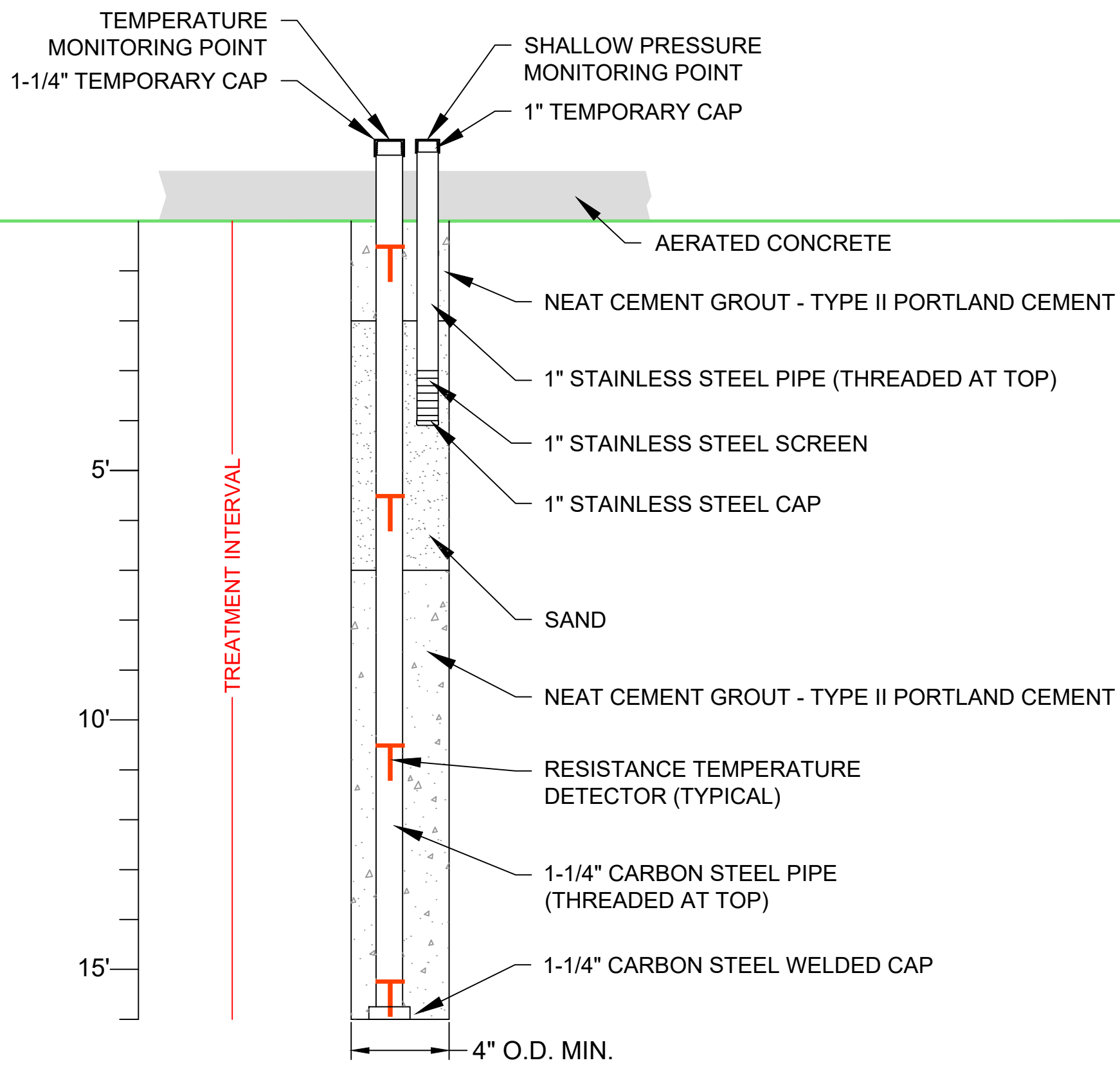
SITE PASCO ZONE A
LOCATION PASCO, WA
CLIENT IWAG

AREA 6 AND 8
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY
DATE

DATE 2023.MAR.08
PROJECT WA.1707
SHEET M-28

AREA 9
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY)
(TYPICAL OF 1)



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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

NO.	DATE	CAD	ENG	REVISIONS
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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

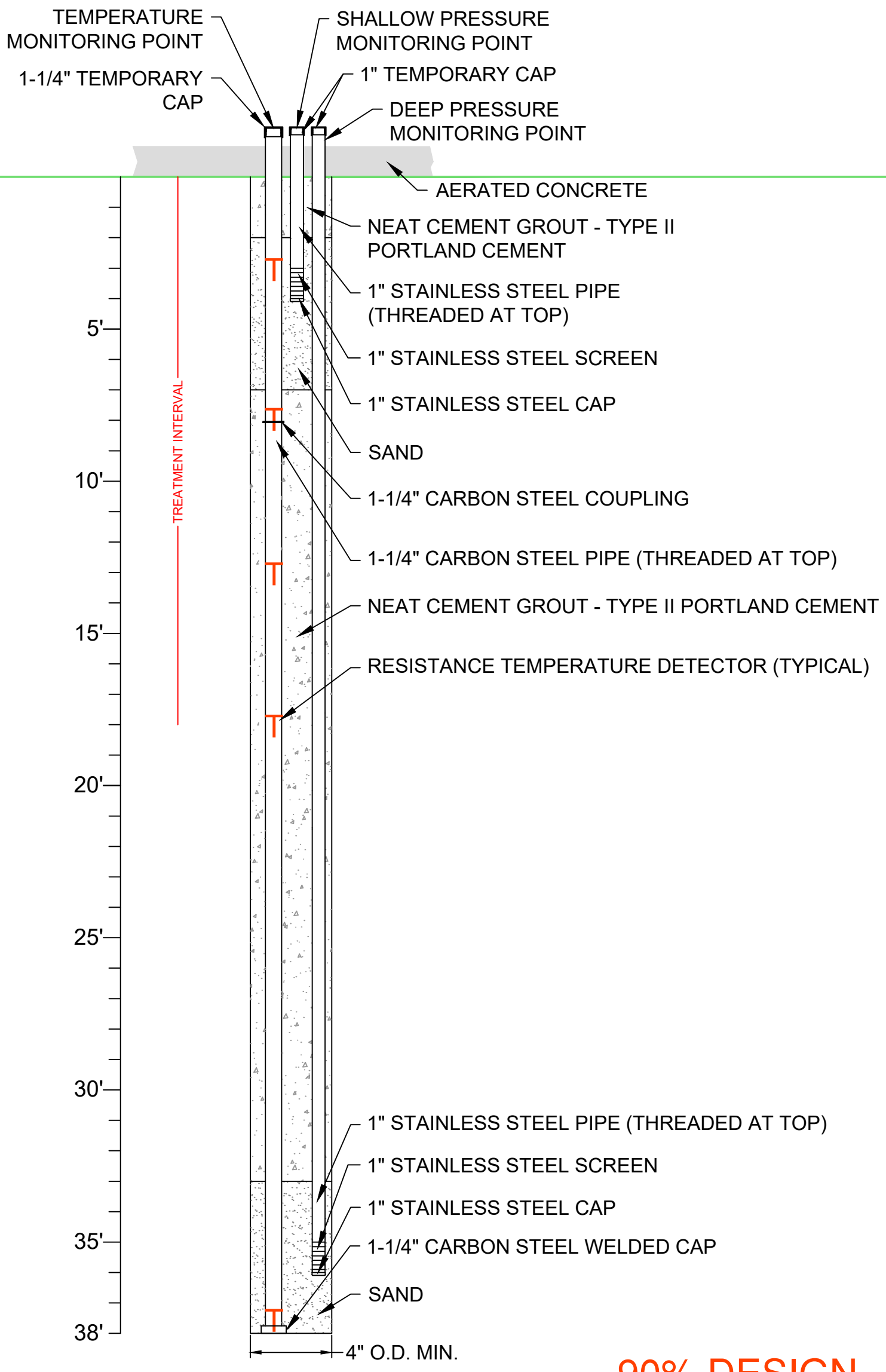
SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 9
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW ONLY) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-29

AREA 9
TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) (TYPICAL OF 1)



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DRAWN BY: A. PEABODY
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PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

AREA 9 TEMPERATURE AND PRESSURE MONITORING POINT (SHALLOW AND DEEP) DETAIL

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.MAR.08
PROJECT: WA.1707
SHEET: M-30

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Not Approved for Construction

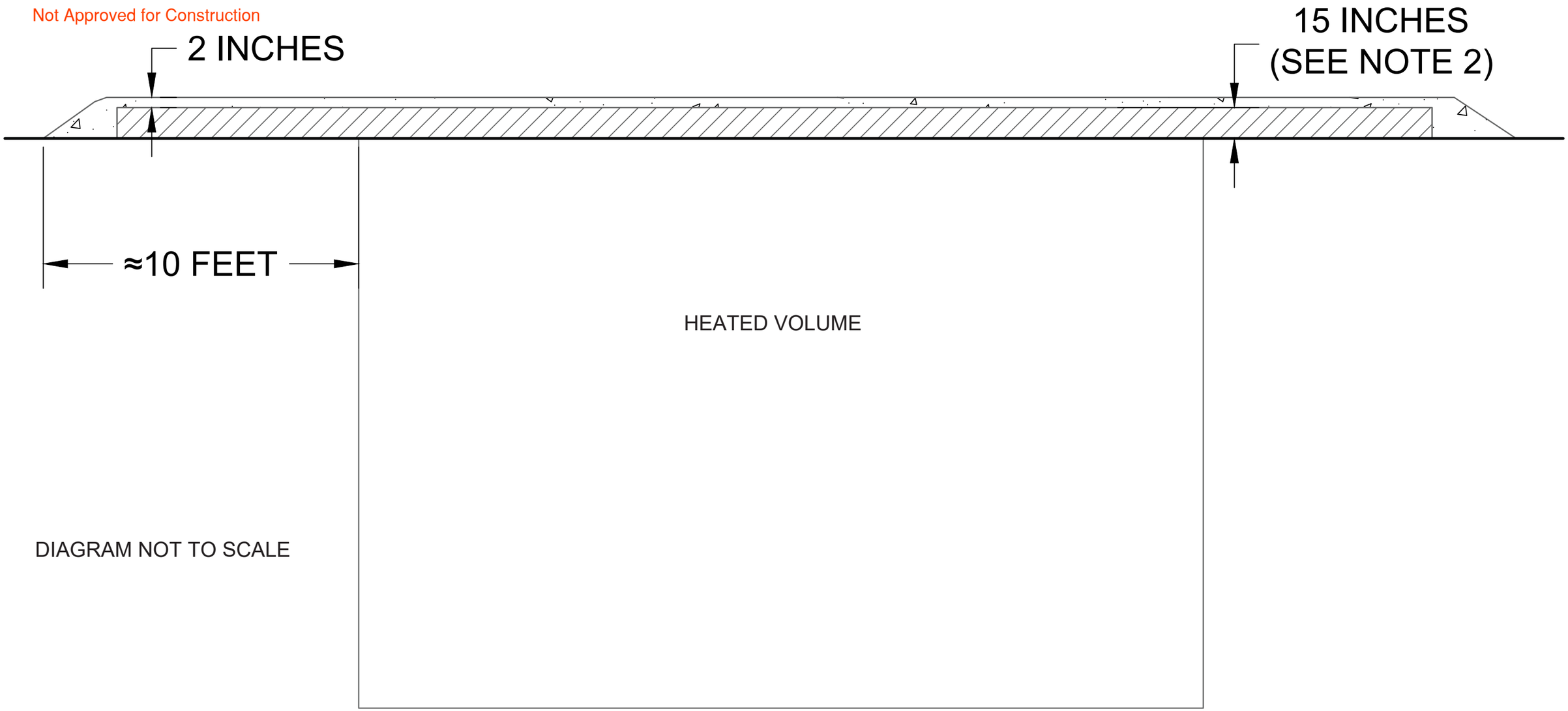

DIAGRAM NOT TO SCALE

Legend

- CONCRETE
- CELLULAR, CLOSED CELL CONCRETE
- MOISTURE BARRIER

NOTES:

1. THE PLASTIC MOISTURE BARRIER WILL PROTECT THE INTEGRITY OF THE CELLULAR CONCRETE DURING THE INITIAL HEATING PHASE.
2. THICKNESS OF SURFACE COVER MAY VARY BETWEEN 12-15' BASED ON CONDITIONS AT INSTALLATION.

NO.	DATE	CAD	ENG	REVISIONS
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DESIGNED BY C. CROWNOVER

DRAWN BY A. PEABODY

CHECKED BY PENDING APPROVAL

PROJECT MANAGER S. AVRITT

QSAT REVIEW QSAT PERSONNEL

SITE PASCO ZONE A

LOCATION PASCO, WA

CLIENT IWAG

INTERIM COVER CONCEPTUAL DESIGN

APPROVED FOR CONSTRUCTION

BY

DATE

DATE 2023.FEB.27

PROJECT WA.1707

SHEET M-31

PIPE MATERIAL ABBREVIATIONS

CS	CARBON STEEL
PVC	POLYVINYL CHLORIDE
SSA	STAINLESS STEEL 304
SS6	STAINLESS STEEL 316
HDPE	HIGH DENSITY POLYETHELYNE
DI	DUCTILE IRON
GS	GALVANIZED STEEL
CU	COPPER
VC	VITROUS CLAY
FRP	FIBERGLASS
PE	POLYETHLENE
PET	POLYETHYLENE TUBING
PFH	PVC FLEX HOSE
CH	CHEMICAL HOSE

LINE SERVICE CODE

AIR	AMBIENT AIR
AV	ATMOSPHERIC VENT
BA	BREATHING AIR
BD	BLOWDOWN
BC	BICARBONATE
BIO	BIOCIDE
BRR	BRINE RETURN
BRS	BRINE SUPPLY
CA	COMPRESSED AIR
CC	CONTAMINATED CONDENSATE
CF	COLD FLARE
CHS	CHEMICAL SEWER
CV	COLD VENT
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
DMW	DEMINERALIZED WATER
DR	DRAIN
DS	DILUTION STEAM
DW	DRINKING WATER
ER	ETHYLENE REFRIGERANT
FF	FLUSHING FLUID
FG	FUEL GAS
FO	FUEL OIL
FW	FIRE WATER
GLR	GLYCOL RETURN
GLS	GLYCOL SUPPLY
H	HYDROGEN
HS	HIGH PRESSURE STEAM
IA	INSTRUMENT AIR
IS	INTERMEDIATE PRESSURE STE AM
LNG	LIQUIFIED NATURAL GAS
LO	LUBE OIL
LPG	LIQUIFIED PETROLEUM GAS
LS	LOW PRESSURE STEAM
ME	METHANOL
MR	MIXED REFRIGERANT
MS	MEDIUM PRESSURE STEAM
N	NITROGEN
NA	CAUSTIC
NAS	CAUSTIC SEWER
NG	NATURAL GAS
NH	AMMONIA
NPW	NON POTABLE WATER
OWS	OILY WATER SEWER
OX	OXYGEN
P	GENERAL PROCESS
PA	PLANT AIR
PC	PROCESS CONDENSATE
PR	PROPYLENE REFRIGERANT
PW	PROCESS WATER
QO	QUENCH OIL
RS	RECOVERED SLOPS
RV	RELIEF VENT
RW	RAW WATER
SC	STEAM CONDENSATE
SD	STACK DISCHARGE
SG	SYNTHESIS GAS
SO	SEAL OIL
SS	SANITARY SEWER
STS	STORM SEWER
SV	SOIL VAPORS
SW	SERVICE WATER
SWR	SEA WATER RETURN
SWS	SEA WATER SUPPLY
TS	SODIUM THIOSULFATE
VAC	VACUUM

PIPING LINES

- DOUBLE CONTAINMENT
- PRIMARY PIPING
- PRIMARY PIPING EXISTING
- SECONDARY PIPING
- SECONDARY PIPING EXISTING
- UTILITY PIPING
- HOSE

SIGNAL LINES

- ELECTRICAL SIGNAL ANALOG
- ELECTRICAL SIGNAL BINARY/DISCRETE
- PNEUMATIC SIGNAL
- SOFTWARE SIGNAL
- SONIC SIGNAL
- HEATER POWER DISTRIBUTION

EQUIPMENT LINES

- EQUIPMENT
- EQUIPMENT EXISTING
- EQUIPMENT VENDOR PACKAGE

MISCELLANEOUS LINES

- CAPILARY
- HYDRAULIC
- MECHANICAL LINK
- TUBING
- WATER ELEVATION

INSULATED PIPING CODE

- XX — PIPING INSULATED
- XX — PIPING INSULATED AND TRACED

AC	ACOUSTIC CONTROL INSULATION
CC	COLD SERVICE INSULATION
CJ	CHILLED FLUID JACKETED
CP	CONDENSATION CONTROL
CT	CHILLED FLUID TRACED
ES	INSTRUMENT ELECTRIC POWER SUPPLY
ET	ELECTRIC TRACED
FP	FIRE PROTECTION INSULATION
HC	HEAT CONSERVATION INSULATION
HJ	HOT FLUID JACKETING
HT	HOT FLUID TRACED
PF	PREVENTION FROM FREEZING INSULATION
PP	PERSONAL PROTECTION INSULATION
PS	PROCESS STABILITY INSULATION
SJ	STEAM JACKETED
ST	STEAM TRACED

FLOW DIRECTION ARROW

OPEN DRAIN

CONNECTOR NUMBER — XXXXX
DESTINATION — YYY
LINE SERVICE CODE — P&ID NO

CLOSED DRAIN

CONNECTOR NUMBER — XXXXX
DESTINATION — YYY
LINE SERVICE CODE — P&ID NO

VALVE SYMBOLS

- GATE
- CHECK
- STOP CHECK
- GLOBE
- BUTTERFLY
- NEEDLE
- BALL
- PLUG
- DIAPHRAGM
- 3-WAY
- 4-WAY
- PINCH
- ANGLE
- FLOAT
- HAND
- WAFER CHECK VALVE
- ANTI-SIPHON VALVE

PIPE FITTING SYMBOLS

- FLANGE
- BLIND FLANGE
- CONCENTRIC (OR GENERIC) REDUCER
- ECCENTRIC REDUCER
- CHEMICAL SEAL
- PLUG (REFERENCE P105)
- CAP
- HOSE CONNECTION
- WELDED CONNECTION
- SPACER
- BLANK
- OPEN FIGURE 8 BLIND
- CLOSED FIGURE 8 BLIND

PIPE SPECIALTY SYMBOLS

- EXCESS FLOW VALVE
- DIVERTER
- ROTARY

PIPE SPECIALTY SYMBOLS CONT.

- Y-TYPE STRAINER
- CONE STRAINER
- T-TYPE STRAINER
- DUPLEX STRAINER
- BASKET STRAINER
- TEMPORARY STRAINER
- FILTER
- DETONATION ARRESTOR
- FLAME ARRESTOR
- DRIP TRAP
- PITOT TUBE
- WATER TRAP
- EXHAUST HEAD
- IN-LINE SILENCER
- VENT SILENCER
- EJECTOR/EDUCTOR
- REMOVALBLE SPOOL
- DESUPERHEATER
- FLEXIBLE HOSE
- EXPANSION JOINT
- DAMPER
- BREATHER
- VENT COVER
- MULTI-LINES
- STATIC MIXER
- CLEANOUT
- FLOW METER TOTALIZER
- OPEN VENT CAP
- WALL PENETRATION

CONTROL VALVE ACTUATOR SYMBOLS

- MANUAL OPERATOR
- DIAPHRAGM
- PRESSURE BALANCED DIAPHRAGM
- HANDWHEEL – USED WITH ANY ACTUATOR
- CYLINDER/PISTON
- MOTOR OPERATED
- ELECTRO-HYDRAULIC
- SOLENOID
- SOLENOID RESET

SELF-ACTUATED DEVICE SYMBOLS

- PRESSURE RELIEF RUPTURE DISC
- VACUUM RELIEF RUPTURE DISC
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE AND VACUUM RELIEF VALVE
- PRESSURE REDUCING REGULATOR
- BACK PRESSURE REGULATOR
- BACK PRESSURE REGULATOR WITH EXTERNAL TAP
- PRESSURE REDUCING REGULATOR WITH EXTERNAL TAP
- DIFFERENTIAL PRESSURE REDUCING REGULATOR
- TEMPERATURE REGULATOR FILLED SYTEM TYPE

PRIMARY FLOW ELEMENT SYMBOLS

- XX — GENERAL SYMBOL IN-LINE ELEMENT XX = FS, FG, FE, FT
- ORIFICE
- M — MAGNETIC
- D — DENSITY
- TURBINE OR PROPELLER
- ULTRASONIC
- VORTEX
- PITOT TUBE
- AVERAGING PITOT TUBE
- FLOW NOZZLE
- VENTURI
- WEDGE METER
- FLUME
- WEIR
- POSITIVE DISPLACEMENT
- ORIFICE IN QUICK CHANGE FITTING
- TARGET
- FLOW CONDITIONING DEVICE (e.g. STRAIGHTENING VANES)

UTILITY SYMBOLS

PA	PLANT AIR
IA	INSTRUMENT AIR
SW	SERVICE WATER
NG	NATURAL GAS
PW	POTABLE WATER
VC	VOLTAGE CONTROL

PROCESS / PAGE CONNECTOR

MATERIAL (EX: CONDENSATE) WHERE TO/WHAT IT'S DOING
PID TO/FROM # | XXXXX
FROM WHERE XXXXX

MATERIAL (EX: CONDENSATE) WHERE TO/WHAT IT'S DOING
XXXXX | PID TO/FROM #
FROM WHERE XXXXX

INSTRUMENT #

INSTRUMENT #

LINE DATA IDENTIFICATION

LINE SIZE (NUMERIC)		PIPE MAT'L (ALPHA)		LINE SERVICE CODE (ALPHA)		SEQUENCE (NUMERIC) (PAGE# STREAM#)
XX	-	XXX	-	XXX	-	XXXX

90% DESIGN

Not Approved for Construction

NOTES

1. THIS IS AN ALL INCLUSIVE LEGEND SHEET. NOT ALL SYMBOLS WILL APPEAR ON EACH SHEET.

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TRS Accelerating Value

TRS GROUP, INC. PO BOX 737 LONGVIEW, WA 98632

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DESIGNED BY: C. CROWNOVER
DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

LEGEND
PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.JUL.26
PROJECT: WA.1707
SHEET: P-1

INSTRUMENTATION LEGEND

	FIRST LETTER		SUCCEEDING–LETTERS		
	MEASURED OR INITIATING VARIBLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	
D	DENSITY OR MASS	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	GAGING (DIMENSIONAL)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE OR HUMIDITY	MOMENTARY			MIDDLE INTERMEDIATE
N					
O			ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIBLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

INSTRUMENT SYMBOLS

LOCATION/ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY AND CONTROL (DCS)	PLC	DISCRETE HARDWARE INTERLOCK
FIELD MOUNTED 1. FIELD OR LOCALLY MOUNTED. 2. ACCESSIBLE TO AN OPERATOR AT DEVICE.				
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. FRONT OF MAIN PANEL OR CONSOLE MOUNTED. 3. VISIBLE ON VIDEO DISPLAY. 4. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. REAR OF PANEL OR CABINET MOUNTED. 3. NOT VISIBLE ON VIDEO DISPLAY. 4. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. FRONT OF SECONDARY OR LOCAL PANEL MOUNTED. 4. VISIBLE ON VIDEO DISPLAY. 5. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. REAR OF SECONDARY OR LOCAL PANEL OR CABINET MOUNTED. 4. NOT VISIBLE ON VIDEO DISPLAY. 5. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.				

MISCELLANEOUS INSTRUMENT SYMBOLS

PILOT LIGHT OR GAUGE GLASS ILLUMINATOR

DUAL FUNCTION OR INSTRUMENTS SHARING COMMON HOUSING

UNDEFINED INTERLOCK LOGIC

FC 1230–99 — INSTRUMENT WITH LONG TAG NUMBER

FUNCTIONAL ELEMENT SYMBOLS

- Σ — SUMMING
- Σ/n — AVERAGING
- Δ — DIFFERENCE
- X — MULTIPLYING
- ÷ — DIVIDING
- √ — SQUARE ROOT
- X^N — EXPONENTIAL
- I/O — CONVERSION INPUT/OUTPUT
- > — HIGH SELECT
- < — LOW SELECT
- >> — HIGH LIMIT
- << — LOW LIMIT
- ± — BIAS
- f(x) — UNSPECIFIED FUNCTION
- AND — AND INTERLOCK
- OR — OR INTERLOCK

MISCELLANEOUS SYMBOLS

- H# — HEATER RTD WHERE: H = TCH HEATER WELL ID NUMBER
- VFD — VARIABLE FREQUENCY DRIVE
- MCC — MOTOR CONTROL CENTER
- LEVEL SWITCH
- XX — NOTE REFERENCE SYMBOL (XX = NOTE NUMBER, ROTATE ARROW AS REQUIRED)
- UNASSIGNED1 UNASSIGNED2 — POINT OF CHANGE (LINE CLASS OR INSULATION REQUIREMENT)
- P XXXX — PURGE CONNECTION (XXXX = PURGE PRESSURE AND MEDIUM)
- SC XX/YY — SAMPLE CONNECTION (XX/YY = TYPE/NUMBER)
- T XXXX — TIE POINT CONNECTION (XXXX = IDENTIFICATION NUMBER)
- WATER LEVEL
- LINE BREAK
- FLOW ARROW
- SLOPE
- HOA — HAND–OFF–AUTO
- DEV — DEVIATION
- LEL — LOWER EXPLOSIVE LIMIT
- NC — NORMALLY CLOSED
- NO — NORMALLY OPENED

PUMPS

HORIZONTAL CENTRIFUGAL PUMP

POSITIVE DISPLACEMENT PUMP

AIR DIAPHRAGM PUMP

VERTICAL INLINE PUMP

LIQUID RING VACUUM PUMP

VACUUM PUMP

SUBMERSIBLE PUMP

CENTRIFUGAL SUMP PUMP

VERTICAL CAN PUMP

VERTICAL TURBINE PUMP

PROGRESSIVE CAVITY PUMP

SCREW PUMP

METERING PUMP

VESSELS

OPEN TANK

TANK

BARREL

KNOCK–OUT DRUM

DISHED ENDS VESSEL

ION EX — WATER SOFTENER

DOUBLE WALL TANK

BLOWERS

POSITIVE DISPLACEMENT BLOWER

CENTRIFUGAL BLOWER

FANS

CENTRIFUGAL FAN

MISC

OFFSITE TRANSPORT

PLATE AND FRAME HEAT EXCHANGER

FORCED DRAFT COOLING TOWER

THERMAL INSULATION VESSEL

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LEGEND
PROCESS AND INSTRUMENTATION DIAGRAM

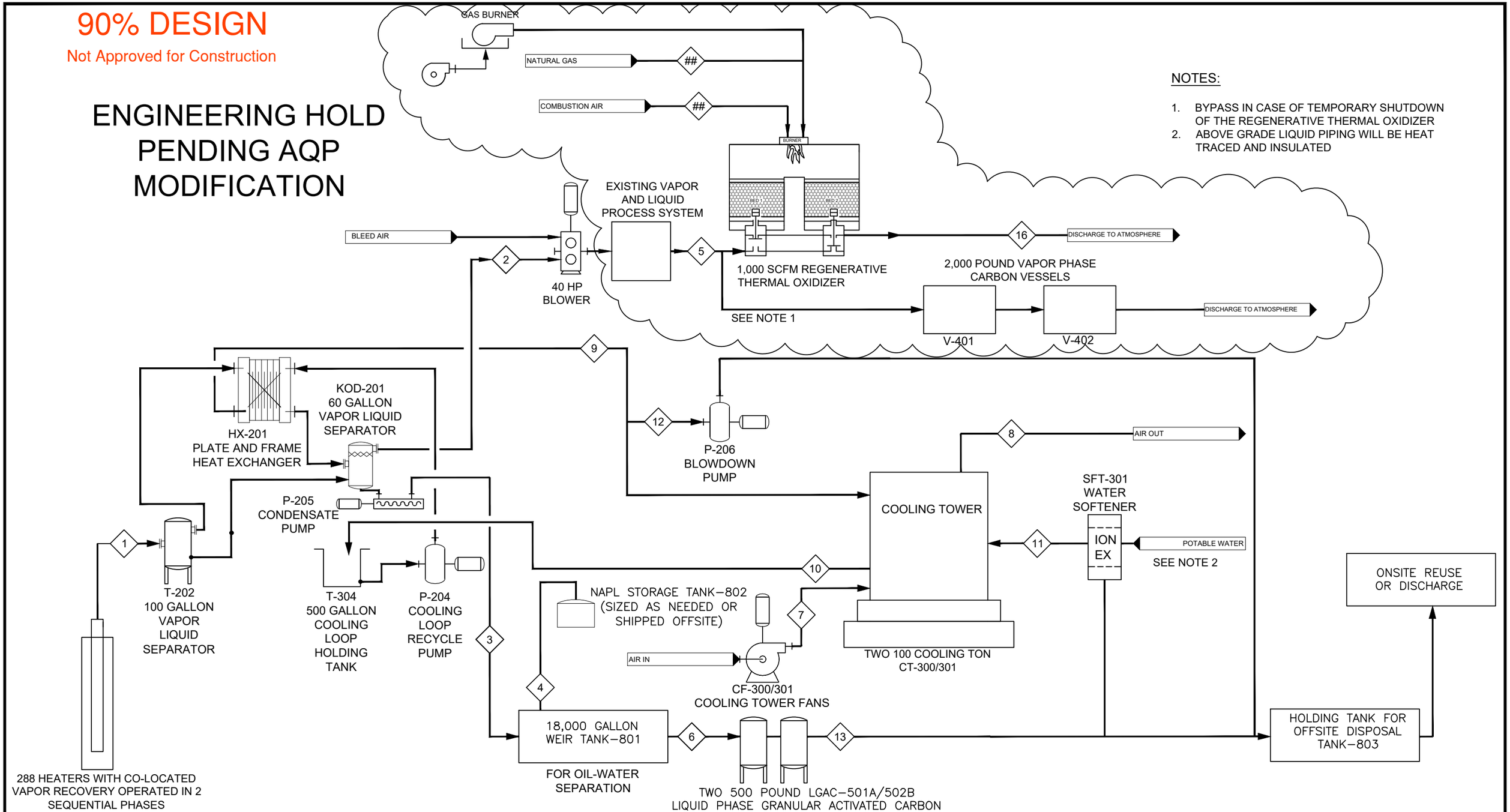
APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.JUL.26
PROJECT: WA.1707
SHEET: P-2

90% DESIGN

Not Approved for Construction

ENGINEERING HOLD PENDING AQP MODIFICATION



NOTES:

1. BYPASS IN CASE OF TEMPORARY SHUTDOWN OF THE REGENERATIVE THERMAL OXIDIZER
2. ABOVE GRADE LIQUID PIPING WILL BE HEAT TRACED AND INSULATED

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PROCESS FLOW DIAGRAM

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.APR.08
PROJECT: WA.1707
SHEET: P-3

90% DESIGN

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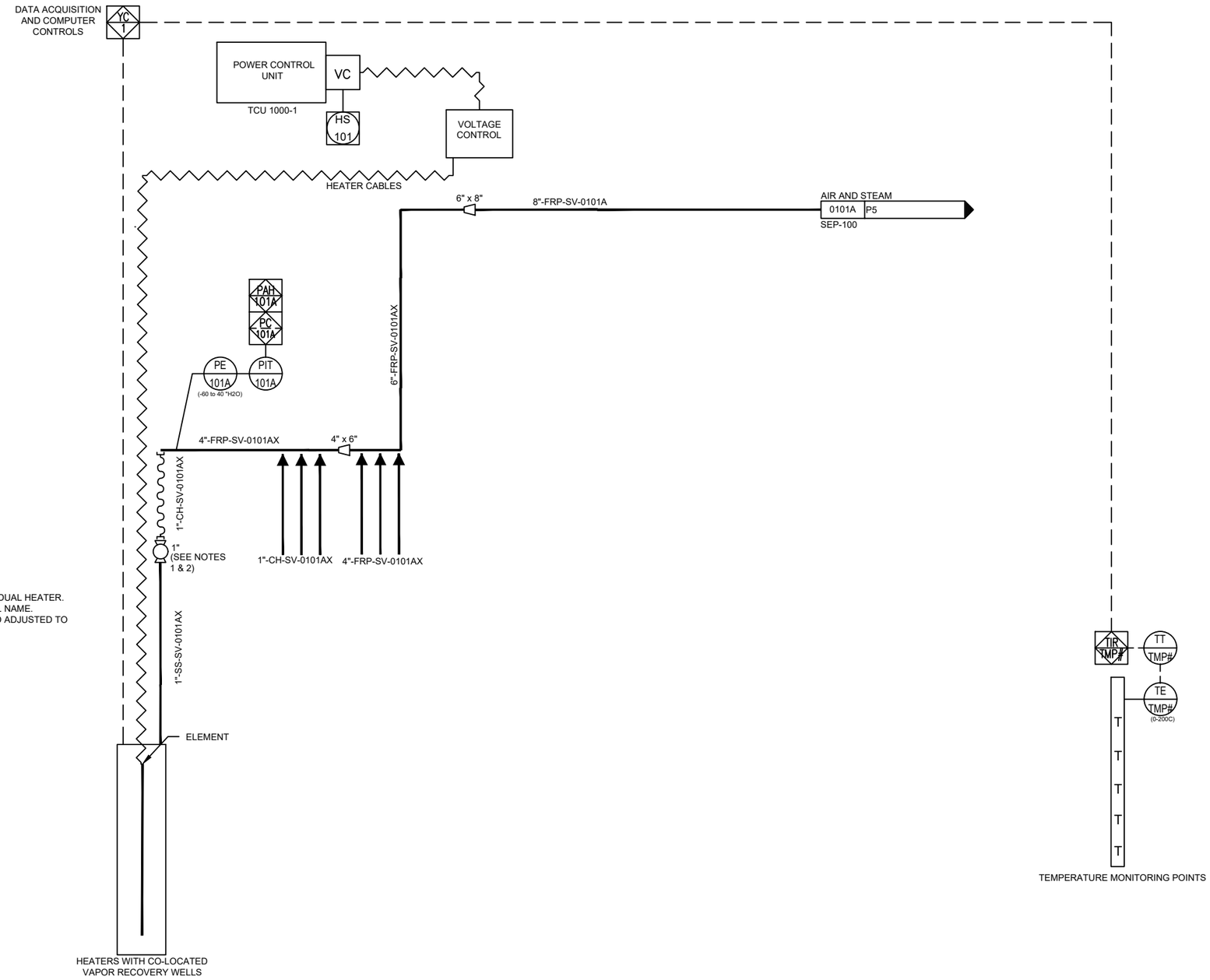

NOTES:
1. BALL VALVES WILL BE CO-LOCATED WITH EACH INDIVIDUAL HEATER. BALL VALVES WILL BE LABELED AS "BV-" HEATER WELL NAME.
2. BALL VALVES WILL BE INSTALLED AS 75% CLOSED AND ADJUSTED TO OPTIMIZE VAPOR CAPTURE.

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FIELD
PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.JUL.26
PROJECT: WA.1707
SHEET: P-4

90% DESIGN

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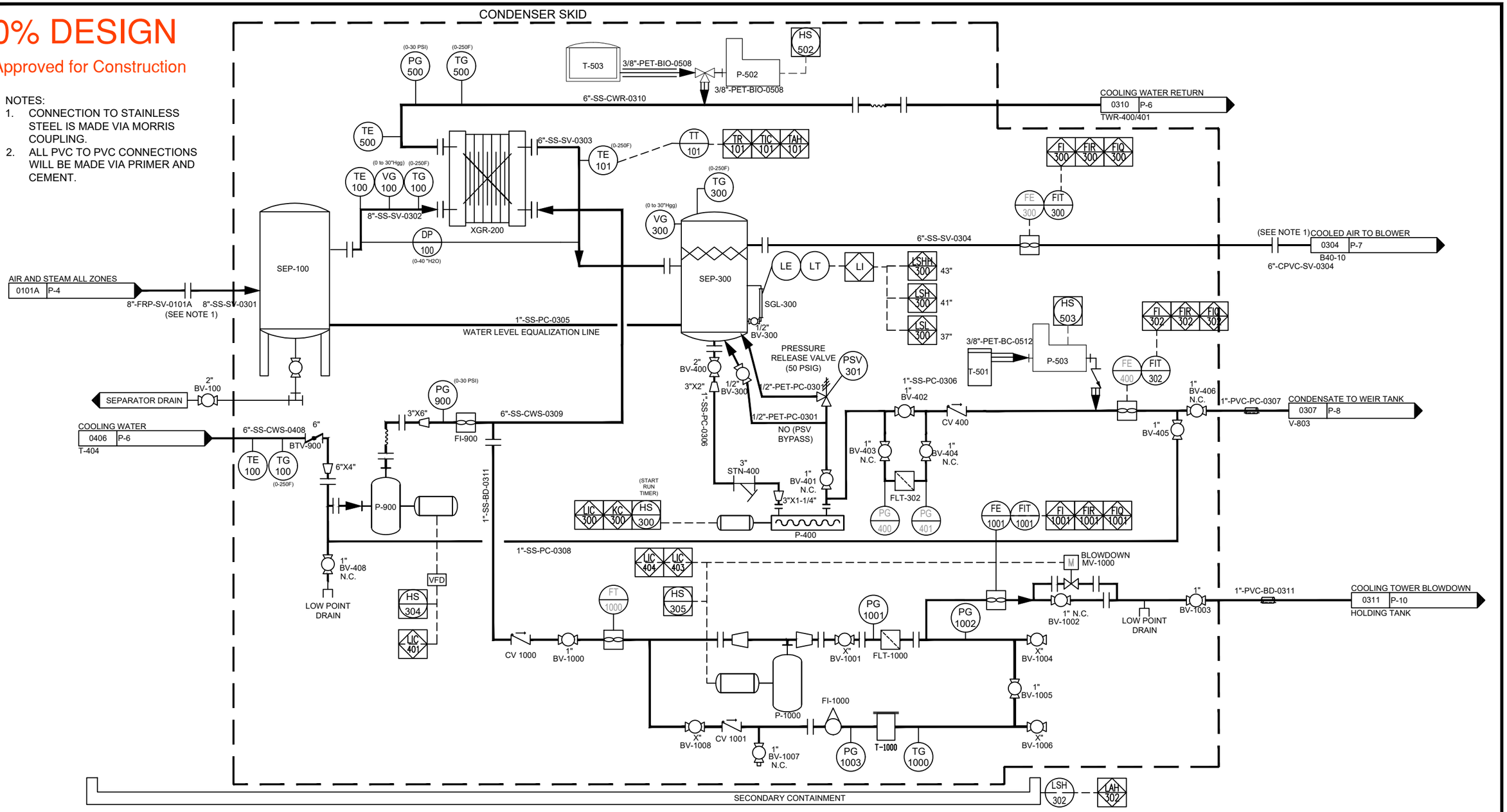
NOTES:
1. CONNECTION TO STAINLESS STEEL IS MADE VIA MORRIS COUPLING.
2. ALL PVC TO PVC CONNECTIONS WILL BE MADE VIA PRIMER AND CEMENT.



P-1000
DRIP PUMP
3/4 HP
480 VAC, 3 PH

P-900
COOLING WATER RECYCLE PUMP
15 HP
480 VAC, 3 PH
VFD

P-400
CONDENSATE PUMP
2 HP
480 VAC, 3 PH

P-503
CONDENSATE
BICARBONATE PUMP
MAX FLOW 0.21 GPH

P-502
BIOCIDE PUMP
MAX FLOW 0.21 GPH

SEP-100
PRIMARY MOISTURE
SEPARATOR
SS 3' DIA

SEP-300
SECONDARY MOISTURE
SEPARATOR
SS 2.5' DIA
SS DEMISTER

FLT-302
SS
100 MICRON
RATING: 100 PSIG

T-501
CONDENSATE
BICARBONATE TANK
POLY

T-503
BIOCIDE TANK
POLY

FLT-1000
POLYPROPYLENE
50 MICRON
RATING: 100 PSIG

NO.	DATE	CAD	ENG	REVISIONS
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DRAWN BY: A. PEABODY
CHECKED BY: PENDING APPROVAL
PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

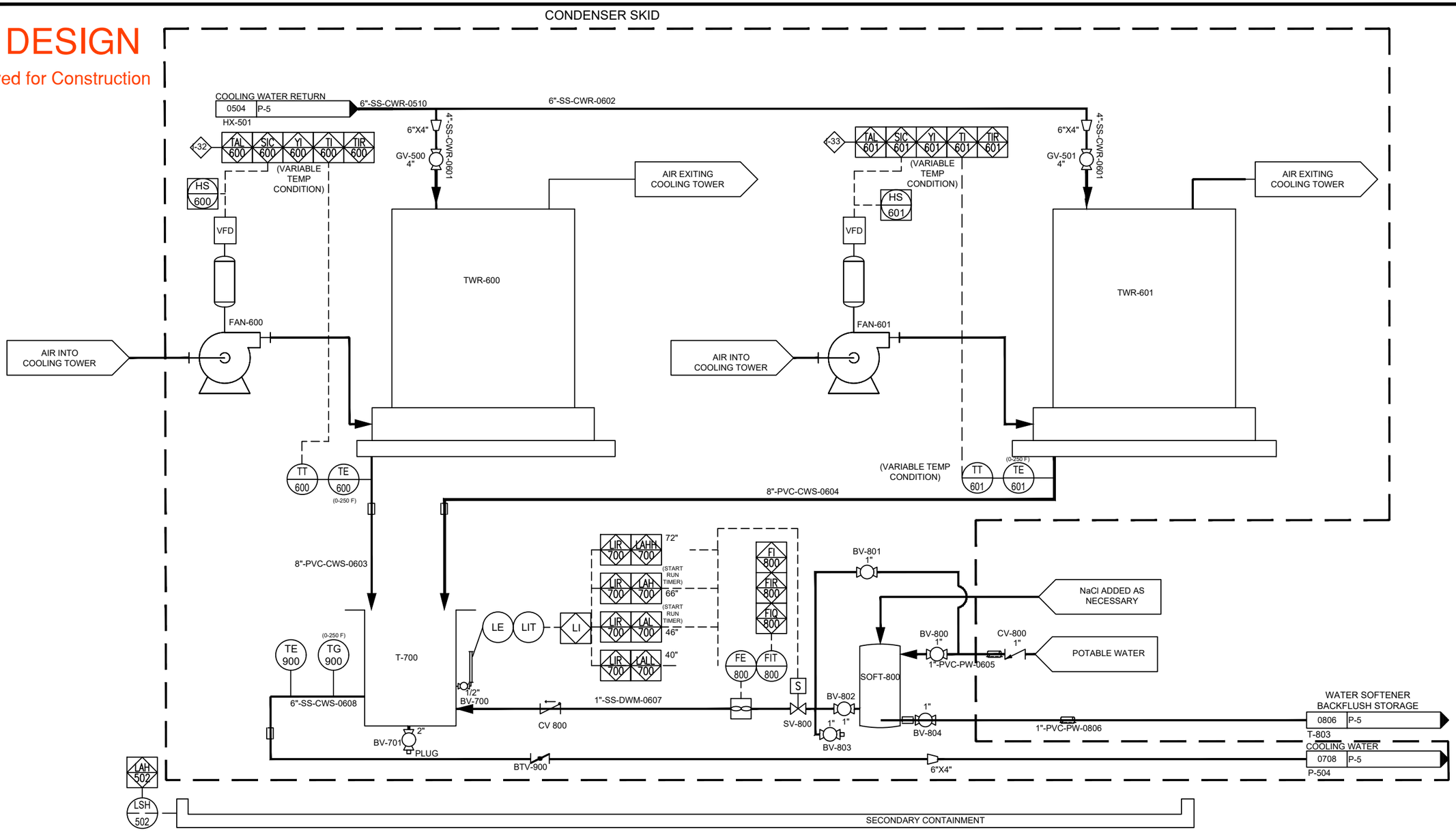
CONDENSER
PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION
BY
DATE

DATE: 2023.JUL.26
PROJECT: WA.1707
SHEET: P-5

90% DESIGN

Not Approved for Construction



TWR-600/601
COOLING TOWER FANS
15 HP
480 VAC, 3 PH
VFD

T-700
MAKE UP WATER STORAGE TANK
STEEL

SOFT-800
WATER SOFTENER ION EXCHANGE TANK
40 GAL
POLY

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QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
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COOLING TOWER PROCESS AND INSTRUMENTATION DIAGRAM

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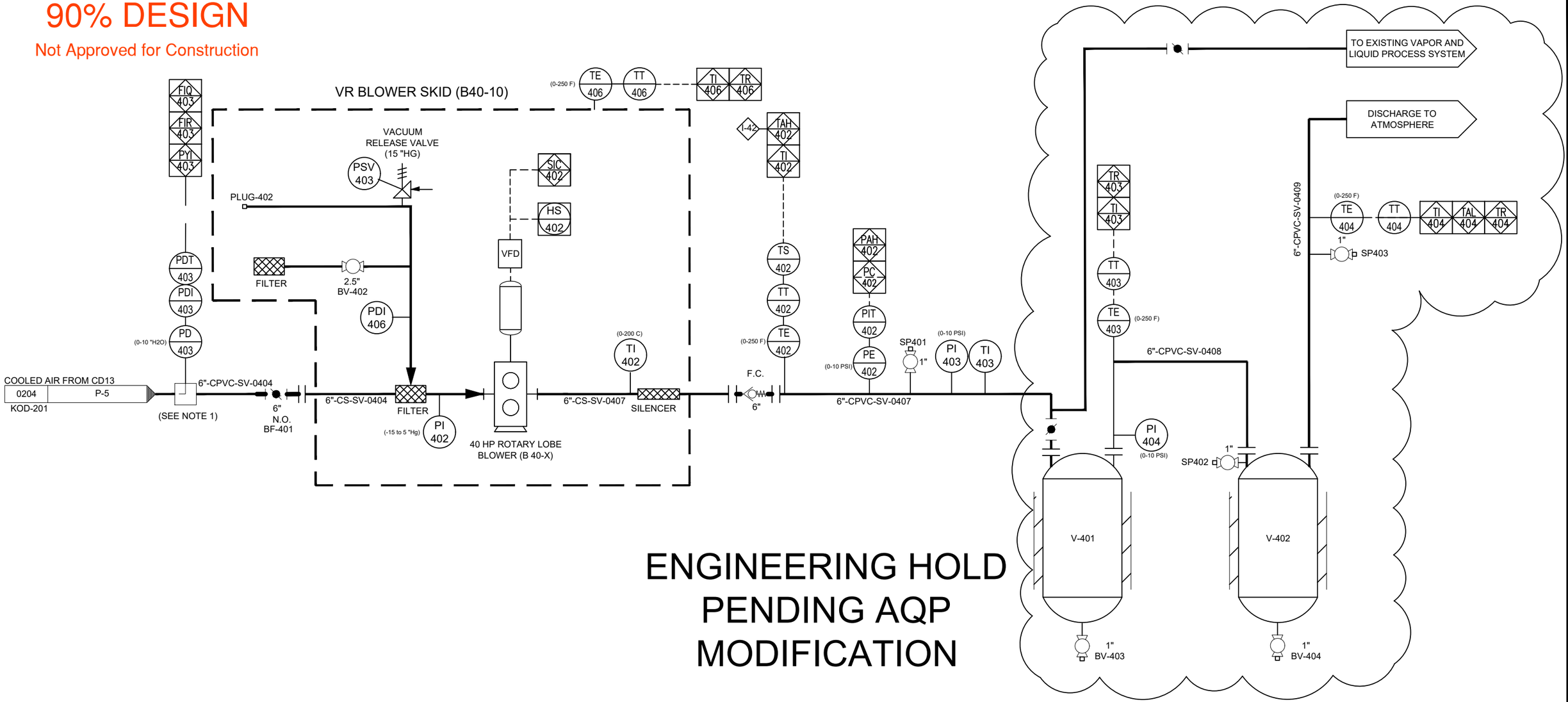

ENGINEERING HOLD
PENDING AQP
MODIFICATION

V-401/402
VAPOR CARBON PRIMARY VESSELS
CARBON STEEL
2000# GAC MEDIA
RATING: 4 PSIG @ 60°C
INSULATED
(VGAC IS AS REQUIRED BY LOCAL,STATE
AND FEDERAL REQUIREMENTS.)

B 40-X
ROTARY LOBE VACUUM BLOWER
40 HP
480 VAC, 3 PH

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QSAT REVIEW: QSAT PERSONNEL

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LOCATION: PASCO, WA
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VAPOR TREATMENT
PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION
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DATE

DATE: 2023.JUL.26
PROJECT: WA.1707
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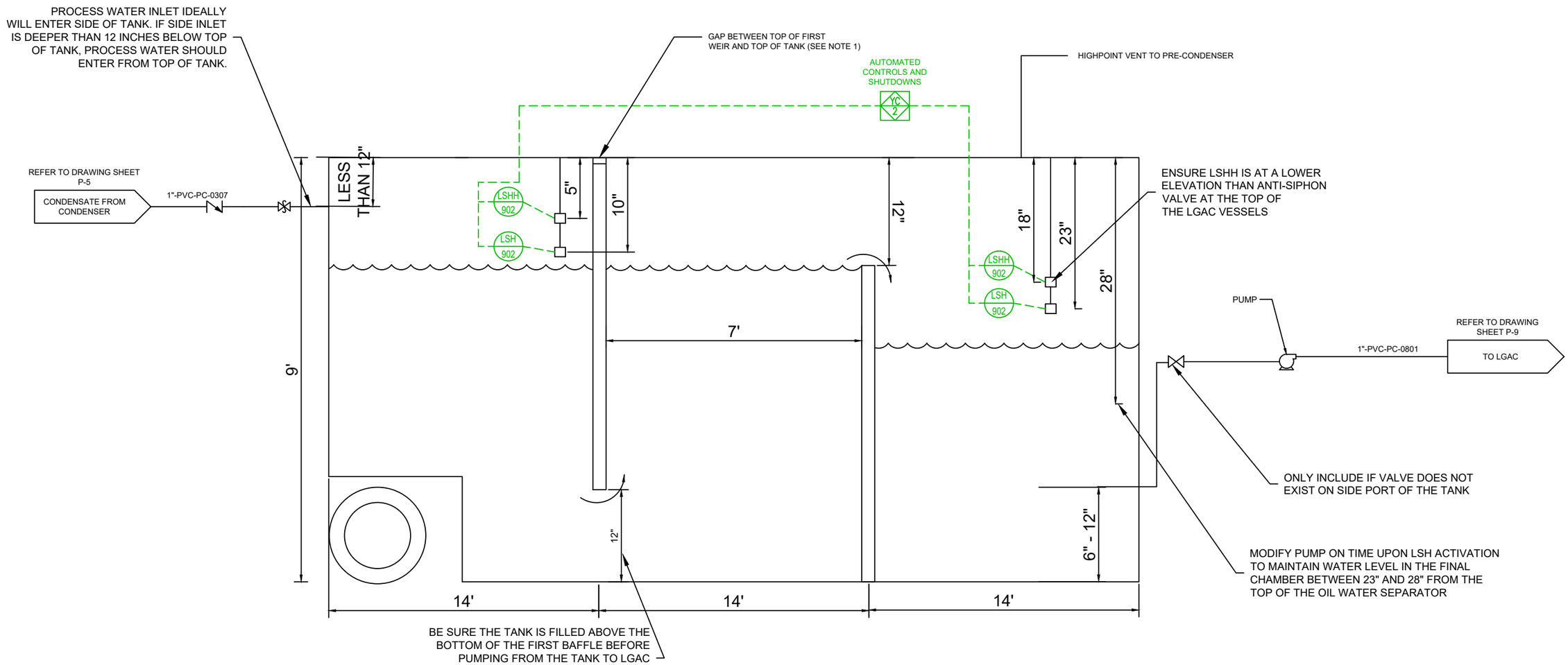

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QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

WEIR TANK
PROCESS AND INSTRUMENTATION DIAGRAM

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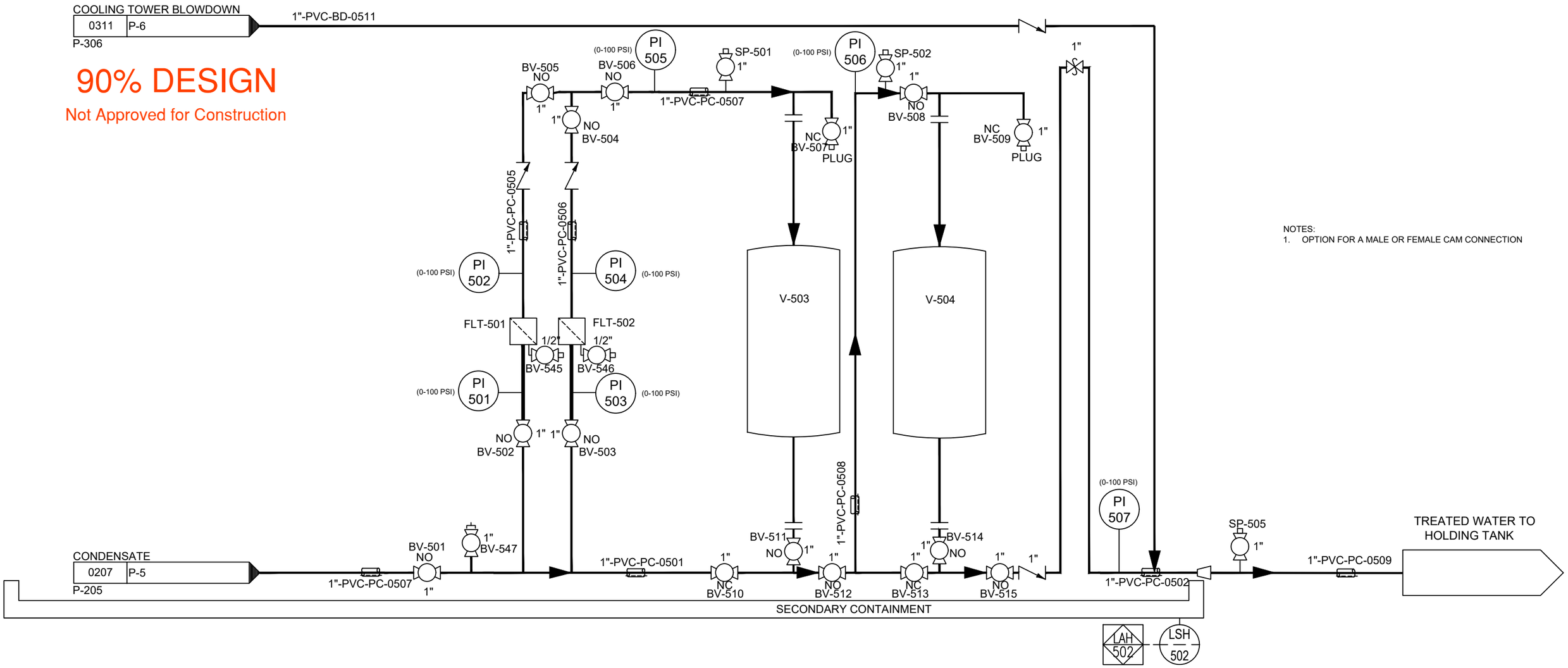
SHEET: P-8



NOTES:
1. OPTION FOR A MALE OR FEMALE CAM CONNECTION

FLT-501/502
CARTRIDGE FILTER
SS
50 MICRON
INSULATED AND HEATED
RATING: 100 PSIG

V-503/504
LIQUID CARBON PRIMARY VESSELS
FIBERGLASS
200# GAC MEDIA
INSULATED AND HEATED
RATING: 150 PSIG @ 60°C

FLT-503/504
CARTRIDGE FILTER
SS
50 MICRON
INSULATED AND HEATED
RATING: 100 PSIG

V-503/504
LIQUID CARBON PRIMARY VESSELS
FIBERGLASS
500# GAC MEDIA
INSULATED AND HEATED
RATING: 150 PSIG @ 60°C

P-501
TREATED WATER TRANSFER PUMP
0.5 HP, 460 VAC, 3PH
TEFC. 15GPM AT 36FT TDH
GOULDS MODEL 3656/3756
S-GROUP

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PROJECT MANAGER: S. AVRITT
QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A
LOCATION: PASCO, WA
CLIENT: IWAG

WATER TREATMENT PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION
BY _____
DATE _____

DATE: 2023.JUL.26
PROJECT: WA.1707
SHEET: P-9

90% DESIGN

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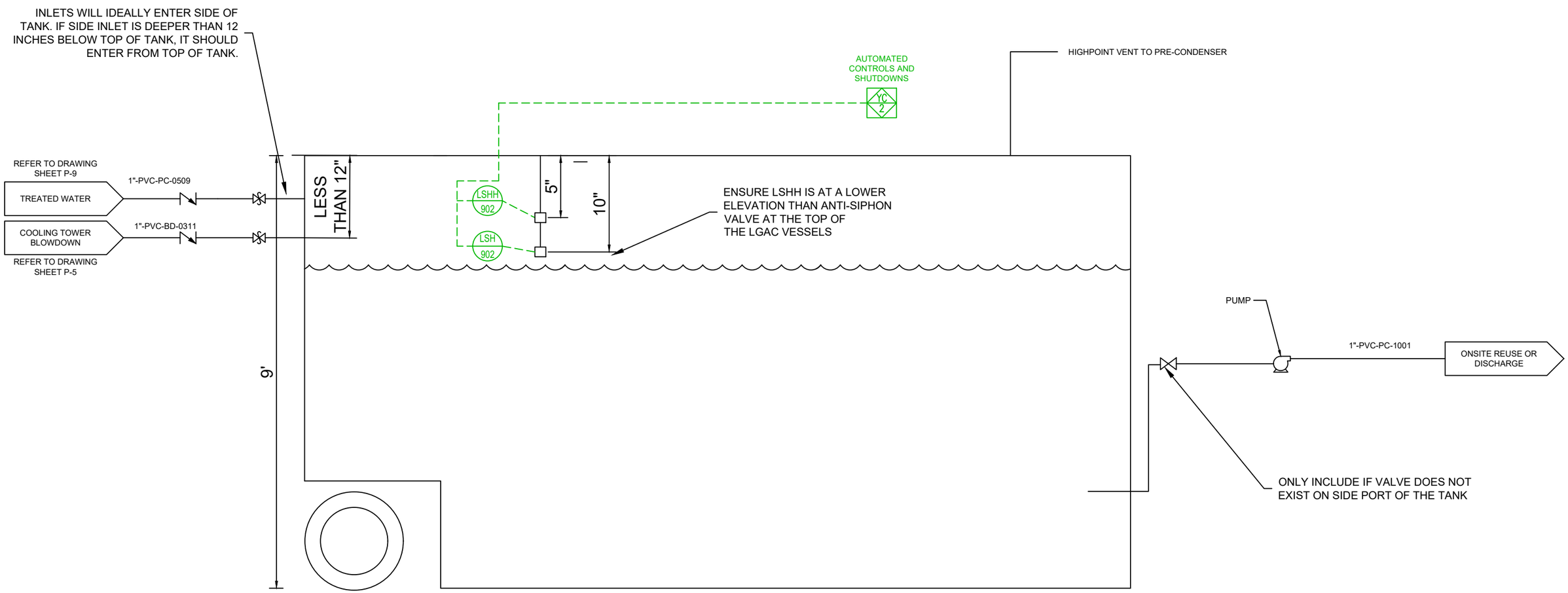

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DRAWN BY: A. PEABODY

CHECKED BY: PENDING APPROVAL

PROJECT MANAGER: S. AVRITT

QSAT REVIEW: QSAT PERSONNEL

SITE: PASCO ZONE A

LOCATION: PASCO, WA

CLIENT: IWAG

HOLDING TANK PROCESS AND INSTRUMENTATION DIAGRAM

APPROVED FOR CONSTRUCTION

BY _____

DATE _____

DATE: 2023.JUL.26

PROJECT: WA.1707

SHEET: P-10

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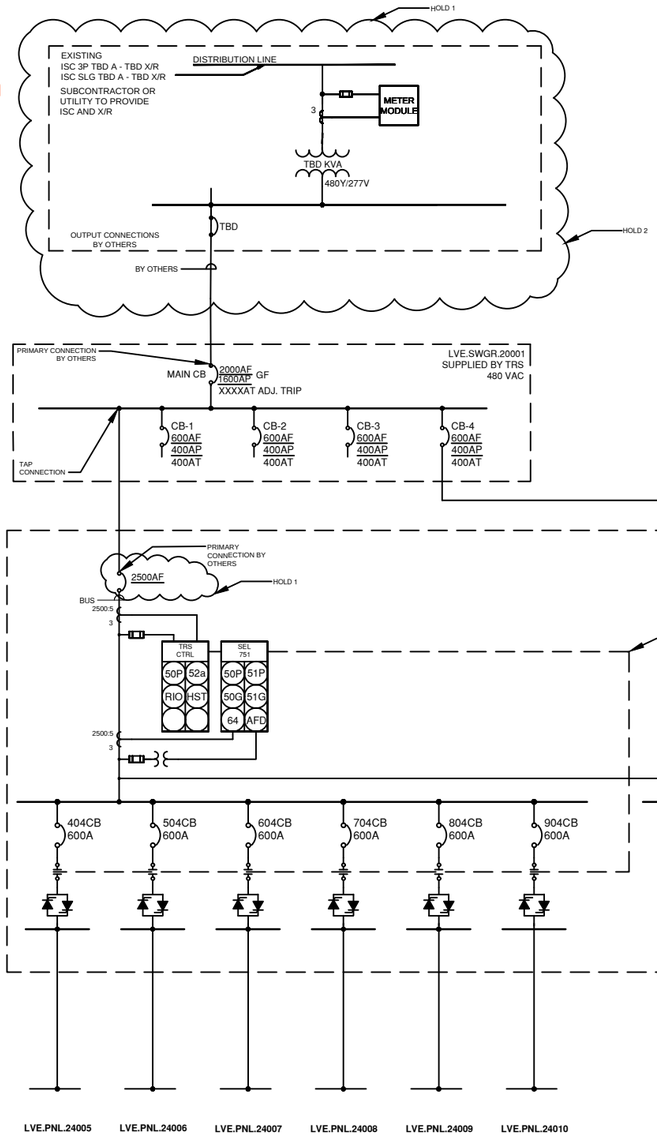


PEAK ELECTRICAL LOAD SUMMARY

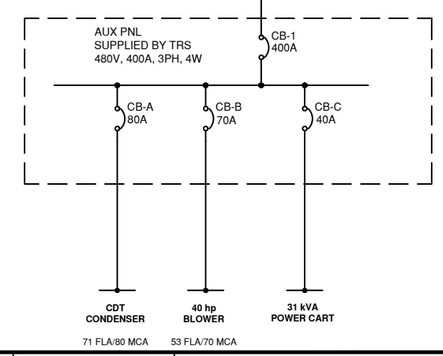
LOAD	NUMBER	CONNECTED LOAD	LOAD FACTOR	DESIGN LOAD
TCU 1000-1				
HEATERS (HIGH TRIAD)	3 X	7 KVA	1.25 =	26 KVA
HEATERS (REMAINDER)	158 X	7 KVA	1 =	1106 KVA
CONTROL & HEATER LOADS	1 X	25 KVA	1 =	25 KVA
			TCU 1000-1 PEAK LOAD =	**1157 KVA**
AUX PNL				
CONDENSER	1 X	60 KVA	1 =	60 KVA
BLOWER	1 X	45 KVA	1 =	45 KVA
POWER CART	1 X	31 KVA	1 =	31 KVA
			AUX PNL PEAK LOAD =	**136 KVA**
			TOTAL PEAK HEATER LOAD =	**1132 KVA**
			TOTAL DESIGN LOAD =	**1293 KVA**

DRAWING HOLDS

1. ENGINEERING HOLD PENDING DESIGN AND SETTINGS.
2. ENGINEERING HOLD PENDING UTILITY DESIGN APPROVAL AND UNDERGROUND FEEDER CALCULATION.
3. ENGINEERING HOLD PENDING OPTION SELECTION

NOTES

1. DRAWINGS HOLDS ARE NOT RELEASED FOR CONSTRUCTION.



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CHECKED BY	PENDING APPROVAL
PROJECT MANAGER	S. AVRITT
QSAT REVIEW	QSAT PERSONNEL

SITE	PASCO ZONE A
LOCATION	PASCO, WA
CLIENT	IWAG

ELECTRICAL ONE-LINE DIAGRAM

APPROVED FOR CONSTRUCTION

BY _____

DATE _____

DATE 2023.FEB.27

PROJECT WA.1707

SHEET E-1

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F
Compliance Monitoring Plan

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Figure F.5 Remedial Performance Objectives Approach Decision Matrix

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Attachment F.2 TRS Hot Soil Sampling Standard Operating Procedure

Attachment F.3 Floyd|Snider Standard Guideline for Soil Sample Collection

List of Abbreviations

Abbreviation	Definition
BDI	Basin Disposal, Inc.
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAA	Clean Air Agency
CACR	Cleanup Action Completion Report
CAMU	Corrective Action Management Unit
CAP	*Cleanup Action Plan – Pasco Landfill NPL Site*
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CMP	Compliance Monitoring Plan
COC	Chemical of concern
CUL	Cleanup level
cVOC	Chlorinated volatile organic compound
CWM	Chemical Waste Management
DCE	Dichloroethene
DRO	Diesel-range organics

Abbreviation	Definition
Ecology	Washington Stated Department of Ecology
EDR	Engineering Design Report
EO	Enforcement Order No. DE 16899
GMP	Groundwater Monitoring Plan
GRO	Gasoline-range organics
H&S	Health and safety
HASP	Health and Safety Plan
HCID	Hazardous Chemicals Identification
HMTA	Hazardous Materials Transportation Act
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDW	Investigation-derived waste
IHS	Indicator hazardous substance
ISTR	In situ thermal remediation
IWAG	Industrial Waste Area Generators Group III
JHA	Job Hazard Analysis
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
LEPC	Local Emergency Planning Committee
LFG	Landfill Group
LGAC	Liquid-phase granular activated carbon
MDL	Method detection limit
MS	Matrix spike
MSD	Matrix spike duplicate
MTCA	Model Toxics Control Act
NAPL	Non-aqueous phase liquid
NAVD 88	North American Vertical Datum of 1988
NPL	National Priorities List
NRC	National Response Center
NWTPH	Northwest Total Petroleum Hydrocarbons
O&M	Operations and maintenance

Abbreviation	Definition
ORO	Oil-range organics
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PCMP	Performance and Confirmation Monitoring Plan
PEC	Post-excavation characterization
PID	Photoionization detector
PLP	Potentially liable person
POC	Point of compliance
PPE	Personal protective equipment
ppmv	Parts per million per volume
PQL	Practical quantification limit
PSLI	Pasco Sanitary Landfill, Inc.
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RAO	Remedial action objective
REL	Remediation level
RL	Reporting limit
RPD	Relative percent difference
RQ	Reportable Quantity
RTD	Resistance temperature detector
RTO	Regenerative thermal oxidizer
SAP	Sampling and Analysis Plan
SERC	State Emergency Response Commission
SIM	Selected Ion Monitoring
Site	Pasco Sanitary Landfill National Priorities List Site
SL	Screening level
SOP	Standard Operating Procedure

Abbreviation	Definition
SOW	Scope of Work and Schedule
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound
TCE	Trichloroethene
TMP	temperature monitoring point
TPH	Total petroleum hydrocarbons
TRS	TRS Group, Inc.
UCL	Upper confidence limit
USEPA	U.S. Environmental Protection Agency
VC	Vinyl chloride
VOC	Volatile organic compound
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

1.0 Introduction

This Zone A Post-Excavation Compliance Monitoring Plan (CMP) was prepared as an appendix to the Zone A Post-Excavation Engineering Design Report (EDR). This CMP provides supplemental information that is necessary for implementation of in situ thermal remediation (ISTR), which will be completed to treat residual contamination in the Industrial Waste Area referred to as Zone A at the Pasco Sanitary Landfill National Priorities List (NPL) Site (Site) in Pasco, Washington.

1.1 PURPOSE

The Zone A cleanup action is being conducted under Enforcement Order No. DE 16899 (EO) issued by the Washington State Department of Ecology (Ecology) to potentially liable persons (PLPs) that are members of the Industrial Waste Area Generators Group III (IWAG), the Landfill Group (LFG), and other PLPs involved at the Site. The EO was issued to PLPs on November 8, 2019, and includes the *Cleanup Action Plan – Pasco Landfill NPL Site* (CAP) as Exhibit B and the associated Scope of Work and Schedule (SOW) as Exhibit C for the Site (Ecology 2019a, 2019b). The EO, CAP, and SOW describe cleanup actions required for all disposal areas at the Site, including Zone A.

Task A.5 of the SOW requires the preparation of a CMP, to be composed of various subplans. These subplans are included as part of this CMP and are more specifically described either as individual sections, as attachments, or incorporated by reference as follows:

- Health and Safety Plan (HASP), described in Section 3.0 of this CMP;
- Contingency Plan, included as Section 4.0 of this CMP;
- Performance and Confirmation Monitoring Plan (PCMP), included as Section 5.0[1] of this CMP;
- Groundwater Monitoring Plan (GMP), summarized in Section 6.0 of this CMP and included by reference only. Appendix B.6 of the Zone A Removal Action EDR (Floyd|Snider and PBS 2020) outlines the Zone A Supplemental GMP, which was approved by Ecology in April 2020.
- Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP), included as Sections 7.0 and 8.0 of this CMP.

1.2 OBJECTIVES

Compliance monitoring to ensure the protectiveness of the cleanup action will be implemented in accordance with Washington Administrative Code (WAC) 173-340-410, Compliance Monitoring Requirements. These regulations call out three types of monitoring: protection, performance, and confirmation. Each will be implemented as part of the ISTR cleanup action in

[1] Section 5.0 includes details regarding both performance monitoring and confirmation monitoring for ISTR.

Zone A. The following are the objectives of compliance monitoring, as stated in WAC 173-340-410:

- **Protection Monitoring** is used to confirm that human health and the environment are adequately protected during implementation of the cleanup action and associated monitoring. Protection monitoring requirements will be described in Site-specific HASPs that address worker activities during remedy construction, implementation, performance monitoring, and post-construction monitoring.
- **Performance Monitoring** is used to confirm that the cleanup action has attained remediation levels (RELs) or other performance standards. Performance monitoring will be conducted throughout each phase of ISTR to document that remedial goals are being achieved.
- **Confirmation Monitoring** is used to confirm the long-term effectiveness of the cleanup action after completion of the cleanup action. Confirmation monitoring will include the collection of soil samples to document post-ISTR conditions and long-term groundwater monitoring to document that cleanup levels (CULs) continue to be attained for Zone A.

1.3 SITE LOCATION AND PROPERTY OWNERSHIP

The Site is located within Franklin County, partially within the City of Pasco, and lies north of the intersection of Pasco-Kahlotus Road and U.S. Highway 12. The Site encompasses an area of 200 acres characterized by gently rolling hills and flat terrain, situated at an elevation of 400 feet (North American Vertical Datum of 1988 [NAVD 88]). The landfill is closed, and an operating transfer station and recycling facility are located on the southern end of the Site on Dietrich Road, which is operated by Basin Disposal, Inc. (BDI).

The landfill property encompasses several parcels within Franklin County owned by Pasco Sanitary Landfill, Inc. (PSLI) and one parcel owned by Columbia Basin LLC. Parcel 113580091, owned by PSLI, includes the northern two-thirds of Zone A. Parcel 113580037, owned by Columbia Basin, LLC, includes the southern portion of Zone A and the BDI transfer station and recycling facility. Figure 2.1 in the EDR shows the locations of the parcels described above.

2.0 Chemicals of Concern and Cleanup Standards

A summary of chemicals of concern (COCs), cleanup standards, and RELs is included in this section. More specific details are provided in the EDR.

2.1 CHEMICALS OF CONCERN

As described in detail in Section 2.5 of the EDR, the soil COCs within the Zone A subsurface include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), gasoline-range organics (GRO), diesel-range organics (DRO), and oil-range organics (ORO), herbicides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbon (PAHs), and metals. COCs in groundwater include VOCs at concentrations at or less than Site CULs and low concentrations of SVOCs and PAHs.

2.2 CLEANUP STANDARDS

Cleanup standards were established in Section 4 of the CAP. Cleanup standards are defined as a CUL combined with a point of compliance (POC) where the CUL applies.

Cleanup standards for soil were not established for the Site in the CAP. Therefore, the default Model Toxics Control Act (MTCA) Method B criteria, which are based on protection of groundwater, were used as initial screening levels (SLs) for post-excavation characterization (PEC) of soil per Ecology's request.

Groundwater CULs were established for indicator hazardous substances (IHSs), which are the analytes of primary concern at the Site. The CULs were established for tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene, *cis*-1,2-dichloroethene, vinyl chloride (VC), 1,1,1-trichloroethane, 1,2-dichloroethane, 1,1-dichloroethane, benzene, methylene chloride, toluene, and total chromium. Table F.1 presents these CULs.

Table F.1
Groundwater Cleanup Levels

Groundwater COC	Cleanup Level (µg/L)
Benzene	1.2
1,1-Dichloroethane	7.68
1,2-Dichloroethane	0.38
1,1-Dichloroethene	0.057
cis-1,2-Dichloroethene	12
Methylene chloride	5
PCE	0.69

Groundwater COC	Cleanup Level (µg/L)
Toluene	157
1,1,1-Trichloroethane	200
TCE	2.5
VC	0.053
Total chromium	100

Abbreviation:
µg/L Micrograms per liter

Groundwater CULs must be met at the standard POC, which is defined in Section 4.7 in the CAP as "throughout the site from the uppermost level of the saturated zone extending vertically to the lowest depth that potentially could be affected by the site."

2.3 REMEDIATION LEVELS

Per Task A.5 of the SOW and Section 4.3.2 of the CAP, RELs were developed for subsurface soils in accordance with WAC 173-340-355 to ensure organic contaminants remaining in Zone A are treated to levels that are protective of groundwater. RELs for soil are summarized in Table F.2 to ensure that ISTR performance is sufficient to meet the remedial action objectives (RAOs) for the Zone A cleanup action.

Table F.2
Soil Remediation Levels

Analyte Group	REL	Basis	Notes
Volatile Organic Compounds			
Total BTEX	250 mg/kg	10 times MTCA Method B (1)	Sum of benzene, toluene, ethylbenzene, and xylenes
Total cVOCs	1.0 mg/kg	10 times MTCA Method B (1)	Sum of TCE, PCE, and VC
Semivolatile Organic Compounds			
Total Naphthalenes	65 mg/kg	10 times MTCA Method B (1)	Sum of naphthalene, 1-methynaphthanlene, and 2-methynaphthalene
Total Petroleum Hydrocarbons			
GRO	1,000 mg/kg	Default residual saturation (2)	Default residual saturation based on coarse gravel (most conservative)

Analyte Group	REL	Basis	Notes
Total Petroleum Hydrocarbons (cont.)			
DRO	2,000 mg/kg	Default residual saturation (2)	Default residual saturation based on coarse gravel (most conservative)

Notes:

1 The REL is based on summing the MTCA Method B criteria for each analyte listed in the specified group and then multiplying the summed value by 10.

2 TPH default residual saturation values obtained from MTCA Table 747-5.

Abbreviations:

BTEX Benzene, toluene, ethylbenzene, and xylenes
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
TPH Total petroleum hydrocarbons

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3.0 Health and Safety Plans

This section satisfies the EO SOW Task A.5 requirement for CMP Subplan A, HASP.

Protection monitoring requirements are defined in WAC 173-340-410(a) and are used to confirm that human health and the environment are adequately protected during implementation of the cleanup action and associated monitoring. Protection monitoring requirements will be described in Site-specific HASPs that address worker activities during remedy construction, implementation, performance monitoring, and post-construction monitoring.

Until a TRS Group, Inc. (TRS) Site-specific HASP is available, IWAG's consultants will follow the current HASP (PBS 2021), for the Site when conducting activities within Zone A prior to mobilization of the ISTR Contractor (TRS) to the thermal treatment area work zone. The HASP for Site operations is a separate document covering routine monitoring, inspections, and operations and maintenance (O&M) of remediation equipment on the landfill property. This HASP is routinely updated by PBS to address worker safety while performing routine O&M tasks in and around Zone A. This HASP is currently scheduled to be reviewed and updated before ISTR work begins. Prior to commencing performance and confirmation sampling (outlined in Section 5.0), the consultant team will complete a Job Hazard Analysis (JHA) to identify potential hazards. The field team will review and assess the JHA before initiating the performance and confirmation sampling.

After TRS mobilization, all persons accessing the thermal treatment area work zone will additionally be required to follow the TRS HASP. TRS will prepare a Site-specific HASP to meet the minimum requirements described in the EO SOW prior to their mobilization for thermal system construction. An outline for TRS's Site-specific HASP is provided in Attachment F.1.

The HASP includes a daily evaluation of tasks and hazards, as well as review of necessary safety controls and personal protective equipment (PPE). To ensure safety during ISTR at Zone A, appropriate PPE will be utilized based on the identified potential hazards. Level D PPE, including safety glasses, high-visibility safety vests, and steel-toed boots will be required for all activities. Hard hats will be required during any activity that involves heavy equipment or potential overhead hazards (i.e., drilling).

During subsurface investigation and construction activities at the Site, all subcontractors (i.e., drillers) must adhere to general health and safety procedures and operate under the TRS HASP. Subcontractors are solely responsible for the health and safety of their employees, representatives, and agents.

All Site personnel who have the potential to contact hazardous waste or contaminated media must also comply with the Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act health and safety training and medical monitoring requirements, including Hazardous Waste Operations and Emergency Response (HAZWOPER) training and certification. All certifications must be kept up to date according to the requirements set by OSHA and the Washington State Department of Labor and Industries Division of Occupational Safety and Health.

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4.0 Contingency Plan

This section satisfies the EO SOW Task A.5 requirement for CMP Subplan B, Contingency Plan. This Contingency Plan is part of the Zone A Post-Excavation EDR as a resource for emergency preparedness and response during the ISTR activities.

TRS shall be responsible for implementing the Contingency Plan in the event of an accident or emergency at the Site and ensure that the Contingency Plan is strictly adhered to during all activities and by all persons accessing the thermal treatment area work zone.

A copy of the Contingency Plan will be maintained on the Site whenever activities are in progress and distributed to all field staff. All personnel entering the Site should be familiar with the on-site location and contents of the Contingency Plan, and any visitors (e.g., vendors, Ecology, IWAG members) should be briefed on the plan before entering the Site. A copy of the Contingency Plan shall be kept in TRS's field office trailer.

The emergency contact numbers presented in Section 4.2 should be reviewed, checked, and revised by TRS and IWAG as necessary. Additionally, the Site map indicating emergency exits must be displayed on the inside of the doors of any work trailers and buildings located within the thermal treatment area work zone.

4.1 OBJECTIVE

The Contingency Plan aims to safeguard on-site personnel and mitigate any potential harm to human health and the environment in the event of an accident or emergency at the Site associated with ISTR. It is essential that Site personnel and local authorities are prepared in the event of an emergency during completion of the work.

The Contingency Plan identifies the emergency preparedness and response measures to be used by personnel performing remedial activities associated with Zone A and the procedures for notifying off-site emergency response personnel.

In the event of a fire, explosion, or hazardous material release that may pose a threat to human health or the environment, Site personnel and first responders will implement the Contingency Plan, as necessary. It is noted that any major event will require involvement from the appropriate outside emergency responders, such as the Franklin County Fire Department. Site personnel are to keep personal safety at the forefront and not attempt to perform services beyond their skills and training.

If any of these agencies respond to an emergency, they will follow their own individual response management procedures.

4.2 EMERGENCY CONTACT INFORMATION

SITE ADDRESS: Pasco Sanitary Landfill
1901 Dietrich Road
Pasco, Washington 99301

EMERGENCY CONTACTS:

Fire Department	911
Ambulance	911
Police Department	911

FIELD/SITE CONTACTS:

Doug Seiler (TRS Emergency Coordinator)	(509) 967-0501
Patrick Brice/PBS (Operations and Oversight)	(509) 375-7840

IWAG PROJECT COORDINATOR:

Jessi Massingale/Floyd|Snider (Owner's Representative)	(206) 683-4307

IWAG CONTACTS:

Nick Garson/Boeing	(425) 269-7866

4.2.1 Additional Contacts

Additional emergency response contacts that the IWAG consultant team has coordinated with for the Zone A Removal Action and anticipate continuing coordination with for ISTR include the following individuals:

FRANKLIN COUNTY FIRE DISTRICT #3 (primary responder)

Chief Mike Harris	(509) 547-9306

PASCO FIRE DEPARTMENT (backs up County Fire District)

Bob Gear, Fire Chief	(509) 545-3426

LOCAL EMERGENCY PLANNING COMMITTEE; FRANKLIN COUNTY EMERGENCY MANAGEMENT

Sean T. Davis, Director	(509) 546-5846
sdavis@co.franklin.wa.us, www.fanklinem.org	

Following outreach to emergency response contacts in the event of an emergency, the IWAG project coordinator will also immediately notify the Ecology Site Manager.

ECOLOGY EASTERN REGIONAL OFFICE

Jeremy Schmidt, Site Manager	(509) 724-1164

Similar to the outreach approach implemented for the Zone A Removal Action, IWAG will coordinate with Ecology and provide project updates prior to TRS mobilization and periodically throughout ISTR to the emergency response teams listed above, as well as the adjacent business, BDI, and landowners. These project updates will also provide an opportunity for the emergency response teams to ask questions.

4.3 EMERGENCY CONTROL PROCEDURES

Specific procedures associated with ISTR that may require emergency controls will be described in the TRS HASP.

4.4 NOTIFICATION

Multiple federal, state, and local regulations require the notification of specified agencies in the event of a spill or release of hazardous materials, hazardous substances, hazardous wastes, and other emergencies. This section of the Contingency Plan describes the reporting requirements for ISTR following a potential emergency, including reporting responsibility, the criteria and deadlines for notification, the appropriate agencies to be notified, and the format for notification following an incident.

The reporting information and phone numbers that may be useful during notification (such as contact information for local agencies) are included in Section 4.2. The TRS Site Health and Safety (H&S) officer, in coordination with the IWAG Project Coordinator, are responsible for ensuring that the necessary notifications are made to the appropriate agencies during or after a spill, release, or other emergency in accordance with all deadlines. Notification of a release should be made without delay and should not be held up pending collection of additional information. This is particularly true in cases of immediate notification requirements and/or those with a 2-hour notification deadline, as required by the National Response Center (NRC) and the U.S. Environmental Protection Agency (USEPA). The Local Emergency Planning Committee (LEPC), Ecology, and/or the OSHA also need to be promptly notified following certain releases or events. In addition, internal reporting is required. Missing information should be supplied during follow-up calls.

4.4.1 Internal Notifications

In the event of an emergency, the personnel who discover the incident will immediately contact the TRS H&S officer. Notification will be made to all other personnel or contractors who may be working at the Site. Given the limited area of the Site, this can be accomplished easily through verbal communication and/or cellular telephones. TRS will provide clear procedures for notifying personnel inside the thermal treatment area work zone of an external issue, as well as for notifying the Emergency Coordinator. After on-site personnel have been informed, the Emergency Coordinator or discoverer must inform the IWAG Project Coordinator.

Following this internal notification, the Emergency Coordinator will be responsible for managing the emergency, while the IWAG Project Coordinator will handle additional notifications, including IWAG contacts.

4.4.2 Community Notifications

In the event of a fire, explosion, leak, or spill of flammable or combustible material, the Franklin County Fire District (with Pasco Fire Department as backup for the county), LEPC, and Ecology regional office will be notified immediately.

4.4.3 Federal and State Agency Notification

All notification to federal, state, and local agencies (other than emergency responders) must be coordinated through the IWAG Project Coordinator, who will coordinate with the IWAG.

4.4.3.1 Comprehensive Environmental Response, Compensation, and Liability Act Notification Requirements

Releases of a hazardous substance (as defined in 40 Code of Federal Regulation [CFR] 302.4) exceeding the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantities (RQs) must be immediately reported to the NRC at (800) 424-8802 as soon as knowledge of the release is obtained. Releases of hazardous substances that exceed CERCLA RQs or extremely hazardous substances (as defined under federal Emergency Planning and Notification regulations 40 CFR 355) must be reported immediately to the LEPC if any area outside the Site is affected. The State Emergency Response Commission (SERC) should be verbally notified at (800) 258-5990 if areas of concern, as determined in coordination with Ecology, are likely to be affected. Ecology's Eastern Regional Office will be notified.

In addition to the above, certain continuous releases of hazardous substances and/or air emission releases (from unpermitted minor sources and concentrations greater than permitted emissions limits due to accidents and malfunctions and/or during start-up and shutdown) may also be reportable under CERCLA and the Emergency Planning and Notification regulations as defined in 40 CFR 355. Any releases of hazardous substances that could expose individuals outside of the facility should be reported immediately to the SERC at (800) 258-5990, the LEPC Franklin County Emergency Management at (509) 545-3546, and the NRC at (800) 424-8802.

4.4.3.2 Occupational Health and Safety Act Notification Requirements

The Occupational Health and Safety Act (29 CFR 1904.8) requires that the fatality of one or more people or the hospitalization of three or more personnel is to be verbally reported to OSHA within 8 hours after knowledge of this information. Additionally, regardless of whether the incident is immediately reportable, if the incident results in the death of a personnel or the hospitalization of three or more personnel within 30 days of the incident, the fatality or multiple hospitalization is to be reported within 8 hours of the employer's knowledge of the event, regardless of whether it was immediately reportable.

4.4.3.3 Washington State Department of Labor and Industries Requirements

Employers are required to contact the Division of Occupational Safety and Health[2] within 8 hours of a workplace fatality or in-patient hospitalization of any employee and within 24 hours of a non-hospitalized amputation or loss of an eye of any employee. Call (800) 423-7233, select option 1.

When reporting an incident, the following information must be provided:

- Name and phone number of the best person to contact
- Name of the establishment/business the injured person(s) is employed by
- Location/address of where the accident occurred
- Date and time of the accident
- Names and number of employees harmed
- Brief description of the incident

4.4.3.4 Washington Department of Transportation Notifications Requirements

The Hazardous Materials Transportation Act (HMTA; 49 CFR 171.15) requires that, if a release of hazardous materials occurs in transport (including loading or unloading) that causes injury or death, property damage over $50,000, public evacuation, a major road closure lasting more than 1 hour, aircraft rerouting, spillage or fire of a radioactive or etiologic material, or continuing danger of life at the scene of the incident exists, then the carrier must notify the Washington State Department of Transportation (WSDOT) via the NRC at (800) 424-8802.

When reporting an incident, the following information must be provided:

- Name of reporter
- Name and address of carrier
- Phone number where reporter can be reached
- Date, time, and location of incident
- Extent of injuries (if any)
- Type and quantity of hazardous materials involved
- Type of incident and whether a continuing danger to life exists at the scene

The carrier must also submit a written report regarding the incident within 30 days, and if any unintentional release of hazardous material occurs (under conditions not necessarily listed above), a written report must be submitted.

[2] https://www.lni.wa.gov/safety-health/preventing-injuries-illnesses/workplace-injuries-fatalities/

4.4.3.5 Washington State Notification: Spills and Discharges into the Environment (WAC 173-303-145)

Washington state regulations establish the requirements for any person responsible for a spill or discharge of a dangerous waste or hazardous substance that is intentionally or accidentally spilled or discharged into the environment (unless otherwise permitted) such that human health or the environment is threatened, regardless of the quantity of dangerous waste or hazardous substance. Any person who is responsible for a spill or non-permitted discharge must immediately notify the individuals and authorities described for the following situations:

- For spills or discharges onto the ground or into groundwater or surface water, notify all local authorities. Check with the local emergency service coordinator and the Franklin County Fire District (with Pasco Fire Department as backup to the county) to determine all notification responsibilities under the local emergency plan. Also notify the Eastern Regional Office of Ecology.
- For spills or discharges that result in emissions to the air, notify the LEPC and the local fire department to determine all notification responsibilities. Also notify the Eastern Regional Office of Ecology, because there is no local clean air agency for Franklin County. The Benton Clean Air Agency (CAA) has jurisdiction over Benton County; in case of a large air emission release that could affect neighboring Benton County, the Benton CAA should also be notified.

4.4.4 Media Inquiries

Media inquiries should be directed to the IWAG's media relations representative, Barbara Smith, at (206) 605-3392. In the event of an emergency, the IWAG Project Coordinator will brief the media relations representative on the details of the situation, who will be available to respond to public or media inquiries and provide notification to the Ecology Public Involvement point of contact. Under direction of the IWAG, the media relations coordinator will issue any necessary statement or media release. Coordination with Ecology will occur prior to any statements or communications with the media that are initiated by the IWAG's media relations coordinator for non-emergency response communication with media or public news.

5.0 Performance and Confirmation Monitoring Plan

This section satisfies the EO SOW Task A.5 requirement for Preparation of Subplan C, Performance Monitoring Plan).

Performance monitoring requirements are defined in WAC 173-340-410(b) and used to confirm that the cleanup action has attained RELs or other performance standards. Performance monitoring will be conducted throughout each phase of ISTR to document that remedial goals are being achieved. Confirmation monitoring requirements are defined in WAC 173-340-410(c) and used to confirm the long-term effectiveness of the cleanup action after completion of the cleanup action.

The following performance and confirmation monitoring will be completed in Zone A during and after implementation of ISTR:

- Collection of routine operational data during ISTR system operation to monitor and assess treatment system performance.
- Collection of treated condensate samples to determine compliance with reuse criteria.
- Collection of vapor samples during ISTR as needed for regenerative thermal oxidizer (RTO) permit compliance.
- Collection of performance monitoring soil samples within the ISTR treatment area to determine compliance with RELs. Depending on the results, these soil samples may become final confirmation samples if remedial objectives are met.
- Collection of confirmation soil samples outside the ISTR treatment area to supplement existing data and to document soil conditions that will remain in place beneath the final engineered cap, which is the final component of the cleanup action for Zone A.

Specific details regarding means and methods and analytical requirements are provided in Sections 7.0 and 8.0, the SAP and QAPP, respectively.

5.1 THERMAL SYSTEM OPERATION DATA COLLECTION

Operation of the thermal system will be monitored and optimized via several parameters: subsurface soil temperature, soil mass recovery, and energy input. Each of these parameters, including monitoring procedures and goals, are described below.

- **Subsurface soil temperature data** from 29 temperature monitoring points (TMPs) installed within 4-inch-minimum-diameter boreholes spaced between heaters will be collected daily via an automated system to observe when soil desiccation has been achieved for a given subarea. Resistance temperature detectors (RTDs) will be positioned in the TMPs every 5 feet vertically to the bottom of the treatment area in each subarea to monitor subsurface soil temperature. These TMPs will be located at or near the center point between adjacent heaters such that the location of the TMP

will be the furthest location from all adjacent heaters. In addition, nine of these TMPs will have a deep temperature sensor positioned 20 feet below the bottom of the treatment area to monitor conductive heat transfer below the treatment area and to verify vapor capture and protection of groundwater beneath the thermal treatment area. The TMPs will use automated monitoring continuously throughout the duration of ISTR, with one reading recorded each day. Subsurface temperatures within the treatment area will rise from ambient to approximately 100 °C, the boiling point of water, at which point they will stabilize until all moisture has been removed. Once the soil is desiccated, the temperatures will rise steadily above 100 °C as energy continues to be added to the soil. It is expected that the soil criteria will be met as soil temperatures rise to between 100 and 120 °C within the treatment area.

- **The rate of mass recovery** from the subsurface will be measured by daily photoionization detector (PID) field readings and biweekly or weekly vapor sampling from the blower discharge. Vapor monitoring will be conducted to calculate VOC mass recovery and discharge in addition to ensuring compliance with the RTO permit discharge limits. Procedures for vapor sampling are described in Section 7.2. Once heating begins, the volatile organics and water near the heaters will begin to volatilize and be collected by the vapor recovery system. As heating continues, the radius of soils desiccated by each heater will grow, and the rate of volatile mass recovery will increase. As desiccation reaches the midpoints between heaters, the rate of volatile mass recovery will drop quickly and reach an asymptotic value. This asymptotic value will indicate a point of diminishing returns on mass recovery.
- **Energy input** will be tracked daily via an automated system and compared to the energy estimate for desiccation to provide a measure of overall progress in each subarea.

As the desiccation energy target, desiccation temperature, and asymptotic volatile mass recovery are achieved, performance soil sampling will be scheduled as described in Section 5.3. A subarea may be determined to be ready for performance sampling prior to reaching all the targeted operation performance metrics above if one or more parameters have been met and other indicators including historical data suggest the remedial performance objectives will be met.

To ensure heater optimization, temperature sensor casings will be collocated with 25% of the heaters. These casings will be equipped with a single RTD sensor that can be manually moved up and down the heater borehole to measure heater temperatures. Temperature measurements are collected manually from these RTD sensors to evaluate heater performance.

Additionally, to confirm pneumatic control and vapor recovery, a series of pressure monitoring points (PMP) will be installed throughout the treatment volume collocated at each of the 29 TMPs and include a 1-inch-diameter, 1-foot-long screen positioned at 2 feet below ground surface (bgs), where subsurface pressure readings can be collected. These PMPs will be monitored weekly with a manometer to confirm zero pressure or slight vacuum to verify sufficient capture is being maintained.

In addition to the shallow PMPs, nine of the PMP boreholes (one in each subarea) will have a deep collocated PMP positioned 17 feet below the bottom of the treatment volume. These deep PMP points will be positioned below the designed ISTR radius of influence to proactively monitor vapor capture and protection of groundwater.

Pressure monitoring at the existing Zone A soil vapor extraction (SVE) vapor monitoring network in the vicinity of the thermal treatment area will continue to be completed at the current rate (biweekly) at a minimum to verify emission control and protection of the public and environment. The existing Zone A SVE monitoring points that will be used to measure pressure in the periphery of the thermal treatment area are VEW-01, VMW-02D, VMW-50S, VMP-21, VMP-28, VMP-29, and VMP-30, and are shown on Figure F.1. In addition, the horizontal SVE wellheads VEW-06H and VEW-07H may also be monitored if supplemental data are needed.

5.1.1 Metrics to Assess ISTR System Performance

A multiple lines of evidence approach will be used by TRS and the consulting team during ISTR operation to evaluate performance.

Three specific performance indicators will be monitored during the remediation to help guide when soil confirmation sampling is likely to show the RELs have been achieved. Soil sampling will be scheduled for when energy input is in line with modeled projections, treatment volume temperatures show desiccation has been achieved, and vapor recovery concentrations are asymptotic. Once the targeted performance metrics for a subarea have been achieved, TRS will recommend performance soil sample collection, as described in Section 5.3, to verify that performance objectives have been met and to confirm that heating can cease.

5.2 ISTR OPERATION COMPLIANCE TESTING

Compliance testing that will be conducted during ISTR operation to ensure the byproducts of ISTR are safely managed include condensate, vapor, and non-aqueous phase liquid (NAPL) sampling.

5.2.1 Condensate

Condensate sampling will be conducted to assess if the treated condensate meets the reuse criteria. If treated condensate water meets the reuse criteria established for VOCs, SVOCs, and PCBs (summarized in Table F.3), then the treated water will be reused on-site for dust control or irrigation (i.e., discharge into the existing stormwater swale in Zone A). If treated condensate water does not meet on-site reuse criteria then the condensate will be retreated and tested again for reassessment. If the treated condensate water fails again to meet reuse criteria or there is insufficient capacity for retreatment then it will be profiled for off-site disposal at a permitted facility.

In addition to post-treatment (effluent) condensate sampling, the two 500-pound liquid-phase granular activated carbon (LGAC) vessels placed in series to treat the condensate water will be routinely sampled at the inlet and midpoint to monitor for contaminant breakthrough. If

breakthrough is observed in the primary vessel, then the piping will be reconfigured to move the secondary vessel into the primary position. The original primary vessel will be moved to the secondary position and restored with new LGAC.

Condensate sampling is described in Section 7.3, with condensate reuse criteria provided in Table F.3.

5.2.2 Vapor

Vapor samples from the ISTR system will be collected biweekly or weekly to ensure compliance with the RTO permit, consistent with current SVE operations. Vapor flow rates will be calculated by using differential pressure gauges on pitot tubes after the condenser and after the blower. These readings, along with temperature and pressure measurements, will be used to calculate the flow of vapors within the system. The flow rate and PID readings collected from the ISTR blower discharge will be used to calculate VOC mass recovery and discharge. In addition to vapor flow rate assessment, a minimum of biweekly vapor samples will be collected to monitor treatment progress and to ensure compliance with the air permit. Vapor sampling is described in Section 7.2.

Performance and confirmation soil sampling will be conducted on a subarea-by-subarea basis when TRS indicates that a subarea has reached the appropriate operational parameters described in Section 5.1. Soil performance and confirmation testing is discussed in Sections 5.3 and 5.4, respectively.

5.2.3 NAPL

NAPL will be generated from the condensate treatment process by passing the condensate through a tank containing a series of weirs to separate NAPL from water. Each batch of generated NAPL will be hazard characterization (HazCat) tested under the requirements of the Corrective Action Management Unit (CAMU) profile. In addition, each NAPL batch ready for disposal will be sampled and analyzed for VOCs, SVOCs, TPH and PCBs.

5.3 SOIL PERFORMANCE TESTING

Soil performance sampling will be completed within the thermal treatment area to verify that remedial performance objectives described in Section 5.5.1 have been met. Soil samples will be collected within each of the nine treatment subareas after the thermal system operation performance metrics described in Section 5.1 have been achieved. Proposed performance soil borings include locations collocated with previous PEC borings within the thermal treatment area and proposed supplemental borings to increase data density. Thermal heaters will be removed once remedial performance objectives have been achieved in each respective subarea. Collected performance soil samples will be analyzed and compared to the RELs established for analytes that are the focus of remediation as defined in Section 2.3 of this CMP and include BTEX, cVOCs, naphthalenes, GRO, and DRO, referred to as the REL analytes. The proposed soil performance sample locations inside the thermal treatment area are shown on Figure F.2.

Within the treatment area, there are nine subareas that are shown individually on Figures F.3a through F.3i.

5.3.1 Performance Sampling Scheme and Schedule

As described in Section 9.0 of the EDR, ISTR will be completed in two phases. During each heating phase (Phase 1 and Phase 2), focused performance soil sampling will occur on a subarea-by-subarea basis after thermal system operation performance metrics (described in Section 5.1) have been reached for a subarea. For efficiency, it is likely that drilling mobilization will occur once multiple subareas are ready for sampling. The sequencing and timing will be more specifically determined as treatment progresses using the multiple lines of evidence approach for thermal system operation performance described in Section 5.1. After performance soil sampling, subareas that meet the remedial performance objectives described in Section 5.5.1 will no longer be heated. If a soil sample does not meet the remedial performance objectives, heating will resume, and additional performance samples will be collected after approximately 2 weeks of additional heating, or as determined by TRS, dependent on the remaining contaminant concentrations in soil and the thermal system performance metrics.

At a minimum, each treatment subarea will have two proposed performance soil borings that include locations collocated with previous PEC borings to evaluate mass removal and proposed supplemental locations in subareas with limited data density as shown on Figure F.2. For PEC-collocated boring locations, new borings will be drilled within 10 feet of the previous PEC location and preferentially targeted between heaters to conservatively sample where the lowest temperatures are expected. At a minimum, one performance sample will be collected at each PEC-collocated boring at the interval where the greatest concentrations of REL analytes were detected in the previous PEC boring. Select performance sample locations that are collocated with PEC locations that had multiple intervals with REL exceedances will also be sampled within the bottom 5 feet of the base depth of the targeted treatment depth for the subarea. A summary of PEC soil data for the REL analytes within the treatment area compared to the RELs is in Table F.4.

The proposed supplemental performance borings were preferentially placed in areas that were not previously sampled to increase data density within the treatment area. One performance sample will be collected at each supplemental performance boring location at a depth interval within 15 feet below the bottom of the removed drummed waste, which PEC sampling indicated was the interval of greatest contaminant concentrations, including REL analytes.

Table F.5 provides a general overview of each subarea and the anticipated sample collection; refer to Table F.6 for more specific details about targeted sample depths and analyses for each location.

Table F.5
Performance Sampling Summary Table

Treatment Subarea	Square Feet	Treatment Depth (feet bgs)	Number of Borings	Number of Samples	Targeted Sample Intervals (feet bgs)
A1	975	0–22	2	3	15–20
A2	2,019	0–25	3	6	15–20 and 20–25
A3	1,486	0–20	2	3	15–20
A4	1,332	0–27	2	4	10–15, 15–20, and 25–30
A5	5,875	0–26	4	7	15–20 and 20–25
A6	6,377	0–28	3	6	15–20, 20–25, and 25–30
A7	4,334	0–25	3	6	10–15, 15–20, and 20–25
A8	3,398	0–28	3	6	15–20, 20–25, and 25–30
A9	2,020	0–16	2	2	15–20
		TOTAL	**24**	**43**	

5.3.2 Soil Field Screening, Sample Collection, and Analyses

Once thermal system operation performance metrics have been met within a treatment subarea, the thermal system will be temporarily shut down in that area and performance soil sampling will be conducted using TRS's Hot Soil Sampling Standard Operating Procedure (SOP) for hot soil sampling described in greater detail in Section 7.0 (refer to attachments for reference). For efficiency, mobilization for performance sampling will occur after multiple subareas are ready for sampling. Achievement of operation performance metrics and intent to temporarily shut down heaters will be communicated to Ecology in advance as part of the regular sharing of treatment system operation information. Ecology will also be provided the drilling schedule prior to treatment subarea(s) shutdown. Soil sample collection means, methods, and procedures are more specifically discussed in the SAP in Section 7.0 of this CMP.

All performance soil samples will be field screened with a PID with a 10.6 electron volt lamp prior to sample collection. If the results of this field screening indicate VOC measurement greater than 200 parts per million per volume (ppmv), then a Sudan IV NAPL test kit will be used to determine the potential presence of NAPL. If PID measurements are less than 200 ppmv, then a sheen test will be conducted to confirm NAPL is not potentially present. A field screening value of 200 ppmv was conservatively selected because PEC analytical data compared to PID field screening measurements showed soils with GRO or DRO concentrations that exceeded the REL typically also had PID readings greater than 300 ppmv.[3] Further details about field screening are described in Section 7.1.

[3] Only two PEC locations had REL exceedances for DRO or GRO and collocated PID readings less than 300 ppmv. These samples exceeded only for DRO and had PID readings less than 100 ppmv. Sheen testing will be used during performance sampling to confirm NAPL is not present as described in Section 7.1.

Soil samples from each performance location will be analyzed for the REL analytes that exceeded the REL in the respective collocated PEC location as summarized in Table F.6. An expedited sample turnaround time for the REL analytes will be requested by the laboratory to minimize thermal system down time. Soil samples collected from the supplemental performance borings will be analyzed for all REL analytes.

Soil samples will be analyzed for the REL analytes by one or more of the following analytical methods:

- BTEX by USEPA Method 8260
- cVOCs by USEPA Method 8260
- Naphthalenes by USEPA Method 8270
- GRO by Northwest Total Petroleum Hydrocarbons (NWTPH)-Gx
- DRO by NWTPH-Dx

Additional soil volume will be collected from each performance location sample depth and archived. If the performance sample REL data in a subarea meets the remedial performance objectives such that they become confirmation samples, then the archived soil samples will be analyzed by the following analytical methods: [4]

- VOCs by USEPA Method 8260
- SVOCs by USEPA Method 8270
- GRO by NWTPH-Gx
- DRO by NWTPH-Dx
- Total PCBs by USEPA 8082A

These additional data will provide confirmation of soil quality that will remain in place in Zone A beneath the final engineered cap and will not be used to assess performance for ISTR. Analytical requirements are more specifically described in the QAPP in Section 8.0.

5.4 CONFIRMATION SOIL SAMPLING

Existing PEC data collected in 2022 outside the lateral and vertical extent of the thermal treatment area and within the completed excavation extent of the Zone A Removal Action will be used as Zone A soil confirmation samples. Per Ecology's request, additional confirmation sample locations will be collected within the lateral extent of the removed drummed waste to supplement the existing dataset and to increase verification that RAOs have been achieved (via email received February 2, 2023).[5] All confirmation soil sample results will be summarized in

[4] USEPA Methods 8260 and 8270 will only be run if the lab did not test for the full analyte list of those methods during the initial performance sample analysis.

[5] Additional soil sample collection may be needed as part of design (i.e., in the vicinity of BH39) to define the lateral limits of the final engineered cap for Zone A and will be coordinated with Ecology.

the Zone A Cleanup Action Completion Report (CACR) to document the soil quality remaining in Zone A after thermal treatment. Existing and proposed soil confirmation samples outside of the lateral extents of the thermal treatment area are shown on Figure F.4.

Additional confirmation soil samples will be collected concurrent with performance samples for efficiency using the same drilling and soil sample collection methods. Hot soil sample collection procedures will not be necessary for the confirmation samples, which will be outside the thermal treatment area. Confirmation soil samples will be collected within 15 feet from the bottom elevation of the excavated drummed waste, which is the area of greatest residual contaminant concentrations based on field observations and PEC soil sample results. The confirmation dataset will be assessed as described in Section 5.5.2 to verify compliance with the RELs and the RAOs for the Zone A cleanup action.

These additional confirmation samples will be analyzed for the following:

- VOCs by USEPA Method 8260
- SVOCs by USEPA Method 8270
- GRO by NWTPH-Gx
- DRO by NWTPH-Dx
- PCBs by USEPA Method 8082

5.5 ASSESSING COMPLIANCE WITH REMEDIATION LEVELS

MTCA section 173-340-740(7) provides data evaluation procedures for assessing compliance with soil CULs; however, there is no specific guidance for determining the statistical compliance of a cleanup action using site-specific RELs. Therefore, MTCA's data evaluation methods for determining compliance with cleanup standards using a statistical approach will be used as the starting point to evaluate performance and confirmation of the cleanup action and provide consistency with MTCA, in coordination with Ecology. An adaptive management approach for evaluating compliance for performance and confirmation soil samples was developed in general accordance with the confidence interval approach for data analysis outlined in WAC 173-340-740(7)(d). Remedial performance objectives were developed for evaluation of the ISTR performance soil samples to verify that the final confirmation dataset evaluation will comply with the RELs, as determined by the statistical evaluation described in Section 5.5.2.

During Phase 1 of treatment, not enough performance samples will have been collected to perform a statistical evaluation of the dataset; therefore, Phase 1 and Phase 2 performance evaluation will be slightly different, as shown on Figure F.5. Because the performance soil samples will be collected in several phases, the evaluation of performance soil sample compliance with remedial performance objectives will use a multiple line of evidence approach, as described in Section 5.5.1. Once all performance samples have met the remedial performance objectives, then a statistical evaluation will be conducted on the confirmation dataset to verify compliance with the RELs, as described in Section 5.5.2.

5.5.1 Performance Soil Sample Evaluation

Performance monitoring requirements are defined in WAC 173-340-410(b) and are used to verify that the cleanup action has attained RELs or other performance standards. Because the goal is to achieve RELs rather than CULs (soil CULs have not been established for the Site), and because the Zone A cleanup action will involve containment of soils that will comply with WAC 173-340-740(6)(f), Ecology has agreed to apply its discretion regarding the need to continue thermal heating in each treatment subarea if performance soil sampling indicates an isolated contaminant concentration that exceeds a REL after achieving target temperatures.

Thermal treatment system operational data, field screening information collected during performance sampling, and performance soil sample analytical data will be used as a multiple lines of evidence/adaptive management approach to determine if each subarea has met the remedial performance objectives and if thermal treatment is complete in the subarea or portion of a subarea in coordination with Ecology. The steps of this evaluation process are detailed on the remedial performance objectives approach decision matrix included as Figure F.5 and summarized as follows:

- In both Phase 1 and Phase 2, thermal treatment will be concluded in a subarea (or portion of a subarea), if there are no exceedances of a REL in performance soil samples.
- In both Phase 1 and Phase 2, if a performance soil sample result exceeds a REL by greater than 2 times, then the subarea or a portion of the subarea will resume heating in coordination with Ecology. A criterion of 2 times is conservatively used; however, there is a possibility that a REL constituent or constituent group may exceed 2 times the REL after reaching desiccation based on treatability considerations of ISTR using information from the bench-scale treatability study.
- The RELs for GRO and DRO are conservatively based on default residual saturation values. Additional field screening will be completed for TPH during soil sample collection to confirm that NAPL is not present in the soil.
    - If field screening indicates there is a potential for NAPL and analytical data confirms the potential for NAPL, then thermal heating will resume in the subarea or a portion of the subarea.
    - If field screening indicates that NAPL is not present, but the analytical data exceed the REL or exceed 2 times the REL, then multiple lines of evidence can be evaluated in coordination with Ecology to document that remaining soil concentrations beneath the final Zone A cap will not result in the accumulation of NAPL in groundwater and thermal heating in the subarea or portion of the subarea can be considered complete if other constituents or constituent groups comply with the RELs.
- If a performance soil sample has a REL exceedance where the concentration is less than 2 times the REL and field testing does not indicate the presence of NAPL, then further evaluation will be completed based on how many performance samples have

been collected. During Phase 1 of treatment, not enough performance samples will have been collected to adequately perform a statistical evaluation. Therefore, a multiple lines of evidence/adaptive management approach to data evaluation is presented in the decision matrix for Phase 1 to determine if thermal treatment should continue or end in a subarea.

- Once Phase 2 of thermal treatment begins and at least 70% of anticipated performance soil samples have been collected, a 90% upper confidence limit (UCL) on the mean will be calculated for each REL analyte using all available performance data.
    - The 90% UCL will use all performance data collected within the treatment area excluding performance data that did not meet the decision matrix criteria and resulted in continuing thermal treatment in a subarea. The 90% UCL will be continually updated as additional performance data are collected.
    - As an interim verification step, a 90% UCL was selected for initial evaluation of performance soil sample results, in lieu of a 95% UCL used in MTCA's statistical approach, because this remedial performance evaluation will be conducted on a limited dataset, will conservatively include only samples within the vertical and lateral limits of the treatment area, and will exclude soil data laterally and vertically bounding the treatment area. The final confirmation dataset will include soil data laterally and vertically outside the treatment area and a preliminary assessment of the data indicates that the use of a 90% UCL to evaluate the performance dataset will result in a confirmation dataset that achieves compliance with the RELs based on a final 95% UCL.
    - If a Phase 2 subarea performance sample exceeds a REL[6] but the respective 90% UCL is less than the REL, then thermal treatment can be concluded in the subarea.
    - If the respective 90% UCL exceeds the REL, then additional questions are presented in the decision matrix to evaluate all performance soil data for compliance with the remedial performance objectives.

Once all performance soil samples have met the remedial performance objectives in coordination with Ecology and thermal treatment has stopped in all subareas, then all performance samples that were the final samples collected in the subarea and did not trigger additional thermal heating will become confirmation samples. Verification that confirmation samples are in compliance with the RELs will be conducted using a 95% UCL as described in Section 5.5.2. Both the 90% and the 95% UCL calculations will be performed using USEPA's ProUCL (Version 5.2) software and the recommended data statistical test unless another test is determined to be more applicable.

[6] Concentration is less than 2 times the REL and field test did not indicate the potential for NAPL to be present.

5.5.2 Statistical Evaluation of Confirmation Soil Samples

Confirmation monitoring requirements are defined in WAC 173-340-410I and are used to confirm the long-term effectiveness of the cleanup action after completion of the cleanup action. Confirmation samples will be evaluated to demonstrate that the cleanup action has met the RAOs. The confirmation soil dataset for Zone A will include the following:

- Soil samples collected in 2022 from PEC borings outside the lateral and vertical extents of the thermal treatment area and within the final excavation limits of the Zone A Removal Action
- Additional confirmation soil samples to be collected from proposed borings located outside the thermal treatment area and within the former extent of the drummed waste to supplement the existing dataset
- Proposed performance samples to be collected from within the thermal treatment area that became confirmation samples upon completion of thermal treatment

Existing and proposed soil confirmation sample locations outside the thermal treatment area are shown on Figure F.4.

The data analysis and evaluation procedures for the confirmation soil dataset were developed based on the requirements in WAC 173-340-740(7) for evaluating compliance with soil CULs. Adjustments to the statistical requirements from MTCA were made to allow adaptive management and to consider technological feasibility of ISTR based on the results of the ISTR treatability study and the PEC dataset. The final confirmation dataset will be evaluated to meet the following requirements:

- The one-sided 95% UCL on the true mean soil concentration shall be less than each respective REL. Data shall be assumed to be lognormally distributed unless this assumption is rejected by a statistical test.
- No single soil sample concentration shall be greater than 2 times the REL unless an empirical demonstration can prove that the exceedance is isolated and will not affect the attainment of RAOs.
- No more than 10% of the soil sample concentrations shall exceed the REL.
- A 95% UCL on the mean will be calculated using ProUCL (Version 5.2) software and the recommended data statistical test unless another test is determined to be more applicable.[7]
    - The 95% UCL will be calculated using all confirmation data, as listed above, and compared to the respective RELs.

The evaluation requirements listed above are targeted to demonstrate compliance with the RELs and the RAOs described in Section 3.2 of the EDR.

[7] Non-detect results will be managed in accordance with the statistical method recommended by the ProUCL software.

6.0 Groundwater Monitoring Plan

The Zone A Supplemental GMP was prepared for use during the Zone A Removal Action and ISTR as described in Section 7.6 and included as Appendix B.6 of the Zone A Removal Action Engineering Design Report (Floyd|Snider and PBS 2020). The Zone A Supplemental GMP was previously approved by Ecology on April 22, 2020; no changes or updates to the Zone A Supplemental GMP are proposed at this time for monitoring during ISTR implementation.

The GMP describes the increased sample frequency schedule and expanded analyte suite that is required by the SOW to assess potential short-term changes in groundwater quality during the Zone A ISTR activities. Specifically, the supplemental monitoring that will be conducted by PBS Engineering and Environmental Inc. includes additional monitoring at the existing Zone A wells, monitoring at three new wells, increased monitoring frequency (Mar/Jun/Sept/Dec) for certain key analytes (VOCs and SVOCs), and additional analytes (herbicides, pesticides, metals, and PCBs) for certain key wells.

Implementation of the Zone A Supplemental GMP was suspended with Ecology approval during the period between the Zone A Removal Action and commencement of ISTR activities. Supplemental groundwater monitoring was resumed in June 2023 in accordance with the Supplemental GMP, with advance notification provided to Ecology.

7.0 Sampling and Analysis Plan

Implementation of the Zone A Post-Excavation EDR will involve collecting subsurface soil, vapor-recovery gas/vapor stream, and condensate samples to assess ISTR performance and confirm achievement of RELs within the subsurface of Zone A. Sampling procedures are described in the following sections, including field methodology, sample nomenclature, and sample handling and custody documentation. ALS Environmental will be the primary laboratory used for sample analysis. Additionally, Table F.7 presents the analytical methods, preservation requirements, bottle types, and holding times for the sampling program. Table F.8 presents the detection limits and reporting limits (RLs) for the analyses.

7.1 SOIL SAMPLE COLLECTION AND ANALYSIS

As described in the PCMP in Section 5.0, performance and confirmation soil samples will be collected during and after Zone A ISTR. The following sections provide field methods and sampling procedures that will be used to complete soil sampling. Performance and confirmation soil sampling will follow TRS's Hot Soil Sampling SOP 3.2 provided in Attachment F.2. This SOP includes the use of brass or stainless-steel sample sleeves and requires the immediate capping and placement of sample sleeves into an ice bath for cooling until the soil approaches ambient temperature prior to sample collection. For additional sampling and field procedures not specified in the TRS Hot Soil Sampling SOP, the Floyd|Snider Standard Guideline for Soil Sample Collection in Attachment F.3 will be followed.

7.1.1 Field Methods

Soil samples will be collected using direct push drilling methods or rotosonic drilling methods if direct push is not possible following the TRS Hot Soil Sampling SOP. Soil borings will be advanced to the target depths presented in Table F.6. To minimize the potential for cross-contamination between sample locations and to facilitate sample retrieval, the core barrel will be lined with a brass or stainless-steel core-barrel sleeve. A new sleeve will be used for each interval advanced with samples collected directly from the borehole sample sleeve after cooldown.

The consultant team will coordinate the drilling schedule with TRS prior to mobilizing the drillers for the collection of performance and confirmation soil samples. This is to ensure that a temporary shutdown of the thermal system can be coordinated with TRS, at least 4 hours prior to the scheduled sampling.

Because hot soil sampling protocols will be followed, soil cores will be collected only from targeted sample intervals. Sample sleeves will be capped immediately after collection and placed into an ice bath until the soil temperature approaches ambient temperature. All borings will be monitored and recorded by a field technician; logging of the entire borehole will not be conducted. Photographs will be taken during sample collection to document soil sample conditions.

7.1.2 Soil Inspection and Photoionization Detector Screening

Once the soil cores have cooled enough to allow handling, soils will be inspected for visual (e.g., light NAPL, staining, or sheen) and/or olfactory indicators of contamination and noted on the field log. Soil headspace will be screened for VOCs using a PID. A small volume of soil from the target depth will be placed in a labeled plastic bag, and the tip of the PID will be inserted into the bag to measure VOCs in the headspace. The results will be recorded in the field log. Additional field screening using an Oil-In-Soil (Sudan IV) or equivalent field test kit will occur when PID detections are greater than 200 ppmv. If the PID measurement is less than 200 ppmv, then a sheen test will be conducted to confirm no heavier TPH analytes are present. If any petroleum sheen or product droplets appear during the sheen test, then a follow-up Sudan IV test will be completed.

7.1.3 Soil Sampling

Soil samples will be collected from the targeted interval for laboratory analysis at a frequency of one sample per targeted depth as shown on Table F.6. Samples will be collected at the location that corresponds to the greatest PID measurement and/or the presence of NAPL within the targeted 1-foot sample interval. Additional sample volume will be collected from each performance sample location as shown on Table F.6 and will be archived at the laboratory pending the results of the initial analyses, as described in Section 5.3.2.

Samples for VOC analysis will be collected via USEPA Method 5035 and transferred directly to the appropriate laboratory-provided jars without homogenization to minimize the potential loss of volatile analytes. Samples for non-volatile analysis will be transferred to a decontaminated stainless-steel bowl and homogenized until uniform in color and texture before being placed into laboratory-provided sample containers. Samples will be stored in a cooler with ice or in the on-site sample refrigerator to cool the samples for preservation prior to transport to the laboratory for chemical analysis.

7.1.4 Field Decontamination Procedures

The decontamination procedure is designed to prevent cross-contamination between sampling locations. Before each use and between sampling locations, the sampling equipment (i.e., stainless-steel bowl and spoon) will be decontaminated as follows:

1. Remove excess soil with a brush and distilled or deionized water.
2. Scrub surfaces of equipment contacting sample material with brushes using an Alconox solution.
3. Rinse equipment with distilled or deionized water.

7.1.5 Soil Sample Nomenclature

Each sample container will be labeled with a unique alphanumeric code (a.k.a. sample name) that will facilitate tracking and cross referencing of sample information. Each sample name will include the information and follow the formats outlined below:

- Each sample name will begin with "PCM-" to indicate the sample is a performance or confirmation sample.
- Each sample name will also include the boring location that identifies where the soil sample was collected (e.g., "BH12-").
  - Collocated soil samples at previously sampled PEC boring locations will include a "b" at the end of the location identifier to indicate that this is a collocated sample at a previous boring location (e.g., "BH12b").
  - Proposed soil samples at new boring locations will be assigned individual location numbers following the last PEC boring location as they are drilled (e.g., the first proposed boring location that is drilled will be named "BH44" because there are currently 43 unique boring locations within Zone A; the next proposed location will become "BH45"; etc.).
- If a sample is a duplicate, a "1" will be added to the sample location identification number (e.g., a duplicate sample collected at location "BH12b" will be termed "BH112b").
- The sample name will include the bottom depth of the 1-foot depth interval that the sample was taken from (e.g., "15" to represent a sample collected between 14 and 15 feet bgs).
- The sample name will end with the sample collection date using the format of "MMDDYY."

As an example, a sample name of PCM-BH12b-15-022323 indicates a sample collected from PEC-boring collocated location BH12 at a depth of 14 to 15 feet bgs on February 23, 2023. An example of a sample collected from a proposed location would be PCM-BH44-15-022323 and an example of a duplicate sample collected from the same proposed location would be PCM-BH144-15-022323.

A label must be affixed to all sample containers to prevent misidentification, and at a minimum, must include the following:

- Client name and project
- Unique sample name
- Date and time of collection
- Preservatives used in the sample, if applicable

The information on each sample label will be recorded on the boring log and/or in the field logbook and on the laboratory chain-of-custody.

7.1.6 Disposal of Investigation-Derived Waste

Investigation-derived waste (IDW) will include soil cuttings from drilling and disposable materials used during fieldwork (e.g., disposable PPE, plastic sheeting, and paper towels). Soil cuttings will be collected in 55-gallon drums or a roll-off container and stored temporarily on-site until the material can be transported off-site to Chemical Waste Management (CWM) for disposal under an existing CAMU soil profile (refer to EDR Section 9.5).

NAPL will be generated as part of the condensate treatment process. Depending on the volume of NAPL recovered, it will be either drummed or pumped into a tanker truck for off-site disposal at CWM under existing Zone A CAMU profiles.

All disposable sampling materials and PPE used in sample processing will be placed in heavy-duty garbage bags or other appropriate containers and disposed of as trash in the municipal collection system.

7.2 VAPOR SAMPLE COLLECTION AND ANALYSIS

As described in Section 7.3 of the EDR, mass recovery will be an important operation parameter that is monitored to track ISTR progress. To assess mass recovery, vapor samples will be collected from the vapor recovery system on a weekly basis for the first 4 weeks of each phase of operation, or after a significant change in airflow, consistent with the current SVE and RTO operations. After the initial 4 weeks, vapor sampling will occur at least every other week. Additional samples will be taken at the discretion of TRS.

7.2.1 Field Methods and Sampling

Field and sampling methods associated with vapor sampling will follow the vapor sampling guidelines described in the current SVE system O&M Manual (PBS 2021).[8] The vapor sampling will include routine PID readings (a minimum of 3 per week) and biweekly samples taken from the reconfigured ISTR effluent piping using either a Tedlar bag or summa canister.

7.2.2 Vapor Sample Nomenclature

Each sample container will be labeled with a unique alphanumeric code (a.k.a. sample name) that will facilitate tracking and cross referencing of sample information. Each sample name will include the information and follow the formats outlined below:

- Each sample name will include either “EFF-“ or “INF-“ to indicate whether the sample is an effluent or influent sample, respectively.

[8] Specific analytes evaluated for RTO destruction efficiency will be in accordance with the final RTO permit.

- Each sample name will include "RTO-" to indicate that these are vapor recovery samples collected before (INF) or after (EFF) the RTO.
- Each sample name will end with sample collection date using the format of "MMDDYY."

As an example, a sample name of EFF-RTO-022323 indicates a vapor effluent sample taken on February 23, 2023. An example of a vapor influent sample would be INF-RTO-022323.

A label must be affixed to all sample containers to prevent misidentification, and at minimum, must include the following:

- Client name and project
- Unique sample name
- Date and time of collection

The information on each sample label will be recorded on laboratory chain-of-custody.

7.3 CONDENSATE WATER SAMPLE COLLECTION AND ANALYSIS

To reduce fuel consumption and greenhouse gas releases associated with the RTO, water will be condensed out from the recovered vapors prior to entry into the RTO. As a sustainable reuse action, this condensate water will be treated, sampled, and analyzed for VOCs, SVOCs, PCBs, and TPH to assess whether this condensate water can be reused on-site for purposes such as dust control or irrigation via discharge to the existing stormwater swale in Zone A. Condensate water reuse criteria that were also used during the Zone A Removal Action are provided in Table F.3.

The goal is that all or most of the treated water will be reused onsite. If initial sample results do not meet on-site reuse criteria, then the water will be recirculated through the treatment system and tested again. In the event that there is not sufficient capacity for retreatment, this water may be transported off-site for disposal at a permitted facility.

7.3.1 Field Methods and Sampling

Condensate effluent will be sampled in batches from the condensate holding tank effluent sample port after it has been treated using two 500-pound LGAC vessels in series. The sample port is opened, and the liquid is released into a 5-gallon bucket until the piping has been flushed. The valve is then adjusted until the flow is approximately 100 milliliters per minute. Each sample container is held below the sampling port and filled completely so that no bubbles are present in the container. Any waste condensate collected in the bucket during purging and bottle filling is then returned to the phase separator for reprocessing. If the treated condensate holding tank does not have an effluent sample port, samples will be collected from the above sample port using a bailer. After collecting a sample with the bailer, the sample will be transferred to the appropriate sample container.

7.3.2 Condensate and NAPL Sample Nomenclature

Each sample container will be labeled with a unique alphanumeric code (a.k.a. sample name) that will facilitate tracking and cross referencing of sample information. Each sample name will include the information and follow the formats outlined below:

- Each sample name will include "COND-" to indicate that these are condensate samples or "NAPL" to indicate the sample is separated NAPL.
- Condensate sample names will include either "EFF-" or "INF-" to indicate whether the sample is an effluent or influent sample, respectively.
- Each sample name will end with the date the sample is collected in the format of "MMDDYY."

As an example, a sample name of EFF-COND-022323 indicates a condensate effluent sample taken on February 23, 2023. An example of a condensate influent sample would be INF-COND-022323.

A label must be affixed to all sample containers to prevent misidentification, and at minimum, must include the following:

- Client name and project
- Unique sample name
- Date and time of collection
- Preservative used in the sample, if applicable

The information on each sample label will be recorded in the field logbook and on the chain-of-custody.

7.4 SAMPLE HANDLING AND CUSTODY DOCUMENTATION

Sample possession and handling must be traceable from the time of sample collection, through laboratory and data analysis, to the time sample results are reported. A sample log form and field logbook entries will be completed for each location occupied and each sample collected.

7.4.1 Sample Chain-of-Custody

Technical field staff will be responsible for all sample tracking and custody procedures in the field, and the chain-of-custody procedures will be strictly followed.

At the end of each day and before sample transfer, each sample will be recorded on the chain-of-custody form in indelible ink. All sample information (i.e., sample names, sampling date/time, sample matrix, number of containers, etc.), including all required analyses, will be recorded on the chain-of-custody form before formal transfer of the sample containers to the

analytical laboratory. The sampler will place the chain-of-custody form in a clear plastic bag inside the sample cooler with the samples.

The samples are considered to be in custody if one of the following is maintained:

- The samples are in someone's physical possession.
- The samples are in someone's view.
- The samples are locked up or secured in a locked container or vehicle, or otherwise sealed so that any tampering would be evident.
- The samples are kept in a secured area that is restricted to authorized personnel only.

Any time possession of the samples is transferred, the individuals relinquishing and receiving the samples will sign, date, and note the time of transfer on the chain-of-custody form. This form also documents the transfer of custody of samples from the sampler to the laboratory. Each shipment of sample coolers will be accompanied by the chain-of-custody forms.

Copies of all forms will be retained as appropriate and included as appendices to quality assurance (QA) and quality control (QC) reports to management.

7.4.2 Sample Transport

Before transport, the field staff will take measures to preserve the integrity of the samples. This includes wrapping the sample containers and securely packing them inside the cooler with ice packs or crushed ice to maintain the required temperature range. Additionally, the original signed chain-of-custody forms will be transferred in the cooler alongside the samples. The coolers containing the samples will be delivered to the laboratory under chain-of-custody protocol after completion of sampling activities on the day of sample collection or the following day depending on the duration of the field sampling. Alternatively, if appropriate, the samples may be shipped directly to the laboratory to maintain the required temperature range and ensure timely delivery.

7.4.3 Sample Receipt

Upon receipt of the samples, the designated sample receiver at the laboratory will accept custody of the samples and verify that the chain-of-custody forms match the samples received. The ALS Environmental Project Manager and/or sample receiver will ensure that the chain-of-custody forms are properly signed, indicating receipt of the samples. Any questions or observations regarding the integrity of the samples will be noted on the chain-of-custody forms to ensure transparency and accountability throughout the sample handling process

7.5 HEALTH AND SAFETY

All field investigation activities described in this SAP will be conducted in accordance with the Site HASPs and task-specific JHA as described in Section 3.0

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8.0 Quality Assurance Project Plan

This section describes the analytical program that will be carried out for each sample selected for chemical analysis. It also discusses the laboratory QA objectives and QC procedures required to produce technically sound and reliable data. To ensure accurate and reliable results, the sampling program will adhere to specific analytical methods, preservation requirements, bottle types, and holding times, which are presented in Table F.7. This table provides a comprehensive list of parameters for each analysis method. Table F.8 presents the detection limits and RLs for each analysis.

8.1 LABORATORY ANALYSES

The samples collected for chemical analysis will be transported to ALS, an accredited laboratory located in Everett, Washington. The laboratory will analyze the samples for various chemicals, as summarized in Table F.8, using the specific methods applicable for soil, vapor, and condensate, as indicated below:

- Soil analyses:
  - GRO by NWTPH-Gx
  - DRO by NWTPH-Dx
  - SVOCs by USEPA Method 8270
  - VOCs by USEPA Method 8260
  - PCBs by USEPA Method 8082
- Vapor analyses:
  - VOCs by USEPA Method 8260
- Condensate analyses:
  - VOCs by USEPA Method 8260/8260 Selected Ion Monitoring (SIM)
  - SVOCs by USEPA Method 8270/8270 SIM
  - TPH by NWTPH-Hazardous Chemicals Identification (HCID)
  - PCBs by USEPA Method 8082

8.2 REPORTING LIMITS

The analytical methods outlined in this QAPP have achievable method detection limits (MDLs) and RLs (or practical quantitation limits [PQLs]) that use standard methodology. Table F.8 provides the target MDLs and RLs for each analytical method as performed by ALS. However, it should be noted that these RLs are goals only, and there may be instances where high sample concentrations, non-homogeneity of samples, or matrix interferences may prevent the laboratory from achieving the desired RL and associated QA/QC criteria. In such cases, the laboratory will report the reason for any deviation from these RLs.

8.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL OBJECTIVES

The laboratory's QA/QC objectives are to obtain technically sound and well-documented data, which have been evaluated against established criteria for the principle data quality indicators. These indicators include precision, accuracy, representativeness, completeness, and comparability, as defined in Ecology and USEPA guidance (Ecology 2004; USEPA 2002). The laboratory will follow the QA/QC criteria presented in Table F.9, which are described in detail in the following sections.

8.3.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, precision is a quantitative measure of the variability of a group of measurements compared to their average values. Analytical precision is measured through matrix spike (MS)/matrix spike duplicate (MSD) samples for organic analysis, through laboratory duplicate samples for inorganic analyses, and on project-specific samples.

To ensure analytical precision, project-specific samples will be analyzed at a minimum frequency of one sample per laboratory analysis group. The laboratory will evaluate precision against quantitative relative percent difference (RPD) performance criteria.

Field precision will be evaluated through the collection of field duplicates. Currently, no performance criteria have been established for field duplicates. Therefore, field duplicate precision will be screened against an RPD of 75% for all samples. However, it is important to note that no data will be qualified based solely on field duplicate precision.

Precision measurements can be affected by the proximity of a chemical concentration to the MDL, which can result in an increase in the percent error (expressed as RPD). The equation used to express precision is as follows:

$$\mathrm{RPD} = \frac{(C_1 - C_2) \times 100\%}{(C_1 + C_2)/2}$$

Where:

RPD = relative percent difference

C1 = larger of the two observed values

C2 = smaller of the two observed values

8.3.2 Accuracy

Accuracy is an expression of the degree to which a measured or computed value represents the true value. To assess analytical accuracy, spiked samples with known concentrations (surrogates, laboratory control samples [LCSs], and/or MS) will be analyzed, and the percent recovery will be measured.

Accuracy measurements on MS samples will be carried out at a minimum frequency of one per laboratory analysis group per matrix analyzed. The laboratory will perform MS/MSDs only on samples from this investigation and not from other projects because MS/MSDs measure the effects of potential matrix interferences of a specific matrix. Surrogate recoveries will be determined for every sample analyzed for organics.

The laboratory accuracy will be evaluated against quantitative LCS, MS, and surrogate spike recoveries using limits for each applicable analyte. Accuracy can be expressed as a percentage of the true or reference value, or as a percent recovery in those analyses where reference materials are not available and spiked samples are analyzed. The equation used to express accuracy is as follows:

$$\%R = 100\% \times (S - U)/C_{sa}$$

Where:

%R = percent recovery

S = measured concentration in the spiked aliquot

U = measured concentration in the unspiked aliquot

C_{sa} = actual concentration of spike added

8.3.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. To ensure representativeness, the sampling program has been carefully designed with proper selection of sample locations, sufficient numbers of samples collected, and representative samples obtained. A sufficient volume of sample will be collected at each sampling location to minimize bias or errors associated with sample particle size and heterogeneity.

8.3.4 Comparability

Comparability is a qualitative parameter that indicates the confidence with which one dataset can be compared to another. To ensure the comparability of results, all samples will be analyzed using standard USEPA methods and protocols. Calibration and reference standards will be traceable to certified standards, and standard data reporting formats will be employed. The data will be reviewed to verify that precision and accuracy criteria were achieved. Any deviations from established QA/QC criteria will be documented and explained in the final report.

8.3.5 Completeness

Completeness is a measure of the amount of data that is determined to be valid in proportion to the amount of data collected. Completeness will be calculated as follows:

$$C = \frac{\text{(Number of acceptable data points)} \times 100}{\text{(Total number of data points)}}$$

The QA/QC objectives for completeness for all components of this project are set at 95%. Any data that were qualified as estimated due to not meeting the QA/QC criteria will still be considered valid for the purpose of assessing completeness. However, any data that were qualified as rejected will not be considered valid for assessing completeness.

8.4 LABORATORY AND FIELD QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

The quality of analytical data generated will be assessed both by the implementation of field QC procedures and by the frequency and type of internal laboratory QA/QC checks developed for analysis type and method. Field QC will be evaluated through the analysis of trip blanks and field duplicates. Field duplicates will be collected to evaluate the efficiency of field decontamination procedures, variability from sample handling, and sample heterogeneity. Laboratory results will be evaluated by reviewing analytical results of method blanks, MS/MSD, field duplicate samples, LCS, calibrations, performance evaluation samples, and interference checks as specified by the analytical methods used.

The QA/QC samples from each laboratory analysis group will be reviewed by the laboratory analyst immediately after completion of the analysis. The QA/QC samples from each laboratory analysis group will be evaluated to determine whether control limits were exceeded. If control limits are exceeded, corrective action such as method modifications followed by reprocessing of the affected samples will be initiated before processing a subsequent group of samples.

All primary chemical standards and standard solutions used will be obtained from documented and reliable commercial sources and will be traceable. Standards will be validated for accuracy by comparing them with an independent standard, and any impurities identified in the standard will be documented.

The procedures that will be used to assess data quality throughout sample analysis are summarized in the following sections.

8.4.1 Analytical Duplicates

Analytical duplicates are subsamples of the original sample that are prepared and analyzed as a separate sample to assess the precision of the analysis and potential sample heterogeneity and matrix effects. A minimum of one analytical duplicate will be analyzed per laboratory analysis group, even when there are fewer than 20 samples.

8.4.2 Matrix Spikes and Matrix Spike Duplicates

Analysis of MS samples provides information on the extraction efficiency of the method on the sample matrix. By performing MSD analyses, information on the precision of the method is also provided for organic analyses. A minimum of one MS/MSD will be analyzed for every laboratory analysis group for which MS/MSD sample analysis is applicable per the approved method. When feasible, MS/MSD analyses will be performed on project-specific samples. When there are fewer than 20 samples, at least one MS/MSD will still be analyzed.

8.4.3 Laboratory Control Samples and Laboratory Control Sample Duplicate

An LCS is a method blank sample carried throughout the same process as the samples to be analyzed, with a known amount of standard added. The blank spike compound recovery assesses analytical accuracy in the absence of any sample heterogeneity or matrix effects. All LCS and LCS duplicate (LCSD) data for metals and organic compounds will be reported. The LCS/LCSD will be performed once per laboratory analysis group.

8.4.4 Surrogate Spikes

All project samples analyzed for organic compounds will be spiked with appropriate surrogate compounds as defined in the analytical methods. Surrogate recoveries will be reported by the laboratories. However, no sample result will be corrected for recovery using these values.

8.4.5 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. A minimum of one method blank will be analyzed for every extraction batch.

8.5 DATA VALIDATION

Floyd|Snider will conduct a Level 2A Compliance Screening on all analytical data. All chemical data will be reviewed with regard to the following:

- Chain-of-custody/documentation
- Sample preservation and holding times
- Method blanks
- RLs
- Surrogate recoveries
- MS/MSD recoveries
- LCS recoveries
- Laboratory and field duplicate RPDs

Data validation will be based on the QA/QC criteria as recommended in the methods identified in this SAP/QAPP and in the National Functional Guidelines for Organic and Inorganic Superfund Methods Data Review (USEPA 2020a, 2020b). The data will be reviewed to ensure its usability, conformance with the QA/QC objectives, and any deviations that may have affected the quality of the data. The final reporting of the data will include information on the basis of application of qualifiers. Any required corrective actions based on the evaluation of the analytical data will be determined by the laboratory in consultation with the Floyd|Snider Project Manager. These actions may include qualification or rejection of the data.

8.5.1 Data Reporting

Validated chemical data will be compiled and presented in tables that include the location of soil borings and monitoring wells, concentrations with appropriate qualifiers, and comparison to relevant criteria. These data will be incorporated into the Zone A Post-Excavation Completion Report.

9.0 References

Floyd|Snider and PBS Engineering and Environmental, Inc. (PBS). 2020. *Pasco Sanitary Landfill NPL Site Zone A Removal Action Engineering Design Report.* Prepared for Industrial Waste Area Generators Group III. August.

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U.S. Environmental Protection Agency (USEPA). 2002. *Guidance on Environmental Data Verification and Data Validation.* EPA/240/R-02/004. November.

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_____. 2019a. *Cleanup Action Plan – Pasco Landfill NPL Site.* August.

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Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F

Tables

Table F.3
Condensate Reuse Criteria

Zone A Analytes and Screening Criteria for the On-Site Reuse of Treated Condensate	On-Site Reuse Criteria (µg/L)
VOCs - EPA Method 8260 SIM - ALS Everett	
1,1-Dichloroethene	0.057
1,1,2,2-Tetrachloroethane	0.22
1,2-Dibromo 3-Chloropropane	0.06
1,2-Dibromoethane (EDB)	0.02
1,2-Dichloroethane	0.38
1,2,3-Trichloropropane	0.1 (1)
Benzene	1.2
Tetrachloroethylene	0.69
Trichloroethene	2.5
Vinyl Chloride	0.053
VOCs - EPA Method 8260 - ALS Everett	
1,1-Dichloroethane	7.68
1,1,1-Trichloroethane	200
1,1,1,2-Tetrachloroethane	1.7
1,1,2-Trichloroethane	0.77
1,2-Dichlorobenzene	720
1,2-Dichloropropane	1.2
1,2,4-Trichlorobenzene	1.5
1,2,4-Trimethylbenzene	80
1,3,5-Trimethylbenzene	80
1,4-Dichlorobenzene	8.1
2-Butanone (MEK)	4,800
2-Chlorotoluene	160
2-Hexanone	40
4-Methyl-2-Pentanone (MIBK)	640
Acetone	7,200
Acrylonitrile	10 (1)
Bromobenzene	64
Bromodichloromethane	0.71
Bromoform	5.5
Bromomethane	11
Carbon Disulfide	800
Carbon Tetrachloride	0.63
Chlorobenzene	160
Chloroform	1.4
cis-1,2-Dichloroethene	12
Dibromochloromethane	0.52
Dibromomethane (methylene bromide)	80
Dichlorodifluoromethane (CFC-12)	1,600
Ethylbenzene	800
VOCs - EPA Method 8260 - ALS Everett (cont.)	
Hexachlorobutadiene	0.56
Isopropylbenzene (cumene)	800
m,p-Xylene	1,600
Methyl T-Butyl Ether	24
Methylene Chloride	5
n-Butylbenzene	400
n-Propyl Benzene	800
Naphthalene	160
o-Xylene	1,600
Styrene	1,600
T-Butyl Benzene	800
Toluene	157
Trans-1,2-Dichloroethene	160
Trichlorofluoromethane (CFC-11)	2,400
SVOCs - EPA Method 8270 SIM - ALS Everett	
Benzo[A]Anthracene	0.12
Benzo[A]Pyrene	0.023
Benzo[B]Fluoranthene	0.02 (1)
Benzo[K]Fluoranthene	1.2
Bis(2-Chloroethyl)Ether	0.04
Chrysene	12
Dibenz[A,H]Anthracene	0.02 (1)
Indeno[1,2,3-Cd]Pyrene	0.12
Hexachlorobenzene	0.055
1-Methylnaphthalene	1.5
Pentachlorophenol	0.22
SVOCs - EPA Method 8270 - ALS Everett	
1,2-Dichlorobenzene	720
1,2,4-Trichlorobenzene	1.5
1,4-Dichlorobenzene	8.1
2-Chlorophenol	40
2-Methylnaphthalene	32
2-Methylphenol (o-Cresol)	400

Table F.3
Condensate Reuse Criteria

Zone A Analytes and Screening Criteria for the On-Site Reuse of Treated Condensate	On-Site Reuse Criteria (µg/L)
SVOCs - EPA Method 8270 - ALS Everett (cont.)	
2-Nitroaniline	160
2,3,4,6-Tetrachlorophenol	480
2,4-Dichlorophenol	24
2,4-Dimethylphenol	160
2,4-Dinitrophenol	32
2,4-Dinitrotoluene	2 (1)
2,4,5-Trichlorophenol	800
2,4,6-Trichlorophenol	4
2,6-Dinitrotoluene	2 (1)
3&4-Methylphenol (m&p-Cresol)	400/800
4-Chloro-3-Methylphenol (Chlorocresol)	1,600
4-Chloroaniline	2 (1)
4-Nitroaniline	64
Acenaphthene	960
Aniline	7.7
Anthracene	4,800
Azobenzene	2 (1)
Benzoic Acid	64,000
Benzyl Alcohol	800
Bis(2-Ethylhexyl)Phthalate	6.3
Butylbenzylphthalate	46
Di-N-Butylphthalate	1,600
Di-N-Octylphthalate	160
Dibenzofuran	16
Diethylphthalate	13,000
Fluoranthene	640
Fluorene	640
Hexachlorocyclopentadiene	48
Hexachloroethane	2 (1)
Isophorone	46
N-Nitroso-Di-n-Propylamine	2 (1)
N-Nitrosodimethylamine	2 (1)
N-Nitrosodiphenylamine	18
Naphthalene	160
Nitrobenzene	16
Phenol	2,400
Pyrene	480
Pyridine	8
PCB Aroclors - EPA Method 8082A - ALS Everett	
Aroclor 1016	0.56
Aroclor 1254	0.022
Aroclor 1260	0.022
Total PCBs	0.022
Total Petroleum Hydrocarbons by NWTPH-HCID - ALS Kelso	
NWTPH-HCID	500
TAL Metals by EPA-200.8/EPA-245.1 - ALS Everett	
Chromium	100
Copper	640
Iron	11,000
Lead	15
molybdenum	N/A
Manganese	750
Nickel	320
Selenium	80
Silver	80
Thallium	0.2 (1)
Vanadium	80
Zinc	4,800
Mercury	2

Notes:

Laboratory RLs were updated by ALS Environmental in March 2023, which resulted in an increase in reuse criteria for the following compounds; 2,4-dinitrotoluene, acrylonitrile, and 1,2,3-trichloropropane.

1 The Ecology-approved RL exceeds the MTCA Method B Cancer Value.

Abbreviations:

Ecology	Washington Department of Ecology
EPA	Environmental Protection Agency
µg/L	Micrograms per liter
MTCA	Model Toxics Control Act
N/A	Not applicable
PCB	Polychlorinated biphenyl
RL	Reporting limit
SVOC	Semivolatile organic compound
VOC	Volatile organic compound

Table F.4
REL Exceedances within Treatment Area

			Analyte	BTEX [1]	cVOCs [1,2]	Naphthalenes [1,3]	Gasoline-Range Organics	Diesel-Range Organics
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			REL	250	1.0	65	1,000	2,000
Location Name	Sample Name	Date	Sample Depth (feet bgs)					
Subarea A1								
BH20	PLF-BH20-13-060222	6/2/2022	13	0.035	0.0010 U	0.25 U	25 UJ	50 U
	PLF-BH20-16-060222	6/2/2022	16	**360**	**1.6**	**72**	*10,000 U*	*7,800 U*
	PLF-DUP11-060222	6/2/2022	16	**630**	*2.6 U*	**70**	**13,000**	**7,900**
	PLF-BH20-22-060222	6/2/2022	22	73	0.24 U	36	*2,500 U*	**4,200**
	PLF-BH20-24-060222	6/2/2022	24	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A2								
BH22	PLF-BH22-12-060122	6/1/2022	12	**330**	**2.3**	6.3	**4,100**	1,900 U
	PLF-BH22-15-060122	6/1/2022	15	**1,100**	**11**	25	*10,000 U*	**4,800**
	PLF-BH22-24-060122	6/1/2022	24	**1,400**	**7.7**	43	*10,000 U*	**8,600**
	PLF-BH22-28-060122	6/1/2022	28	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH23	PLF-BH23-14-060222	6/2/2022	14	7.3	0.021 U	12	420	1,300
	PLF-BH23-17-060222	6/2/2022	17	9.1	0.28 U	27	*2,500 U*	1,000
	PLF-BH23-22-060222	6/2/2022	22	63	0.24 U	30	**2,600**	**3,600**
	PLF-BH23-28-060222	6/2/2022	28	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH23-31-060222	6/2/2022	31	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A3								
BH05	PLF-PEC-BH05-11-020422	2/4/2022	11	15	0.29 U	27	790	**2,100**
	PLF-PEC-BH05-17-020422	2/4/2022	17	**280**	*1.5 U*	**140**	**4,900**	**6,500**
	PLF-PEC-BH05-23-020422	2/4/2022	23	0.020 U	0.0010 U	11	300	1,600
	PLF-PEC-BH05-36-020422	2/4/2022	36	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH05-44-020422	2/4/2022	44	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH05-61-020422	2/4/2022	61	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A4								
BH07	PLF-PEC-BH07-12-020222	2/2/2022	12	**470**	**19**	1.6	**3,000**	100 U
	PLF-PEC-BH07-15-020222	2/2/2022	15	25	0.48	2.5 U	40	**3,100**
	PLF-PEC-BH07-27-020322	2/3/2022	27	--	--	9.4	66	**3,300**
	PLF-PEC-BH07-30-020322	2/3/2022	30	37	0.22 U	9.1	660	**3,000**
	PLF-BH07a-34-092222	9/22/2022	34	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH07a-41-092222	9/22/2022	41	0.026 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH07-53-020322	2/3/2022	53	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH07-63-020322	2/3/2022	63	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A5								
BH25	PLF-BH25-15-060122	6/1/2022	15	8.5	0.042	**79**	*2,500 U*	880 U
	PLF-BH25-18-060122	6/1/2022	18	74	0.46	**100**	**3,500**	2,000 U
	PLF-BH25-22-060122	6/1/2022	22	73	0.67	51	*2,500 U*	1,400
	PLF-DUP10-060122	6/1/2022	22	100	**1.2**	51	**3,800**	**2,300**
	PLF-BH25-26-060122	6/1/2022	26	230	1.0	18	*10,000 U*	**2,600**
	PLF-BH25-34-060122	6/1/2022	34	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH25-63-060122	6/1/2022	63	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH27	PLF-BH27-14-060322	6/3/2022	14	0.020 U	0.0010 U	0.25 U	25 U	160
	PLF-BH27-19-060322	6/3/2022	19	0.020 U	0.0010 U	0.25 U	25 U	130
	PLF-BH27-22-060322	6/3/2022	22	**1,700**	*2.3 U*	20	**14,000**	1,600
	PLF-BH27-28-060322	6/3/2022	28	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH27-33-060322	6/3/2022	33	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH27-38-060322	6/3/2022	38	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH27-61-060322	6/3/2022	61	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH28	PLF-BH28-04-061622	6/16/2022	4	2.5	0.25	7.0	1,000 U	540
	PLF-BH28-17-061622	6/16/2022	17	**1,100**	**15**	**94**	*10,000 U*	*4,500 U*
	PLF-BH28-24-061622	6/16/2022	24	3.6	0.040	0.42	52	50 U
	PLF-BH28-29-061622	6/16/2022	29	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A6								
BH29	PLF-BH29-17-061622	6/16/2022	17	0.020 U	0.0010 U	6.8	*2,500 U*	1,300
	PLF-BH29-20-061622	6/16/2022	20	3.4	*0.025 U*	58	*10,000 U*	*4,500 U*
	PLF-BH29-23-061622	6/16/2022	23	**530**	**1.6**	41	*10,000 U*	*2,200 U*
	PLF-BH29-33-061622	6/16/2022	33	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH29-44-061622	6/16/2022	44	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH30	PLF-BH30-03-061622	6/16/2022	3	0.034	0.0075	0.25 U	25 U	50 U
	PLF-BH30-16-061622	6/16/2022	16	**580**	**26**	**120**	**13,000**	*5,000 U*
	PLF-BH30-24-061622	6/16/2022	24	**920**	**16**	**250**	**11,000**	*7,500 U*
	PLF-BH30-32-061622	6/16/2022	32	0.14	0.0019	0.25 U	25 U	50 U

Table F.4
REL Exceedances within Treatment Area

			Analyte	BTEX [1]	cVOCs [1,2]	Naphthalenes [1,3]	Gasoline-Range Organics	Diesel-Range Organics
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			REL	250	1.0	65	1,000	2,000
Location Name	Sample Name	Date	Sample Depth (feet bgs)					
Subarea A7								
BH11	PLF-PEC-BH11-12-020722	2/7/2022	12	170	*2.1 U*	**120**	**4,900**	**4,200**
	PLF-PEC-BH11-20-020722	2/7/2022	20	0.93	0.014 U	0.25 U	25 U	64
	PLF-PEC-DUP3-020722	2/7/2022	20	140	*1.7 U*	**78**	**3,500**	**4,000**
	PLF-PEC-BH11-48-020822	2/8/2022	48	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH11-57-020822	2/8/2022	57	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH12	PLF-BH12-05-060722	6/7/2022	5	77	0.85	43	**2,800**	1,900 U
	PLF-BH12-21-060722	6/7/2022	21	**3,200**	**13**	51	**15,000**	*3,800 U*
	PLF-BH12-24-060722	6/7/2022	24	**3,100**	**25**	**69**	**11,000**	*5,000 U*
	PLF-DUP12-060722	6/7/2022	24	**5,300**	**57**	**100**	**25,000**	*5,000 U*
	PLF-BH12-27-060722	6/7/2022	27	0.67	0.019 U	0.39	25 U	150
	PLF-BH12-38-060722	6/7/2022	38	0.020 U	0.0017	1.9	25 U	*2,500 U*
Subarea A8								
BH15	PLF-PEC-BH15-11-021022	2/10/2022	11	9.7	0.13	4.3	330	1,000
	PLF-PEC-BH15-16-021022	2/10/2022	16	18	0.29	10	**2,300**	310
	PLF-PEC-BH15-23-021122	2/11/2022	23	**450**	**5.9**	13	**3,400**	1,700
	PLF-PEC-BH15-48-021122	2/11/2022	48	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH16	PLF-PEC-BH16-12-021322	2/13/2022	12	8.2	0.018	12	320	1,800
	PLF-PEC-BH16-17-021322	2/13/2022	17	200	**1.2**	**120**	**2,000**	**9,000**
	PLF-PEC-BH16-32-021322	2/13/2022	32	53	0.018	6.0	590	1,200
	PLF-PEC-BH16-36-021322	2/13/2022	36	9.5	0.046	1.0	150	1,200
	PLF-PEC-BH16-44-021322	2/13/2022	44	31	0.74	5.3	790	2,000
	PLF-BH16a-46-092222	9/22/2022	46	0.020 U	0.0010 U	4.5	25 U	**6,500**
	PLF-BH116a-46-092222	9/22/2022	46	0.055	0.0018	4.3	25 U	**4,600**
	PLF-BH16a-51-092222	9/22/2022	51	1.5	0.0042	0.25 U	31	150
	PLF-PEC-BH16-62-021322	2/13/2022	62	0.020 U	0.0010 U	0.25 U	25 U	50 U
Subarea A9								
BH18	PLF-PEC-BH18-12-021422	2/14/2022	12	0.020 U	0.0033	2.6	56	1400
	PLF-PEC-BH18-17-021422	2/14/2022	17	**390**	**5.8**	54	**1,800**	**3,200**
	PLF-PEC-BH18-22-021422	2/14/2022	22	0.068	0.0010 U	0.99	25 U	380
	PLF-PEC-BH18-39-021422	2/14/2022	39	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH18-45-021422	2/14/2022	45	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-PEC-BH18-60-021422	2/14/2022	60	0.020 U	0.0010 U	0.25 U	25 U	50 U
BH34	PLF-BH34-10-060622	6/6/2022	10	0.020 U	0.0010 U	0.25 U	25 U	50 U
	PLF-BH34-15-060622	6/6/2022	15	**340**	**22**	43	**7,000**	**5,700**
	PLF-BH34-18-060622	6/6/2022	18	0.020 U	0.0010 U	0.25 U	25 U	50 U

Notes:

-- Analyte was not tested.

Italic Analyte was not detected. Reported limit exceeds REL.

BOLD Exceedance of REL.

1 Summation was performed using detected concentrations plus one-half the reported value for component analytes that were not detected. If all analytes were not detected, the maximum reported non-detect concentration is used.

2 Calculation of total cVOC concentration was performed using tetrachloroethene, trichloroethene, and vinyl chloride.

3 Calculation of total naphthalenes concentration was performed using naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

BTEX Benzene, toluene, ethylbenzene, and xylenes
bgs Below ground surface
cVOC Chlorinated volatile organic compound
mg/kg Milligrams per kilogram
REL Remediation level

Qualifiers:

U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table F.6
Performance Sampling Analytical Approach

Treatment Subarea	Treatment Interval (feet bgs)	Boring Location	Target Sample Depth (feet bgs)	VOCs			SVOCs		GRO	DRO	PCBs
				BTEX	cVOCs [1]	Full List	Naph [2]	Full List			
A1	0 to 22	BH20	16	X	X	archive	X	archive	X	X	archive
		Proposed	14	X	X	archive	X	archive	X	X	archive
			19	X	X	archive	X	archive	X	X	archive
A2	0 to 25	BH22	15	X	X	archive		archive	X	X	archive
			24	X	X	archive		archive	X	X	archive
		BH23	22			archive		archive	X	X	archive
		Proposed	15	X	X	archive	X	archive	X	X	archive
			20	X	X	archive	X	archive	X	X	archive
			25	X	X	archive	X	archive	X	X	archive
A3	0 to 20	BH05	17	X	X	archive	X	archive	X	X	archive
		Proposed	15	X	X	archive	X	archive	X	X	archive
			20	X	X	archive	X	archive	X	X	archive
A4	0 to 27	BH07	12	X	X	archive		archive	X	X	archive
		Proposed	15	X	X	archive	X	archive	X	X	archive
			22	X	X	archive	X	archive	X	X	archive
			27	X	X	archive	X	archive	X	X	archive
A5	0 to 26	BH25	18		X	archive	X	archive	X	X	archive
			22		X	archive	X	archive	X	X	archive
		BH27	22	X	X	archive		archive	X	archive	archive
		BH28	17	X	X	archive	X	archive	X	X	archive
		Proposed	15	X	X	archive	X	archive	X	X	archive
			20	X	X	archive	X	archive	X	X	archive
			25	X	X	archive	X	archive	X	X	archive
A6	0 to 28	BH29	23	X	X	archive		archive	X	X	archive
		BH30	16	X	X	archive	X	archive	X	X	archive
			24	X	X	archive	X	archive	X	X	archive
		Proposed	18	X	X	archive	X	archive	X	X	archive
			23	X	X	archive	X	archive	X	X	archive
			28	X	X	archive	X	archive	X	X	archive
A7	0 to 25	BH11	12		X	archive	X	archive	X	X	archive
		BH12	21	X	X	archive	X	archive	X	X	archive
			25	X	X	archive	X	archive	X	X	archive
		Proposed	15	X	X	archive	X	archive	X	X	archive
			20	X	X	archive	X	archive	X	X	archive
			25	X	X	archive	X	archive	X	X	archive
A8	0 to 28	BH15	23	X	X	archive		archive	X	archive	archive
		BH16	17		X	archive	X	archive	X	X	archive
		Proposed	13	X	X	archive	X	archive	X	X	archive
			18	X	X	archive	X	archive	X	X	archive
			23	X	X	archive	X	archive	X	X	archive
			28	X	X	archive	X	archive	X	X	archive
A9	0 to 16	BH18	17	X	X	archive		archive	X	X	archive
		BH34	15	X	X	archive		archive	X	X	archive

Notes:

Target depth within the sample interval may be subject to change based on field screening where the greatest indication of contamination is observed.

1 Calculation of cVOC concentration includes tetrachloroethene, trichloroethene, and vinyl chloride.

2 Calculation of naphthalenes concentration includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Abbreviations:

BTEX benzene, toluene, ethylbenzene, and xylenes
bgs Below ground surface
cVOC Chlorinated volatile organic compound
DRO Diesel-range hydrocarbons
GRO Gasoline-range hydrocarbons
Naph Naphthalenes

Table F.7
Analytical Requirements, Methods, Preservation, Bottle Type, and Holding Times

Parameter	Method	Bottle Type	Preservative	Holding Time
Soil Samples				
VOCs	SW-846 8260	40-mL VOAs x 3 4-oz jar x 1	1 MeOH vial/jar - Cool <6 °C 2 unpreserved vials – Freeze within 48 hours	14 days to analysis
TPH: Gasoline-Range Organics	NWTPH - Gx	40-mL VOAs x 2 4-oz jar x 1	MeOH vials/jar - Cool <6 °C	14 days to analysis
TPH: Diesel-Range Organics	NWTPH - Dx	4-oz glass jar x 1	Cool <6 °C	14 days to extraction; 40 days to analysis
SVOCs	SW-846 8270	8-oz glass jar x 1	Cool <6 °C	14 days to extraction; 40 days to analysis
PCB Aroclors	SW-846 8082	Share with SVOCs	Cool <6 °C	1 year to extraction; 40 days to analysis

Table F.7
Analytical Requirements, Methods, Preservation, Bottle Type, and Holding Times

Parameter	Method	Bottle Type	Preservative	Holding Time
Vapor Samples				
VOCs	SW-846 8260	Tedlar Bag	None	72 hours
Condensate and Non-Aqueous Phase Liquid Samples				
VOCs	SW-846 8260	40-mL VOAs x3	HCl, Cool <6 °C	14 days to analysis
VOCs by SIM	SW-846 8260 SIM	40-mL VOAs x3	HCl, Cool <6 °C	14 days to analysis
SVOCs	SW-846 8270	1-liter amber glass	Cool <6 °C	7 days to extraction, 40 days to analysis
SVOCs by SIM	SW-846 8270 SIM	1-liter amber glass	Cool <6 °C	7 days to extraction, 40 days to analysis
TPH (NWTPH-HCID)	NWTPH-HCID	1-liter amber glass	Cool <6 °C	7 days to extraction, 40 days to analysis
PCB Aroclors	SW-846 8082	1-liter amber glass	Cool <6 °C	1 year to extraction 40 days to analysis

Abbreviations:

°C Degrees Celsius
mL Milliliters
oz Ounces
PCB Polychlorinated biphenyl
PCE Tetrachloroethene
SIM Select ion monitoring
SVOC Semivolatile organic compound
TCE Trichloroethene
TPH Total petroleum hydrocarbons
VC Vinyl chloride
VOA Volatile organic analysis
VOC Volatile organic compound

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Soil (mg/kg)				
Volatile Organic Compounds				
1,1,1-Trichloroethane	71-55-6	EPA Method 8260	0.15	10
1,1,2,2-Tetrachloroethane	79-34-5		0.11	0.32
1,1,2-Trichloroethane	79-00-5		0.039	1.0
1,1-Dichloroethane	75-34-3		0.085	1.0
1,1-Dichloroethene	75-35-4		0.15	1.0
1,2,4-Trichlorobenzene	120-82-1		0.087	10
1,2-Dibromo-3-chloropropane	96-12-8		0.034	50
1,2-Dibromoethane	106-93-4		0.036	0.11
1,2-Dichlorobenzene	95-50-1		0.052	1.0
1,2-Dichloroethane	107-06-2		0.045	1.0
1,2-Dichloropropane	78-87-5		0.048	1.0
1,3-Dichlorobenzene	541-73-1		0.049	10
1,4-Dichlorobenzene	106-46-7		0.060	10
Methyl ethyl ketone	78-93-3		0.077	50
2-Hexanone	591-78-6		0.26	50
Methyl isobutyl ketone	108-10-1		0.18	50
Acetone	67-64-1		0.17	50
Benzene	71-43-2		0.075	1.0
Bromodichloromethane	75-27-4		0.047	1.0
Bromoform	75-25-2		0.055	10
Bromomethane	74-83-9		0.16	1.0
Carbon Disulfide	75-15-0		0.11	10
Carbon Tetrachloride	56-23-5		0.078	1.0
Chlorobenzene	108-90-7		0.042	10
Chloroethane	75-00-3		0.12	10
Chloroform	67-66-3		0.15	1.0
Chloromethane	74-87-3		0.14	10
Cis-1,2-Dichloroethene	156-59-2		0.089	1.0
Cis-1,3-Dichloropropene	10061-01-5		0.065	10
Dichlorodifluoromethane	75-71-8		0.15	10
Ethylbenzene	100-41-4		0.063	10
Isopropylbenzene	98-82-8		0.058	10
Xylene (meta & para)	179601-23-1		0.13	20
Methyl-tert-butyl ether	1634-04-4		0.16	1.0
Methylene chloride	75-09-2		0.75	2.3
Xylene (ortho)	95-47-6		0.078	10
Styrene	100-42-5		0.061	10
Tetrachloroethene	127-18-4		0.097	1.0
Toluene	108-88-3		0.045	10
Trans-1,2-Dichloroethene	156-60-5		0.14	10
Trans-1,3-Dichloropropene	10061-02-6		0.10	10
Trichloroethene	79-01-6		0.082	1.0
Trichlorofluoromethane	75-69-4		0.097	10
Vinyl Chloride	75-01-4		0.0040	0.080
Semivolatile Organic Compounds				
1,2,4-Trichlorobenzene	120-82-1	EPA Method 8270	0.029	0.10
1,2-Dichlorobenzene	95-50-1		0.022	0.10
1,3-Dichlorobenzene	541-73-1		0.022	0.10
1,4-Dichlorobenzene	106-46-7		0.020	0.10
1-Methylnaphthalene	90-12-0		0.074	0.25
2,3,4,6-Tetrachlorophenol	58-90-2		0.022	0.10
2,4,5-Trichlorophenol	95-95-4		0.026	0.10
2,4,6-Trichlorophenol	88-06-2		0.022	0.10
2,4-Dichlorophenol	120-83-2		0.10	0.50
2,4-Dimethylphenol	105-67-9		0.027	0.10
2,4-Dinitrophenol	51-28-5		0.030	0.10
2,4-Dinitrotoluene	121-14-2		0.028	0.10
2,6-Dichlorophenol	87-65-0		0.076	0.25
2,6-Dinitrotoluene	606-20-2		0.026	0.10
2-Chloronaphthalene	91-58-7		0.026	0.10
2-Chlorophenol	95-57-8		0.041	0.25
2-Methylnaphthalene	91-57-6		0.063	0.25
2-Methylphenol	95-48-7		0.030	0.10
2-Nitroaniline	88-74-4		0.027	0.10
2-Nitrophenol	88-75-5		0.030	0.10
3&4-Methylphenol	15831-10-4		0.032	0.10
3,3-Dichlorobenzidine	91-94-1		0.071	0.25
3-Nitroaniline	99-09-2		0.24	1.0
4,6-Dinitro-2-methylphenol	534-52-1		0.098	0.50
4-Bromophenyl-phenylether	101-55-3		0.029	0.10
4-Chloro-3-methylphenol	59-50-7		0.13	0.50
4-Chloroaniline	106-47-8		0.24	1.0
4-Chlorophenyl-phenylether	7005-72-3		0.032	0.10
4-Nitroaniline	100-01-6		0.053	0.25
4-Nitrophenol	100-02-7		0.029	0.10

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Soil (mg/kg) (cont.)				
Semivolatile Organic Compounds (cont.)				
Acenaphthene	83-32-9	EPA Method 8270	0.026	0.10
Acenaphthylene	208-96-8		0.027	0.10
Aniline	62-53-3		0.019	0.10
Anthracene	120-12-7		0.028	0.10
Azobenzene	103-33-3		0.021	0.10
Benzo(a)anthracene	56-55-3		0.026	0.10
Benzo(a)pyrene	50-32-8		0.018	0.10
Benzo(b)fluoranthene	205-99-2		0.028	0.10
Benzo(g,h,i)perylene	191-24-2		0.031	0.10
Benzo(k)fluoranthene	207-08-9		0.029	0.10
Benzoic Acid	65-85-0		0.30	1.0
Benzyl Alcohol	100-51-6		0.021	0.10
Bis(2-chloroethoxy)methane	111-91-1		0.050	0.25
Bis(2-chloroethyl)ether	111-44-4		0.040	0.25
Bis(2-chloroisopropyl)ether	108-60-1		0.052	0.25
Bis(2-ethylhexyl)phthalate	117-81-7		0.035	0.10
Butylbenzylphthalate	85-68-7		0.028	0.10
Carbazole	86-74-8		0.046	0.25
Chrysene	218-01-9		0.030	0.10
Dibena(a,h)anthracene	53-70-3		0.022	0.10
Dibenzofuran	132-64-9		0.031	0.10
Diethylphthalate	84-66-2		0.028	0.10
Dimethylphthalate	131-11-3		0.027	0.10
Di-n-butylphthalate	84-74-2		0.025	0.10
Di-n-octylphthalate	117-84-0		0.029	0.10
Fluoranthene	206-44-0		0.033	0.10
Fluorene	86-73-7		0.030	0.10
Hexachlorobenzene	118-74-1		0.033	0.10
Hexachlorobutadiene	87-68-3		0.054	0.25
Hexachlorocyclopentadiene	77-47-4		0.029	0.10
Hexachloroethane	67-72-1		0.027	0.10
Indeno(1,2,3-cd)pyrene	193-39-5		0.023	0.10
Isophorone	78-59-1		0.029	0.10
Naphthalene	91-20-3		0.026	0.10
Nitrobenzene	98-95-3		0.023	0.10
N-Nitrosodimethylamine	62-75-9		0.023	0.10
N-Nitroso-di-n-propylamine	621-64-7		0.039	0.25
N-Nitrosodiphenylamine	86-30-6		0.18	0.50
Pentachlorophenol	87-86-5		0.060	0.25
Phenanthrene	85-01-8		0.033	0.10
Phenol	108-95-2		0.017	0.10
Pyrene	129-00-0		0.050	0.20
Pyridine	110-86-1		0.039	0.20
Total Petroleum Hydrocarbons				
Gasoline-Range Organics	TPHG	NWTPH-Gx	0.49	3.0
Diesel-Range Organics	TPHD	NWTPH-Dx	3.9	25
Polychlorinated Biphenyls				
Aroclor 1016	12674-11-2	EPA Method 8082	0.0027	0.10
Aroclor 1221	11104-28-2		0.0027	0.10
Aroclor 1232	11141-16-5		0.0027	0.10
Aroclor 1242	53469-21-9		0.0027	0.10
Aroclor 1248	12672-29-6		0.0027	0.10
Aroclor 1254	11097-69-1		0.0027	0.10
Aroclor 1260	11096-82-5		0.0027	0.10
Vapor (µg/L)				
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	630-20-6	EPA Method 8260	0.0031	0.20
1,1,1-Trichloroethane	71-55-6		0.0030	0.20
1,1,2,2-Tetrachloroethane	79-34-5		0.0053	0.20
1,1,2-Trichloroethane	79-00-5		0.0018	0.20
1,1-Dichloroethane	75-34-3		0.00050	0.20
1,1-Dichloroethene	75-35-4		0.0012	0.20
1,1-Dichloropropene	563-58-6		0.0018	0.20
1,2,3-Trichlorobenzene	87-61-6		0.0012	0.20
1,2,3-Trichloropropane	96-18-4		0.0019	0.20
1,2,4-Trichlorobenzene	120-82-1		0.0014	0.20
1,2,4-Trimethylbenzene	95-63-6		0.00067	0.20
1,2-Dibromo-3-Chloropropane	96-12-8		0.0030	1.0
1,2-Dichlorobenzene	95-50-1		0.0011	0.20
1,2-Dichloroethane	107-06-2		0.0014	0.20
1,2-Dichloropropane	78-87-5		0.0031	0.20
1,3,5-Trimethylbenzene	108-67-8		0.0010	0.20
1,3-Dichlorobenzene	541-73-1		0.0010	0.20
1,3-Dichloropropane	142-28-9		0.0018	0.20
1,4-Dichlorobenzene	106-46-7		0.00094	0.20

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Vapor (µg/L) (cont.)				
Volatile Organic Compounds (cont.)				
2,2-Dichloropropane	594-20-7	EPA Method 8260	0.0018	0.20
2-Butanone	78-93-3		0.014	1.0
2-Chlorotoluene	95-49-8		0.0013	0.20
2-Hexanone	591-78-6		0.0054	1.0
4-Chlorotoluene	106-43-4		0.0011	0.20
Acetone	67-64-1		0.074	2.5
Acrylonitrile	107-13-1		0.0016	0.20
Benzene	71-43-2		0.0011	0.20
Bromobenzene	108-86-1		0.0013	0.20
Bromochloromethane	74-97-5		0.0028	0.20
Bromoform	75-25-2		0.0035	0.20
Bromomethane	74-83-9		0.0059	0.20
Butane, 2-methoxy-2-methyl-	994-05-8		0.00046	0.20
Carbon Disulfide	75-15-0		0.0018	0.20
Carbon Tetrachloride	56-23-5		0.0013	0.20
Chlorobenzene	108-90-7		0.00087	0.20
Chloroethane	75-00-3		0.0016	0.20
Chloroform	67-66-3		0.015	0.20
Chloromethane	74-87-3		0.0041	0.20
Cis-1,2-Dichloroethene	156-59-2		0.0015	0.20
Cis-1,3-Dichloropropene	10061-01-5		0.00093	0.20
Dibromochloromethane	124-48-1		0.0015	0.20
Dibromomethane	74-95-3		0.0029	0.20
Dichlorodifluoromethane (CFC-12)	75-71-8		0.0022	0.20
Diisopropyl Ether (Dot)	108-20-3		0.0014	0.20
Ethanol	64-17-5		3.4	20
Ethylbenzene	100-41-4		0.0012	0.20
Ethylene dibromide	106-93-4		0.00092	0.20
Hexachlorobutadiene	87-68-3		0.0028	0.20
Isopropylbenzene (Cumene)	98-82-8		0.0012	0.20
m, p-Xylene	108-38-3/ 106-42-3		0.0021	0.40
Methyl isobutyl ketone	108-10-1		0.0018	1.0
Methyl t-butyl ether	1634-04-4		0.0010	0.20
Methylene Chloride	75-09-2		0.060	0.50
n-Butylbenzene	104-51-8		0.00079	0.20
n-Propylbenzene	103-65-1		0.00094	0.20
Naphthalene	91-20-3		0.0010	0.20
o-Xylene	95-47-6		0.0011	0.20
p-Isopropyltoluene	99-87-6		0.00097	0.20
Propane, 2-Ethoxy-2-Methyl-	637-92-3		0.0015	0.20
Sec-Butylbenzene	135-98-8		0.00093	0.20
Styrene	100-42-5		0.00054	0.20
Tert-Butylbenzene	98-06-6		0.00072	0.20
Tertiary butyl alcohol	75-65-0		0.016	0.20
Tetrachloroethene	127-18-4		0.0010	0.20
Toluene	108-88-3		0.0012	0.20
Trans-1,2-Dichloroethene	156-60-5		0.0018	0.20
Trans-1,3-Dichloropropene	10061-02-6		0.0011	0.20
Trichloroethene	79-01-6		0.0017	0.20
Trichlorofluoromethane (CFC-11)	75-69-4		0.0020	0.20
Vinyl Chloride	75-01-4		0.0020	0.020
Condensate and Non-Aqueous Phase Liquid (µg/L)				
Volatile Organic Compounds				
1,1-Dichloroethene	75-35-4	EPA Method 8260 SIM	0.0053	0.020
1,1,2,2-Tetrachloroethane	79-34-5		0.048	0.20
1,2-Dibromo 3-Chloropropane	96-12-8		0.0085	0.10
1,2-Dibromoethane (EDB)	106-93-4		0.0026	0.010
1,2-Dichloroethane	107-06-2		0.0012	0.10
1,2,3-Trichloropropane	96-18-4		0.0060	0.10
Benzene	71-43-2		0.0037	0.020
Tetrachloroethylene	127-18-4		0.037	0.20
Trichloroethene	79-01-6		0.0087	0.050
Vinyl Chloride	75-01-4		0.0036	0.020
1,1-Dichloroethane	75-34-3	EPA Method 8260	0.069	2.0
1,1-Dichloropropene	563-58-6		0.094	2.0
1,1,1-Trichloroethane	71-55-6		0.091	2.0
1,1,1,2-Tetrachloroethane	630-20-6		0.092	2.0
1,1,2-Trichloroethane	79-00-5		0.065	2.0
1,2-Dichlorobenzene	95-50-1		0.12	2.0
1,2-Dichloropropane	78-87-5		0.057	2.0
1,2,3-Trichlorobenzene	87-61-6		0.13	2.0
1,2,4-Trichlorobenzene	120-82-1		0.13	2.0
1,2,4-Trimethylbenzene	95-63-6		0.14	2.0
1,3 Dichlorobenzene	541-73-1		0.13	2.0

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Condensate and Non-Aqueous Phase Liquid (µg/L) (cont.)				
Volatile Organic Compounds (cont.)				
1,3-Dichloropropane	142-28-9	EPA Method 8260	0.081	2.0
1,3,5-Trimethylbenzene	108-67-8		0.15	2.0
1,4-Dichlorobenzene	106-46-7		0.13	2.0
2-Butanone (MEK)	78-93-3		0.23	10
2-Chlorotoluene	95-49-8		0.15	2.0
2-Hexanone	591-78-6		0.11	10
2,2-Dichloropropane	594-20-7		0.16	2.0
4-Chlorotoluene	106-43-4		0.14	2.0
4-Methyl-2-Pentanone (MIBK)	108-10-1		0.18	10
Acetone	67-64-1		0.22	25
Acrylonitrile	107-13-1		0.097	10
Bromobenzene	108-86-1		0.13	2.0
Bromochloromethane	74-97-5		0.063	2.0
Bromodichloromethane	75-27-4		0.053	2.0
Bromoform	75-25-2		0.072	2.0
Bromomethane	74-83-9		0.082	2.0
Carbon Disulfide	75-15-0		0.10	2.0
Carbon Tetrachloride	56-23-5		0.020	2.0
Chlorobenzene	108-90-7		0.089	2.0
Chloroethane	75-00-3		0.073	2.0
Chloroform	67-66-3		0.097	2.0
Chloromethane	74-87-3		0.068	2.0
cis-1,2-Dichloroethene	156-59-2		0.076	2.0
cis-1,3-Dichloropropene	10061-01-5		0.055	2.0
Dibromochloromethane	124-48-1		0.077	2.0
Dibromomethane (methylene bromide)	74-95-3		0.043	2.0
Dichlorodifluoromethane (CFC-12)	75-71-8		0.13	2.0
Diisopropyl Ether	108-20-3		0.11	10
Ethanol	64-17-5		7.2	1,000
Ethyl T-Butyl Ether (propane, 2-ethoxy-2-methyl)	637-92-3		0.10	10
Ethylbenzene	100-41-4		0.097	2.0
Hexachlorobutadiene	87-68-3		0.17	2.0
Isopropylbenzene (cumene)	98-82-8		0.099	2.0
m,p-Xylene	108-38-3		0.19	4.0
Methyl T-Butyl Ether	1634-04-4		0.049	2.0
Methylene Chloride	75-09-2		0.34	5.0
n-Butylbenzene	104-51-8		0.16	2.0
n-Propyl Benzene	103-65-1		0.15	2.0
Naphthalene	91-20-3		0.12	2.0
o-Xylene	95-47-6		0.086	2.0
p-Isopropyltoluene	99-87-6		0.16	2.0
s-Butyl Benzene	135-98-8		0.16	2.0
Styrene	100-42-5		0.075	2.0
T-Butyl Benzene	98-06-6		0.16	2.0
tert-Amyl Methyl Ether	994-05-8		0.11	2.0
tert-Butanol (tertiary butyl alcohol)	75-65-0		0.62	20
Toluene	108-88-3		0.081	2.0
Trans-1,2-Dichloroethene	156-60-5		0.079	2.0
Trans-1,3-Dichloropropene	10061-02-6		0.091	2.0
Trichlorofluoromethane (CFC-11)	75-69-4		0.13	2.0
Semivolatile Organic Compounds				
Benzo[A]Anthracene	56-55-3	EPA Method 8270 SIM	0.0010	0.020
Benzo[A]Pyrene	50-32-8		0.0023	0.020
Benzo[B]Fluoranthene	205-99-2		0.0030	0.020
Benzo[K]Fluoranthene	207-08-9		0.0049	0.020
Chrysene	218-01-9		0.0021	0.020
Dibenz[A,H]Anthracene	53-70-3		0.0036	0.020
Indeno[1,2,3-Cd]Pyrene	193-39-5		0.0018	0.020
1-Methylnaphthalene	90-12-0		0.0010	0.020
Pentachlorophenol	87-86-5		0.0054	0.50
2-Methylnaphthalene	91-57-6		0.0017	0.020
Acenaphthene	83-32-9		0.0036	0.020
Acenaphthylene	208-96-8		0.0025	0.020
Anthracene	120-12-7		0.0027	0.020
Benzo[G,H,I]Perylene	191-24-2		0.0020	0.020
Fluoranthene	206-44-0		0.00061	0.020
Fluorene	86-73-7		0.0011	0.020
Naphthalene	91-20-3		0.00078	0.020
Pyrene	129-00-0		0.0013	0.020

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Condensate and Non-Aqueous Phase Liquid (µg/L) (cont.)				
Semivolatile Organic Compounds (cont.)				
1,2-Dichlorobenzene	95-50-1	EPA Method 8270	0.48	2.0
1,2,4-Trichlorobenzene	120-82-1		0.37	2.0
1,3-Dichlorobenzene	541-73-1		0.46	2.0
1,4-Dichlorobenzene	106-46-7		0.34	2.0
2-Chloronaphthalene	91-58-7		0.30	2.0
2-Chlorophenol	95-57-8		0.28	2.0
2-Methylnaphthalene	91-57-6		0.34	2.0
2-Methylphenol (o-Cresol)	95-48-7		0.43	2.0
2-Nitroaniline	88-74-4		0.90	3.0
2-Nitrophenol	88-75-5		0.38	2.0
2,3,4,6-Tetrachlorophenol	58-90-2		0.35	2.0
2,4-Dichlorophenol	120-83-2		0.26	2.0
2,4-Dimethylphenol	105-67-9		0.29	2.0
2,4-Dinitrophenol	51-28-5		0.98	10
2,4-Dinitrotoluene	121-14-2		0.26	2.0
2,4,5-Trichlorophenol	95-95-4		0.51	2.0
2,4,6-Trichlorophenol	88-06-2		0.30	2.0
2,6-Dichlorophenol	87-65-0		0.25	2.0
2,6-Dinitrotoluene	606-20-2		0.61	2.0
3-Nitroaniline	99-09-2		2.5	10
3&4-Methylphenol (m&p-Cresol)	106-44-5		0.27	2.0
4-Bromophenyl-Phenylether	101-55-3		0.26	2.0
4-Chloro-3-Methylphenol (Chlorocresol)	59-50-7		0.40	2.0
4-Chloroaniline	106-47-8		0.63	2.0
4-Chlorophenyl-Phenylether	7005-72-3		0.25	2.0
4-Nitroaniline	100-01-6		2.1	10
4-Nitrophenol	100-02-7		1.5	2.0
4,6-Dinitro-2-Methylphenol	93951-76-9		0.80	2.5
Acenaphthene	83-32-9		0.26	2.0
Acenaphthylene	208-96-8		0.27	2.0
Aniline	62-53-3		0.86	2.0
Anthracene	120-12-7		0.27	2.0
Azobenzene	103-33-3		0.54	2.0
Benzo[G,H,I]Perylene	191-24-2		0.18	2.0
Benzoic Acid	65-85-0		0.81	10
Benzyl Alcohol	100-51-6		0.34	2.0
Bis(2-Chloroethoxy)Methane	111-91-1		0.35	2.0
Bis(2-Chloroisopropyl)Ether	39638-32-9		0.21	2.0
Bis(2-Chloroethyl)Ether	111-44-4		0.31	2.0
Bis(2-Ethylhexyl)Phthalate	117-81-7		1.1	3.5
Butylbenzylphthalate	85-68-7		0.72	2.0
Carbazole	86-74-8		0.55	2.0
Di-N-Butylphthalate	84-74-2		1.2	3.5
Di-N-Octylphthalate	117-84-0		0.29	2.0
Dibenzofuran	132-64-9		0.17	2.0
Diethylphthalate	84-66-2		1.0	3.0
Dimethylphthalate	131-11-3		0.23	2.0
Fluoranthene	206-44-0		0.31	2.0
Fluorene	86-73-7		0.34	2.0
Hexachlorobenzene	118-74-1		0.21	2.0
Hexachlorocyclopentadiene	77-47-4		0.98	2.0
Hexachloroethane	67-72-1		0.67	2.0
Isophorone	78-59-1		0.39	2.0
N-Nitroso-Di-n-Propylamine	621-64-7		0.70	2.0
N-Nitrosodimethylamine	62-75-9		0.50	2.0
N-Nitrosodiphenylamine	86-30-6		1.6	5.0
Naphthalene	91-20-3		0.19	2.0
Nitrobenzene	98-95-3		0.40	2.0
Phenanthrene	85-01-8		0.32	2.0
Phenol	108-95-2		0.35	2.0
Pyrene	129-00-0		0.20	2.0
Pyridine	110-86-1		1.1	2.0
1-Methylnaphthalene	90-12-0		0.32	2.0
3,3-Dichlorobenzidine	91-94-1		1.5	2.0
Benzo[A]Anthracene	56-55-3		0.25	2.0
Benzo[A]Pyrene	50-32-8		0.16	2.0
Benzo[B]Fluoranthene	205-99-2		0.38	2.0
Benzo[K]Fluoranthene	207-08-9		0.43	2.0
Bis(2-Chloroethyl)Ether	111-44-4		0.31	2.0
Chrysene	218-01-9		0.27	2.0
Dibenz[A,H]Anthracene	53-70-3		0.32	2.0
Indeno[1,2,3-Cd]Pyrene	193-39-5		0.19	2.0
Pentachlorophenol	87-86-5		1.2	5.0
4-Nitrophenol	100-02-7		1.5	2.0

Table F.8
Analytical Methods, Detection Limits, and Reporting Limits

Analyte	CAS No.	Method	Detection Limit	Reporting Limit
Condensate and Non-Aqueous Phase Liquid (µg/L) (cont.)				
Total Petroleum Hydrocarbons				
NWTPH-HCID (Gasoline Range)	--	NWTPH-HCID	100	130
NWTPH-HCID (Diesel Range)	--		250	310
NWTPH-HCID (Oil Range)	--		250	310
Polychlorinated Biphenyls				
Aroclor 1016	12674-11-2	EPA Method 8082	0.0028	0.0050
Aroclor 1221	11104-28-2		0.0028	0.010
Aroclor 1232	11141-16-5		0.0028	0.0050
Aroclor 1242	53469-21-9		0.0028	0.0050
Aroclor 1248	12672-29-6		0.0028	0.0050
Aroclor 1254	11097-69-1		0.0028	0.0050
Aroclor 1260	11096-82-5		0.0028	0.0050

Notes:

Site-specific conditions such as high sample concentrations, matrix interference, or sample dilution may preclude achieving the targeted RL.
RLs will be confirmed with the laboratory prior to initiating work and are subject to change.

Abbreviations:

CAS Chemical Abstracts Service
µg/L Micrograms per liter
mg/kg Milligrams per kilogram
RL Reporting limit

Table F.9
Data Quality Assurance and Quality Control Criteria

Parameter	Precision	Accuracy	Completeness	Reference
Soil Samples				
Gasoline-Range Organics	± 35%	50–150%	95%	NWTPH-Gx
Diesel-Range Organics	± 35%	50–150%	95%	NWTPH-Dx
SVOCs	± 35%	50–150%	95%	SW-846 8270
VOCs	± 35%	50–150%	95%	SW-846 8260
PCB Aroclors	± 35%	50–150%	95%	SW-846 8082
Vapor Samples				
VOCs	± 30%	70–130%	95%	SW-846 8260
Condensate Samples				
VOCs	± 30%	70–130%	95%	SW-846 8260/SIM
SVOCs	± 30%	60–140%	95%	SW-846 8270/SIM
TPH	± 30%	60–140%	95%	NWTPH-HCID
PCB Aroclors	± 30%	60–140%	95%	SW-846 8082

Abbreviations:

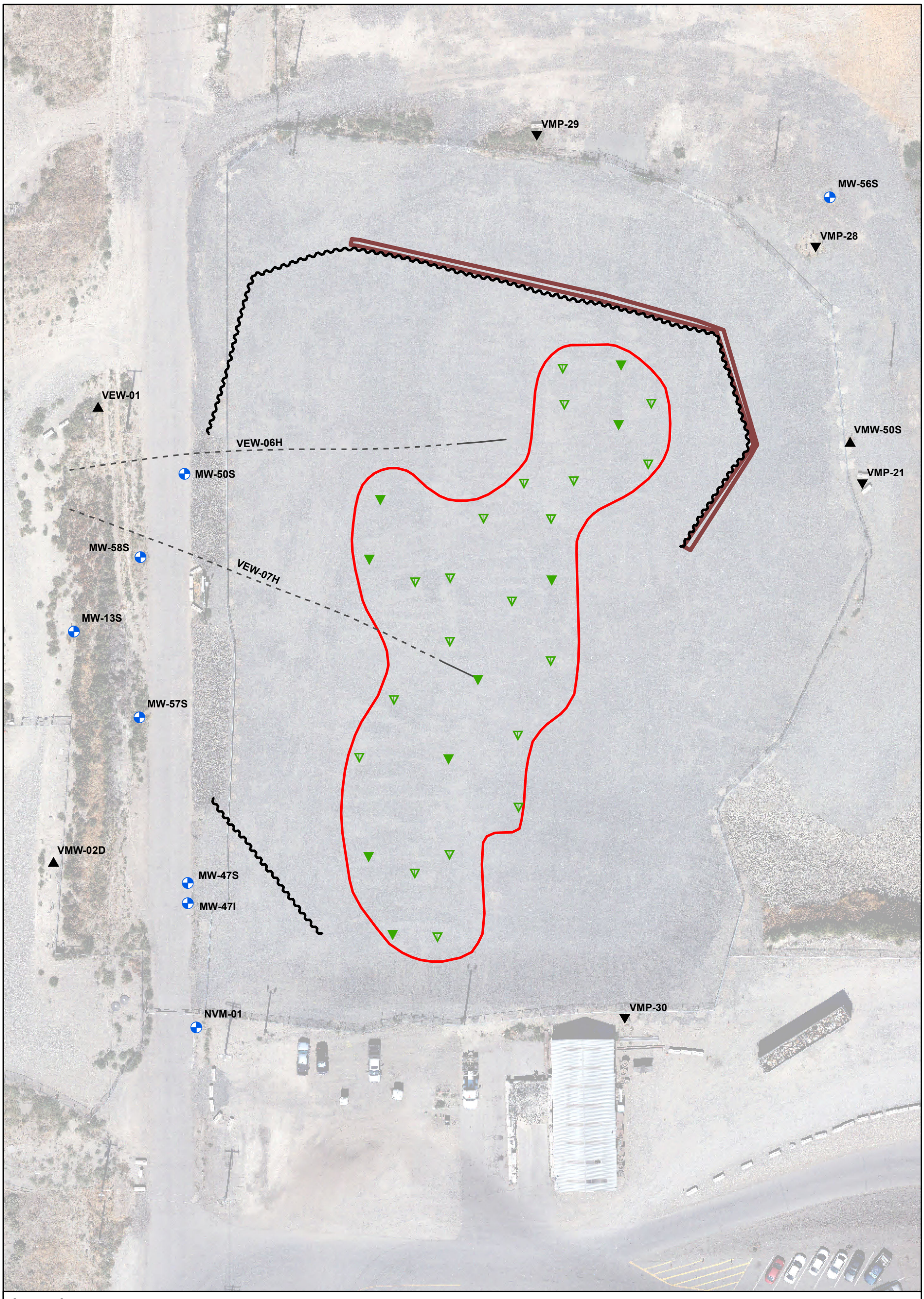
LOQ Limit of quantitation
PCB Polychlorinated biphenyl
PQL Practical quantitation limit
SVOC Semivolatile organic compound
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F

Figures



Legend

- Vapor Monitoring Point
- Vapor Monitoring Well
- Shallow and Deep TMP and PMP
- Shallow TMP and PMP
- Zone A Groundwater Monitoring Network Well
- Horizontal VEW Piping
- Horizontal VEW Screen
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area

Notes:
- Map data provided by PBS Engineering and Environmental Inc.
- Bulk Soil TMP and PMP Locations provided by TRS Groupl Inc.
- Orthoimagery obtained from NearMap, 2022.

Abbreviations:
PMP = Pressure monitoring point
TMP = Temperature monitoring point
VEW = Vapor extraction well

N

0 25 50 100
Scale in Feet

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Figure F.1
Zone A Vapor Monitoring Network

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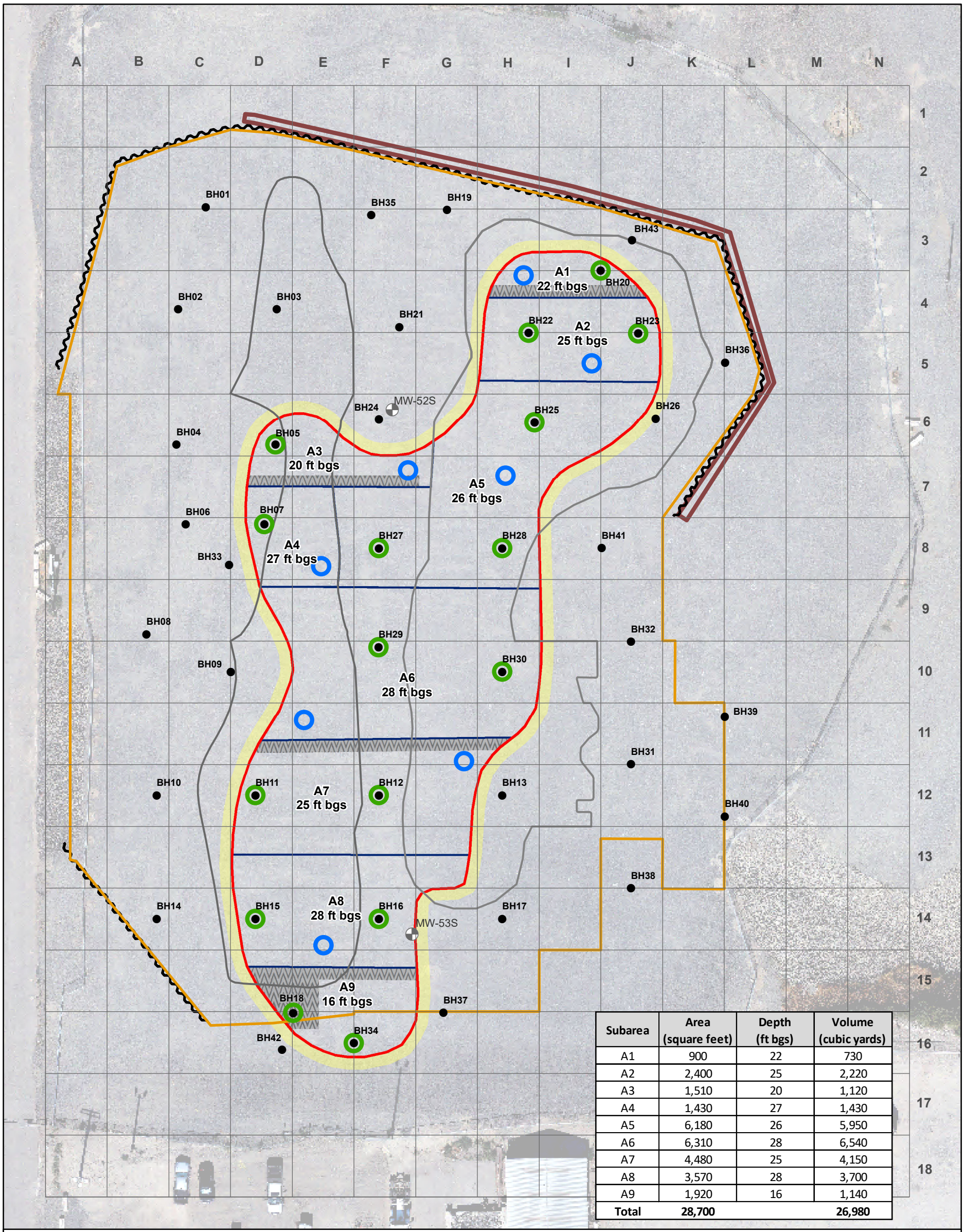
7/25/2023



Subarea	Area (square feet)	Depth (ft bgs)	Volume (cubic yards)
A1	900	22	730
A2	2,400	25	2,220
A3	1,510	20	1,120
A4	1,430	27	1,430
A5	6,180	26	5,950
A6	6,310	28	6,540
A7	4,480	25	4,150
A8	3,570	28	3,700
A9	1,920	16	1,140
Total	**28,700**		**26,980**

Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring(1)
- Decomissioned Monitoring Well
- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area
- Thermal Treatment Halo(2)
- Thermal Subareas(3)
- Heater Transition Zone (4)

Notes:
1. PEC borings were advanced between January 2022 and September 2022.
2. Heat will radiate approximately 5 to 8 ft laterally and vertically from the edges of the treatment area. This extended heat will result in a halo of contaminant concentration reductions surrounding the treatment area
3. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft below the targeted treatment depths.
4. Heater depths will be stair stepped between thermal subareas to reduce heat loss between different depths. The width of each transition zone will depend on the final heater positioning and difference between depths. Refer to EDR Appendix E for design details.

· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
ft = Feet
EDR = Engineering Design Report
bgs = Below ground surface
PEC = Post-excavation characterization

0 20 40 80
Scale in Feet
N

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Figure F.2
Proposed Soil Performance Sample Locations—Inside Thermal Treatment Area

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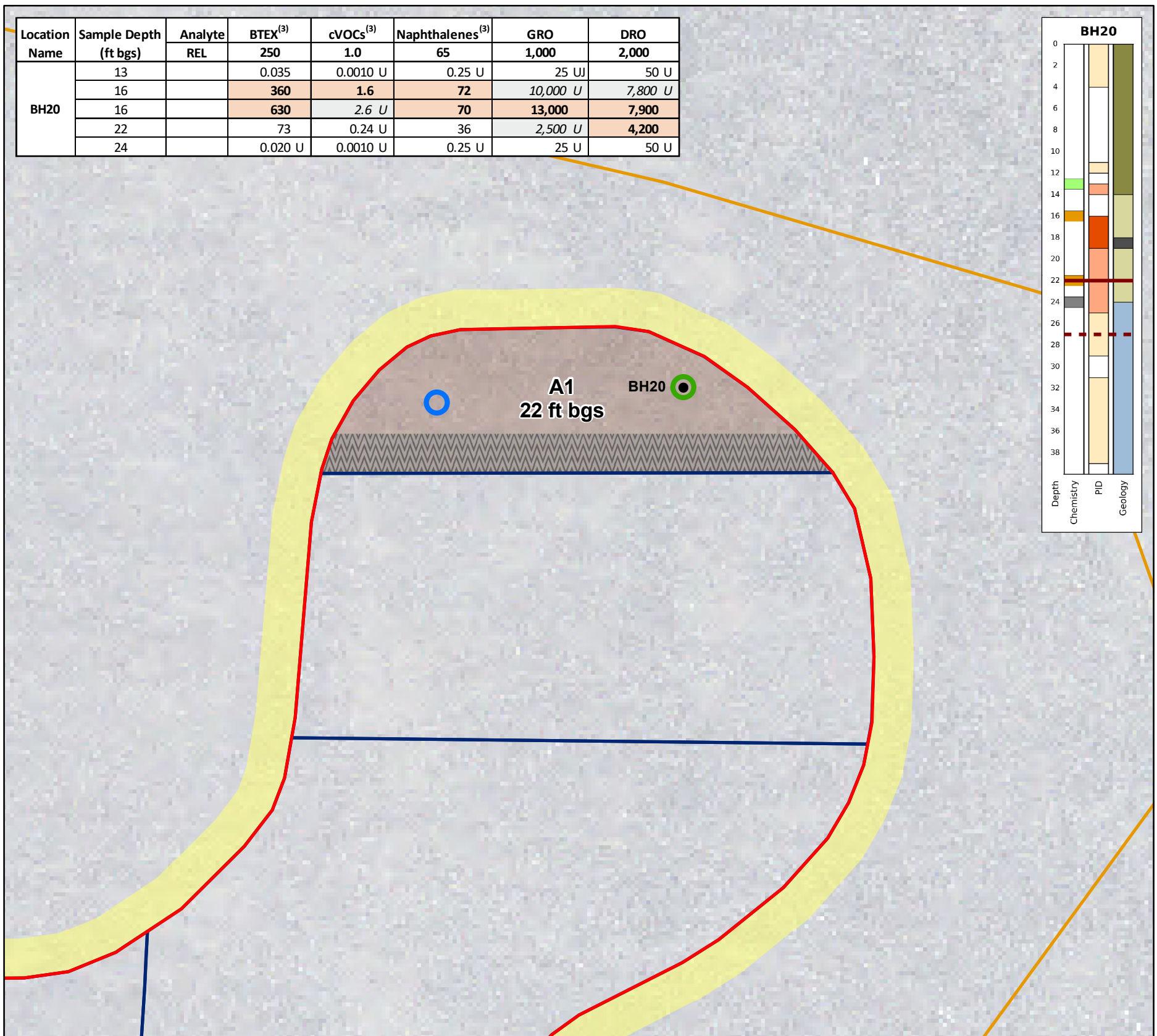
8/8/2023

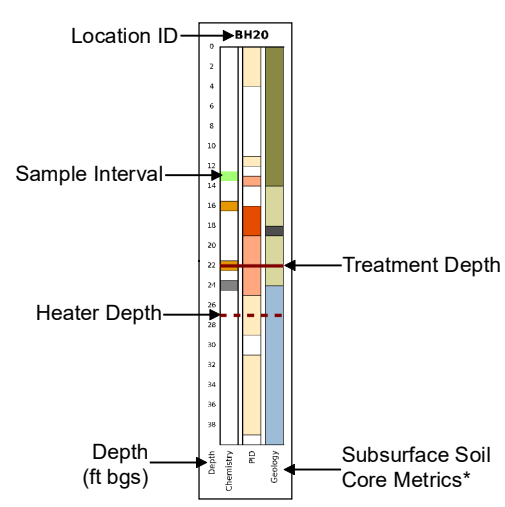
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH20	13		0.035	0.0010 U	0.25 U	25 UJ	50 U
	16		**360**	**1.6**	**72**	*10,000 U*	*7,800 U*
	16		**630**	*2.6 U*	**70**	**13,000**	**7,900**
	22		73	0.24 U	36	*2,500 U*	**4,200**
	24		0.020 U	0.0010 U	0.25 U	25 U	50 U

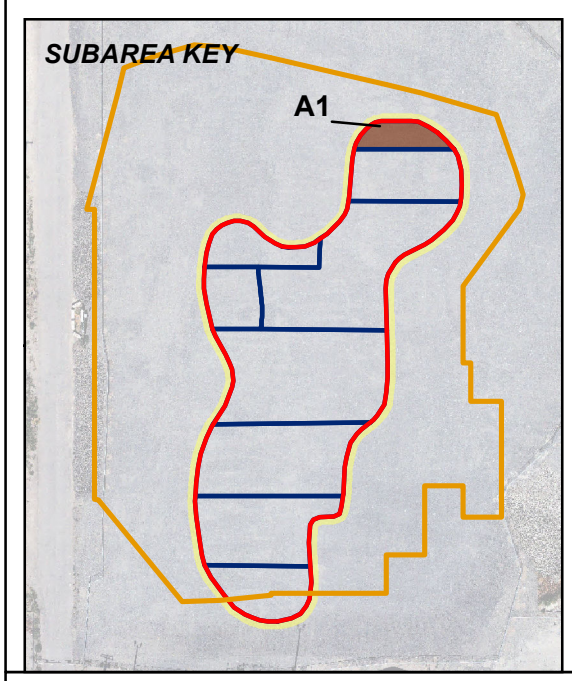


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifers:
U = Analyte was not detected at the associated reporting limit.
UJ = Analyte was not detected at the associated reporting limit, which is an estimate.

0 7.5 15 30
Scale in Feet
N

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Figure F.3a
Proposed Soil Performance Sample Locations and PEC Data—Subarea A1

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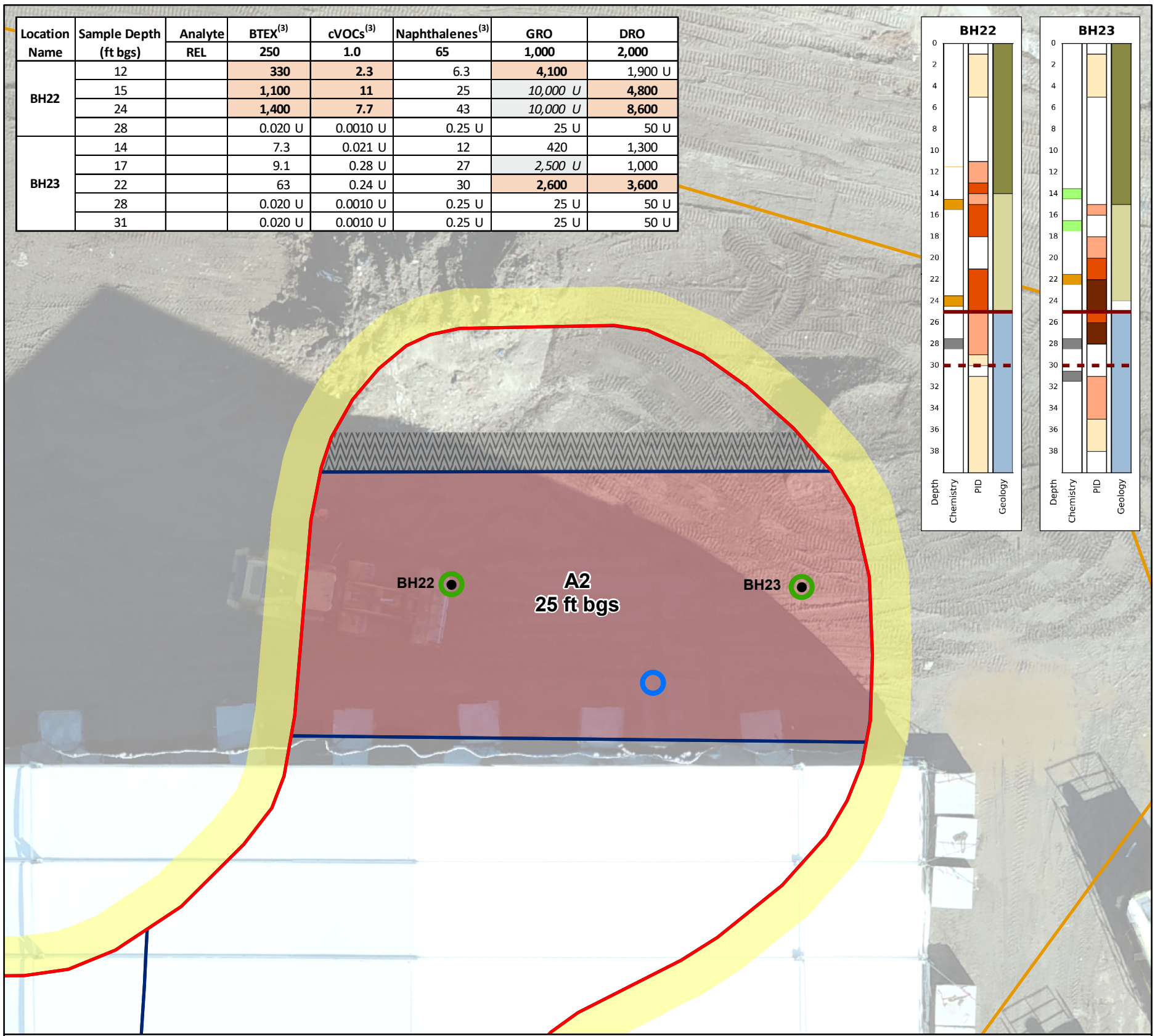
8/8/2023

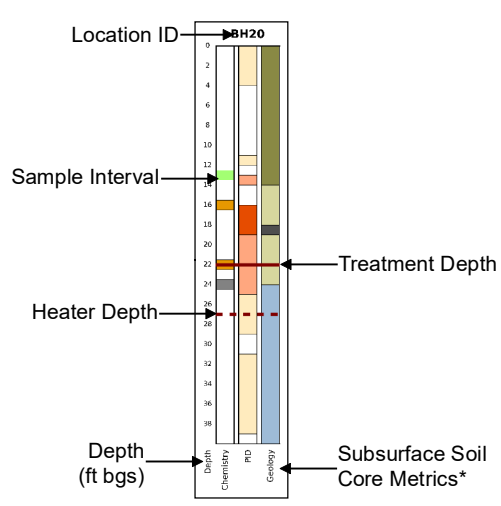
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH22	12		**330**	**2.3**	6.3	**4,100**	1,900 U
	15		**1,100**	**11**	25	*10,000 U*	**4,800**
	24		**1,400**	**7.7**	43	*10,000 U*	**8,600**
	28		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH23	14		7.3	0.021 U	12	420	1,300
	17		9.1	0.28 U	27	*2,500 U*	1,000
	22		63	0.24 U	30	**2,600**	**3,600**
	28		0.020 U	0.0010 U	0.25 U	25 U	50 U
	31		0.020 U	0.0010 U	0.25 U	25 U	50 U

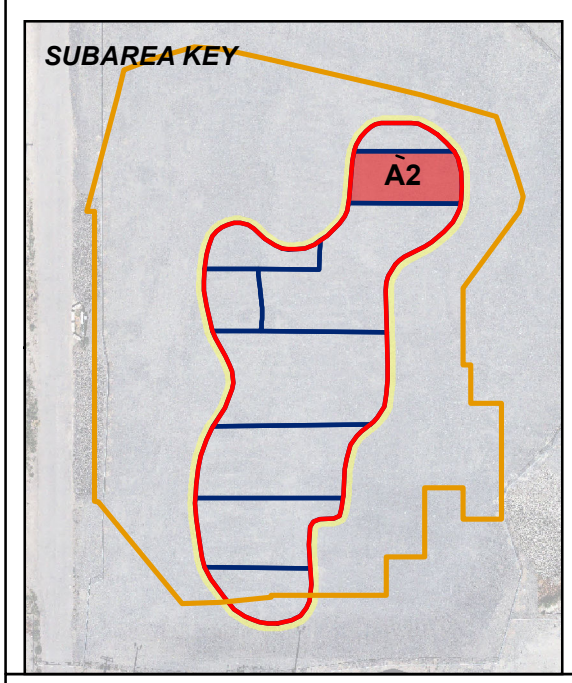


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer toTRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet
N

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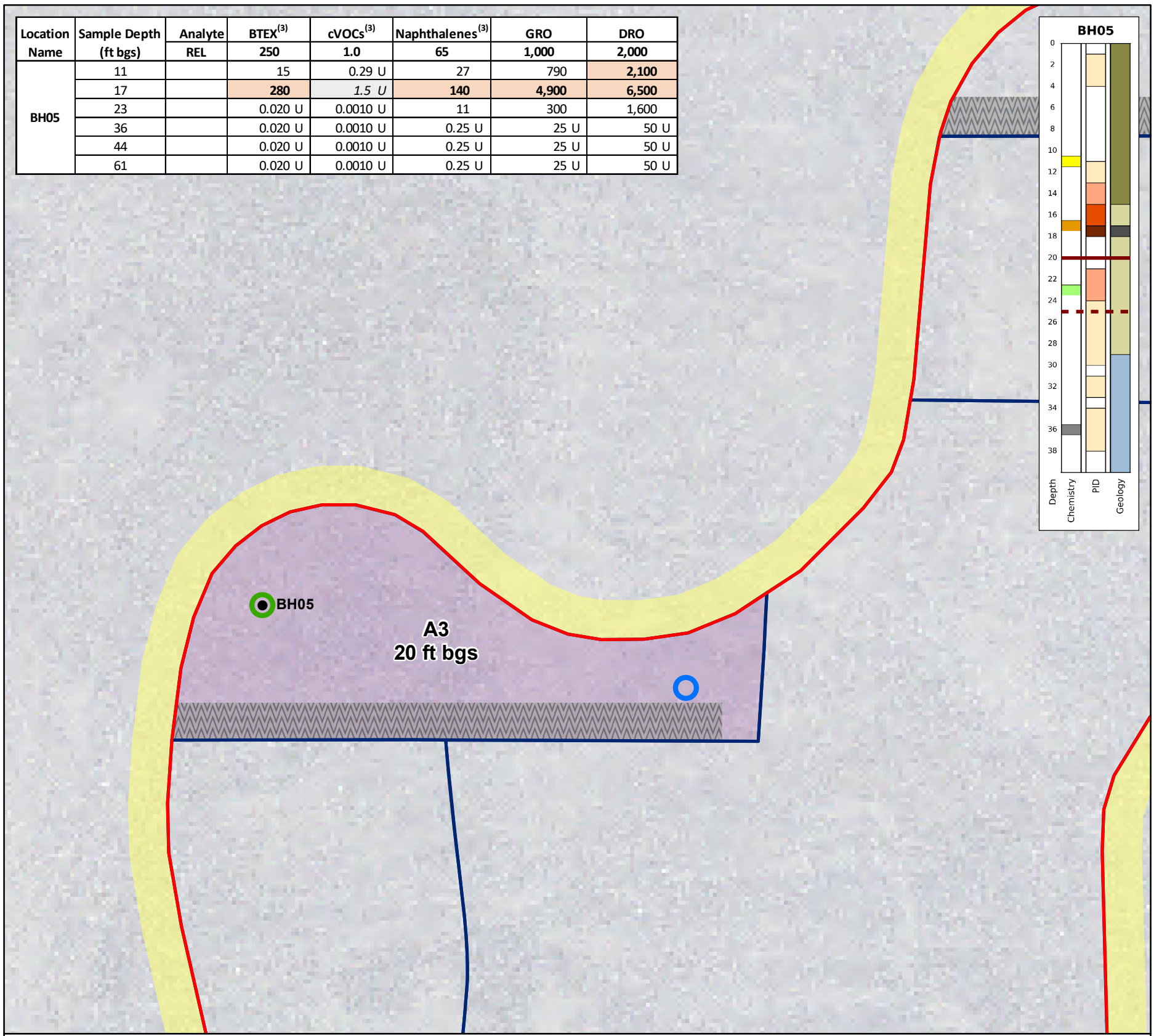
Figure F.3b
Proposed Soil Performance Sample Locations and PEC Data—Subarea A2

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Appendix F - Subarea Soil Metrics\Figure F.3b Prop Soil Perf Sample Locs and PEC Data – Subarea A2.mxd
8/8/2023

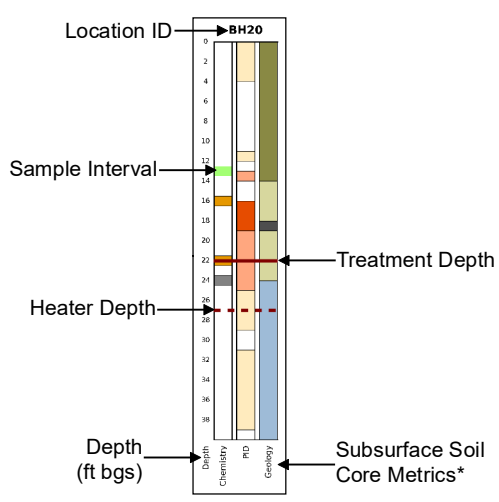
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH05	11		15	0.29 U	27	790	**2,100**
	17		**280**	*1.5 U*	**140**	**4,900**	**6,500**
	23		0.020 U	0.0010 U	11	300	1,600
	36		0.020 U	0.0010 U	0.25 U	25 U	50 U
	44		0.020 U	0.0010 U	0.25 U	25 U	50 U
	61		0.020 U	0.0010 U	0.25 U	25 U	50 U

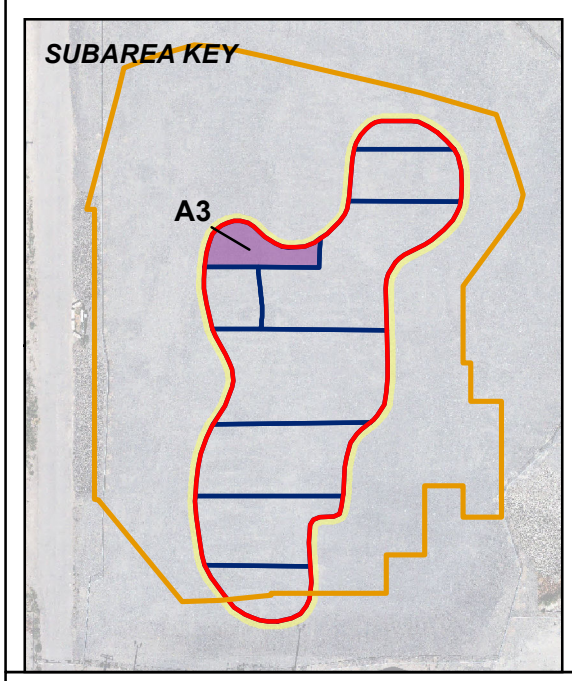


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet
N

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Figure F.3c
Proposed Soil Performance Sample Locations and PEC Data—Subarea A3

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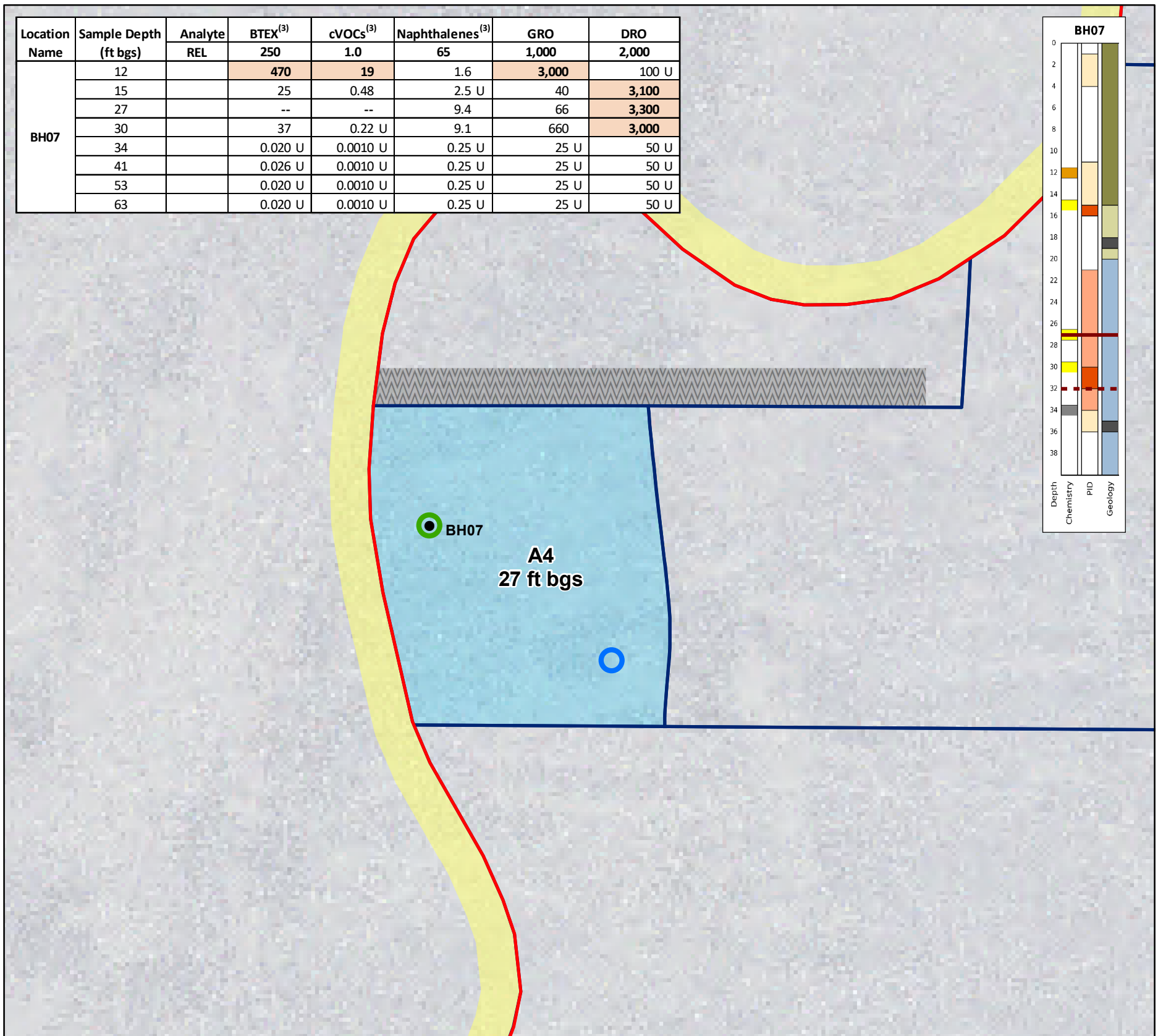
8/8/2023

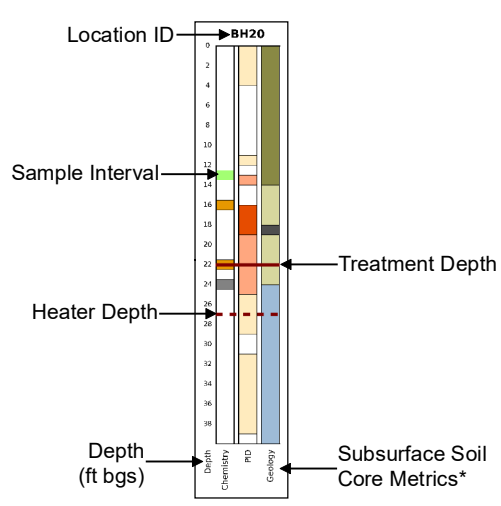
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH07	12		**470**	**19**	1.6	**3,000**	100 U
	15		25	0.48	2.5 U	40	**3,100**
	27		--	--	9.4	66	**3,300**
	30		37	0.22 U	9.1	660	**3,000**
	34		0.020 U	0.0010 U	0.25 U	25 U	50 U
	41		0.026 U	0.0010 U	0.25 U	25 U	50 U
	53		0.020 U	0.0010 U	0.25 U	25 U	50 U
	63		0.020 U	0.0010 U	0.25 U	25 U	50 U

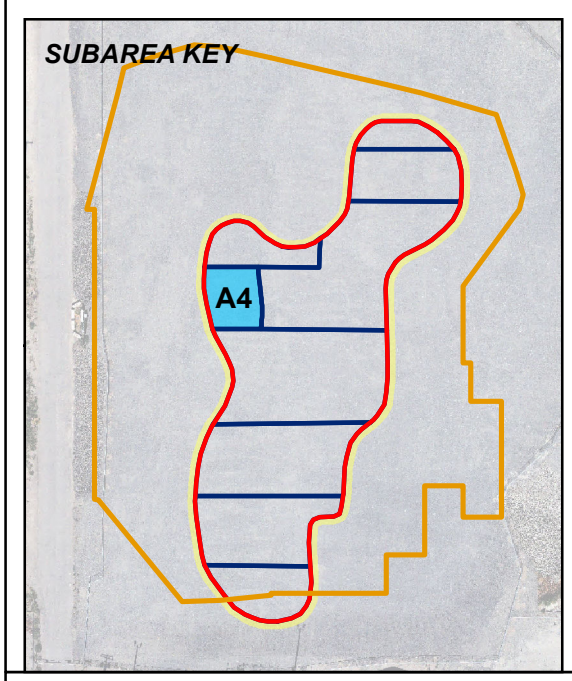


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- - - in table indicates value does not exist.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 7.5 15 30
Scale in Feet
N

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Figure F.3d
Proposed Soil Performance Sample Locations and PEC Data—Subarea A4

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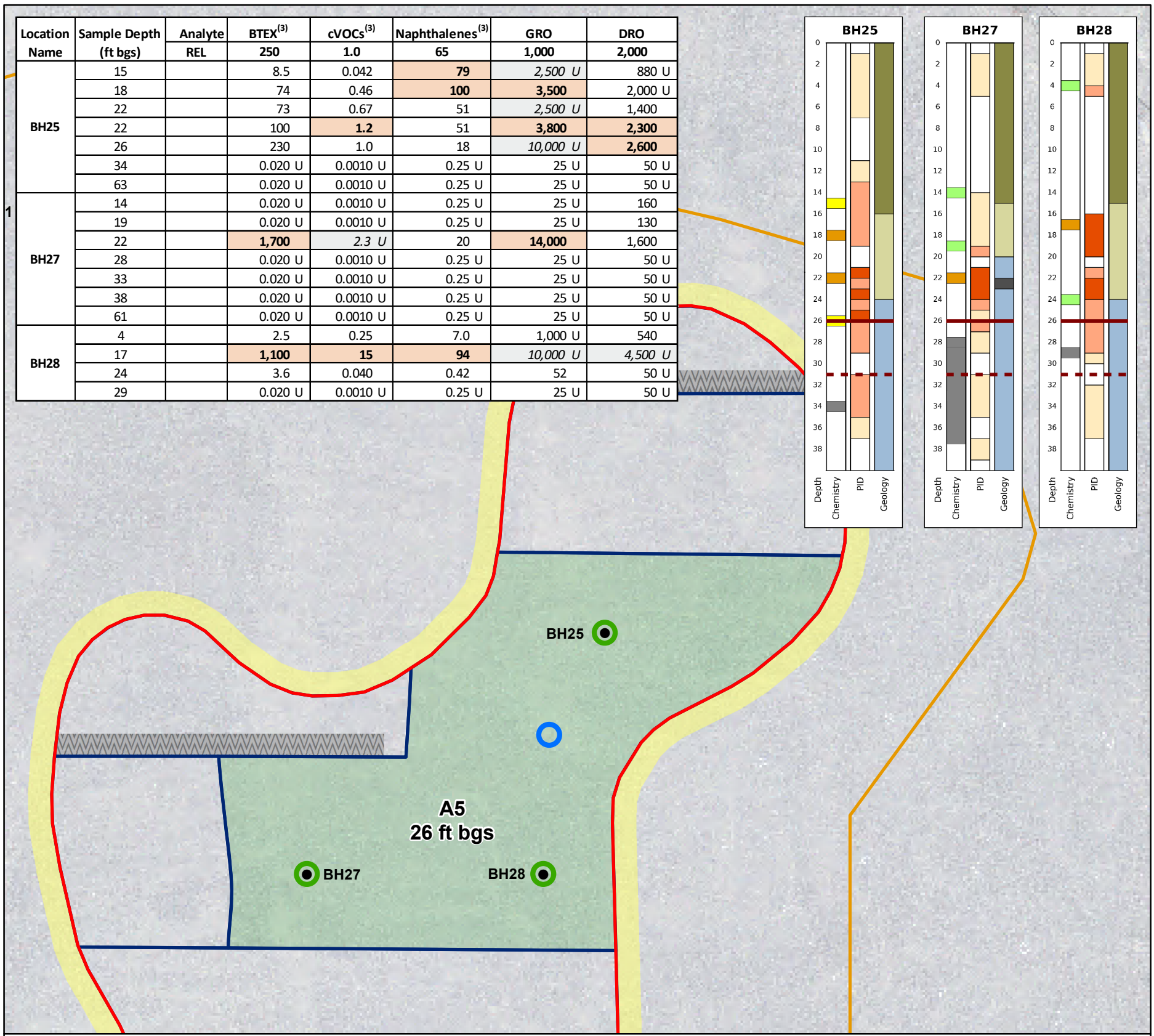
8/8/2023

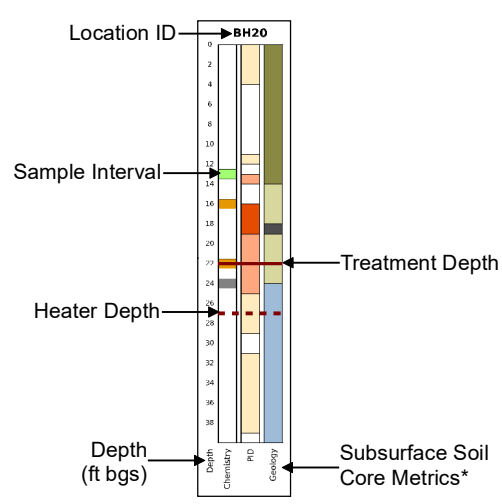
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH25	15		8.5	0.042	**79**	*2,500 U*	880 U
	18		74	0.46	**100**	**3,500**	2,000 U
	22		73	0.67	51	*2,500 U*	1,400
	22		100	**1.2**	51	**3,800**	**2,300**
	26		230	1.0	18	*10,000 U*	**2,600**
	34		0.020 U	0.0010 U	0.25 U	25 U	50 U
	63		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH27	14		0.020 U	0.0010 U	0.25 U	25 U	160
	19		0.020 U	0.0010 U	0.25 U	25 U	130
	22		**1,700**	*2.3 U*	20	**14,000**	1,600
	28		0.020 U	0.0010 U	0.25 U	25 U	50 U
	33		0.020 U	0.0010 U	0.25 U	25 U	50 U
	38		0.020 U	0.0010 U	0.25 U	25 U	50 U
	61		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH28	4		2.5	0.25	7.0	1,000 U	540
	17		**1,100**	**15**	**94**	*10,000 U*	*4,500 U*
	24		3.6	0.040	0.42	52	50 U
	29		0.020 U	0.0010 U	0.25 U	25 U	50 U

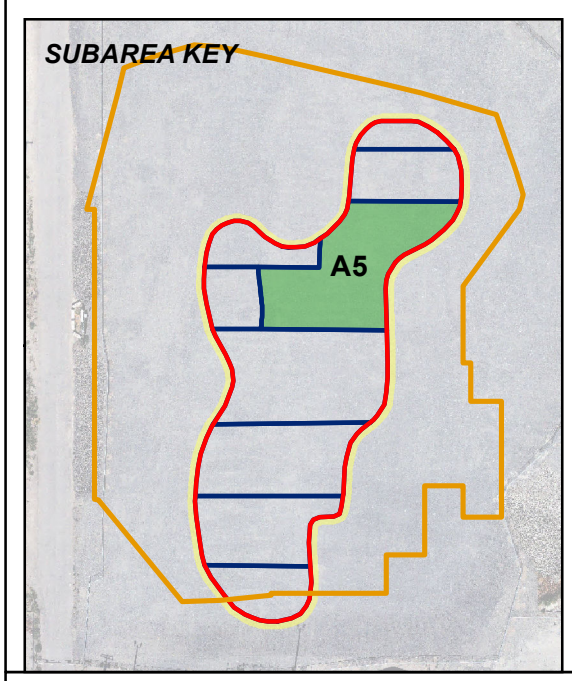


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 12.5 25 50
Scale in Feet
N

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Figure F.3e
Proposed Soil Performance Sample Locations and PEC Data—Subarea A5

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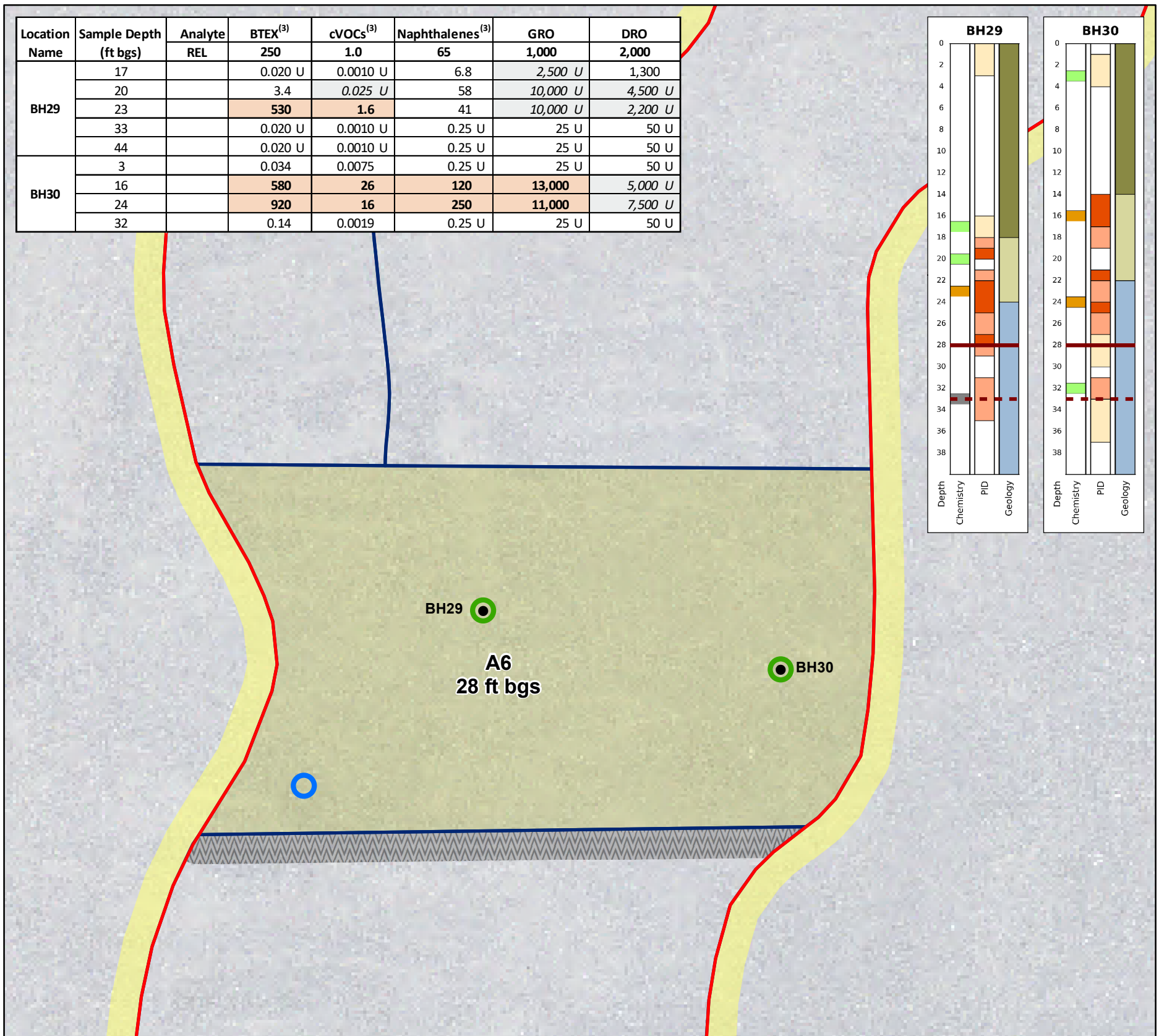
8/8/2023

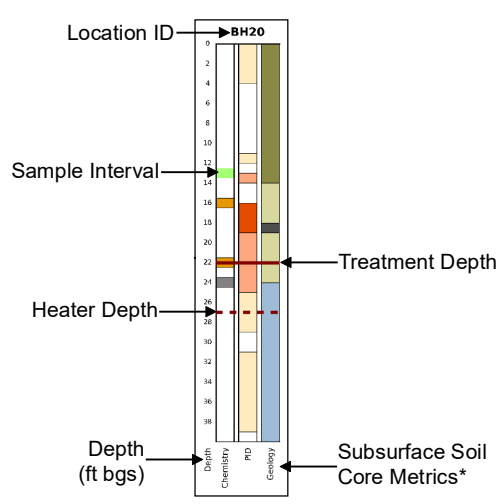
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH29	17		0.020 U	0.0010 U	6.8	*2,500 U*	1,300
	20		3.4	*0.025 U*	58	*10,000 U*	*4,500 U*
	23		**530**	**1.6**	41	*10,000 U*	*2,200 U*
	33		0.020 U	0.0010 U	0.25 U	25 U	50 U
	44		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH30	3		0.034	0.0075	0.25 U	25 U	50 U
	16		**580**	**26**	**120**	**13,000**	*5,000 U*
	24		**920**	**16**	**250**	**11,000**	*7,500 U*
	32		0.14	0.0019	0.25 U	25 U	50 U

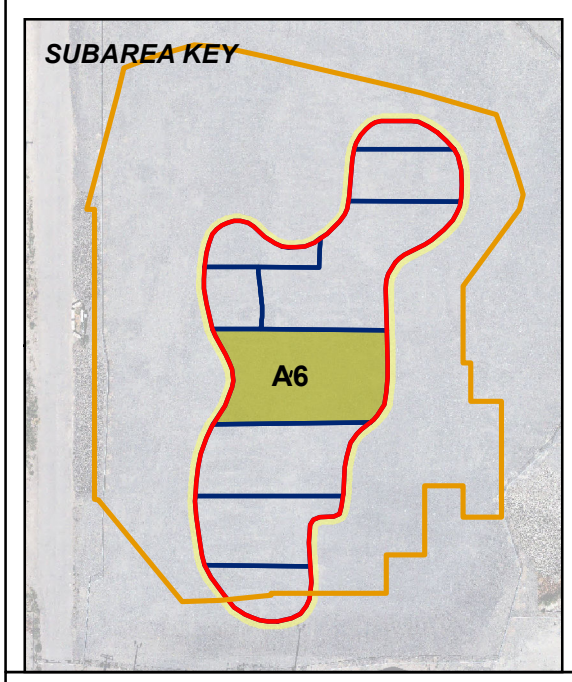


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID(ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Levelns

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 10 20 40
Scale in Feet
N

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Figure F.3f
Proposed Soil Performance Sample Locations and PEC Data—Subarea A6

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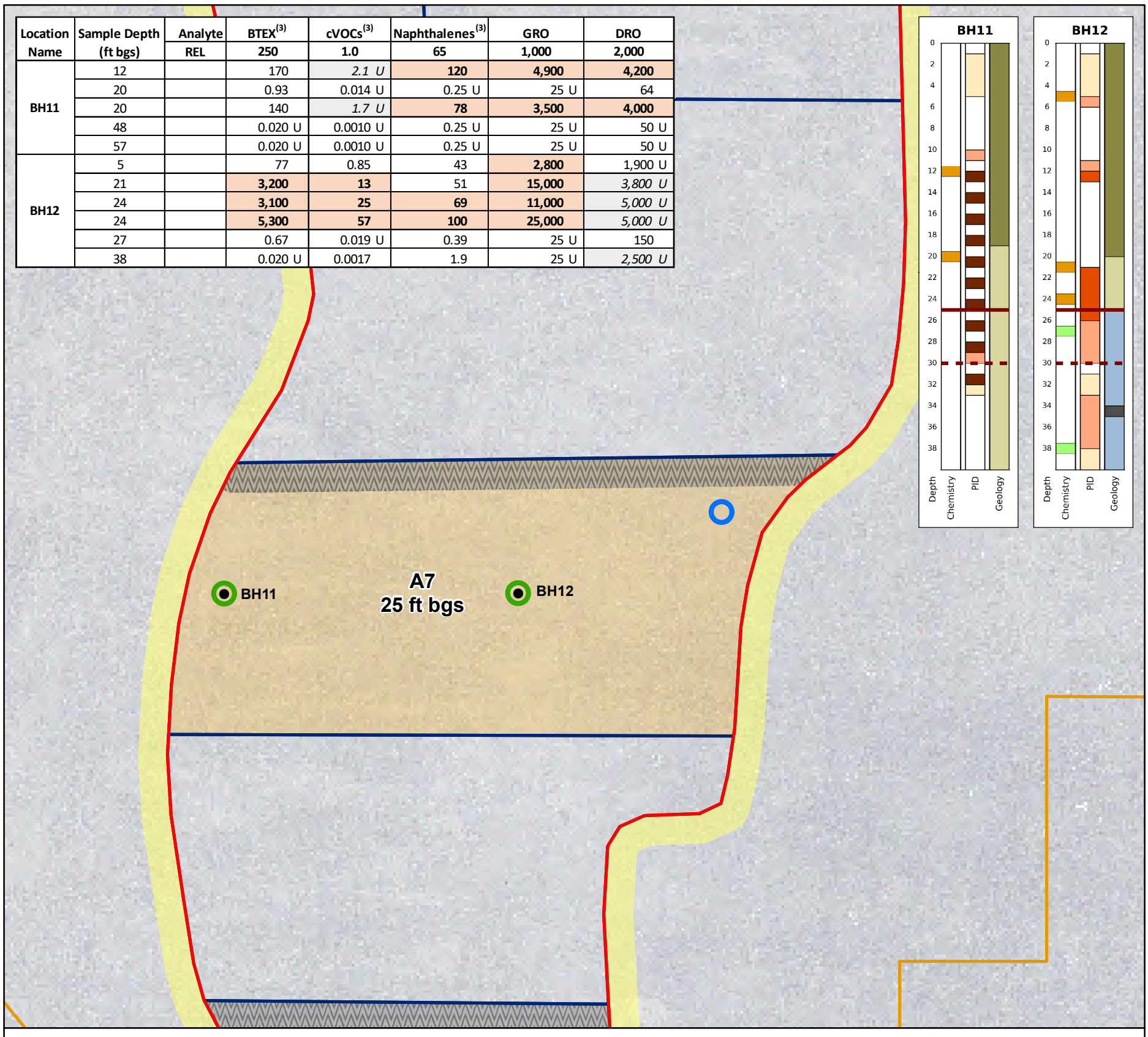
8/8/2023

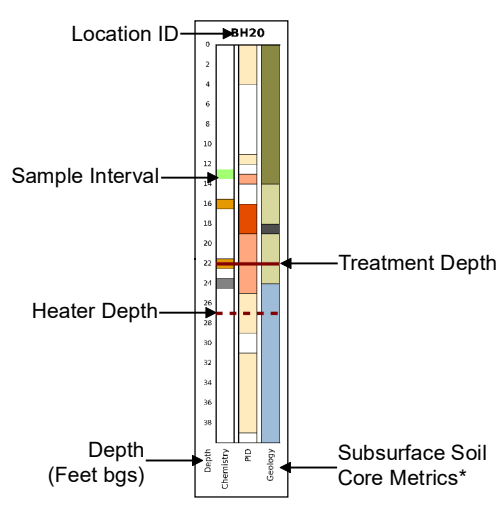
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH11	12		170	*2.1 U*	**120**	**4,900**	**4,200**
	20		0.93	0.014 U	0.25 U	25 U	64
	20		140	*1.7 U*	**78**	**3,500**	**4,000**
	48		0.020 U	0.0010 U	0.25 U	25 U	50 U
	57		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH12	5		77	0.85	43	**2,800**	1,900 U
	21		**3,200**	**13**	51	**15,000**	*3,800 U*
	24		**3,100**	**25**	**69**	**11,000**	*5,000 U*
	24		**5,300**	**57**	**100**	**25,000**	*5,000 U*
	27		0.67	0.019 U	0.39	25 U	150
	38		0.020 U	0.0017	1.9	25 U	*2,500 U*

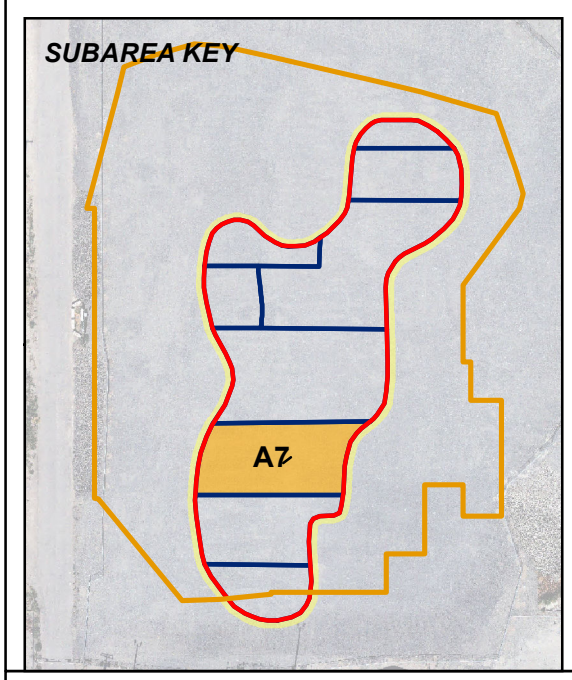


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 10 20 40
Scale in Feet
N

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Figure F.3g
Proposed Soil Performance Sample Locations and PEC Data—Subarea A7

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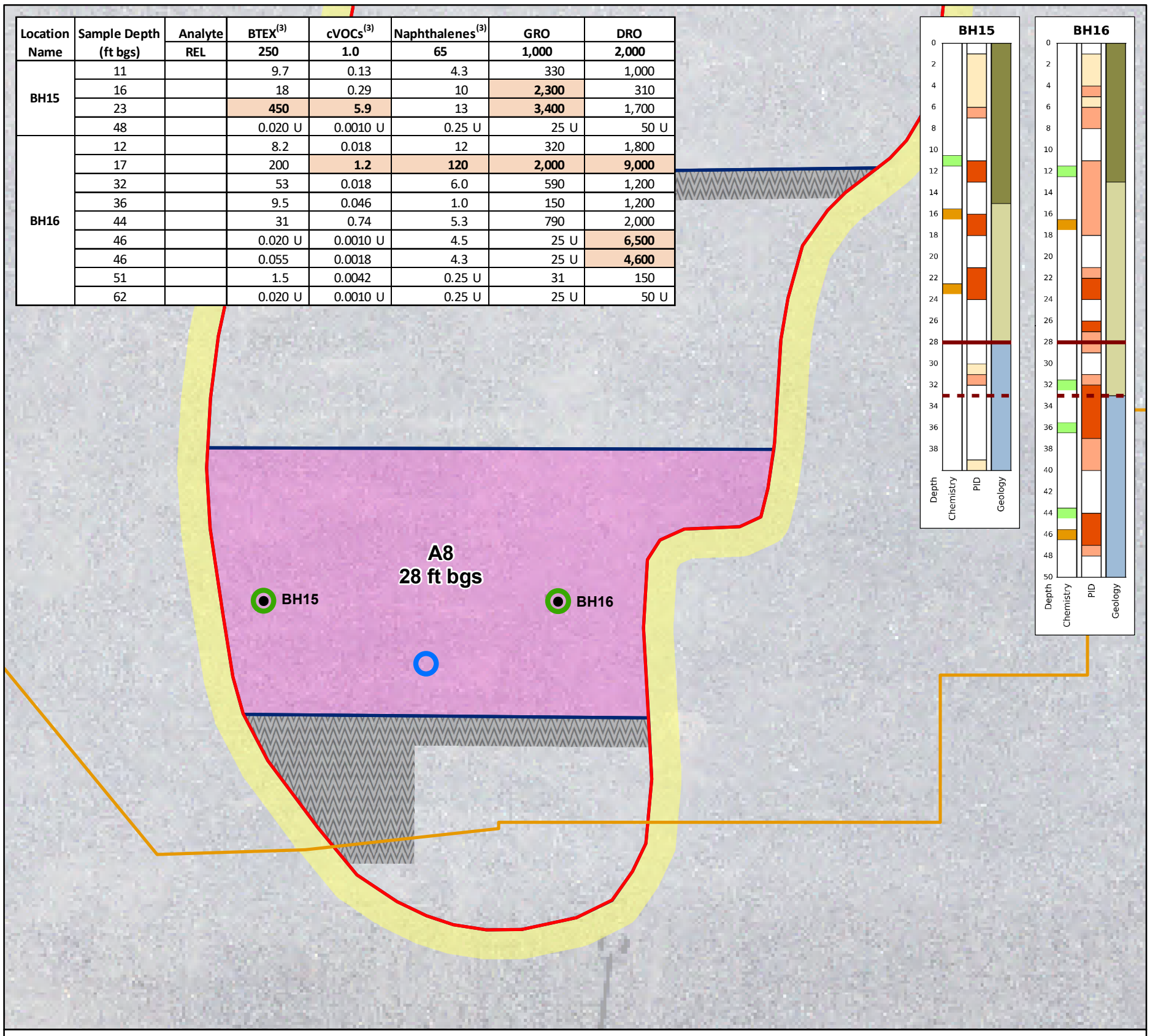
8/8/2023

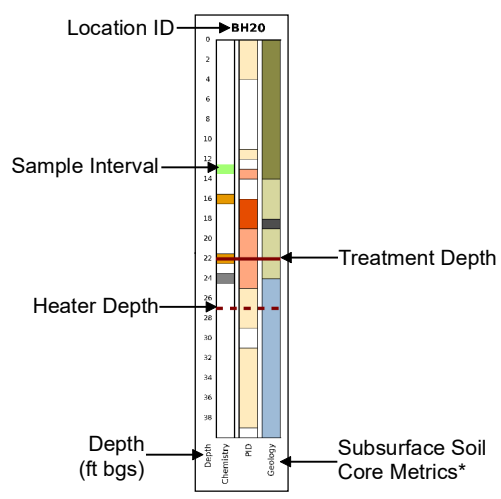
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH15	11		9.7	0.13	4.3	330	1,000
	16		18	0.29	10	**2,300**	310
	23		**450**	**5.9**	13	**3,400**	1,700
	48		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH16	12		8.2	0.018	12	320	1,800
	17		200	**1.2**	**120**	**2,000**	**9,000**
	32		53	0.018	6.0	590	1,200
	36		9.5	0.046	1.0	150	1,200
	44		31	0.74	5.3	790	2,000
	46		0.020 U	0.0010 U	4.5	25 U	**6,500**
	46		0.055	0.0018	4.3	25 U	**4,600**
	51		1.5	0.0042	0.25 U	31	150
	62		0.020 U	0.0010 U	0.25 U	25 U	50 U

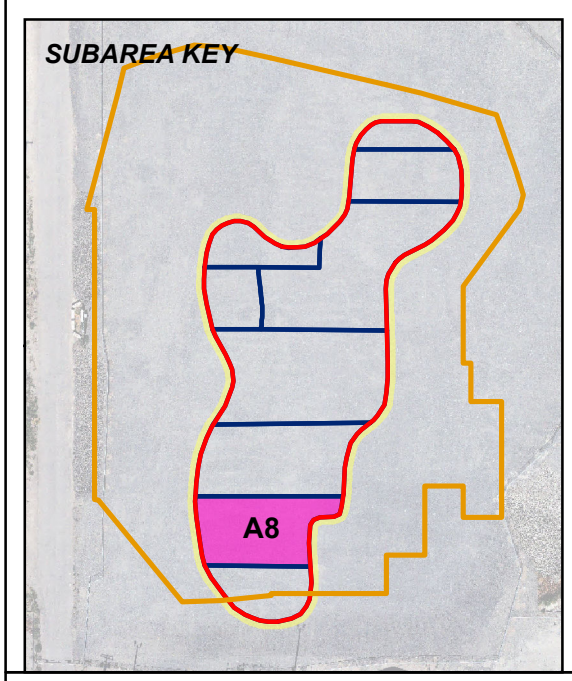


Legend

- Proposed Performance Sample
- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
- One or More Detected Results >REL to ≤2X REL
- All Detected Results ≤ REL
- All Results Non-Detect

PID (ppmv)

- >10,000
- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 10 20 40
Scale in Feet
N

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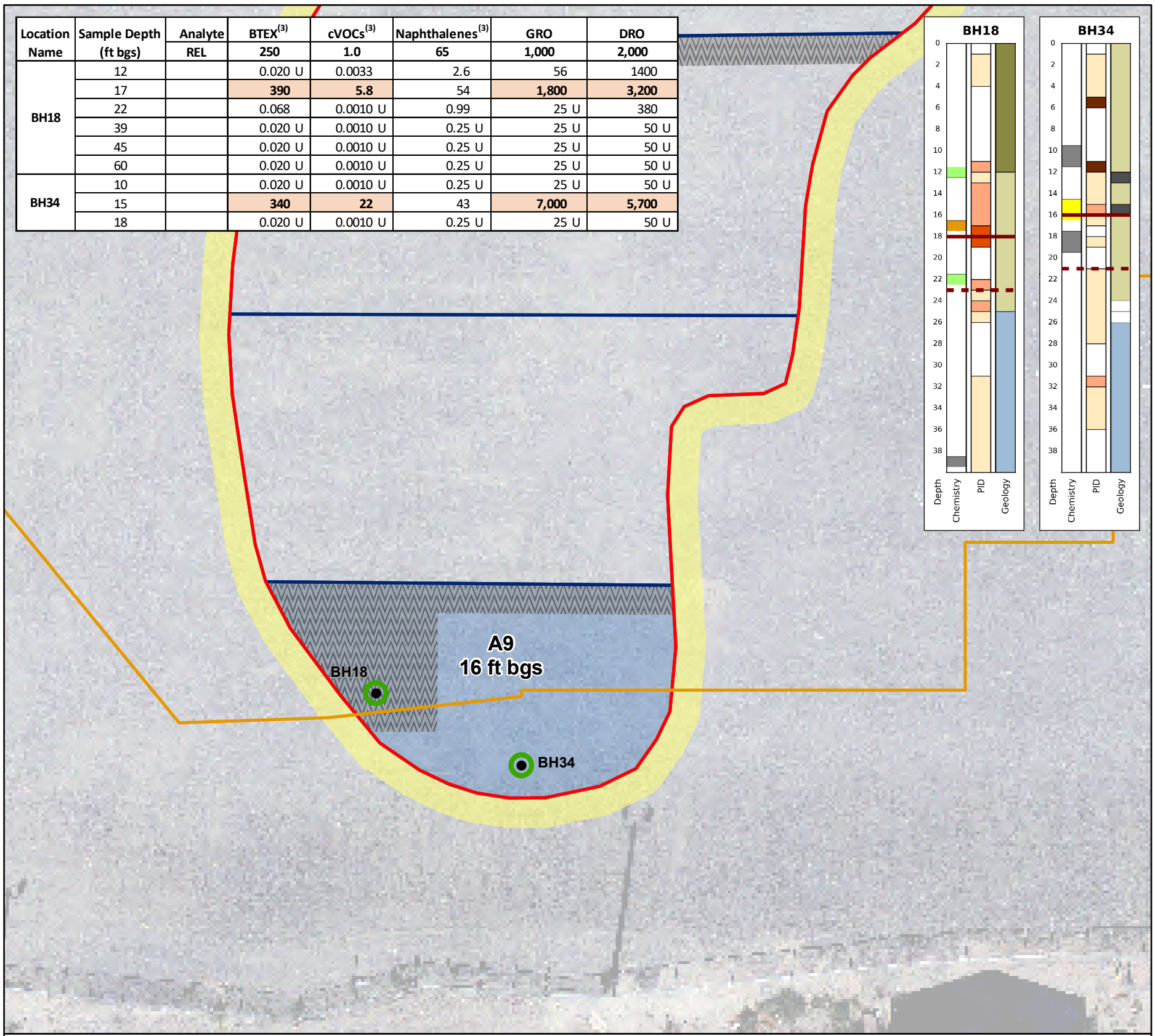
Figure F.3h
Proposed Soil Performance Sample Locations and PEC Data—Subarea A8

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Appendix F - Subarea Soil Metrics\Figure F.2h Prop Soil Perf Sample Locs and PEC Data – Subarea A8.mxd
7/12/2023

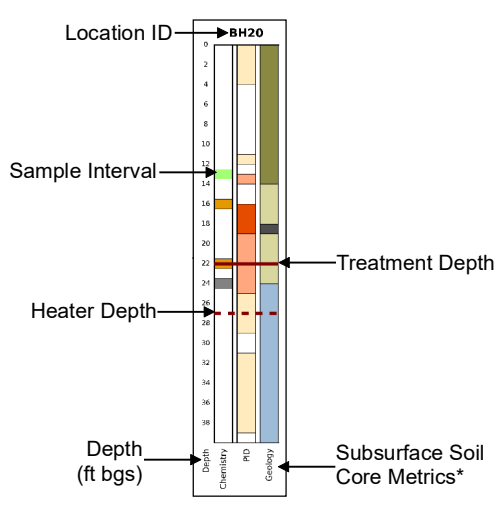
Location Name	Sample Depth (ft bgs)	Analyte	BTEX[3]	cVOCs[3]	Naphthalenes[3]	GRO	DRO
		REL	250	1.0	65	1,000	2,000
BH18	12		0.020 U	0.0033	2.6	56	1400
	17		**390**	**5.8**	54	**1,800**	**3,200**
	22		0.068	0.0010 U	0.99	25 U	380
	39		0.020 U	0.0010 U	0.25 U	25 U	50 U
	45		0.020 U	0.0010 U	0.25 U	25 U	50 U
	60		0.020 U	0.0010 U	0.25 U	25 U	50 U
BH34	10		0.020 U	0.0010 U	0.25 U	25 U	50 U
	15		**340**	**22**	43	**7,000**	**5,700**
	18		0.020 U	0.0010 U	0.25 U	25 U	50 U

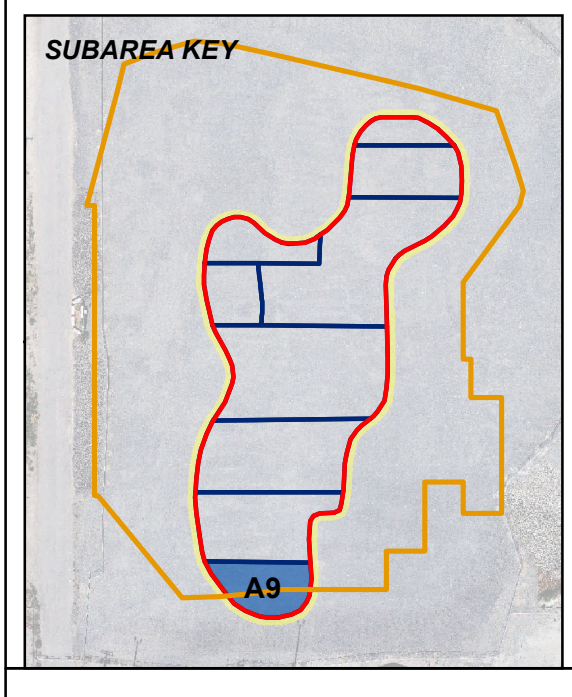


Legend

- Proposed Performance Sample Collocated with PEC Boring
- Existing PEC Boring
- Completed Excavation Extent
- Thermal Treatment Area Based on RELs
- Thermal Transition Zone
- Thermal Subareas[1]
- Heater Transition Zone[2]

Label Key





Subsurface Soil Core Information*

Chemistry

- One or More Detected Results >2X REL
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- All Detected Results ≤ REL
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PID (ppmv)

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- >1,000–10,000
- >100–1,000
- ≤100

Geology

- Fill
- Touchet Beds
- Silt/Cementation Lens
- Upper Pasco Gravels
- Lower Pasco Gravels

Notes:
1. Heaters will be positioned to reach the targeted treatment temperatures at the depths shown. Bottom heater placement will be 5 ft bgs below the targeted treatment depths.
2. Heater depths will be stair stepped between areas to reduce heat loss between different depths. Refer to TRS design report for additional details in Appendix E.
3. Summation was performed using detected concentrations plus one-half the reported value for component constituents that were not detected. If all constituents were not detected, the maximum reported non-detect concentration was used.

- Sample interval shown larger for visibility. Discreet samples were collected at the middle point of the sample interval shown.
- All analytical units in mg/kg
- Total cVOC calculation includes tetrachloroethene, trichloroethene, and vinyl chloride.
- Total naphthalenes calculation includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
- **BOLD** in table indicates exceedance of REL.
- *Italic* in table indicates analyte was not detected. Reported limit exceeds REL.
- Map data provided by PBS Engineering and Environmental Inc.

Constituent and Constituent Sum RELs (mg/kg):
- BTEX: 250
- cVOCs: 1.0
- Naphs: 65
- GRO: 1,000
- DRO: 2,000

Abbreviations:
bgs = Below ground surface
BTEX = Benzene, toluene, ethylbenzene, and xylenes
cVOC = Chlorinated volatile organic compound
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
mg/kg = Milligrams per kilogram
Naphs = Naphthalenes
PEC = Post-excavation confirmation
ppmv = Parts per million by volume
PID = Photoionization detector
REL = Remediation Level

Qualifer:
U = Analyte was not detected at the associated reporting limit.

0 10 20 40
Scale in Feet
N

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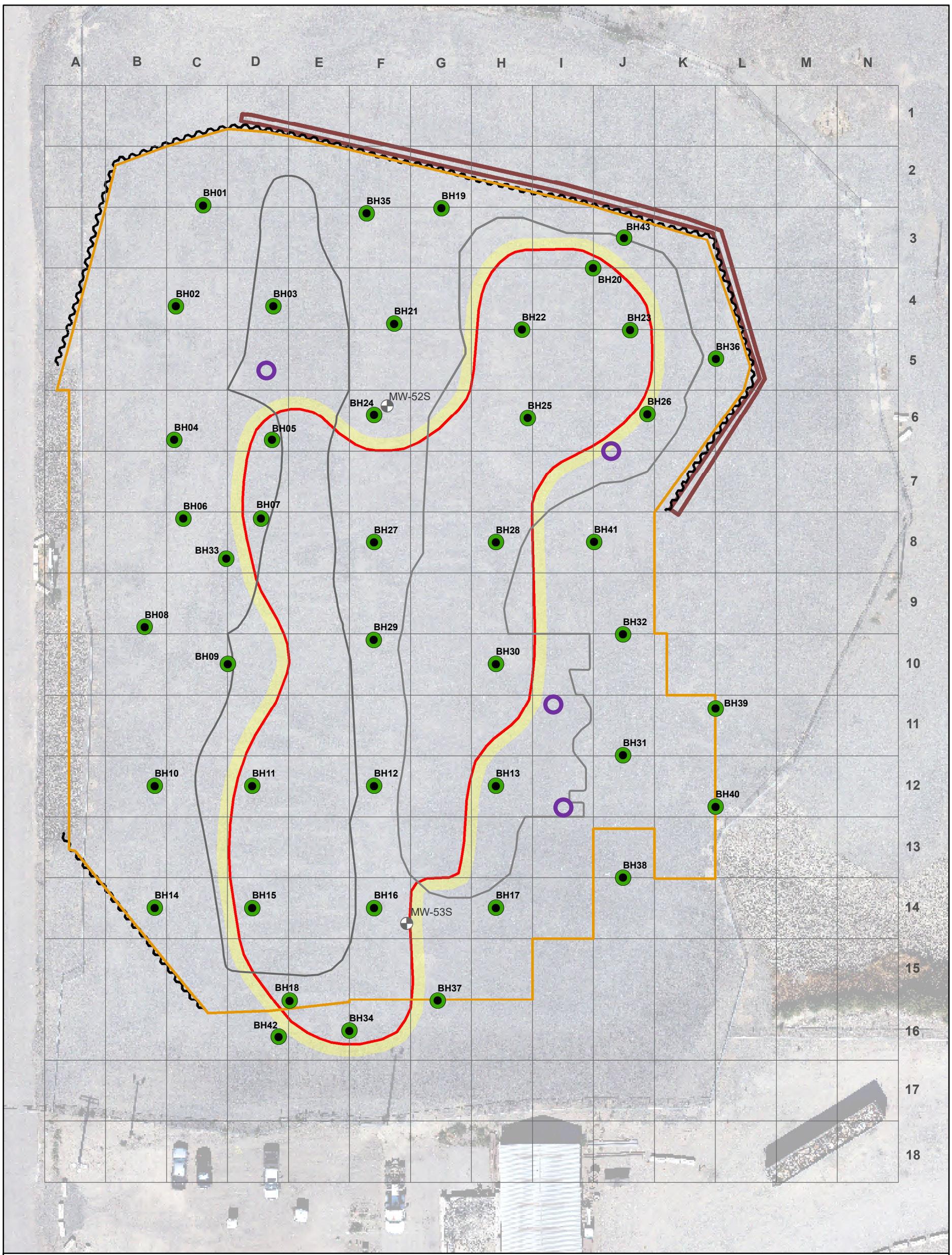
Figure F.3i
Proposed Soil Performance Sample Locations and PEC Data—Subarea A9

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Appendix F - Subarea Soil Metrics\Figure F.2i Prop Soil Perf Sample Locs and PEC Data – Subarea A9.mxd
7/12/2023



Legend

- Proposed Confirmation Sample
- Existing Confirmation Sample
- Existing PEC Boring(1)
- Decomissioned Monitoring Well
- Zone A Excavation Grid
- Former Drum Area
- Completed Excavation Extent
- Sheet Pile Wall
- Protection Barrier Wall
- Thermal Treatment Area
- Thermal Treatment Halo(2)

Notes:
1. PEC borings were advanced between January 2022 and September 2022.
2. Heat will radiate approximately 5 to 8 feet laterally and vertically from the edges of the treatment area. This extended heat will result in a halo of contaminant concentration reductions surrounding the treatment area

· Map data provided by PBS Engineering and Environmental Inc.

Abbreviations:
PEC = Post-excavation characterization

0 20 40 80
Scale in Feet

N

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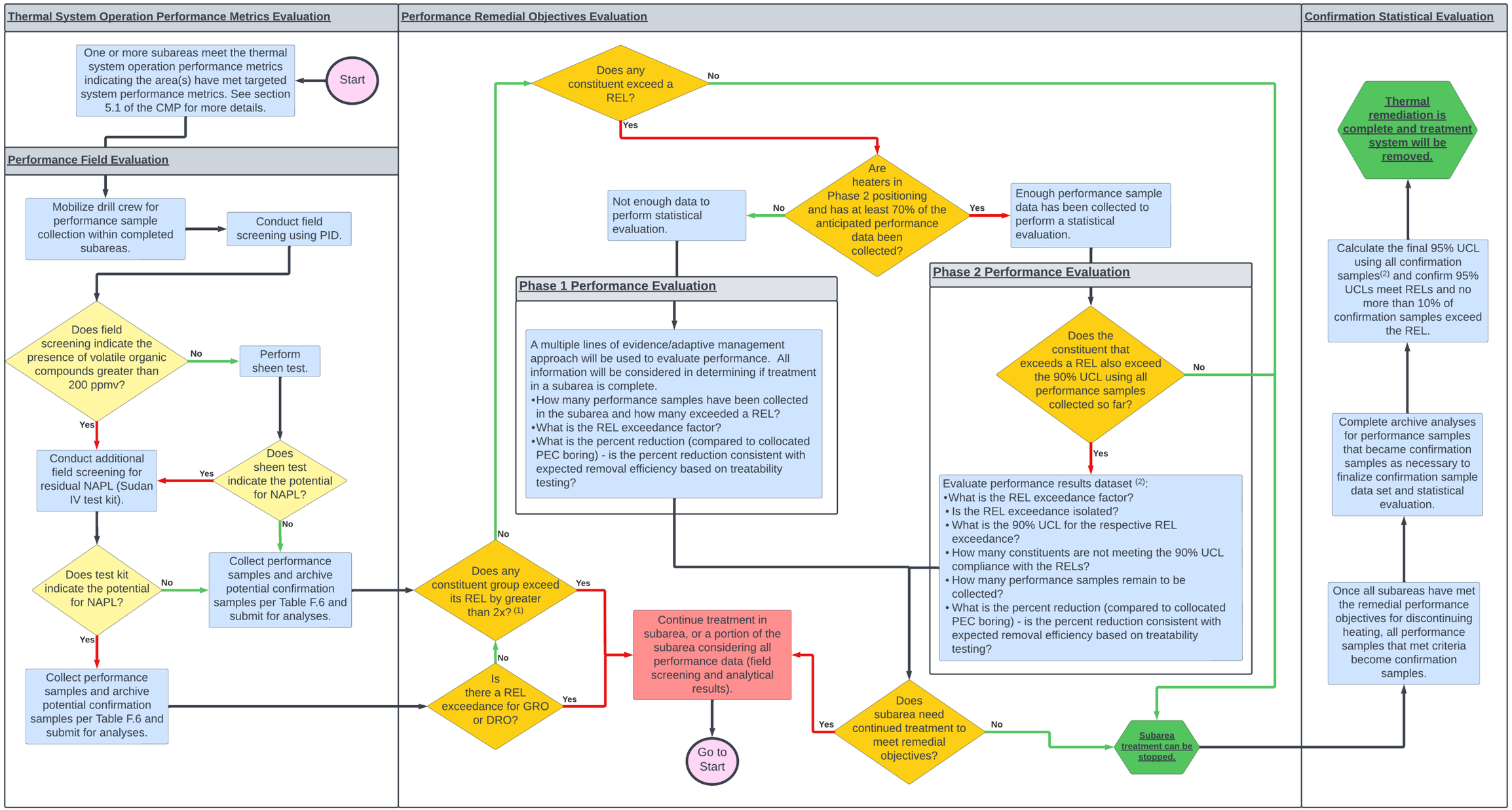
Figure F.4
Existing and Proposed Soil Confirmation Sample Locations—Outside Thermal Treatment Area

I:\GIS\Projects\IWAG-Pasco\MXD\Zone A Post-Excavation EDR\Appendix F - Subarea Soil Metrics\Figure F.4 Existing and Proposed Soil Confirmation Sample Locations- Outside Thermal Treatment Area.mxd
7/12/2023



Notes:

1. Consult with Ecology if performance soil sampling indicates an isolated exceedance greater than 2 times the REL after achieving target temperatures.
2. Performance dataset includes all performance samples collected so far from all subbasins, except for samples that did not meet remedial performance objectives and resulted in reheating a subarea.

Abbreviations:
DRO = Diesel-range organics, EPH = Extractable Petroleum Hydrocarbons, GRO = Gasoline-range organics, NAPL = Non-aqueous phase liquid, REL = Remediation level, PEC = Post-excavation characterization, PID = Photoionization detector, PMP = Performance Monitoring Plan, ppmv = Parts per million by volume, TPH = Total petroleum hydrocarbons, UCL = Upper confidence limit, VPH = Volatile Petroleum Hydrocarbons

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Zone A Post-Excavation Engineering Design Report
Pasco, Washington

Figure F.5
Remedial Performance Objectives Approach Decision Matrix

8/8/2023

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F

Attachment F.1
ISTR Contractor Health and Safety Plan Outline

Health and Safety Plan
In Situ Thermal Remediation

EXAMPLE SITE

Issued:

Title	Signature	Date
Greg Knight TRS Group, Inc. TRS Safety & Quality Manager		
Susan Avritt TRS Group, Inc. Project Manager		

TRS
TRS Group, Inc.
Accelerating Value

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SHSO Monthly Safety Checklist
TRS Restricted Zone Acknowledgement Form
TRS Safe Behavior Observation Form

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Appendix E – Site-Specific Emergency Response Plan

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F

Attachment F.2
TRS Hot Soil Sampling Standard Operating Procedure

TRS Accelerating Value	STANDARD OPERATING PROCEDURE	PROCEDURE No: 3.2

Procedure Title:

HOT SOIL SAMPLING

Author:	TRS Team	**Issue Date:**	04/22/08

Revisions:

Date	Initials	Revision Description	Revision #
12-04-17	GK	Removed Geoprobe® Dual-Tube Sampler reference and revised determination for use of Teflon liners.	4
12-02-19	GK	Added section on hot sampling with sonic drill rig	5
03-09-21	GK	Revised hot sampling procedures for sonic drill rig	6

Reviewed and Approved by (initial and date):

SOP/ Revision #	Safety & Quality		Engineering	
REV 4	12/4/17		12/6/17	
REV 5	12/2/2019		12/2/2019	
REV 6		3/9/21		3/9/21

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide a procedure for the safe collection of representative soil samples during, or after, the application of *in situ* thermal remediation (ISTR) technologies.

2.0 SCOPE

This SOP serves as a guideline for the collection of soil samples during, or after, the application of ISTR. To minimize the risk due to electrical hazards, lockout/tagout (LOTO) procedures must be applied to the ISTR power control unit (PCU) throughout the duration of the soil sampling effort. Only authorized persons trained in procedures and requirements described in SOP 1.1 are permitted to conduct LOTO on TRS equipment. Samples collected using this SOP are generally used for evaluating treatment effectiveness, and/or confirming treatment goals have been met.

TRS Group, Inc. (TRS) personnel shall use this procedure in conjunction with site-specific sample analysis plans and permit requirements. These are standard (i.e., typically applicable) operating procedures, which may be varied or changed as required, dependent on site conditions, equipment limitations, permit requirements, or limitations imposed by the procedure. The ultimate procedures, including any deviations from this SOP, shall be documented in the soil sampling form.

3.0 DEFINITIONS

Authorized Employee

Any designated employee who locks out or tags out equipment to perform servicing or maintenance. This person must have completed the mandatory LOTO training described in SOP 1.1 LOTO to be qualified as an authorized worker. Only an authorized worker installs and removes his or her own lock and tag as required by this program.

Competent Person

Any designated employee who has been trained in proper procedures for the application of ISTR to the subsurface at remediation sites.

ISTR – In Situ Thermal Remediation

A process whereby soil and groundwater are heated to the desired temperature to volatilize the target contaminants. Some ISTR technologies are electrical resistance heating (ERH), thermal conduction heating (TCH), and steam enhanced extraction (SEE).

LOTO – Lockout/Tagout

The practice of using a tag for visibility and awareness in conjunction with placement of a keyed device ("lock") on an energy isolating device, in accordance with SOP 1.1, to prevent the unwanted activation of mechanical or electrical equipment. Lockout ensures the equipment being controlled cannot be operated until the lock is removed.

4.0 EQUIPMENT LIST

1) Soil Sampling Field Form and pen (recommend indelible).
2) Drill rig and related equipment. Soil sampling is best achieved using a direct push drill rig such as a Geoprobe®. Alternative types of drilling methods are hollow stem auger (HSA) or rotosonic (sonic).

3) Ice bath for soil samples. An example is a cooler filled with ice. The cooler (or container) must be equipped with an opening at the bottom to allow water from melting ice to drain.

4) Standard cooking thermometer. Calibrated to both zero (0) degrees Celsius (°C) and 100°C (an infrared thermometer can be substituted when sampling denser soils or bedrock. Keep in mind the sample tube will likely be a few degrees cooler than the internal temperature of the sample).
5) LOTO equipment as described in TRS SOP 1.1.
6) Sample containers, labels, and chain-of-custody forms (as required by the laboratory for the analysis).
7) Safety Glasses with side shields. Additional option: full face-shield (wear over safety glasses).
8) Hearing protection adequate for sampling equipment decibel level. Refer to site-specific Health and Safety Plan (HASP).
9) Latex or nitrile gloves. Additional option: cotton or leather outer gloves (wear over inner latex gloves).
10) Site-specific personal protective equipment (PPE) requirements. Refer to site-specific HASP.
11) Packaging material, chain-of-custody seals, and shipping labels.

5.0 HOT SOIL SAMPLING PROCEDURES

A soil-sampling event begins with the shutdown and application of LOTO to the PCU. This is done to prevent any electrical hazards between the steel drill string and sampling personnel. The vapor recovery system should continue to operate to maintain capture of steam in the subsurface, rather than allowing it to exit through the sample borehole. Interim and final soil sampling is best achieved using a direct push drill rig such as a Geoprobe®. As the probe casing is extracted from the subsurface, it should be considered to be very hot, and handled with proper precaution and personal protective equipment.

Choose a sample sleeve compatible with the conditions being encountered. For example, if the sample location temperature is elevated above 100°C, then a stainless steel sleeve will be a better choice than a Teflon sleeve as the Teflon sleeve will become soft and deform at elevated temperatures. Consult engineering for the appropriate sleeve. Teflon sleeves are only recommended for sampling when expected subsurface temperatures will be at or below 70°C.

Note: sample sleeves can be custom fabricated if supplier inventories are inadequate. Please contact equipment@thermalrs.com *if additional resources are needed to procure sampling sleeves.*

5.1 Safety Considerations

There are certain hazards associated with the application of ISTR to contaminated soil and groundwater. These hazards include possible contact with hazardous voltages, steam, hot water, hot soil, other hot surfaces, and/or hazardous chemicals. Exposure to these hazards can be mitigated through engineering controls and strict adherence to documented procedures and safety protocols such as the following restrictions:

- The ISTR PCU system must be turned off and LOTO applied during soil sampling activities. Only trained and authorized TRS personnel can perform LOTO of ISTR equipment.
- High temperatures, hot water, and steam may be encountered when collecting subsurface soil samples; the use of the proper PPE is mandatory, and caution is advised.
- Contaminant vapors may be present at the borehole during sampling.
- Personnel shall be trained on hazards and engineering controls associated with drilling before beginning sampling operations. Potential hazards include rotating equipment, overhead loads, and slips trips and falls.

Refer to the site-specific Sampling and Analysis Plan (SAP) and HASP for site-specific requirements and restrictions.

Caution: Exposure to hot groundwater and steam possible

The removal of water and soil from the sample borehole can change the temperature/pressure equilibrium conditions existing within the borehole prior to drilling and sampling by reducing the hydrostatic head in the borehole, allowing hot water and steam to eject from the borehole. Review the site conditions prior to commencing drilling or boring. If sampling soil beneath the groundwater surface level elevation, always remove the boring equipment and samples slowly from the boring to allow the borehole conditions to safely re-equilibrate.

Stop and complete the attached Site Sampling Evaluation Checklist before proceeding with this procedure.

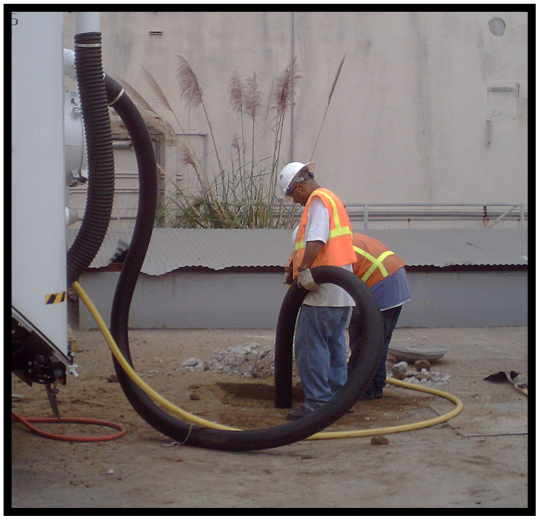
5.2 Hot Soil Sampling Procedures

Whenever possible, sampling shall be completed in order from sample locations having the lowest anticipated concentrations of contaminants of concern (COCs) to locations having the highest anticipated COC concentrations (i.e., outside treatment area, treatment area boundary, locations within the source area). The steps outlined below must be followed for iterative, interim, and/or final hot soil sampling.

Contact the TRS Project Manager (PM) the day prior to sampling to coordinate a shutdown. A shutdown period of 4 hours is preferred prior to soil sampling.

1) An authorized person shall apply LOTO to the ISTR PCU by site-specific instructions. Note: Only personnel who have been trained and certified by TRS in LOTO procedures can complete this procedure.
2) Position drill rig in the area to be sampled and perform a visual check for any safety concerns. Potential concerns include high voltage lines, uneven terrain, underground utilities, and egress limitations with rig placement.

3) Hand auger or air knife the first five (5) feet of the boring to clear the location for potential buried utilities.



4) Advance the push sampler to the depth required and collect samples. If subsurface temperatures are expected to be greater than 70°C, the sample sleeves used must be made of brass or stainless steel. Sample sleeves made of acrylic or other materials can melt and bias sample results.

5) The sample sleeves must be capped immediately and placed into the ice bath to begin the cool-down process. Water from melting ice must be allowed to drain, as the sample sleeves should not be submerged at any time.

6) The sample sleeves should be cooled until the soil nears ambient temperature (approximately 20°C/70 degrees Fahrenheit [°F]). A standard cooking thermometer can be inserted through the end cap for temperature monitoring. The sample sleeve may be opened and sampled once near-ambient temperatures have been reached. Soil samples, including quality control (QC) samples, are collected, labeled, preserved, and shipped per the site-specific SAP.
7) Plugging/sealing of the soil borehole will be in accordance with Federal, State, and/or Local regulatory and client requirements.
8) Soil cuttings not consumed in the sampling process will be disposed of according to Federal, State, and/or Local regulatory and client requirements.

6.0 Hot Soil Sampling Using Rotosonic Method

The procedures for hot soil sampling with a Sonic rig are similar to the steps outlined in **Section 5.2**, except for the following deviations:

- Sonic drilling methods produce large soil cores, four to six inches in diameter. Cool the cores in a large trough of ice, with drainage of melt water. Ice consumption may range from 500-1,000 pounds per day depending on soil temperature, ambient temperature, and soil core production rate.
- In ambient temperature soil conditions, Sonic drilling methods use a low-density polyethylene (LDPE) bag to recover soil cores from the Sonic rig sample apparatus. The LDPE bags used for

this method of sample retrieval are typically only rated for temperatures below 90°C, therefore bags must be used with additional precautions:

  - Cool the exterior of the sonic barrel with a garden hose prior to contact with the LDPE liner and extraction of the soil core. It is recommended to double-bag hot soil cores in the LDPE liners. Have an ice bath ready for immediate cooling of the soil cores.
  - Direct contact with ice below and above the bagged soil core cools the soil cores in approximately 1 hour. Additional plastic may be preferred to further eliminate risk of cross contamination but does slow the cooling rate.
- For sampling at ISTR sites where soil temperatures are greater than 90°C, LEXAN™ polycarbonate liners (or equivalent) are an alternative. LEXAN™ polycarbonate is rated to approximately 110 to 130°C.
- Some subsurface conditions may make the LEXAN™ polycarbonate liners prohibitive.
- Verify with the drilling subcontractor that additional sample core barrels are available to maintain production while sample core barrels are cooling and during core extraction.
- Extreme caution will be exercised in cutting the LEXAN™ polycarbonate liners when the soil core is ready to be sampled.

Alternative Procedure for Rotosonic Method

If soil temperatures exceed 90°C and/or when LEXAN™ polycarbonate liners are not on option, the following procedure can be implemented if the drilling subcontractor has the available hardware to perform the procedure. Verify with the drilling subcontractor that multiple core barrels are available to maintain production while sample core barrels are cooling prior to core extraction.

- Collect samples using a core barrel without a liner. Use only decontaminated core barrels for each core/sample.
- Once sample barrels are retrieved from the borehole, the core barrel will be capped and placed on ice.
- Once the soil in the barrel reaches ambient temperatures (approximately 20°C/70°F), the barrel will be placed back on the rod presenter on the rig.
- The core barrel caps are then removed, and the core barrel is attached to the drill head on the Sonic rig.
- The core will then be extruded into a standard sonic sample bag and labeled as appropriate by borehole location, sample depth(s), and starting depth and ending depth for the length of the core.

7.0 RESPONSIBILITIES

Role	Responsibility
VP Operations	• Develop and implement SOPs • Periodically review and update procedures based on project feedback • Provide training and maintain training documentation
TRS Safety & Quality Manager	• Assist VP Operations with providing training and maintaining training documentation. • Assist Site Health and Safety Officer (SHSO) with modifying SOP to meet site-specific HASP requirements.

Role	Responsibility
PM	• Review procedures in conjunction with site-specific sample requirements and scope of work (SOW). Coordinate changes to procedures as necessary. • Schedule and coordinate sampling effort. Ensure adequate supplies are available.
SHSO	• Conduct orientations for subcontractors and employees • Coordinate training needs with TRS SQM • Review procedures in conjunction with site-specific HASP. Coordinate changes to procedures as necessary to maintain safe working procedures.
Sampling Personnel	• Complete training to the level of competent person prior to initiating sampling activities. • Follow procedures and document information related to soil sampling effort as identified in this SOP, including and deviations from the SOP.

8.0 TRAINING

Training in SOPs is provided upon initial assignment and annually thereafter. Additional retraining is provided if there is a change in procedures or if inadequacies are observed in the individual's application of procedures. Subcontractors must train their own employees. LOTO training requirements for personnel are outlined in SOP 1.1.

9.0 RECORD KEEPING

These are standard (i.e., typically applicable) procedures, which may be varied or changed as required dependent on site conditions, equipment limitations, permit requirements, or limitations imposed by the procedure. The ultimate procedures used during any sampling event, including any deviations from these procedures, shall be documented in the sample logbook.

At a minimum, the following information shall be maintained in the sample logbook related to hot soil sampling at ISTR sites:

- Date
- Sample identification and corresponding location
- Sample time
- Sample identifications and analysis to be performed
- Chain-of-custody number
- Shipping information
- Deviations from this SOP
- Any other information deemed relevant to the sample results

Copies of chain-of-custody forms and shipping documentation shall be maintained and kept with the sample logbook.

10.0 REFERENCES

TRS Group, Inc., 2013. SOP 1.1, Lockout/Tagout (LOTO), Most Recent Version.

US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, Most Recent Version (Method 5035)

SOP 3.2 Hot Soil Sampling

Reading Acknowledgment

All personnel that receive training on this procedure will review and sign the acknowledgement form contained in this section.

I have been trained by TRS Group, Inc. (TRS) to perform hot soil sampling at TRS ISTR project sites. By signing this document, trainee acknowledges that **SOP 3.2 Hot Soil Sampling** has been read and the contents of the document are understood.

Date	Trainee (print)	Trainee (Sign)

SOP 3.2 Hot Soil Sampling
Training Acknowledgment

All personnel that receive training on this procedure will review and sign the acknowledgement form contained in this section.

I have been trained by TRS Group, Inc. (TRS) to perform hot soil sampling at TRS ISTR project sites. By signing this document, trainee acknowledges that they have received hands-on training from a competent person who is authorized to use and instruct others on hot soil sampling procedures at TRS project sites as outlined in **SOP 3.2 Hot Soil Sampling**.

Date	Trainee (print)	Trainee (Sign)	Trainer

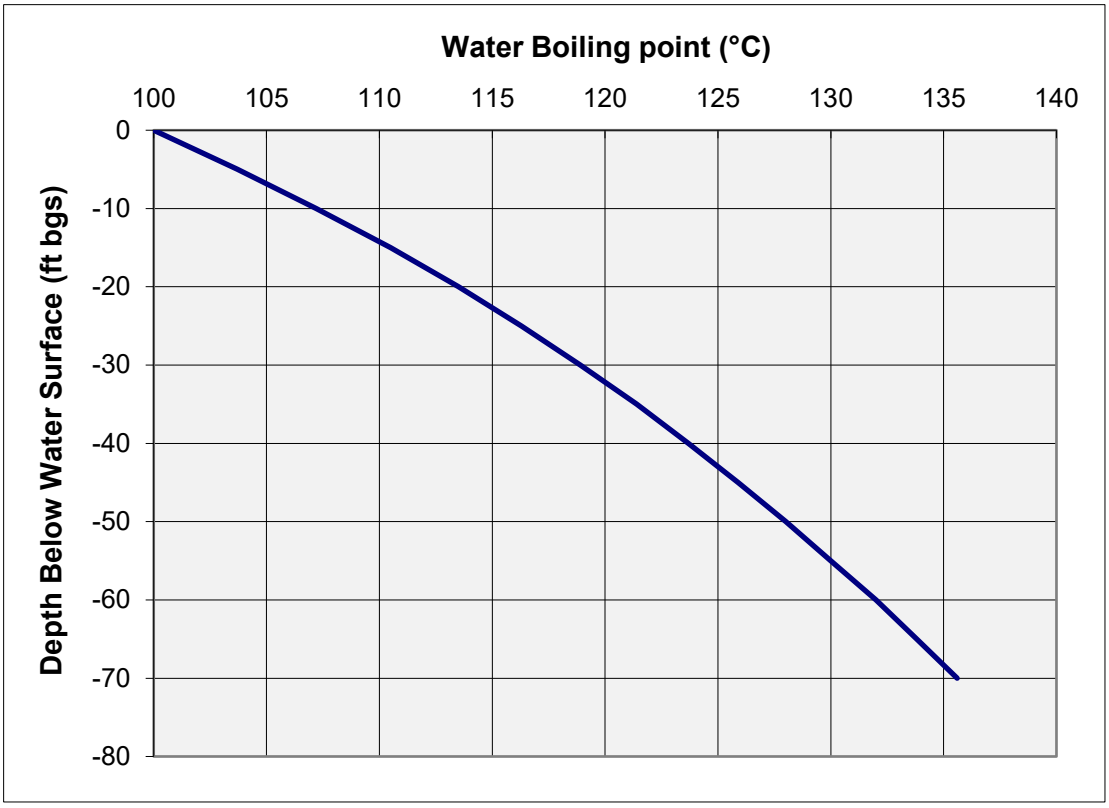
Site Sampling Evaluation Checklist

Project #: _____

Date: _____

Subsurface Conditions

1) Are soil samples being recovered from beneath the groundwater surface?
2) What is the depth to groundwater at the time of sampling?
3) How deep below the groundwater surface elevation are we sampling?
4) What are the current temperatures at or near each boring location?
5) Are there confining layers on site? Clay or silt over saturated zone sand for example.
6) Use the figure below to determine where the sites actual temperatures fit on the boiling point curve.



7) Actual temperature for each depth elevation that is higher in value than the temperatures represented by this curve suggest a temperature value greater than the hydrostatic boiling point of water.

REVISION RECORD

Date	Initials	Revision Description	Revision #
01-04-10	LS	Add Scope, responsibilities, training, definitions, recordkeeping	1
5-6-14	TP	Added caution concerning hot water, steam expulsion	2
2-22-16	TP	Review, revised power off requirement	3
12-4-17	GK	Removed Geoprobe® Dual-Tube Sampler reference and revised determination for use of Teflon liners.	4
12-02-19	GK	Added section on hot sampling with sonic drill rig	5
03-09-21	GK	Revised hot sampling procedures for sonic drill rig	6

SOP/ Revision #	Safety & Quality	Engineering
Original	4/22/08	4/22/08
REV 1	1/4/10	1/4/10
REV 2	5/6/14	5/6/14
REV 3	2/24/16	2/22/16
REV 4	12/4/17	12/6/17
REV 5	12/2/2019	12/2/2019
REV 6	3/9/2021	3/9/2021

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix F

Attachment F.3
Floyd|Snider Standard Guideline for Soil Sample Collection

Two Union Square
601 Union Street, Suite 600
Seattle, WA 98101
tel: 206.292.2078 fax: 206.682.7867

F|S STANDARD GUIDELINE

Soil Sample Collection

DATE/LAST UPDATE: December 2022

These procedures should be considered standard guidelines and are intended to provide useful guidance when in the field but are not intended to be step by step procedures, as some steps may not be applicable to all projects.

All field staff should be sufficiently trained in the standard guidelines for the sampling method they intend to use and should review and understand these procedures prior to going into the field. It is the responsibility of the field staff to review the standard guidelines with the field manager or project manager and identify any deviations from these guidelines prior to field work. When possible, the project-specific Sampling and Analysis Plan should contain any expected deviations and should be referenced in conjunction with these standard guidelines.

1.0 Scope and Purpose

This standard guideline presents commonly used procedures for collection of soil samples for characterization and laboratory analysis. The methods presented in this guideline apply to the collection of soil samples during the following characterization activities: soil borings via drilling, manual collection of shallow soil samples, test pit excavation, excavation confirmation, and stockpile characterization. Specific details regarding the collection of discrete and composite samples, and special sampling techniques for volatile organic compounds (VOCs) are also included. The guideline is intended to be used by staff who collect soil samples in the field.

It is important that the field staff completing the soil sample collection discusses the specific needs for a particular investigation with the project geologist, the project manager, or whoever will ultimately be responsible for interpreting the findings of the field investigation. This discussion is in addition to field training and general knowledge about soil sampling, and should happen prior to entering the field, with additional follow-up before finalizing the field forms, after the investigation is complete.

2.0 Equipment and Supplies

Soil Sampling Equipment and Tools:

- Tape measure or measuring wheel
- Stainless steel bowls and spoons
- Trowel, hand auger, or shovel (if needed)
- Table and disposable sheeting, tape or clamps to hold down sheeting (if needed).
- White board and dry erase pen
- Graduated plunger and collection tubes for VOC samples (if needed)
- Photoionization detector (PID) (if needed)
- Ziploc bags (sandwich and gallon sizes)
- Trash bags
- Decontamination tools including:
  - Paper towels or shop towels
  - Spray bottles of Alconox (or similar) solution
  - Deionized or distilled water
  - Scrubbing brush and bucket
- Adhesive drum labels, and paint or grease pen
- Washington State Department of Transportation- (WSDOT) approved drums for investigation-derived waste (IDW) disposal, if needed (if drilling, to be provided by driller)
- Camera
- Hand-held global position system (GPS; if needed)
- Coolers, sample jars, labels, ice

Paperwork:

- Work Plan and/or Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP)
- Field map printed on Rite in the Rain paper
- Site-specific Health and Safety Plan (HASP)
  - Tailgate meeting form (for each day you expect to be on Site)
  - Safety Data Sheets
- Floyd|Snider's Accident Prevention Plan (APP)

- Sample collection forms printed in Rite in the Rain paper
- Boring Logs
- Rite in the Rain field notebook
- Chain of custody forms
- Emergency contact numbers for utilities, property owner/manager, etc. (as needed)

Safety Equipment:

- Steel-toed boots
- Safety vest
- Safety glasses
- Nitrile gloves
- Rain gear
- Work gloves
- Hard hat
- Ear protection
- Traffic barricades or cones
- Vehicle emergency kit (road flares, fire extinguisher, first aid kit, etc.)
- Sunscreen if needed
- Hand and foot warmers, if needed
- Mosquito repellent, Hornet Spray, if needed
- Drinking water
- Rain or sun shelter, if needed
- Cell phone and charger cables

3.0 Standard Procedures

3.1 OFFICE PREPARATION

Prior to going into the field, review the SAP and QAPP to become familiar with the sampling goals, data quality objectives, desired sample intervals and nomenclature, field Quality Assurance (QA) samples (i.e., frequency of field duplicates, MS/MSDs) to be collected, analytes, sample containers, and holding times for each analytical method.

At least one week prior to sampling, coordinate with the laboratory specified in the SAP/QAPP to receive coolers and appropriate sample containers (including additional containers for

QA samples). Familiarize yourself with the volume requirements and container types, preservation methods, and holding times for each class of analytes.

If drilling or digging test pits, mark the sample area and sample locations with white spray paint prior to sampling, then submit an 811 public utility locate request at least 3 business days prior to work. Hire a private utility locator and schedule to locate utilities on private property and ensure proposed boring and/or excavation locations are free of utilities (Note: not all locators are equipped to mark non-conductible utilities).

3.2 TAILGATE SAFETY MEETING

Conduct a tailgate safety meeting prior to beginning work at the Site. Include any subcontractors working with you at the Site in this meeting. The safety meeting should cover the hazards specific to soil sampling. Typical hazards include:

- Heavy machinery/drill rig awareness (overhead hazards, pinch points, noise, uncontrolled release of energy). Always make eye contact before approaching an operator.
- Physical hazards (heavy lifting, uneven ground/trip hazards)
- Chemical hazards (dust, site-specific contaminants of concern, lab preservatives)
    - Refer to HASP for specific air monitoring requirements, permissible exposure limits (PELs), and actions if PELs are exceeded.

Additional hazards that may be present at any job site include traffic, adverse weather, slips, trips, falls, biological hazards (such as insects, plants, animals), and worksite distractions (such as pedestrians or other onsite activities).

Record the meeting attendees and topics discussed on the front page of the tailgate safety meeting form. All attendees should sign the form.

3.3 OTHER HEALTH AND SAFETY GUIDELINES

The following are additional health and safety guidelines that should be followed in the field. These guidelines are intended to supplement the guidelines and requirements identified in the HASP and are not intended to replace the HASP.

- Review and sign the HASP prior to going out into the field.
- Conduct a tailgate safety meeting prior to beginning work at the site as discussed in Section 3.2.
- If conditions change (e.g., weather or personnel) or when moving between sampling locations/switching to different sampling tasks, assess any additional hazards that may be associated with the new condition or location/task. Record additional hazards noted and corrective actions to address those hazards on the second page of tailgate safety meeting form.

Record near misses and incidents on the Near Miss and Incident Reporting Form (included as an attachment to the HASP) and conduct management/client notifications according to the protocols detailed in the HASP.

3.4 GENERAL SOIL SAMPLE COLLECTION PROCEDURES

1. Locate the desired sample location and depth interval using a handheld GPS or by taking field measurements from known site features. Record the soil type and any other observations or indications of contamination on a soil boring log (enclosed), soil sample collection form, or field notebook, as described in the Soil Logging Standard Guideline. Note the location and depth of the sample on the whiteboard or notecard and take a photograph with a scale (e.g., tape measure), if possible.
2. Refer to Sections 3.4.1 through 3.4.4 for the appropriate soil collection procedures for drilling, shallow soil, test pit excavation, excavation confirmation, and stockpiles. If collecting samples for VOC analysis by the U.S. Environmental Protection Agency (USEPA) Method 5035, refer to Section 3.5 for specific sample collection procedures for this method. If composite soil sampling is recommended, refer to Section 3.6 for details.
3. Once soil has been collected from the desired depth or interval, mix thoroughly in a disposable or decontaminated stainless-steel bowl until the sample is homogenous in color, texture, and moisture.
4. Fill the required laboratory-provided jars, taking care not to overfill. If large gravels (diameter greater than ~ 1 inch) are encountered, these should be discarded to ensure that an adequate soil volume is collected for analysis. If necessary, use a clean paper towel to remove soil particles from the threaded mouth of the jar before securing lids to ensure a good seal. Remove any soil or dirt from the outside of the jar with a clean paper or shop towel.
5. Label each jar with the sample name, date, time, field staff initials and required analyses. If collecting a field duplicate, use the sample nomenclature specified in the SAP\QAPP and note the field duplicate name and sample time in the sample log and/or field notebook. If extra volume for matrix spike/matrix spike duplicate (MS/MSD) analysis is required, use the same name on all jars. Soil samples should be protected from moisture by placing the filled sample jars into separate sealed Ziploc bags before placing them into a cooler.
6. Upon completion of each day of sampling, complete a chain-of-custody form for all samples, including sample names, date and time of collection, number of containers, and required analyses and methods. Write neatly and make sure information on the chain is legible. If you need to correct an entry, strike the incorrect entry out once, and add your initials next to the strike out. Samples collected for waste characterization purposes should be recorded on a separate chain-of-custody. Keep samples on ice (unless otherwise specified in the SAP/QAPP) to maintain

temperatures of 4-6 degrees Celsius (°C) and transport to the laboratory under chain-of-custody procedures.

3.4.1 Soil Sample Collection via Drilling

These procedures should be used for drilling via direct-push, hollow stem auger, or roto-sonic methods where a pre-designated sample interval (i.e., 0 to 5 feet below ground surface [bgs]) is retrieved from the subsurface using a split spoon sampling device, lined core, or bag sampler.

1. Ensure that reusable sampling equipment has been thoroughly decontaminated prior to sampling.
2. Collect PID measurements and other field tests, if necessary. PID measurements should be collected using the head-space method: put a small amount of soil from the selected interval into a sandwich bag and seal the bag. Label the bag with the soil interval. After at least 10 seconds, insert the tip of the PID into the bag and record the PID reading on the boring log or field collection form. If a sheen test is necessary, place a small amount of soil into a disposable or decontaminated stainless steel bowl, spray it with tap water or deionized water and observe whether a sheen appears on the water. Record results on the boring log or sample collection form.
3. Prior to sample collection, log soil on the boring log or sample collection form following the Soil Logging Standard Guideline.
4. Use a stainless-steel spoon or trowel, or disposable scoop to remove an equal volume of soil across the targeted depth interval from the sampler.
    a. If using a split spoon sampler or other reusable sampler, avoid collecting the soil that is touching the sides of the sampler to the extent practical.
    b. If the soil touching a reusable sampler must be collected to obtain adequate volume for analysis, notify the PM and record in the field logbook.

3.4.2 Manual Collection of Shallow Soil Samples

These procedures should be used for shallow soil sampling via scoop, trowel, shovel, or hand auger.

1. Dig or auger to the bottom depth of the shallowest sample to be collected, using a tool that has been thoroughly decontaminated. Verify that the target depth has been reached using a measuring tape.
2. If using a scoop or trowel, collect the soil directly into a decontaminated stainless-steel bowl.
3. If using a shovel, the soil may either be collected in bowls or set as aside on plastic sheeting in favor of collecting the sample from the sidewall of the hole. If sampling the sidewall, use a decontaminated or disposable scoop or trowel to collect soil from the target depth, or scrape along the sidewall to collect soil across a target depth

interval. Transfer soil to a disposable or decontaminated stainless-steel bowl, repeating until a sufficient volume has been collected.

4. If using a hand auger, empty the cylinder of the auger directly into a disposable or decontaminated stainless-steel bowl. It may be necessary to empty the hand auger onto plastic sheeting or into a bowl to reach the target depth without overflowing the sampler.
5. Any soil from depth intervals that are not targeted for sampling should be set aside on plastic sheeting and returned to the hole after sampling.
6. Collect PID measurements and other field tests as described in Section 3.4.1.

3.4.3 Sample Collection from Test Pits or Limited Soil Excavations

These procedures should be used for collecting samples from test pit explorations excavated using a backhoe or excavator. These same general procedures should also be followed for post-excavation soil samples used to confirm that an excavation has removed contaminated material or to document post-excavation conditions after target excavation limits have been reached.

1. Measure the length, width, and depth of the test pit or excavation area to verify that the target extents have been reached. The lateral spacing of the test pit or excavation confirmation samples, or exact location of samples should be specified in the work plan and typically depend on the size of the excavation area but can vary significantly by project.
2. If not specified in the work plan, sidewall samples may be collected either midway between the ground surface and base of the excavation, or incrementally along the entire height of the sidewall. Both sidewall and base (bottom) samples should penetrate a minimum of 6 inches into the excavated surface.
3. If the test pit or excavation is less than 4 feet deep, or has been benched to accommodate safe entry, a sample may be collected directly from the sidewall(s). Do not enter an excavation before reviewing and verifying the necessary safety requirements. Most excavations can be sampled without entering, which is preferred. If entering is safe, based on the depth or accommodations to support entry, to collect soil from a sidewall, use a decontaminated or disposable scoop, trowel, or shovel to obtain soil from the desired depth or depth interval directly into a decontaminated stainless-steel bowl.
4. If a test pit or excavation cannot be safely entered, instruct the excavator operator to scoop sidewall material from the target depth or depth interval. Collect the soil sample from the excavator bucket using a decontaminated stainless-steel spoon, trowel, or disposal scoop, avoiding material that has come into contact with the teeth or sides of the bucket. Place an adequate volume of soil into a decontaminated stainless-steel bowl. If necessary, follow the compositing procedures in Section 3.6.

3.4.4 Stockpile Sampling

These procedures should be used for classifying stockpiled soil, including excavated soil and imported backfill material.

1. Where potentially contaminated soils have been previously excavated and stockpiled on site, Washington State Department of Ecology (Ecology) guidance recommends using a decontaminated or disposable scoop or trowel, penetrating 6 to 12 inches beneath the surface of the pile at several locations until sufficient volume for analysis is achieved. A decontaminated shovel may also be used to facilitate collection of soil from large piles. The locations for soil collection should be where contamination is most likely to be present based on field screening (i.e., staining, odor, sheen, or elevated photoionization detector [PID] readings). If there are not field indications of contamination, the locations should be distributed evenly around the stockpile.
2. The stockpile may need to be broken up into sections for sample collection depending on the size of the pile (i.e., segregate the pile in half or quarters). If this is necessary, it is important to document where each set of samples were collected from (i.e., north quadrant) and create a field sketch in the project notebook of the pile for reference and mark sample locations with flags.
3. If a sampling frequency is not specified in the work plan, the general rule of thumb for contaminated soil stockpile profiling is to collect and submit 3 analytical samples (these samples can be multi-point composites or grabs) for stockpiles less than 100 cubic yards (CY), 5 samples for stockpiles between 100 and 500 CY, 7 samples for stockpiles 500 to 1,000 CY, 10 samples for stockpiles 1,000 to 2,000 CY, and 10 samples for stockpiles larger than 2,000 CY with an additional sample collected for every 500 CY of material. This rule of thumb is consistent with the Washington State Guidance for Remediation of Petroleum Contaminated Site (Ecology 2016).
4. Samples for characterization of stockpiles of imported backfill or other presumed clean material should also be collected as described under 3. If not described in the work plan, the typical sample frequency for imported or clean material characterization is one sample per 500 CY.

3.5 SOIL SAMPLE COLLECTION FOR VOC ANALYSIS

If collecting soil samples for VOC analysis by USEPA Method 5035, collect these samples first before disturbing the soil. This method uses a soil volume gauge fitted with a disposable soil sampling plunger tube to collect a soil plug that can be discharged directly to a VOA vial, limiting the loss of volatiles during sampling. The collection of VOC samples using the 5035 method specifies use of an airtight VOA vial with a septum lid. Ecology's interpretation of the USEPA 5035 method allows for field preservation of the sample with methanol or sodium bisulfate, or laboratory preservation (i.e., field collection into an un-preserved vial). It is important to note that if laboratory preservation is the selected method, samples must be received at the laboratory within 48-hours of sample collection. The method of sample preservation for the 5035 method will vary for each site and is dependent on site-specific conditions. Preservation

method selection should be coordinated with the laboratory and specified in the sampling plan. Note that not all labs use the soil volume gauge as described below (some use syringes or Terra Core samplers) and that it is important to verify the sampling process with the lab.

1. Note the volume of soil needed for analysis as specified by the laboratory (commonly 5 or 10 grams). Raise the handle of the soil volume gauge to the slot in the gauge body corresponding to the desired volume and turn clockwise until the tabs in the handle lock into the slot.
2. Insert a sample tube at the open end of the gauge body and turn clockwise until the tabs on the tube lock into the "0 gram" slot. Remove the cap from the sample tube and press directly (where possible) into the shallow soil, soil core/sampler, excavation base or sidewall, or stockpile.
3. Continue pressing the sample tube until the plunger is stopped by the sample volume gauge. If a depth interval (for example 9 to10 feet) is targeted for VOC sampling, collect small volumes of soil across this interval until the sample tube is filled
4. Twist counterclockwise to disengage the sample tube, then depress the plunger to eject the soil plug directly into a laboratory-provided VOA vial. Wipe off any soil particles on the VOA vial threads before tightening the lid. Grit on the VOA vial threads can cause a poor seal and interfere with the laboratory analyses. If multiple vials per sample are required, the same plunger may be re-used to fill the remaining vials.

3.6 COMPOSITE SAMPLE COLLECTION

For this guideline, composites are considered samples that are collected across more than one location, or multiple depth intervals at a single location. Samples collected over continuous depth intervals within a sampling device (i.e., split spoon) are addressed for each sampling method in Section 3.4 above.

Compositing of sample material may be performed in the field or by the analytical laboratory. To collect a field composite sample, identify the locations and depth(s) that will comprise the composite. Collect soil from the first target sub-sample depth or depth interval and hold in a decontaminated stainless-steel bowl, covered with aluminum foil to prevent cross contamination and label with the location and depth. Continue to collect and hold individual sub-samples until all components of the composite have been collected, then transfer an equal amount of each sub-sample to a clean bowl and homogenize. Fill necessary sample jars from homogenized composite. In some cases, project plans may require that each individual sample that comprised the composite be collected in jars and submitted to the laboratory if individual sample analysis is desired, or if laboratory compositing is requested in addition to field compositing as a field quality control measure. In this case, label each individual jar, but indicate HOLD on the chain-of-custody, and note that the sample is part of composite XYZ.

To collect a laboratory composite sample, collect, and label each sub-sample using the procedures described above in Section 3.4. Record each sub-sample on the chain-of-custody form, and indicate on this form which samples should be composited by the laboratory and the

desired name of the composite sample. It is important to communicate to the laboratory if discrete samples will also require analysis (in some cases) or only the composite sample. It is helpful to send a follow up email to the laboratory PM with laboratory compositing details.

4.0 Decontamination

All reusable equipment that contacts soil or dust should be decontaminated prior to moving to the next sampling location.

Stainless-steel bowls and spoons, and any tools used for sample processing will be decontaminated between each sample; alternatively, disposable bowls and spoons may be used. Equipment decontamination will consist of a tap water rinse to remove soil particles, followed by scrubbing with brushes and an Alconox (or other soap)/tap water solution, and a final rinse with distilled or deionized water.

5.0 Investigation-Derived Waste

Unless otherwise specified in the project work plan, waste soils accumulated as investigation derived waste (IDW) will be contained, transported, disposed of in accordance with applicable laws, and stored in designated drums in a designated area until transported off-site for disposal.

The approach to handling and disposal of these materials is as follows. For IDW that is containerized, such as waste soils, 55-gallon drums approved by WSDOT (or the applicable stage agency) will be used for temporary storage pending profiling and disposal. Each container holding IDW will be sealed and labeled as to its contents (e.g., “soil”), the dates on which the soil was accumulated, the site owner’s name (i.e., the generator), Floyd|Snider name, and the Floyd|Snider field person contact information or front desk telephone number.

Refer to the IDW Special Conditions SOP for further information on IDW storage, sampling, profiling, and handling.

Disposable sampling materials and incidental trash such as paper towels and personal protective equipment (PPE) used in sample processing will be placed in heavy duty garbage bags or other appropriate containers and disposed of as solid waste in the municipal collection system (i.e., site dumpster).

6.0 Field Documentation

All observations including sample collection locations, soil descriptions, sample depths, collection times, analyses, and field QC samples should be recorded on a boring log, soil sample collection form, and/or bound field notebook. Information recorded should additionally include personnel present (including subcontractors), purpose of field event, weather conditions, sample collection date and times, sample analytes, and any deviations from the SAP.

At the end of the day, complete and review the second page of the tailgate safety meeting form detailing additional hazards, corrective actions, near-misses or incidents. Any incidents that result in field staff injuries or have the potential to result in staff injuries (such as hitting buried utility lines when drilling) should be reported immediately to the PM.

7.0 Demobilization

Upon returning to the office, ensure that all equipment is property cleaned and put away in the field room. Equipment with rechargeable batteries should be plugged in as appropriate so it is ready for use by the next person. It is preferable to dispose of trash at the project site, but any trash left in the field vehicle should be brought upstairs, labeled, and placed in the front production room for building staff to dispose of.

If equipment or sample coolers will be placed at the front desk for pickup, clearly label each item with the company picking it up, anticipated pickup time frame, and your contact information so front desk staff can contact you if there are any questions. Notify front desk staff if any items require a signature at pickup.

Within one week of returning from the field, the field lead for the event should review field notes, sampling forms and tailgate safety meeting forms with the PM. Following PM review and approval, field notes will be scanned and saved to the project folder. Hard copies should be filed. The PM will provide copies of near miss and incident reports to the Health and Safety Administrator.

Enclosures: Boring Log
Test Pit Log and Sample Collection Form

Record of Revisions:

Revisions	**Date**
Added H&S information and line edits for clarity.	7/22/2022
Reviewed with minor updates	SD 12/9/2022

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	PROJECT:	LOCATION:	BORING ID:
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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	PROJECT:	LOCATION:	BORING ID:
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

Test Pit Log and Sample Collection Form

Project:	Date:
Field Personnel:	
Test Pit #	
Pit Dimensions	Depth:_____ Length:_____ Width:_____ Units:_____
Soil Description: (note depth to native, presence of debris, odor, sheen)	
Sketch	
GPS coordinates	
Other Notes or Observations:	

Samples Details	Sample ID	Depth	Time	Analysis

Zone A Post-Excavation Engineering Design Report

Pasco Sanitary Landfill NPL Site

Appendix G
RTO Operations and Maintenance Manual Addendum

Memorandum

DATE: August 10, 2023

TO: Jeremy Schmidt and Jenny Filipy
Washington State Department of Ecology

FROM: Industrial Waste Area Generators Group III (IWAG)
PBS Engineering and Environmental Inc. (PBS)

PROJECT: 64180.023

REGARDING: Regenerative Thermal Oxidizer Operations and Maintenance Manual (2017 Installation) – Addendum for Zone A In Situ Thermal Remediation

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The operation, maintenance, and monitoring procedures for the regenerative thermal oxidizer (RTO) at the Pasco Landfill National Priorities List (NPL) Site in Pasco, Washington (Site), are currently documented in the RTO Operations and Maintenance (O&M) Manual (RTO O&M Manual), published in December 2017 by PBS Engineering and Environmental Inc. (PBS) on behalf of the Industrial Waste Area Generators Group III (IWAG) in accordance with Approval Order 16AQ-E031, which serves as the air permit for the Site, and Washington Administrative Code (WAC) 173-340-400(4)(c) and (6)(b)(ii). The RTO O&M Manual was approved by the Washington State Department of Ecology (Ecology) on January 11, 2018.

The IWAG is preparing for in situ thermal remediation (ISTR) of Zone A in accordance with Enforcement Order No. DE 16899, which also requires the preparation of a Vapor Recovery (VR) and RTO O&M Manual Addendum (Task A.4, Subtask B, Paragraph c). This Addendum to the RTO O&M Manual (RTO O&M Addendum) will be a companion document to the ISTR VR System O&M Manual (VR O&M Manual) and will be in effect during active ISTR operations. Together they describe modifications or changes to the existing Zone A soil vapor extraction (SVE) and RTO systems to support ISTR operations. There are numerous modifications to the existing SVE system that are necessary to support ISTR VR operations, but there are no proposed modifications to the RTO system or to RTO operation, maintenance, and monitoring procedures as described in the RTO O&M Manual.

The RTO O&M Manual Addendum incorporates the following minor updates to the RTO O&M Manual:

- All references to the SVE system, SVE system components, or SVE-generated vapor shall be replaced with VR system, VR system components, or VR-generated vapor, respectively.
- References to the existing Approval Order 16AQ-E031 shall be replaced with the pending Approval Order A021083, which incorporates permit modifications for the planned ISTR operations.

LM:PMB:tl