Remedial Investigation Work Plan
Buse Mill Timber & Sales, Inc.
Everett, Washington

Prepared for:
3812 Everett Partners, LLC

March 5, 2024
32-21001485

APEX

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State of Washington
Hydrogeologist
1778
Licensed Geologist
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Principal

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Abbreviations/Acronyms

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
µg/L	Micrograms per liter
µS/cm	Microsiemens per centimeter
amsl	Above mean sea level
AO	Agreed Order No. DE 21518
Apex	Apex Companies, LLC
AST	Aboveground storage tank
bgs	Below ground surface
bml	Below the mudline
CAP	Cleanup Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Chemical of potential concern
CSM	Conceptual site model
Ecology	Washington Department of Ecology
EISC	Ecological indicator screening concentrations
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
Everett Partners	3812 Everett Partners, LLC
FS	Feasibility Study
GPR	Ground-penetrating radar
HASP	Health and Safety Plan
HxCDD	Hexachlorodibenzo-p-dioxin
I-5	Interstate 5
IDP	Inadvertent Discovery Plan
IDW	Investigation-derived waste
LSI	Limited Site Investigation
MCL	Maximum contamination level
mg/kg	Milligrams per kilogram
MTCA	Model Toxics Control Act
NELAP	National Environmental Laboratory Accreditation Program
NFA	No Further Action
ng/kg	Nanograms per kilogram
NPDES	National Pollutant Discharge Elimination System
PA	Preliminary Assessment
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCP	Pentachlorophenol

pg/g	Picograms per gram
PID	Photoionization detector
PPE	Personal protective equipment
PQL	Practical quantitation limits
Property	3812 28th Place NE, Everett, Washington 98201
PVC	Polyvinyl chloride
QA/QC	Quality assurance/quality control
REC	Recognized environmental condition
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SCL	Significant concentration level
SCO	Sediment cleanup objective
SCUM	Sediment Cleanup User's Manual
SGC	Silica gel cleanup
Site	Buse Timber & Sales, Inc. site
SMS	Sediment Management Standards
TeCP	Tetrachlorophenol
TEQ	Toxicity equivalence
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons
TPH-Dx	Diesel-range total petroleum hydrocarbons
TPH-Gx	Gasoline-range total petroleum hydrocarbons
URS	URS Consultants, Inc.
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
UST	Underground storage tank
VOC	Volatile organic compound
WAC	Washington Administrative Code

1.0 Introduction

This Remedial Investigation (RI) Work Plan was prepared for the Buse Timber & Sales, Inc. site (Site) generally located at 3812 28th Place NE in Everett, Washington 98201 (Property; Figure 1). The Work Plan was prepared under the Agreed Order (the AO) No. DE 21518 between 3812 Everett Partners, LLC (Everett Partners) and the State of Washington Department of Ecology (Ecology). This Work Plan summarizes existing data and Site characteristics, identifies data gaps, and describes the RI approach, field sampling activities to be completed, and the schedule for activities and reporting.

1.1 Purpose and Objectives

The purpose of the RI is to collect data necessary to adequately characterize the Site for the purpose of developing and evaluating cleanup action alternatives. The RI will determine the nature and extent of contamination based on Model Toxics Control Act (MTCA) cleanup levels, Sediment Management Standards (SMS) cleanup standards, and other regulatory requirements. Several areas across the Site require additional investigation to determine the nature and extent of contamination posing risk to humans and ecological receptors. Results from the RI will be used to develop a Feasibility Study (FS), which will evaluate remedial alternatives to ensure protection of human health and the environment within the applicable requirements of Washington Administrative Codes (WAC) 173-340-360 and 173-204-570. Evaluation of the RI/FS will determine the draft Cleanup Action Plan (CAP) that will provide the proposed remedial action to address contamination at the Site.

Additionally, revisions to MTCA were enacted on January 1, 2024 that include, among other things, provisions requiring that environmental justice and climate change considerations be incorporated into the RI/FS.

1.2 Regulatory Framework

In 1990, Ecology completed a Preliminary Assessment for the Site and recommended that the Site be placed on the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list of potential hazardous waste sites. Additional chlorinated hydrocarbon testing in sediment and the nearby Union Slough did not find impacts. In 1992, Ecology issued a No Further Action (NFA) determination based on the additional testing. The EPA completed an additional investigation in 1994 and found that no further investigation was required under the Superfund program.

Further investigations were conducted at the Site beginning in 2018. A Notification of Apparent Release letter was submitted to Ecology on April 21, 2020 for discovery of an MTCA Method A cleanup level exceedance for arsenic in groundwater. Site assessments were completed for lending purposes in 2018 and for due diligence in 2021. On April 27, 2022, Ecology rescinded the 1992 NFA and listed the Site on the Confirmed and Suspected Contaminated Sites List based primarily on the concentrations of dioxins found during investigation activities between 2018 and 2021. The AO between Everett Partners and Ecology was entered into on June 22, 2023.

Buse Timber & Sales, Inc. currently operates under Industrial Stormwater General National Pollutant Discharge Elimination System (NPDES) permit number WAR000097 issued by Ecology.

1.3 Work Plan Organization

This document is organized in the following manner:

- Section 2 provides a description of the Site, previous investigations, and interim actions;
- Section 3 presents the current conceptual site model (CSM) addressing geology, nature/extent of contamination, and chemicals of potential concern (COPC);
- Section 4 discusses data gaps for the Site;
- Section 5 presents the plan for evaluating chemical characteristics of the Site soil, groundwater, and sediment;
- Section 6 presents the laboratory analytical program;
- Section 7 presents the proposed risk assessment;
- Section 8 presents the proposed schedule and reporting deliverables; and
- Section 9 lists the references cited in this Work Plan.

Supporting information is provided in tables, figures, and appendices. Appendix A is the Sampling and Analysis Plan (SAP). The inadvertent discovery plan is provided in Appendix B, and the National Wetlands Inventory map is provided as Appendix C.

1.4 Project Management and Responsibilities

The RI will be managed by Apex Companies, LLC's (Apex) Seattle office. Subcontractors including laboratory services, surveying, drilling, and sampling support will be used during the project. Responsibilities of the team members, as well as laboratory project managers, are described below.

Project Coordinator (Apex): John Foxwell. As the Project Coordinator under the AO and the primary point of contact for agency communications, Mr. Foxwell will be responsible for implementing the field investigation in accordance with the Work Plan and QAPP. Mr. Foxwell will have primary responsibility for ensuring project controls and schedule are maintained. His contact information is as follows:

John Foxwell
Office: (503) 312-0676
john.foxwell@apexcos.com

Quality Assurance/Quality Control (QA/QC) Manager (Apex): Katya English. Ms. English is responsible for implementing the QA/QC program and managing the field and laboratory site database. Her contact information is as follows:

Katya English
Office: 314-964-9090
katya.english@apexcos.com

Data Validation Specialist (Apex): Laura England Witt. Ms. Witt is responsible for validating laboratory data reports to ensure the integrity of data relative to data quality objectives. Her contact information is as follows:

Laura England Witt
Office: 916-247-8303
laura.witt@apecos.com

Field Manager (Apex): Corey Stout. Mr. Stout is responsible for coordinating all field activities in accordance with the RI Work Plan and the SAP. He will arrange all sampling containers and oversee sampling, ensure standard operating procedures are being followed in the field, coordinate with the QA/QC Manager and the Project Manager, and assist in managing wastes generated during the investigation. His contact information is as follows:

Corey Stout
Office: 509-224-9521
corey.stout@apexcos.com

Project Engineer (Apex): Herb Clough, P.E. Mr. Clough will serve as project engineer and also provide technical assistance for dioxin assessment. He is a professional engineer registered in the State of Washington. His contact information is as follows:

Herb Clough, P.E.
Office: 503-974-0420
herb.clough@apexcos.com

Laboratory Data Manager (Fremont Analytical): Brianna Barnes. Ms. Barnes will serve as the project manager for the analytical laboratory contracted for the analysis of samples. Fremont Analytical is responsible for conducting laboratory analysis and maintains a current certification from the National Environmental Laboratory Accreditation Program (NELAP) and Ecology's laboratory accreditation program under WAC 173-50. Her contact information is as follows:

Brianna Barnes
Office: 206-352-3790
bbarnes@fremontanalytical.com

Laboratory Data Manager (Ceres Laboratories): James Hedin. Ceres Laboratories is responsible for subcontracting laboratory analytical services. Ceres Laboratories and subcontract laboratories maintain a current certification from NELAP and Ecology's laboratory accreditation program under WAC 173-50. His contact information is as follows:

James Hedin
Office: 916-932-5011
jhedin@ceres-lab.com

2.0 Site Description and History

2.1 Site Description

The Property consists of two parcels of land (Parcel Nos. 29050400300600 and 29050900201500) comprising approximately 60.48 acres (Figure 2). Buse Timber & Sales Inc. has operated as a lumber mill since the mid-1940s. Current operations include a sawmill facility, log storage, and 11 buildings including the main office and maintenance and storage buildings (Figure 3).

Logs to be processed by the lumber mill are primarily brought in by truck. Some logs are occasionally brought in through the Union Slough. Log storage is located on the southern end of the Site, and milling activities and lumber storage are located in the center of the Site. Some lumber is treated with a water-based anti-stain solution in the dip tank and painted with a water-based end seal. Wood by-products from lumber processing are sold to suppliers. Operations and log storage areas are paved, and the north end of the Site is unpaved and undeveloped.

The Site is situated on generally flat terrain at a surface elevation of approximately 1 foot above mean sea level (amsl). The nearest body of water is the Union Slough, located north and west adjacent to the Site. A drainage system encircles most of the Property that discharges any collected water to Union Slough through a tide gate located at the far north end of the Site. The tide gate is part of a culverted system that connects the Union Slough Cutoff and East Drainage to Union Slough. The East Drainage is a man-made drainage that receives the majority of the stormwater from the Site for eventual discharge to Union Slough. The Union Slough Cutoff formerly connected Union Slough to the Snohomish River near Dagmars Marina (Figure 2). The ends of the Union Slough Cutoff were filled in the early 1950s. The north section of the Union Slough Cutoff that parallels the west boundary of the Site is referred to in this and other reports as the West Drainage.

The tide gate is a valved system that allows surface water runoff from the site to discharge into Union Slough when the Union Slough stage is less than 0.5 feet amsl. According to the United States Fish and Wildlife Service National Wetland Inventory, wetlands are present at the north and south portions of the Site. The wetlands inventory map is provided as Appendix C. Surrounding properties generally consist of commercial or industrial businesses (Figure 2).

2.2 Site History

The Site is located on Smith Island, which was diked in the early 1900's to prevent flooding from the Snohomish River (Ecology, 1990). The Buses purchased the Property in 1942, and the sawmill has operated at the Property since 1946. Prior to the purchase of the Property, the land was reportedly used as a dairy farm and later as a golf course. The oldest resource describing early land uses available to Apex is a 1941 aerial photograph that shows the entire site was pasture land, presumably used for the former dairy operation located south of the Buse Property on the property that is now Dagmars Marina. Based on the limited duration of former agricultural and golf course uses, Apex concludes these land uses were not contaminant sources to the Property.

The Property has operated in two configurations. The initial configuration included the mill in the western portion of the Property with a log pond. According to aerial photographs, the tide gate between the Union Slough and the drainage system was constructed between 1952 and 1954 when the Union Slough Cutoff was formed after the connection to Union Slough and the Snohomish River was filled in the 1950s (note the area referred to as the West Drainage in prior reports is designated as the "Union Slough Cutoff). Around 1968, the operations at the Property expanded due to the construction of Interstate 5 (I-5) to the east. This expansion included constructing buildings, paving with asphalt, developing a fire pond, filling the log pond, and expanding the log storage area to the south of the operating areas of the Property. The fire pond was later backfilled around 2003 for the construction of the current lube building and mechanic shop.

Until 1986, some wood products were treated with pentachlorophenol (PCP) using a dip tank. In 1986, the EPA sponsored studies to determine whether wood treatment chemicals were entering the soil at certain lumbermills in Washington. Sediment collected from the lumber yard, a storm drain, and Union Slough had detections of PCP and tetrachlorophenol (TeCP). PCP was removed from operations in 1986, replaced with "PQ8," and the dip tank operation was moved to a shed with secondary containment. The former dip tank reportedly did not have a cover or secondary containment, and the area was paved over without removal of potentially impacted soil (Ecology, 1990). Wood treatment with PCP was reported to be limited since most Buse products were sold untreated.

An underground storage tank (UST) system was formerly operated at the northeastern portion of the Site. The UST system included two USTs, one with unknown contents and one with gasoline. The USTs were believed to have been installed circa 1964 and removed in 1996. Removal of the USTs was not properly documented, and files are not available for review (Apex, 2021b).

Based on the available aerial photos, stormwater conveyance and management for the Site as configured between 1946 and 1968 is assumed to have been either directly to the former log pond or to the Union Slough Cutoff, but this is not documented. After the 1968 reconfiguration of the Site, stormwater was conveyed through at least one reported storm drain line and surface drainage to a single stormwater line that emptied to the north and into the East Drainage (Figure 3). Stormwater released directly into the East Drainage was not treated. The current stormwater system had been constructed by 1993 to include improved catch basins, settling/detention basins, oil/water separators, and boomed areas to prevent the contamination of stormwater. The former stormwater line to the East Drainage was taken out of service at the time of construction of the new system. Additional improvements are discussed below.

Flooding in the area of the historical stormwater line is rare and has occurred just once in the last 17 years according to Site personnel.

In 1998, a Phase II Environmental Site Assessment (Exponent, 1998) recommended that sediments with petroleum hydrocarbons in the East Drainage be excavated for off-site treatment and disposal. That same year, stockpiled soils labeled "slough sludge" were removed for off-site disposal by Clean Service Company, Inc. (Exponent, 2010).

Sediment removal from the East Drainage was completed in 2003. The west ditch was also dredged and did not show signs of contamination as observed in 2003 (Exponent, 2010).

Several improvements were implemented based on recommendations in the Phase II Environmental Site Assessment Report (Exponent, 1998). These included the following:

- Secondary containment for lube storage was added. A new building for lubrication and hydraulic oils was constructed by 2003, which included concrete floors and a sump.
- A new fueling facility was completed in 2004. This area included connection to an oil/water separator with the ability to control spills. Above ground storage tanks (ASTs) were also upgraded to double-walled containers.
- As of 2010, lubricants used at the mill were zinc-free, and wood preservatives were water-based/oil-free products.

In September 2023, a diesel fuel release from the AST system occurred which resulted in a release of approximately 2,580 gallons of diesel fuel. Containment and recovery efforts by Buse and the emergency response contractor have recovered 1,952 gallons of diesel fuel to date. The diesel fuel was released to the Property stormwater system and eventually the East Drainage. Buse personnel immediately closed the tide gate and confirmed that petroleum hydrocarbon sheens were contained within the ditch and did not migrate past the tide gate to Union Slough. Adsorbent booms remain deployed to contain and recover residual diesel.

Spill response efforts have been overseen by Ecology and other state and federal agencies. The area impacted by this release will be further assessed in the RI (see Section 3.3.8).

2.3 Prior Agency Consent Decrees

Buse Timber & Sales has been a party to two consent decrees with the State of Washington, as summarized below.

A 1990 Consent Decree was filed in response to a Toxic Substances Control Act inspection for oil-filled equipment with polychlorinated biphenyls (PCBs). Buse removed seven transformers as part of this consent decree and paid a fine.

A 2015 Consent Decree was filed in response to Clean Water Act violations. Consent Decree requirements included complying with the NPDES stormwater permit, updating the site Stormwater Pollution Prevention Plan (Buse Timber & Sales, 1993), improving operations practices at the log float beach (including removal of woody debris), and implementing other best management practices related to stormwater management.

2.4 Previous Site Characterization Activities

A number of previous environmental investigations have been conducted to document conditions at the Site. This section presents a summary of the findings of these previous investigations.

1990 Investigation. In 1990, Ecology completed a preliminary assessment (PA) for the Buse Mill site. Elevated concentrations of PCP and TeCP were detected in drainage sediment samples near the former dip tank. Samples were not analyzed for dioxins. The PA concluded that there were no significant threats to human health and the environment. However, it did recommend sampling of the drainages and ranking under Ecology's Washington Ranking Method guidelines. Follow-up sampling was completed in site drainages, and PCP and TeCP were not detected.

1994 Investigation. A Screening Site Inspection Report was prepared for the Site by URS Consultants, Inc. (URS) on behalf of the EPA (URS, 1994). This report summarized the results of a limited sampling event that included surface and subsurface soil, storm drain sediment, drainage sediment sampling, and sediment sampling at the Site and nearby slough/river. Samples were tested for PCBs, semi-volatile organic compounds, metals, chlorinated phenols, and/or PCP. Dioxin analyses were not completed as part of this work. Local soil and sediment background samples (from neighboring locations away from possible contamination sources) were also collected.

URS compared results to the background samples for the purpose of determining whether a release had occurred using protocols from the EPA Alternative Remediation Contracting Strategy (EPA, 1990) to determine whether a release had occurred. In summary:

- If the non-background sample concentration is less than the Sample Quantitation Limit, no observed release is established, and the result is not significant.
- If non-background sample measurement is greater than the Sample Quantitation Limit, an observed release or "significant" result establishes a release when:
    - If the local background sample concentration is non-detect, the concentration in the non-background sample exceeds the Sample Quantitation Limit; and
    - If the background sample concentration exceeds the Sample Quantitation Limit, the non-background sample measurement is three times or more above the background concentration.

None of the detected non-background surface soil or subsurface soil results met the criteria for significant concentrations.

Samples collected from catch basins and in the north ditch (near the storm drain outfall) had sporadically detected concentrations of lead, mercury, PCBs, PCP, and 2-phenylphenol that were considered significant when compared to the release criteria significant concentration level (SCL), summarized as follows.

- Lead – 56.2 to 57 milligrams per kilogram (mg/kg), above the SCL for lead of 36 mg/kg;
- Mercury – 0.282 to 1.84 mg/kg, above the SCL for mercury of 0.66 mg/kg;
- PCBs (Aroclor 1254) – a single detection of 1.0 mg/kg, above the SCL for total PCBs of 0.11 mg/kg;
- PCP – 0.071 mg/kg to 0.109 mg/kg, above the SCL of 0.054 mg/kg; and
- 2-phenylphenol – a single detected concentration of 0.032 mg/kg (an SCL is not available for 2-phenylphenol).

One sediment sample was collected on the downstream side of the Union Slough tide gate. Concentrations of metals were detected below the criteria for significant concentrations. PCBs (Aroclor 1254), polycyclic aromatic hydrocarbons (PAHs), and chlorinated phenols (including PCP) were not detected.

1998 Investigation and 2010 Update. Exponent conducted a Phase II Environmental Site Assessment (Phase II ESA) in August 1998 (Exponent, 1998) to address recognized environmental conditions (RECs) identified in Exponent's prior Phase I ESA for the Site. The investigation consisted of sampling sediments in the drainage ditches surrounding the Site, sampling the storm drain system, and assessing soil and groundwater impacts at the Site. Only results for some of the 1998 Exponent sampling locations are available. The file copy is an incomplete copy and includes approximately half of the data set. Attempts to obtain a complete report were unsuccessful. Soil sampling locations with available data are shown on Figures 5 and 7. Sediment sampling locations with available data are shown on Figures 6 and 8.

Samples were analyzed for total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs). Select soil and groundwater samples were tested for chlorinated phenols. One soil sample was analyzed for dioxins/furans. The 1998 Phase II data set did not indicate widespread impacts in upland areas. Drainage sediment (samples NDM-1 through NDM-6) were analyzed for TPH and sediment from a drainage control structure (MSA-4) was analyzed for TPH, VOCs, and chlorinated phenols. Primary impacts included sediments within drainage control structures (TPH at sample MSA-4) and sediments within the east drainage (NDM-1 through NDM-4).

2018 Limited Site Investigation (LSI). In August 2018, Terracon conducted an LSI (Terracon, 2018b) to assess the potential presence of compounds of concern in subsurface soil and groundwater at the Site that may have originated from the RECs identified in the 2018 Phase I ESA prepared by Terracon (Terracon, 2018a). This LSI included advancing six soil borings (B1 through B6) and collecting soil and/or groundwater samples from each boring. Boring locations are shown on Figure 11. The LSI results/findings are summarized as follows:

- Soil samples collected from B1 and B2 had concentrations of arsenic and/or chromium which exceeded their respective MTCA Method A cleanup levels. Soil from B2 was also analyzed for hexavalent chromium which was not detected.
- Soil samples collected from B5 and B6 had concentrations of dioxins and furans. Although these concentrations are below their respective MTCA Method B cleanup levels, they exceed the natural background concentrations of 5.2 nanograms per kilogram (ng/kg) for dioxin and furan mixtures in soil.
- Only one groundwater sample was collected, from boring B2. This sample had concentrations of arsenic which exceeded the MTCA Method A cleanup level. The remaining groundwater sample results were either non-detect or below the MTCA Method A or MTCA Method B cleanup levels.

Terracon concluded that the operations at the Site with a vehicle repair shop, wash-down area, diesel UST area, fire pond, and documented dioxins and furans appear to have previously contributed and may potentially continue to contribute to the release of select chemicals of concern to soils and/or groundwater. With the exception of arsenic in soil and groundwater, Terracon concluded that conditions representative of a large-scale release were not present.

It appears that arsenic concentrations identified in soil and groundwater are consistent with the current Site use. While there are arsenic exceedances of the MTCA cleanup level, Terracon inferred that they are limited to the Site soil and groundwater within the limits of the Site boundary.

2021 Phase II Environmental Site Assessment. In July 2021, Apex performed a Phase II ESA based on the findings of its Phase I ESA (Apex, 2021b and 2021a, respectively). Field sampling activities included surface soil sampling, direct-push soil explorations for soil and groundwater samples, and drainage sediment sampling in areas where additional investigation was required. The Phase II ESA results and findings are included below:

- Chlorinated phenols, PCBs, VOCs, and metals, when present in soil or groundwater, were largely below upland cleanup levels with the following exception:
  - PCP was detected in a single shallow groundwater sample at SB-11 (near the former dip tank) above the MTCA Method B cleanup level for cancer risks, but not in adjacent sample SB-12A, collected from deeper intervals. Reporting limits (10 micrograms per liter [µg/L]) were above the MTCA Method B cleanup level for cancer risks of 0.22 µg/L.
- Mercury was detected in the East Drainage sample.
- Diesel and oil range petroleum hydrocarbons (TPH-Dx) were widely detected at the Site. However, TPH-Dx concentrations in groundwater were decreased with silica gel cleanup (SGC). Biogenic compounds from wood product residuals or natural organic matter may be present in groundwater and are elevating TPH-Dx reported concentrations without SGC. A decrease in TPH-Dx following SGC may also be reflective of petroleum weathering and biodegradation to polar metabolites.
- PCP reporting limits in sediment were elevated based on required 15x to 30x dilutions due to matrix interference.
- Dioxins/furans detected in surface soil in the hog fuel mixing area exceeded the natural background concentration and the MTCA Method B cleanup level at locations SS-1 and SS-2.
- Dioxins/furans detected in drainage sediment and at the tide gate exceeded the Puget Sound natural background concentration. The East Drainage formerly received the majority of stormwater runoff, and concentrations of dioxins/furans were the highest at this location.
- PCBs were not detected in drainage sediment samples. However, the reporting limits were 0.128-3.22 mg/kg, greater than the SMS Freshwater Sediment Cleanup Objective (0.11 mg/kg) and, for the East Drainage sample, the Cleanup Screening Level (2.5 mg/kg).

The Phase II ESA recommended the following.

- Future TPH-Dx analysis should continue to use SGC for an accurate representation of the TPH that is present.
- A UST system formerly operated at the Site was removed in 1996, and complete documentation was not provided to Ecology. While concentrations of TPH and VOCs were below cleanup levels at the former UST area, the detected concentrations of petroleum in groundwater are a release from a UST system that is reportable under WAC 173-340. For compliance with UST regulations, confirmation soil sampling and groundwater characterization should be completed.
- Based on the 2018 Terracon investigation, an arsenic release was reported due to detected concentrations of arsenic above MTCA Method A cleanup levels. Sampling completed in this area

during this Phase II ESA did not detect arsenic at concentrations above cleanup levels. Soil and groundwater sampling should be completed in order to verify if this was an actual release, or the result of variability in arsenic concentrations.

- Additional sampling at the former dip tank is not recommended based on collected data suggesting the source of PCP is not present.
- The nature and extent of dioxins/furans near the waste mixing "donut" should be determined.
- The nature and extent of dioxins/furans in the Site drainage should be determined, and an ecological risk assessment should be performed.

2.5 Current Site Conditions

Buse Mill Timber & Sales Inc. currently operates the Site as a sawmill facility and a log yard. Production includes sizing, debarking, trimming, milling, planning, treating, drying, banding, and shipping. Current industrial activities performed at the Site include the following:

- Delivery of logs by truck and infrequent retrieval of logs from Union Slough;
- Sawmill operation including debarking, milling, and planer surfacing;
- Storage of logs, sawdust, bark, milled lumber, oil, and fuel;
- Lumber sorting;
- Treatment of lumber that may include sapstain treatment, banding, and end painting;
- Vehicle operation and maintenance including washing, fueling, and parking; and
- Dust control.

Buildings at the Property do not include process water drainage, except for the office. A septic system located north of the office provides drainage for office restrooms and kitchen use.

Recreational uses and subsistence fishing along the banks of the Union Slough and Union Slough Cutoff, may occur, or may have occurred in the past.

2.5.1 Site Use

The Property has the capacity to produce approximately 75 million board feet per year of finished lumber products. The majority of logs are received by truck, but some are infrequently received on rafts via Union Slough. The log float tie-ups were removed from the slough in 2023. Logs transported to the Property are stored in the paved log storage yard to the south.

Historically, logs were removed from the Union Slough by a Log Stacker that is located on a man-made dike. The logs extracted from Union Slough were transported by a log truck to the log storage area. Logs retrieved from Union Slough were infrequently stored on a rocked area near the slough access ramp. While Buse is currently not bringing in logs via log floats, this practice could be renewed in the future based on market conditions.

Log handling machines move the logs in the log storage area. Debris collected from the log storage yard is placed in exposed piles on asphalt located between the sawmill and the debarker. This wood debris is periodically placed on a conveyor to a hopper where it is ground and then transported to storage bins.

Logs are debarked in the eastern portion of the Property. The area is paved, and the debarker is located under cover. Sawdust from the sawmill and planer and bark from the debarker are conveyed to elevated covered storage silos located to the east of the facility near the debarker. These silos are emptied regularly, and contents are hauled off-site. Milled lumber is stored on paved areas near the various mill operations throughout the Property. Three dry storage sheds are located west of the decommissioned kilns.

Anti-stain (sapstain) chemicals are applied to approximately 15% of finished products in a dip tank south of the office building. The sapstain chemical is a water-based solution containing 46.5% didecyl dimethyl ammonium chloride and 4.9% propiconazole. The treated lumber is dried on a drip rack adjacent to the dip tank, and a concrete drip pan collects the excess anti-stain chemical. After drying, the treated lumber is stored outside. Lumber ready for shipment is banded into bundles and end painted to prevent checking. The end painting is done within the dip tank building.

Vehicle maintenance is done in the eastern portion of the Property within a vehicle repair shop. There are three 500-gallon ASTs that hold motor oil, hydraulic oil, and waste oil on the north side of the building under an overhang. Vehicles are also steam cleaned at a wash down area near the fuel pad on the western side of the Property. Vehicles are fueled near the main entrance and the log storage area. Lubricating oils are stored in the lube building in 275-gallon and 55-gallon drums.

Two areas of the Property are leased to Swanson Bark and Wood Products, Inc. for recycling and sale of mulch products. The north lease area is used for storage and sale of mulch products. The south lease area is used for chipping operations and sawdust pile storage.

2.5.2 Access

The Site can be accessed from State Route 529 to 28th Place NE via a bridge traversing the Union Slough Cutoff as shown on Figure 3.

2.5.3 Structures and Improvements

Buse Timber & Sales, Inc. currently operates the Property as a sawmill facility and a log yard. It is developed with 11 buildings consisting of an office, storage sheds, and associated lumber use buildings. Approximately 40 acres of the Property are paved with asphalt or concrete. The north end of the property is unpaved and undeveloped. A Log Stacker is located on a man-made dike along the Union Slough. Manmade drainages and the Union Slough Cutoff discharge any collected water to Union Slough through a tide gate at the north end of the Site. The tide-gate is a culverted system from the Union Slough Cutoff and East Drainage through the man-made dike to a valved system that discharges when Union Slough Stage is less than 0.5 feet amsl. An access road paved with asphalt and crushed rock is located on the dike.

2.5.4 Site Drainage and Stormwater

A man-made dike is located between the Union Slough and site drainages. Stormwater runoff from the northeast side of the dike enters the slough directly. A rocked area is located adjacent to the slough access ramp, where the log handling equipment and sometimes logs are stored. This area slopes toward the interior of the property, where runoff drains to a grassy area. Stormwater is exposed to heavy mobile log handling equipment, bark, soil, and other debris from logs in this area.

A paved log storage area is located in the southern portion of the Property. Stormwater in this area is exposed to dirt, bark, debris from the logs, and log handling machines. A vegetated berm composed of soil and wood debris is located between the southern half of the log storage yard and the perimeter ditch. Stormwater from the southern half of the log storage collects against the berm, where it will either evaporate or flow back into the Buse storm drain system. Stormwater from the northern portion of the log storage area flows to a catch basin near the mechanics shop, where oil and floating debris are separated from the water. This water drains into the Property stormwater system.

Stormwater from paved operating portions of the Site and buildings is collected within the Property stormwater system. This includes the northern portion of the log storage area, milled lumber storage, sawdust and bark conveyance lines, the debarking area, the sawmill, the planer mill, lumber chemical treatment areas, the vehicle repair shop, and the vehicle fueling pad. Stormwater is exposed to wood debris including bark and sawdust.

Lumber that has been treated with sapstain, an anti-staining chemical treatment, is stored outside on asphalt. This treated lumber is exposed to stormwater, which flows into the facility stormwater system. The manufacturer of the sapstain chemical reports that it is bonded to the wood within 15 minutes, and the observed leachate after that time is 200 to 500 parts per billion.

Vehicles can be fueled near the main entrance or the log storage area. Secondary containment is present at both fueling areas. The main entrance fueling area has a concrete secondary containment with 8-inch curbing and a fueling pad with a sump that collects stormwater from the pad. The sump discharges through a series of two oil/water separators before reaching the Property stormwater system. The fueling pad near the log storage area also has a concrete secondary containment with 4-foot walls and a 5-inch curbed fueling pad. Stormwater from this pad is discharged into the Property stormwater system after passing through a series of two oil/water separators.

A parking area is located near the office along the north edge of the asphalt-paved area and adjacent to the office on the west and south sides. Stormwater in these areas flows onto unpaved ground along the north edge of the pavement and into the Property storm drain system. Parking is also located in the northeast corner of the property on gravel. Stormwater from this area percolates into the ground.

Stormwater on the Property either infiltrates or discharges to perimeter drainages within six basins around the Property. A levee along the north side of the Property prevents direct discharge to Union Slough. Figure 4 shows the primary drainage features. The perimeter drainages are located within six drainage basins at the Property, described as follows.

- East Basin – The East Basin receives runoff from most of the developed portions of the Property as well as some undeveloped areas. The majority of the runoff in this basin is collected through a developed storm drain system (a series of catch basins and drainage pipes) that discharge at outfall SW-1 to the East Basin drainage ditch. The East Basin drainage ditch flows north and west along the toe of the Union Slough levee, joining the Union Slough Cutoff (sometimes referred to as the West Drainage) just prior to the Union Slough tide gate. The combined flows discharge to Union Slough through a tide gate when Union Slough water levels are at +0.5 feet amsl or lower. Prior to the 1968 reconfiguration of the site, western portions of this basin may have discharged to the Union Slough Cutoff, and interior portions of the East Basin discharged to the on-site log ponds.
- West Basin – The western portion of the Property consisting primarily of undeveloped areas flows to the Union Slough Cutoff. Small, developed areas (parts storage and AST fuel tanks) are located in the West Drainage. The Union Slough Cutoff flows northerly, joining with the East Drainage at the Union Slough levee. Union Slough Cutoff also receives runoff from off-Property sites including BMC West and Glacier Northwest. Prior to development of the 1968 site reconfiguration, the West Drainage may have included some western portions of the operations area.
- Infiltration Basin – Since 1968, the Infiltration basin has received runoff from the south side of the developed portion of the Property. Stormwater flows in a southerly direction but is prevented from entering the South Drainage by a containment berm where the water infiltrates. Prior to the 1968 reconfiguration, runoff from the Infiltration basin area likely drained to on-site log ponds and/or to the South Drainage.
- South Basin – The South Drainage basin is comprised of a narrow strip of undeveloped land. The South Drainage flows westerly and receives runoff from off-Property sites Dagmars Marina and IFF

Holdings/Hima Farms through a culvert beneath I-5. Prior to the 1968 site reconfiguration, the South Drainage basin may have included runoff from portions of the southern operations area.

- I-5 Basin – The I-5 basin runs along the toe of the I-5 embankment along the east edge of the Property. It was created during construction of I-5 in 1968. This basin consists of a very narrow strip of undeveloped land. Drainage within this basin flows southerly and discharges to the South Basin just prior to the culvert beneath the I-5 embankment.
- Union Slough Basin – This basin is a narrow strip on the north side of the Union Slough levee. This area has never been part of the developed operations at the Property.

2.5.5 Topography

The Site is situated on generally flat terrain at a surface elevation of approximately 1 foot amsl. The nearest body of water is the Union Slough located north and west adjacent to the Site.

2.5.6 Vegetation

The northern portion of the property is unpaved and vegetated with grass. The dike to the north of the Site along Union Slough and the perimeter drainages are vegetated with grass or low shrubs. The remaining portions of the Site are paved and used for lumber mill operations.

2.5.7 Surrounding Properties

The Property is bound by Union Slough to the north, I-5 to the east, a lumber distributor to the northwest, and undeveloped land to the west and south. A marina and an aggregate producer are not adjacent to the Property but are located to the south.

2.5.8 Cultural Resources

The Inadvertent Discovery Plan (IDP) is included as Appendix B and outlines the procedures in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. The IDP will be kept at the Site during all project activities and will be used if cultural resources are discovered.

2.6 Future Site Use

Future site use is expected to be consistent with current occupational uses. Redevelopment plans have not been considered to date, and the mill is under a long-term lease. Recreational uses and subsistence fishing may occur along the banks of the Union Slough and Union Slough Cutoff.

3.0 Conceptual Site Model

This section summarizes the CSM including Site geology, nature and extent of contamination, and identification of preliminary COPC. The CSM identifies the potential sources of hazardous substances, the potential migration pathways and environmental media where they are suspected or confirmed to be found, and the receptors and exposure pathways. The CSM presented within this Section is preliminary and will be adjusted as needed based on the results of sampling in support of the remedial investigation. Graphical CSMs are presented for human health and ecological exposures in Figures 9 and 10.

3.1 Geology and Hydrogeology

The Site is located in Everett, Washington, which is in the central part of the Puget Sound Lowland. The geologic unit for this Site is Qyal, Holocene-aged younger alluvial and estuarine deposits (Minard, 1985). These deposits lie in and along the present streams near the water table. The sediment is largely sand, silt, and clay with considerable amounts of organic matter. Thickness of the younger alluvial and estuarine deposits probably exceeds 30 meters. The alluvium overlies deposits from the last Pleistocene glaciation. Prior investigations noted approximately 10 feet of sand and gravel fill, underlain by silt.

The Site is located in the delta region of the Snohomish River, adjacent to and south of Union Slough on Smith Island north of the Snohomish River. Within a half mile, Union Slough discharges to Possession Sound. Marine water intrusion from Possession Sound is expected in the Snohomish River estuaries near the Site; however, information describing salinity levels on-Site is not available. Because of proximity to tidally influenced waters, the drainage surrounding the Site is affected by tidal flooding and ebbing. Drainage into Union Slough is also controlled by a tide gate located to the north of the Site at the confluence of the East Drainage and Union Slough Cutoff. The Site lies within the 100-year floodplain (Ecology, 1990) and the Snohomish County density fringe area. The Union Slough shoreline is comprised of an unaccredited levee that is maintained by the United States Corps of Engineers (USACE). The slough-side of the levee is vegetated to the water line. An access road is present on top of the levee.

Union Slough is located in the Snohomish River Basin. The Snohomish River basin is the second largest watershed in Puget Sound, with an area of 1,856 square miles. The basin includes three major rivers draining the west slope of the Cascade Mountains: the Skykomish River, the Snoqualmie River, and the Snohomish River. The Snoqualmie and Skykomish Rivers join to form the Snohomish River at approximately RM 20.4. The Snohomish River flows westward through the City of Everett into Port Gardner Bay. The river and its floodplain have been shaped into a network of channels, dikes, and sloughs with the most significant including Steamboat, Union, and Ebey sloughs. The lower mile of the river mainstem is dredged by the USACE on an annual basis. Tidal backwater effects extend to approximately RM 18.1 (Snohomish County, 2003). Union Slough enters the Snohomish at approximately River Mile 6, within the zone of tidal backwater effects.

There are three aquifer systems within the vicinity of the Site. These include recent alluvial deposits within the Snohomish River (10-75 feet bgs), the Marysville sand member (100-180 feet bgs), and the Esperance sand member (greater than 225 feet bgs).

The Site is relatively flat with the highest elevations near the center of the developed area (approximately elevation 10 feet amsl) and gentle slopes downward to the Property perimeter. Slopes are on the order of one percent to the north and south with elevations near 1 foot amsl in the northern undeveloped area and in the range of 2 to 4 feet amsl along the southern Property boundary. Elevations of the west and east edges of the developed areas are in the range of 6 to 7 feet amsl. According to historical information, the static water level at the Site is within a range of 10 to 15 feet below ground surface (bgs), with perched water locally present in areas of higher relative permeability. The depth to the water table varies due to tidal and Snohomish River flow influences. Groundwater flow in the unconfined aquifer has not been characterized. Because tidally controlled water bodies (Snohomish River, Union Slough) nearly surround the Property, groundwater flow directions are expected to be variable, controlled by local features such as infiltration areas and ditches.

Groundwater at the site is expected to be brackish. Electrical conductivity values between 1,500 microsiemens per centimeter (µS/cm) and 50,000 µS/cm are considered brackish. While electrical conductivity values for groundwater at Buse are not available, electrical conductivity monitoring at the adjacent Dagmars Marina yielded values within this range.

3.1.1 Climate Change

Consistent with recent MTCA revisions, the final CSM in the RI report will include a discussion about climate in the area of the Site and factors that could impact or be impacted by climate. WAC 173-340-350(6)(f) states that, based on best available science, sufficient information should be presented in the RI on current and projected local and regional climatological characteristics to determine which could affect the migration of hazardous substances or the resilience of cleanup action alternatives. Relevant characteristics can include:

- Temperature extremes;
- Sea level;
- Seasonal patterns of rainfall;
- The magnitude and frequency of extreme storm events (such as flooding);
- The potential for landslides;
- Prevailing wind direction and velocity;
- Variations in barometric pressure; and
- Potential for wildfires.

3.2 Existing Conditions and Site Use

Current operations include a sawmill facility, log storage, and 11 buildings including the main office and maintenance and storage buildings. The northern portion of the Site is undeveloped and covered with vegetation. The operational portions of the Site are paved, and stormwater is collected via a conveyance system that discharges to the Eastern Drainage (Figure 4). The perimeter of the Site includes a drainage ditch system that discharges directly to Union Slough via the tide gate. These drainage ditches and Union Slough provide habitat for wildlife. Wetlands are present in the northern portion of the Site near the East Drainage and Union Slough Cutoff, and to the southwest near the South Drainage. Emergent wetlands are present in the southern portion of the Site. The wetlands inventory map is provided as Appendix C. The Site and nearby areas are currently zoned for heavy industrial use and are within the Snohomish County density fringe area. The density fringe area provides specific criteria to be used in regulating development in areas of high flood damage potential where conventional floodway areas cannot be established (Snohomish County Code Title 30 Chapter 30.65).

Vulnerable populations and overburdened communities may be present near the Site. In addition, subsistence and/or recreational activities may occur in Union Slough and/or Union Slough Cut-Off. The Remedial Investigation will include an evaluation of these possible land uses. Vulnerable populations and overburdened communities will be assessed pursuant to WAC 173-340-350(6)(h)(iii) and Implementation Memorandum No. 25: Identifying Likely Vulnerable Populations and Overburdened Communities under the Cleanup Regulations (Ecology, 2024).

3.3 Nature and Extent of Contamination

Various investigations have been performed to characterize areas where soil, groundwater, and drainage sediment may have been impacted by site operations. The following includes a summary of the nature and extent of contamination in areas previously investigated that pose an unacceptable or unknown risk. This summary was developed for the purpose of identifying data gaps and preliminary COPC. Preliminary COPC are identified based on: detected concentrations in a given medium above health based or ecological screening levels; analytes associated with operations and processes at Buse Timber & Sales (when comprehensive data is not available); and applicable guidance, particularly Section 3.3.6 of the Department of Ecology's Sediment Cleanup User's Manual (SCUM; Ecology, 2021).

The screening levels used to identify COPC included:

- MTCA Method A soil cleanup levels (for TPH);
- MTCA Method B soil cleanup levels (for cancer and non-cancer risks as well as protection of groundwater);

- MTCA Method B Target Groundwater Cleanup Levels, which generally consist of the federal maximum contamination level (MCL) when available or the lowest of the Method B groundwater cleanup levels (for cancer or non-cancer risks) when MCLs are not available;
- Ecological Indicator Screening Concentrations for Terrestrial Plants and Animals (Ecology, 2017);
- Sediment Cleanup Objectives (SCOs) for marine water and freshwater from Table 8-1 of SCUM; and
- Applicable natural background concentrations for soil (Ecology, 1994), regional background concentrations for dioxins in soil (Ecology, 2010) and regional background concentrations for sediment (Ecology, 2021).

Screening levels are shown together with available chemical data in Tables 1 through 7. Data from the 2018 LSI (Terracon, 2018b) and the 2021 Phase II ESA (Apex, 2021) are summarized on Figures 5 through 8. Data from the Exponent PA (Exponent, 1998) are discussed for the purpose of identifying data gaps. Because of the age (approximately 25 years old) and the incomplete report, presentation and risk screening using these data are not included in the figures.

3.3.1 Site Drainages

Several sampling events have included surface sediment sampling at one or more of the Site drainages and in the vicinity of the tide gate. Subsurface sediment sampling has not been conducted. Surface sediment sampling has been conducted in each of the drainages receiving runoff from the Property: the East Drainage, West Drainage (sometimes referred to as Union Slough Cutoff), and South Drainage. The tide gate surface sediment sample (DR-1) was collected just ahead of the discharge point to Union Slough and located at the confluence of the East and West Drainages.

Surface sediment samples collected in the Site perimeter drainage have been analyzed for TPH-Dx, TPH-Dx with SGC, gasoline-range TPH (TPH-Gx), VOCs, PAHs, PCBs, chlorinated phenols, metals, and dioxins/furans. Results were compared against the SCOs identified in Section 3.3 and background concentrations. Arsenic, nickel, zinc, mercury, and dioxins/furans have been detected above the Puget Sound background concentrations and the SCOs for arsenic and nickel in one or more of the drainage systems. In addition, mercury exceeded the background concentration and the SCO for the East Drainage. TPH-Dx SCO exceedances were also noted for East Drainage samples collected in 1998; however, an analysis of sampling conducted in 2021 concluded that TPH-Dx concentrations may be biased high due to biogenic compounds, and further investigations may be required to confirm this conclusion. Below is a summary table of sediment samples collected in Site drainage areas with COPC and exceedances of applicable screening levels (Puget Sound background concentrations and SMS SCOs).

Area and Year Sampled	Sample ID and Depth	Analyses	Detections	Exceedances
Tide Gate (2021)	DR-1 (0-12 inches)	TPH-Dx, TPH-Dx with SGC, PAHs, PCBs, phenols, metals, and dioxins/furans	TPH-D and TPH-O, TPH-D and TPH-O with SGC, metals, and dioxins/furans	Arsenic, nickel, and dioxins/ furans
West Drainage (2021)	West Drainage (0-12 inches)	TPH-Dx, TPH-Dx with SGC, PAHs, PCBs, phenols, metals, and dioxins/furans	Metals and dioxins/furans	Arsenic, nickel, and dioxins/ furans
East Drainage (1998)	NDM-1 to NDM-6 (0-4 inches)	TPH-Dx and TPH-Gx	TPH-D and TPH-O	TPH-D and TPH-O
East Drainage (2021)	DR-1 (0-12 inches) East Drainage (0-12 inches)	TPH-Dx, TPH-Dx with SGC, PAHs, PCBs, phenols, metals, and dioxins/furans	TPH-D and TPH-O, TPH-D and TPH-O, TPH-Dx with SGC, PAHs, metals, and dioxins/furans	TPH-D and TPH-O, arsenic, nickel, mercury, zinc, and dioxins/ furans
South Drainage (2021)	South Drainage (0-12 inches)	TPH-Dx, TPH-Dx with SGC, PAHs, PCBs, phenols, metals, and dioxins/furans	TPH-D and TPH-O, TPH-D and TPH-O with SGC, PAHs, metals, and dioxins/furans	Arsenic, nickel, and dioxins/ furans
South Drainage (2021)	DR-10 (0-12 inches)	Dioxins/furans	TPH-D and TPH-O, metals, dioxins/furans	Arsenic and nickel

Two discrete drainage sediment samples (DR-1 near the tide gate and DR-10 near the former waste mixing area) and three composite samples (West Drainage [DR-2 to DR-4], East Drainage [DR-5 to DR-7], and South Drainage [DR-8 to DR-10]) were collected and analyzed for TPH-Dx, TPH-Dx with SGC, PAHs, PCBs, phenols, metals, and dioxins/furans (sample DR-10 was analyzed for dioxins only). Soil dioxins/furans concentrations were reported in 2,3,7,8-tetrachlorodibenzodioxin toxicity equivalence (2,3,7,8-TCDD TEQ). The drainage sediment results are compared to Natural or Regional Background Concentrations and Freshwater SMS from WAC 173-204. In the Everett region, total 2,3,7,8-TCDD TEQ of 4 picograms per gram (pg/g) or fewer in sediment is considered below regional background concentrations.

Concentrations of dioxins/furans in drainage sediment collected from 0 to 12 inches below the mudline (bml) in the South, East, and West Drainages exceeded the natural background concentration for 2,3,7,8-TCDD TEQ. In the East Drainage, the detected dioxin total 2,3,7,8-TCDD TEQ was 113 pg/g, which is greater than the 4.0 pg/g regional background concentration. All but one of the remaining samples were significantly lower than the East Drainage sample, having TEQs greater than 4 pg/g. Discrete sample DR-10 was the only sample with a TEQ less than the 4.0 pg/g regional background concentration.

Concentrations of TPH-Dx were only detected above screening levels in the East Drainage (DR-5 to DR-7) composite sample. PAHs, PCBs, and metals were not detected, or they were detected below screening levels, with the exception of arsenic, nickel, zinc, and mercury.

Affected Media and Preliminary COPC. Available data indicate the greatest sediment impacts are present in the East Drainage extending to the vicinity of the tide gate. Data from the other drainages indicates lesser impacts are present, but these areas have less comprehensive characterization. Additionally, the soil along the banks of the East Drainage has not been characterized to delineate the extent of COPC in this area.

Preliminary sediment COPC identified based on detections above health-based screening levels in sediment include TPH-Dx, metals (arsenic, nickel, zinc, and mercury), and dioxins/furans. PCP and PCBs were identified as preliminary sediment COPC based on elevated reporting limits. Ammonia, sulfides, benzoic acid, and benzenemethanol were identified as preliminary COPC to evaluate potential wood waste impacts.

Preliminary soil COPC identified at the Site based on detections in sediment include TPH-Dx, metals, and dioxins/furans. Chlorinated phenols are also included as a COPC based on association with wood preservatives.

3.3.2 Union Slough

Data is available from one surface sediment sample, USG-1, collected in Union Slough immediately on the slough side of the tide gate. This sample was analyzed for TPH-Dx, TPH-Gx, VOCs, and chlorinated phenols. Oil range TPH was the only compound detected. The detected concentration did not exceed screening levels.

Area and Year Sampled	Sample ID and Depth	Analyses	Detections	Exceedances
Union Slough (1998)	USG-1 (0-4 inches)	TPH-Dx, TPH-Gx, VOCs, and chlorinated phenols	TPH-O	None

Affected Media and Preliminary COPC. Sediment is the medium of interest in Union Slough. Preliminary sediment COPC for Union Slough are identical to the COPC identified for drainage sediment and include: TPH-Dx, metals, nickel, mercury, chlorinated phenols, PCBs, and dioxins/furans.

3.3.3 Log Float Beach

The nature and extent of wood waste COPC has not been characterized at the Log Float Beach.

Affected Media and Preliminary COPC. Sediment is the medium of interest at the Log Float Beach. Preliminary COPC include ammonia, sulfides, benzoic acid, and benzenemethanol, consistent with Ecology wood waste guidance.

3.3.4 Former Waste Mixing Area

The former Hog Fuel/Waste Mixing Area was used until 2022 to mix oil-water separator sludges with wood waste that was periodically sold for hog fuel. During the 2021 Phase II ESA, surface soil sampling (SS-1 through SS-3) was completed from exposed soil in the vicinity of the waste mixing area. One direct push boring (SB-6) was also completed to 15 feet bgs in this area.

Surface soil samples were analyzed for TPH-Dx with SGC, chlorinated phenols, and dioxins/furans as shown in Tables 1, 3, and 4. Chlorinated phenols were not detected, and TPH-Dx was detected at concentrations below MTCA Method A Cleanup Levels and Ecological Indicator Concentrations in surface soil. Concentrations of dioxins/furans were detected in surface soil near the former waste mixing area, sometimes referred to as the “donut” (Figure 3). This area is also near the bank of the South Drainage. Concentrations of dioxins, expressed as the 2,3,7,8-TCDD TEQ, exceed the regional background concentration, the MTCA Method B cleanup level (in some instances), and the Terrestrial Ecological Evaluation site-specific evaluation screening level. Below is a summary table of surface soil characterization within the former hog fuel/waste mixing area.

Soil boring SB-6 was completed to 15 feet bgs, and soil samples were collected from 3 to 4 feet bgs and 8 to 9 feet bgs. Soil samples were analyzed for TPH-Dx with SGC and VOCs. Results are summarized in Tables 1 and 2, respectively. Only trace concentrations of TPH-Dx and VOCs were detected. None of the detected concentrations exceed screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SS-1 (6 inches)	TPH-Dx with SGC, phenols, and dioxins/furans	TPH-D and TPH-O with SGC and dioxins/furans	Dioxins (human and ecological)
SS-2 (6 inches)	TPH-Dx with SGC, phenols, and dioxins/furans	TPH-D and TPH-O with SGC and dioxins/furans	Dioxins (human and ecological)
SS-3 (6 inches)	TPH-Dx with SGC, phenols, and dioxins/furans	TPH-D and TPH-O with SGC and dioxins/furans	Dioxins (ecological)

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SB-6 (0-5) (3-4 feet bgs) SB-6 (5-10) (8-9 feet bgs)	TPH-Dx with SGC and VOCs, chlorinated phenols, and dioxins/furans	TPH-D and TPH-O with SGC, acetone, benzene, 2-butanone, toluene, 1,2,3-trimethylbenzene, and xylenes	None

One grab groundwater sample was also collected and analyzed for TPH-Dx and TPH-Dx with SGC (Table 5). The detected concentrations (860 µg/L diesel-range TPH and 673 µg/L residual-range TPH) exceeded the MTCA Method A groundwater cleanup level. However, the TPH-Dx concentrations were significantly reduced to either below reporting limits or below screening levels after being analyzed with SGCW. Below is a summary table of subsurface concentrations near the waste mixing area for soil boring SB-6.

GW Sample ID and Depth	Analyses	Detections	Exceedances
SB-6 Groundwater (11.7 feet bgs)	TPH-Dx and TPH-Dx with SGC	TPH-D and TPH-O and TPH-D and TPH-O with SGC	TPH-Dx

Affected Media and Preliminary COPC. Soil and groundwater are the media of interest for the waste mixing area. Preliminary COPC for each media include:

- Soil – TPH-Dx and dioxins/furans based on screening level exceedance. Chlorinated phenols, PAHs, metals, and VOCs based on associated processes and compounds.
- Groundwater – TPH-Dx, chlorinated phenols, PAHs, metals, and VOCs based on associated processes and compounds.

3.3.5 Vehicle Repair Shop

Data from three soil borings and two discrete groundwater samples are available in the area of the vehicle repair shop near petroleum storage and operations areas. Soil samples collected in this area have been analyzed for TPH-Dx, TPH-Dx with SGC, TPH-Gx, VOCs, chlorinated phenols, and/or metals as shown in Tables 1, 2, and 3.

TPH-Dx, VOCs, and metals have been detected in soil. Concentrations of arsenic in soil exceeded the MTCA Method A Cleanup Level at depths up to 3 feet bgs. Deeper soil collected at 6.5 feet bgs had concentrations of arsenic below MTCA Method B Cleanup Levels. Concentrations of chromium and lead in soil above 3 feet bgs have also exceeded the Ecological Indicator Soil Concentrations. Below is a summary table of subsurface soil concentrations near the vehicle repair shop.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
B1-2.5 (2.5 feet bgs)	TPH-Dx, TPH-Gx, VOCs, and metals	VOCs (acetone), arsenic, chromium, lead, and mercury	Arsenic, chromium, and lead
B1-6.5 (6.5 feet bgs)	TPH-Dx, TPH-Gx, VOCs, and metals	TPH-Dx, arsenic, chromium, and lead	Arsenic and chromium
B2-3 (3 feet bgs)	TPH-Dx, TPH-Gx, VOCs, and metals	VOCs (acetone), arsenic, chromium, lead, and mercury	Arsenic and chromium
SB-1 (0-5) (2-3 feet bgs) SB-1 (5-10) (6-7 feet bgs)	TPH-Dx with SGC, VOCs, phenols, and metals	TPH-D and TPH-O with SGC, VOCs, arsenic, barium, chromium, lead, selenium, and mercury	Arsenic and chromium

Grab groundwater samples were collected from four soil borings. Grab groundwater samples were analyzed for TPH-Dx, metals, chlorinated phenols, and/or VOCs, as shown in Table 5.

GW Sample ID and Depth	Analyses	Detections	Exceedances
MSA-1 (2-6 feet bgs) MSA-2 (2-6 feet bgs)	TPH-Gx, TPH-Dx, and VOCs	TPH-D, acetone, ethylbenzene, 1,2,4-trimethlybenzene, xylenes, and carbon disulfide	None
B2-3 (~5 feet bgs)	TPH-Dx, TPH-Gx, VOCs, and metals	VOCs (acetone), arsenic, and chromium	Arsenic and chromium
SB-1W (15.2 feet bgs)	TPH-Dx, TPH-Dx with SGC, VOCs, phenols, and metals	TPH-D and TPH-O	None

Affected Media and Preliminary COPC. Soil and groundwater are the media of interest for the vehicle repair area. Preliminary COPC at the vehicle repair shop include:

- Soil – arsenic, chromium, and lead based on screening level exceedances.
- Groundwater – arsenic, chromium, and lead based on screening level exceedances.

3.3.6 Former UST Area

A UST system was previously operated at the northeastern portion of the Site. The USTs were believed to be installed circa 1964 and removed in 1996. No releases or spills associated with these USTs were reported. However, no tank removal documentation submitted to Ecology, or otherwise, was available for review. Generally, Site characterization work prior to 2021 was completed at intervals that were too shallow or at locations away from the UST area. During the 2021 Phase II ESA, boring SB-13 was completed to characterize the vicinity of the former UST system. Petroleum odors were noted during the field investigation. In soil, concentrations of TPH and constituents were minimally detected in this area. When detected, all concentrations were below screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
UST-1 through UST-3 (2-4 feet bgs)	TPH-Gx, TPH-Dx, and VOCs	TPH-D	None
B3-6.5 (6.5 feet bgs) B3-17.5 (17.5 feet bgs)	TPH-Gx, TPH-Dx with SGC, and VOCs	TPH-D, TPH-O, and acetone	None
SB-13 (0-5) (0-5 feet bgs) SB-13 (5-10) (5-10 feet bgs) SB-13 (10-15) (10-15 feet bgs)	TPH-Dx, TPH-Dx with SGC, and VOCs	TPH-D with SGC and 2-butanone	None

One groundwater sample was collected from SB-13. Petroleum constituents were detected in groundwater at concentrations below applicable screening levels. Results are shown in Table 5.

GW Sample ID and Depth	Analyses	Detections	Exceedances
SB-13W (23.5 feet bgs)	TPH-G, TPH-Dx, TPH-Dx with SGC, and VOCs	TPH-D and multiple VOCs	None

Affected Media and Preliminary COPC. Soil and groundwater are the media of interest for the former UST area. Preliminary COPC at the vehicle repair shop include:

- Soil – TPH-Gx, TPH-Dx, VOCs, PAHs, and lead based on fuel product types formerly used.

- Groundwater – TPH-Gx, TPH-Dx, VOCs, PAHs, and lead based on fuel product types formerly used.

3.3.7 Current and Former Dip Tank Area

The current dip tank area is located approximately 70 feet south of the former dip tank area. A relatively minor amount of Buse's wood products is treated with a water-based anti-stain/brightener at the current dip tank. During the 2021 Phase II ESA, boring SB-7 was completed to assess whether the current dip tank was a potential contamination source. Soil samples from the current dip tank area have been analyzed for TPH-Dx and chlorinated phenols as shown in Tables 1 and 3, with results summarized therein.

Soil Sample ID and Depth	**Analyses**	**Detections**	**Exceedances**
SB-7 (0-5) (3-4 feet bgs) SB-7 (5-10) (8-9 feet bgs)	TPH-Dx and chlorinated phenols	TPH-D and TPH-O	None

During the 2021 Phase II ESA, boring SB-7W was completed to assess whether the current dip tank was a potential contamination source to groundwater. These results are summarized in Table 5.

GW Sample ID and Depth	**Analyses**	**Detections**	**Exceedances**
SB-7W (9.7 feet bgs)	TPH-Dx, TPH-Dx with SGC, and chlorinated phenols	TPH-D, TPH-D with SGC and TPH-O	TPH-D and TPH-O (without SGC)

Historically, wood treatment using PCP occurred at the former dip tank until at least 1986. Wood treatment with PCP was also reported to be limited (most Buse products are sold untreated). This dip tank reportedly did not have a cover or secondary containment. Historical samples FDT-1, FDT-2, and FDT-3 were collected at the former dip tank during the 1998 Phase II ESA. Borings SB-11 and SB-12/12A were completed to depths of 10 and 25 feet, respectively, to assess the former dip tank area during the 2021 Phase II ESA. Soil samples from the current and former dip tank areas have been analyzed for TPH-Dx, VOCs, chlorinated phenols, and/or dioxins/furans as shown in Tables 1 through 4. TPH-Dx was mostly not detected, and detected concentrations did not exceed screening levels. Chlorinated phenols compounds were not detected with the exception of soil sample FDT-2 collected at 4 to 6 feet bgs, which was below potentially applicable screening levels. Dioxins were detected in the shallow interval (approximately 3 to 4 feet deep) at SB-11 and SB-12, but detected concentrations were below background concentrations and MTCA Method B Cleanup Levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
FDT-1 (2-4 feet bgs) FDT-2 (4-6 feet bgs) FDT-3 (2-4 feet bgs)	VOCs and/or chlorinated phenols	Pentachlorophenol	None
SB-11 (0-5) (3-4 feet bgs) SB-11 (5-10) (7-8 feet bgs) SB-12 (0-5) (3.5 to 4.5 feet bgs) SB-12 (5-10) (8-9 feet bgs) SB-12A (0-5) (3.5 to 4.5 feet bgs) SB-12A (5-10) (8-9 feet bgs)	TPH-Dx with SGC, chlorinated phenols, and/or dioxins/furans.	TPH-Dx and dioxins/furans	None

Historical samples FDT-4 and FDT-6 were collected at the former dip tank during the 1998 Phase II ESA. During the 2021 Phase II ESA, groundwater samples were collected from SB-11W and SB-12A-W. Because groundwater was not encountered at SB-12, SB-12A was re-drilled approximately 1 foot away from SB-12 to a total depth of 25 feet bgs for groundwater sampling. Grab groundwater samples were collected from SB-7, SB-11, and SB-12A and analyzed for TPH-Dx. Samples collected from SB-11 and SB-12A were also analyzed for chlorinated phenols. In sample SB-11W, collected at 6.8 feet bgs, PCP, 2,4,5-trichlorophenol, and 2,4,6-pentachlorophenol were detected in groundwater. The detected concentrations of PCP (58.4 µg/L) exceeded the MTCA Method B cleanup level (0.22 µg/L). Chlorinated phenols were not detected in sample SB-12A collected at 22 feet bgs or in the sample from SB-7. Because the data were not collected from a monitoring well, turbidity from the shallow discrete sample SB-11W may be the cause of the detected PCP.

In SB-7 and SB-11, TPH-Dx was detected above screening levels when analyzed without SGC. TPH-Dx was not detected above screening levels when SGC was used. TPH-Dx was also detected in the sample collected from SB-12A when analyzed without SGC, but it was below the MTCA Method A cleanup level. The TPH-Dx concentrations were significantly reduced to either below detection limits or below cleanup levels after SGC.

GW Sample ID and Depth	Analyses	Detections	Exceedances
FDT-4 (3-7 feet bgs) FDT-6 (4-8 feet bgs)	Chlorinated phenols	None	None
SB-11W (9.7 feet bgs) SB-12A-W (22 feet bgs)	TPH-Dx, TPH-Dx with SGC, and chlorinated phenols	TPH-Dx and phenols	TPH-Dx and phenols

Affected Media and Preliminary COPC. Soil and groundwater are the media of interest for the former dip tank area. Preliminary COPC at the former dip tank area include:

- Soil – TPH-Dx, chlorinated phenols, dioxin/furans, metals, and VOCs based on contaminants associated with wood preservatives and processes.
- Groundwater – TPH-Dx, chlorinated phenols, metals, and VOCs based on contaminants associated with wood preservatives and processes.

3.3.8 Historical Stormwater Drain Area

According to historical investigations, a main plant storm drain was located near the current dry shed building at the central portion of the Site. During the 2021 Phase II ESA, SB-10 was completed in the area for assessment as the feature was not previously characterized. Soil sampling has not been completed near the outfall of the historical stormwater drain pipe.

Soil samples from this area were analyzed for TPH-Dx as shown in Table 1. Select soil samples were also analyzed for dioxins/furans. Only trace concentrations of TPH-Dx were detected. None of the detected concentrations exceed screening levels. Dioxins were detected in the shallow interval (approximately 3 to 4 feet deep) at SB-10. Detected concentrations were below background concentrations and screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SB-10 (0-5) (3-4 feet bgs) SB-10 (5-10) (6.5 to 7.5 feet bgs)	TPH-Dx with SGC and dioxins/furans	TPH-D with SGC, TPH-O with SGC and dioxins/furans	None

One grab groundwater sample (NSD-1) was collected in the area of the historical storm drain outfall and analyzed for TPH-Dx, TPH-G, and VOCs. TPH-D was detected above screening levels (Table 5). One grab groundwater sample was collected from SB-10 and analyzed for TPH-Dx as shown in Table 5. Concentrations of TPH-Dx were detected in the sample as estimated values, but they were below the MTCA Method A groundwater cleanup level. The TPH-Dx concentrations were significantly reduced to below detection limits after being analyzed with SGC.

GW Sample ID and Depth	Analyses	Detections	Exceedances
NSD-1	TPH-Dx, TPH-G, and VOCs	TPH-D and carbon disulfide	TPH-D (without SGC)
SB-10W (16.5 feet bgs)	TPH-Dx and TPH-Dx with SGC	TPH-D and TPH-O	None

Affected Media and Preliminary COPC. Soil and residual sediment within stormwater pipe and control structures are the media of interest for the former main plant drain area. Groundwater may become a medium of concern based on sampling results. Preliminary COPC associated with the historical stormwater drain area include:

- Soil – TPH-Dx, chlorinated phenols, dioxin/furans, metals, and VOCs based on contaminants associated with wood preservatives and processes.
- Sediment – TPH-Dx, chlorinated phenols, dioxin/furans, metals, and VOCs based on contaminants associated with wood preservatives and processes.

3.3.9 Current Washdown Area

There is currently a vehicle washdown area located at the southwestern portion of the Site. Heavy duty vehicles are frequently washed in this area. The wastewater from the washdown flows to a separator vault nearby, as shown in Figure 4. SB-8 was completed during the 2021 Phase II ESA at a low point near the outlet to the washdown area to characterize any potential containment/releases originating from the washdown operation.

Soil samples from this area were analyzed for TPH-Dx as shown in Table 1. TPH-Dx was detected, and none of the detected concentrations exceeded screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
B6-3 (3 feet bgs)	TPH-Dx , VOCs, dioxins/furans	TPH-D, dioxins/furans, and acetone	None
SB-8 (0-5) (2-3 feet bgs) SB-8 (5-10) (8-9 feet bgs)	TPH-Dx with SGC	TPH-D with SGC, TPH-O	None

A grab groundwater sample was collected from SB-8 and analyzed for TPH-Dx as shown in Table 5. The detected TPH-Dx concentration in SB-8W of 1,060 exceeded the MTCA Method A groundwater cleanup level. However, the TPH-Dx concentrations were significantly reduced to either below detection limits or below screening levels after SGC.

GW Sample ID and Depth	Analyses	Detections	Exceedances
SB-8 W (2.9 feet bgs)	TPH-Dx and TPH-Dx with SGC	TPH-D and TPH-O	TPH-D and TPH-O

Affected Media and Preliminary COPC. Affected media were not identified for the washdown area.

3.3.10 AST Area (Current and Former)

ASTs were previously located near the northwestern entrance of the Site. In 2004, this area was redeveloped with secondary containment for current AST storage. During the 2021 Phase II ESA, one boring (SB-14) was completed to characterize the area and assess whether any contamination originated from former AST operations.

Soil samples from this area were analyzed for TPH-Dx as shown in Table 1. Only trace concentrations of TPH-Dx were detected. None of the detected concentrations exceeded screening levels. Groundwater was not encountered in this area and was not sampled.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
AST-1 (0-2 feet bgs) AST-2 (0-2 feet bgs) SB-14 (0-5) (3-4 feet bgs) SB-14 (5-10) (7-8 feet bgs)	TPH-Dx, TPH-Dx with SGC, and/or VOCs	TPH-D, TPH-O, and and TPH-O with SGC	None

Affected Media and Preliminary COPC. Soil and groundwater are the media of interest for the former UST area. Preliminary COPC at the vehicle repair shop include:

- Soil – TPH-Dx and PAHs based on fuel type that was released.
- Groundwater – TPH-Dx and PAHs based on fuel type that was released.

3.3.11 Former Log Pond Area

During the 2021 Phase II ESA, soil borings SB-2, SB-3, and SB-9 were completed near the former log pond fill area. SB-9 is also in proximity to the current AST area.

Soil samples from this area were analyzed for TPH-Dx with SGC as shown in Table 1. Soil samples from SB-2 and SB-9 were also analyzed for VOCs from multiple locations and intervals from this sample group. Select soil samples were also analyzed for chlorinated phenols and dioxins/furans. Chlorinated phenolic compounds were not detected. Concentrations of TPH-Dx, VOCs, and dioxins/furans were detected. None of the detected concentrations exceeded screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SB-2 (0-5) (3-4 feet bgs) SB-2 (5-10) (8-9 feet bgs) SB-3 (0-5) (3-4 feet bgs) SB-3 (5-10) (8.5-9.5 feet bgs) SB-9 (0-5) (3-4 feet bgs) SB-9 (5-10) (8-9 feet bgs)	TPH-Dx with SGC, VOCs, chlorinated phenols, and dioxins/furans	TPH-D with SGC, TPH-O with SGC , dixoins/furans, and VOCs	None

Grab groundwater samples were collected from SB-2, SB-3, and SB-9 and analyzed for TPH-Dx and chlorinated phenols as shown in Table 5. In SB-2 and SB-3, TPH-Dx was detected above screening levels when analyzed without SGC. TPH-Dx was not detected above screening levels when SGC was used. In SB-9, TPH-Dx was detected in the groundwater samples from SB-9 at an estimated concentration below the laboratory reporting limit. Chlorinated phenols were not detected in groundwater samples from SB-2, SB-3, and SB-9.

GW Sample ID and Depth	Analyses	Detections	Exceedances
SB-2W (12.7 feet bgs) SB-3W (12.3 feet bgs) SB-9W (21.3 feet bgs)	TPH-Dx, TPH-Dx with SGC, VOCs, and chlorinated phenols	TPH-D and TPH-O, TPH-D with SGC and TPH-O with SGC	TPH-D and TPH-O (without SGC)

Affected Media and Preliminary COPC. Preliminary COPC were not identified for the log pond fill area. TPH exceedances were only noted in TPH samples analyzed without SGC. Site-wide characterization of total organic carbon (TOC) in groundwater will be used to evaluate the impacts of biogenic, non-polar organic compounds. Based on the results of this evaluation, TPH-Dx could be retained as a COPC in the future.

3.3.12 Current Lube Building/Mechanics Shop Area

During the 2021 Phase II ESA, soil borings SB-4 and SB-5 were completed near the current lube building and mechanic shop area. The current lube building and mechanic shop were constructed after a former fire pond in this area was backfilled.

Soil samples from this area were analyzed for TPH-Dx as shown in Table 1. They were also analyzed for VOCs from multiple locations and intervals from this sample group. Select soil samples were also analyzed for dioxins/furans. Only trace concentrations of TPH-Dx and VOCs were detected. None of the detected concentrations exceeded screening levels. In the shallow interval (approximately 2 to 4 feet bgs) at SB-4 and SB-5, dioxins/furans were detected but at concentrations below background concentrations and screening levels.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SB-4 (0-5) (4-5 feet bgs) SB-4 (5-10) (6-7 feet bgs) SB-5 (0-5) (3.5-3.5 feet bgs) SB-5 (5-10) (6-7 feet bgs)	TPH-Dx with SGC, VOCs, chlorinated phenols, and dioxins/furans	TPH-D with SGC, TPH-O with SGC, VOCs, and dioxins/furans	None

Groundwater samples were collected from SB-4 and SB-5 and analyzed for only TPH-Dx as shown in Table 5. Significant concentrations of TPH-Dx were detected in each of these samples. TPH-Dx was detected above screening levels when analyzed without SGC. TPH-Dx was not detected above screening levels when SGC was used.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
SB-4W (6.8 feet bgs) SB-5W (6.4 feet bgs)	TPH-Dx and TPH-Dx with SGC	TPH-D and TPH-O, and TPH-D and TPH-O with SGC	TPH-D and TPH-O

Affected Media and Preliminary COPC. Preliminary COPC were not identified for the area of the current lube building/mechanics shop. TPH exceedances were only noted in TPH samples analyzed without SGC. Site-wide characterization of TOC in groundwater will be used to evaluate the impacts of biogenic, non-polar organic compounds. Based on the results of this evaluation, TPH-Dx could be retained as a COPC in the future.

3.3.13 Former Fire Pond Area

Soil samples were collected from the fill within the former fire pond area in the southeast area of the Property during the 1998 Phase II (Exponent, 1998) and 2018 LSI (Terracon, 2018b). During the 1998 Phase II, shallow soil samples FPD-1, FPD-2, and FPD-3 were collected between depths of 2 and 4 feet bgs. An additional sample (FPS-1) was collected from a soil stockpile that contained soils removed from the former fire pond before backfill. During the 2018 Phase II, two soil samples were collected from soil boring B-5 at depths of 2.5 and 18 feet bgs.

In sample FPS-1, the concentration of lube oil was 18,200 mg/kg. This stockpile was removed from the Property for disposal.

Soil samples from this area were analyzed for TPH-Dx as shown in Table 1. They were also analyzed for VOCs from multiple locations and intervals from this sample group. Select soil samples were also analyzed for dioxins/furans. Only trace concentrations of TPH-Dx and VOCs were detected. None of the detected concentrations exceeded screening levels. In sample B5-2.5, dioxin concentrations exceeded the Terrestrial Ecological Evaluation (TEE) ecological screening level.

Soil Sample ID and Depth	Analyses	Detections	Exceedances
FPD-1 (2-4 feet bgs) FPD-2 (2-4 feet bgs) FPD-3 (2-4 feet bgs)	TPH-Dx, TPH-Gx, and VOCs	TPH-D, TPH-O, and VOCs	None
B5-2.5 (2.5 feet bgs) B5-18 (18 feet bgs)	TPH-Dx, TPH-Gx, VOCs, and dioxins/furans	TPH-G, TPH-O, 1,2,4-trimethylbenzene, dioxins/furans	Dioxins/furans (ecological)

Groundwater samples were collected from FPD-1, FPD-2, and FPD-3 and analyzed for TPH-G and TPH-Dx as shown in Table 5. TPH-Dx was detected in each of these samples at concentrations above screening levels.

GW Sample ID and Depth	Analyses	Detections	Exceedances
FPD-1 (2-6 feet bgs) FPD-2 (3-7 feet bgs) FPD-3 (4-8 feet bgs)	TPH-Gx and TPH-Dx	TPH-D	TPH-D

Affected Media and Preliminary COPC. Preliminary COPC were not identified for the former fire pond area. In soil, dioxin concentrations in one sample did exceed ecological criteria. Based on ecological risk assessment scoping, additional dioxin sampling in this area could be needed to evaluate Site-wide risks. In groundwater, TPH exceedances were only noted in TPH samples analyzed without SGC. Site-wide characterization of TOC in groundwater will be used to evaluate the impacts of biogenic, non-polar organic compounds. Based on the results of this evaluation, TPH-Dx could be retained as a COPC in the future.

3.3.14 Upland Soil

The available data indicate that the potential on-site sources (e.g., UST system, site drainages, maintenance shop) do not present conditions that represent a Site-wide risk, with the possible exception of dioxins/furans in upland soil. Dioxins and furans are detected Site-wide, but at concentrations that are mostly below background concentrations or screening levels. Currently there are 14 soil samples available to evaluate dioxin impacts.

COPC. Preliminary COPC that will be used to evaluate Site-wide soil conditions are dioxins/furans (screening level exceedances).

3.3.15 Wood Waste

The current nature and extent of wood waste has not been documented.

COPC. Preliminary COPC include ammonia, sulfides, benzoic acid, and benzenemethanol, consistent with Ecology wood waste guidance.

3.4 Exposure Pathways

An exposure pathway describes the mechanisms by which human and/or ecological receptor exposure can occur assuming no remedial action or protective control is in place. An exposure pathway is considered complete if a human or ecological receptor can be exposed to a contaminant via that pathway. Potential pathways for human and/or ecological exposure are summarized on Figures 9 and 10, respectively, and are outlined below. Incidental leaks or spills are the primary release mechanisms, and rainfall runoff is the primary transport pathway at the Site.

Human health exposure pathways include ingestion and dermal contact with soil, sediment, surface water, and potable groundwater. In addition, volatile COPC may be inhaled (representing potential vapor intrusion and outdoor air exposures), and fish/shellfish may be ingested from contaminated media (if present) in surface water and sediment.

Terrestrial ecological receptors may come into contact with COPC via direct contact with soil, sediment, and surface water, through incidental ingestion, or through dietary ingestion.

Aquatic ecological receptors may come into contact with contaminants present at the site via direct contact with sediment and surface water, through incidental ingestion, or through dietary ingestion.

3.5 Preliminary COPC, Cleanup Levels, Points of Compliance

Preliminary COPC are identified based on detected concentrations in a given medium above health based or ecological screening levels, analytes associated with operations and processes at Buse Timber & Sales (when comprehensive data is not available), and Washington cleanup guidance and rules including MTCA, Washington SMS, and Washington SCUM. Preliminary sediment COPC are established using Section 3.3.6 of SCUM and the standard SMS benthic chemicals (Table 8-1) of Washington SCUM.

As described in Section 2.2, aerial photographs suggest former agricultural uses were pasture and grass/hayfield related. Row crops and orchards, which are common contaminant sources, were not observed. Hazardous substances generally associated with former agricultural uses were not considered preliminary COPC.

Preliminary cleanup levels are discussed for the purposes of establishing analytical data quality objectives and evaluating method reporting limits. Preliminary points of compliance are also discussed to ensure data is collected across the area and intervals needed to evaluate compliance with MTCA and SMS.

3.5.1 COPC

Preliminary COPC were identified in Section 3.3 for the purpose of establishing a list of target analytes for the RI. Final COPC identification will be completed using the full RI data set during the initial stages of the risk assessment. The table below summarizes preliminary COPC and their likely presence in environmental media.

Preliminary COPC	Media			
	Soil	Groundwater	Sediment	Air
TPH-Gx	Suspected	Suspected	Suspected	Suspected
TPH-Dx	Confirmed[1]	Confirmed[1]	Confirmed[1]	--
VOCs	Suspected	Suspected	--	Suspected
PAHs	Suspected	Suspected	Suspected	--
Chlorinated Phenols	Suspected	Suspected	Suspected	--
Dioxins/Furans	Confirmed	--	Confirmed	--
PCBs	--	--	Suspected	--
Metals[2]	Confirmed	Confirmed	Confirmed	--
Ammonia	--	--	Suspected	--
Sulfides	--	--	Suspected	--
Benzoic acid	--	--	Suspected	--
Benzenemethanol	--	--	Suspected	--

Notes:

1. TPH Dx from the 2023 diesel release is suspected in soil, groundwater, and sediment. TPH-Dx is confirmed to be present in sediment as a result of historical operations. TPH-Dx has been detected in soil and groundwater; however, these concentrations are likely the result of biogenic interference.
2. Arsenic, barium, cadmium, chromium, copper, lead, selenium, silver, mercury, nickel, zinc
3. – refers to constituents not likely to be a COPC in a given medium based on historical results, solubility, or volatility.

3.5.2 Preliminary Cleanup Levels

The Sampling and Analysis Plan (Appendix A) includes tables summarizing preliminary cleanup levels, practical quantitation limits (PQLs), and background concentrations (when applicable). For protection of human health in upland areas, preliminary cleanup levels will be designated using MTCA Method B cleanup levels for all COPC. Cancer and non-cancer Method B cleanup levels in addition to protection of groundwater cleanup levels will be evaluated, with the lowest of the three values used as the preliminary cleanup level. Preliminary soil and groundwater cleanup levels are summarized in Tables 8 and 9.

Evaluation of ecological risks is required based on the terrestrial and aquatic habitat located on and adjacent to the Property and the likely presence of ecological endpoints within this area. For upland areas, ecological indicator screening concentrations (EISCs) will be used for initial screening as part of a Terrestrial Ecological Evaluation. Preliminary sediment cleanup levels are described below. The results of the initial screening for ecological risks may lead to the need for development of Site-specific cleanup levels. If required, Site-specific cleanup levels would be developed as part of a successive phase of risk assessment conducted for the RI. EISCs were also considered when evaluating preliminary cleanup levels.

Preliminary sediment cleanup levels will be determined using the SCO SMS Table 8-1 for marine (WAC 173-204-562 Table III) and freshwater (WAC 173-204-562 Table VI) sediments for all COPC except dioxins/furans. For cleanups in the Port Gardner area, 3.9 pg/g is considered the regional background concentration. Because the PQL (5 pg/g) is above the background concentration, preliminary sediment cleanup levels for dioxins/furans are established using the PQL. Therefore, for screening dioxin/furan equivalence, the preliminary sediment cleanup level is established at 5 pg/g. Preliminary sediment cleanup levels are summarized in Table 10.

Based on the frequency and concentration of certain COPC detections in sediment, collection and evaluation of Site-specific biological data could be required to determine compliance with the SMS. If required, Site-specific biological criteria would be used to develop final cleanup levels as part of a successive phase of risk assessment conducted for the RI. Data would be collected consistent with the biological criteria in the SMS (WAC 173-204-562 Table V and 173-204-563 Table VIII).

3.5.3 Preliminary Points of Compliance

Points of compliance are established in order to define the points within a specific medium where applicable cleanup levels must be achieved. Points of compliance are required for both human and ecological exposures and are established in accordance with WAC 173-340-720 through 173-340-760, as applicable.

Soil. Preliminary points of compliance for human and ecological exposures to soil include the following:

- Human health – throughout the entire soil column based on protection of groundwater quality; and
- Terrestrial ecological – throughout the first 15 feet of soil to account for surface and burrowing ecological receptors.

Groundwater. Points of compliance will be established within identified areas of groundwater contamination based on protection of groundwater quality. The default point of compliance is throughout the Site from the uppermost level of the saturated zone to the lowest depth potentially affected by the Site (WAC 173-340-720(8)(b)). If required, conditional points of compliance will be established to evaluate the groundwater to surface water pathway for protection of ecological endpoints in surface water per WAC 173-340-720(8)(d)(i).

Sediment. Washington SMS are largely based on protection of the benthic community. For sediment, the preliminary point of compliance is the biologically active zone, corresponding to the upper 10 centimeters. In freshwater systems, specific ecological endpoints may be identified for organisms that live over a deeper biologically active zone. Therefore, the sediment point of compliance could change based on site-specific conditions.

Air. VOC sources have not been confirmed but may be present in the UST area. Points of compliance for air would include the breathing zone in indoor and outdoor air.

4.0 Data Gaps

Based on the nature and extent of hazardous substances summarized in Section 3, data gaps have been identified for the areas of the Site where contamination sources may be present or have been documented based on prior Site characterization. Data gaps for sources documented during prior investigations are summarized below.

Area & Target Media	Preliminary COPC	Data Gap
Drainage Ditch System **Target Media:** Sediment	TPH-Dx, arsenic, nickel, mercury, zinc, chlorinated phenols, PCBs, and dioxins/furans TOC, ammonia, sulfide, benzoic acid, and benzenemethanol	Delineate lateral and vertical extent of COPC above applicable preliminary cleanup levels. Perform additional analysis of chlorinated phenols and PCBs where reporting limits are above applicable preliminary cleanup levels. Characterize wood waste in sediment and potential affects to benthic community.
Union Slough (downstream tide gate) **Target Media:** Sediment	TPH-Dx, arsenic, nickel, mercury, chlorinated phenols, PCBs, and dioxins/furans TOC, ammonia, sulfide, benzoic acid, and benzenemethanol	Delineate lateral and vertical extent of COPC above applicable preliminary cleanup levels. Perform additional analysis of chlorinated phenols and PCBs where reporting limits are above applicable preliminary cleanup levels. Characterize wood waste in sediment and potential affects to benthic community.
Log Float Beach **Target Media:** Sediment	TOC, ammonia, sulfide, benzoic acid, and benzenemethanol	Characterize wood waste in sediment and potential affects to benthic community.
Former Waste Mixing Area **Target Media:** Soil Groundwater	Dioxins/furans (soil only), TPH-Dx, chlorinated phenols, PAHs, TOC, metals, and VOCs	Delineate lateral and vertical extent of COPC previously above applicable preliminary cleanup levels. Perform additional investigation of COPC associated with past and current Site activities. Include investigation of wood waste, chlorinated phenols, PAHs, and VOCs.

Area & Target Media	Preliminary COPC	Data Gap
Vehicle Repair Shop **Target Media:** Soil Groundwater	Metals (arsenic, chromium, and lead)	Complete shallow soil sampling in order to define the extent of metals concentrations exceeding preliminary cleanup levels. Groundwater conditions associated with elevated metals concentrations.
Former UST Area **Target Media:** Soil Groundwater	TPH-Gx, TPH-Dx, VOCs, PAHs, and lead	Complete additional investigation of this area to characterize the impacts from a documented UST release per MTCA requirements.
Former PCP Dip Tank **Target Media:** Soil Groundwater	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Complete additional investigation and monitoring of detections of COPC.
AST Area **Target Media:** Soil Groundwater	TPH-Dx	Characterize drainage sump/oil-water separator downstream of 2023 AST release area.
Soil at Historical Stormwater Line **Target Media:** Soil	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Limited investigations have been performed near the historical stormwater drainage system. Additional characterization of site COPC is required to determine potential need for remedial action. Review plant files and complete additional interviews to confirm historical drainage locations.
East Drainage Bank Soil **Target Media:** Soil	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Impacts from known contaminants in drainage sediment have not been fully delineated in the East Drainage. Additional soil characterization is needed to determine lateral and vertical extent of remedial action, if necessary.

4.1 Site-Wide Data Gaps

Wood-Waste. The extent of wood waste has not been characterized and is considered a data gap for uplands and sediment. Wood waste will be characterized in order to assess the potential impact on the benthic community using the SMS (WAC 173-204; Ecology, 2013a) and the Wood Waste Cleanup guidance (Ecology, 2013b).

Organic Carbon. The 2021 Phase II investigation analyzed multiple TPH-Dx samples with and without SGC. Because reductions in petroleum concentrations can be reflective of petroleum weathering and biodegradation to polar metabolites, which have known toxicity, TOC in soil and groundwater will be evaluated during the RI. For soil samples analyzed for TPH, selected samples will also be analyzed for TOC. TOC in groundwater will be evaluated using samples from a monitoring well without impacts.

5.0 RI Field Investigation

The RI field investigation will be completed to characterize the nature and extent of hazardous substances at the Site in all affected media (soil, groundwater, and sediment). The data will be used to characterize risks to human health and the environment and to inform future remedial actions. Additionally, potential wood waste sources will be evaluated as described in Section 4.0.

This section describes the proposed scope of the RI field investigation including specific sampling locations and methodologies to address the data gaps identified in Section 4.0. A detailed discussion of the sampling design and methods, protocols for sample collection, and quality assurance are provided in the SAP (Appendix A).

Proposed upland sampling locations are shown on Figure 11. Proposed sediment sampling locations are shown on Figure 12. Sampling locations associated with the historical or current stormwater drainage systems are shown on Figure 14.

5.1 Preparatory Activities

Preparatory activities for soil characterization efforts include coordinating Site access with Buse personnel, clearing proposed sample locations of underground utility conflicts and vegetation where necessary, and preparing health and safety documents. These activities are discussed in more detail in the SAP (Appendix A).

Site Health and Safety Plan. A Site-specific health and safety plan (HASP) will be prepared for the proposed activities. The HASP will be prepared in general accordance with the Occupational Safety and Health Administration and WAC. A copy of the HASP will be maintained on-Site during the field activities.

Property Access. To delineate on-Site contamination, Property-wide access will be required for the RI. Apex will coordinate with Buse personnel to obtain access in order to conduct the field investigation.

Research Former Stormwater System. Buse personnel will be interviewed, and files will be reviewed to assist in identifying the location and depth of historical stormwater infrastructure. Additionally, a geophysical survey will be used to identify the location and depth of historical stormwater system components.

Underground Utility Locates. Prior to implementation of the work, Apex will contact the Washington Utility Notification Center, which will in turn notify the various utilities in the area to mark any underground installations. Sample locations could require relocation based on the results of the geophysical survey, utility locates, or operational considerations. The geophysical survey (described below) will also be used to locate utilities on the property.

Geophysical Survey. The geophysical survey will include electro-magnetic survey, ground penetrating radar (GPR), and radio detection to locate conductive utilities. It will also be completed in order to:

- identify the location of the historical stormwater infrastructure; and
- identify the former dip tank location.

This survey will be used to map the former stormwater line and estimate depth to contact. The former dip tank structure was located with GPR during the 2021 Phase II ESA. The survey will locate this structure again in order to accurately place the groundwater monitoring well planned for this location.

5.2 Field Sampling Scope

The RI field investigation includes data collection from a range of environmental media, including soil, groundwater, and sediment within surface water, Site drainages, and the Site stormwater system. The proposed sampling scope for each of the investigation areas of the Site is summarized in this section.

5.2.1 Common Activities

Field investigation activities that will be consistently utilized during the sampling program are summarized below.

Sample Logging. Soil and sediment samples from cores will be logged and field screened at minimum 5-foot intervals. Surface soil and surface sediment samples will be individually logged and field screened. The field scientist or engineer will describe each soil core, noting indications of contamination based on visual inspection and lithology using the Unified Soil Classification System (USCS) in general accordance with ASTM 2487/2488. Other features such as sorting, sedimentary features, mineralogy, degree of weathering, contacts with other soil types, and proportional amount of wood waste/organic material will be noted. Soil samples will be field screened for the presence of VOCs using olfactory observation, sheen tests, and a photoionization detector (PID). Field screening procedures are described in the SAP (Appendix A).

Wood Waste Characterization. Each investigation area will be continually surveyed for wood waste. Boring and test pit logs will note the presence, type, and description of wood waste or organic material. Wood waste will be characterized by determining the following:

- Lateral and horizontal dimensions including the depth, area, and percent coverage;
- The percent surface and subsurface, with overall volume on and within sediment; and
- The type of wood waste (bark, chips, sawdust, and logs).

Sample Location Control. The location of each soil boring, surface soil sample, stormwater system sample, and sediment sample will be recorded with a sub-meter grade global positioning system. Monitoring wells will be surveyed by a licensed surveyor. Monitoring well surveys will include determination of the horizontal location and elevation of the wells (State Plane Coordinate System for horizontal control and North American Vertical Datum 88 or other approved datum for vertical control).

Monitoring Well Development. Following installation, monitoring wells will be developed to establish a connection with the aquifer. Well development will occur no earlier than 48 hours after well construction. The monitoring wells will be developed in accordance with Apex SOP 2.14 (Appendix A), by purging and pumping a minimum of five casing volumes of water from the well using a downhole pump. Field parameters will be collected during development and include temperature, pH, ORP, DO, and conductivity. Development will be considered complete when the water is visually clear and field parameters have stabilized to within five percent of the previous measurement for three consecutive borehole volumes.

Investigation Derived Waste Management. Investigation-derived waste (IDW) will consist of soil cuttings from drilling, decontamination water, monitoring well purge water, sampling materials (e.g., sample tubing), and personal protective equipment (PPE). Soil and water IDW will be placed in properly labeled drums and stored at a pre-approved location on the Site, pending receipt of chemical data to be used for profiling the waste for disposal. Based on the results, IDW will be transported to an appropriate facility for disposal or treatment. Sampling materials and PPE will be disposed of as solid waste.

Inadvertent Archaeological or Historical Resource Discovery. In the event of an inadvertent discovery, work within 100 feet of the area will be stopped and the protocols described in Appendix B will be followed.

5.2.2 Former UST Area

The Former UST System Area consisted of two USTs, referred to as the east and west tanks. The volumes and precise locations of the tanks are not documented. Pre-2021 site characterization work was completed at intervals that were too shallow or at locations away from the UST. The 2021 Phase II ESA located the former USTs with aerial photographs. Borings completed during the 2021 Phase II ESA identified petroleum odors and detected petroleum constituents in groundwater at concentrations below applicable cleanup levels.

A direct-push investigation is proposed in order to characterize the nature and extent of contamination, determine if monitoring wells are required, and aid in selection of final monitoring well location if warranted.

The former UST area will be located using aerial photographs and other historical resources. Five soil borings will be completed across the former UST area to characterize the magnitude and extent of soil and groundwater contamination related to the former USTs. Proposed sampling locations are shown on Figure 11. The anticipated depth to groundwater is approximately 15 feet bgs. Soil borings will be completed to a depth of 20 feet bgs, unless field screening indicates contamination is present at deeper depths. Default soil sampling intervals are as follows: 0.5 to 3 feet bgs, 5 to 8 feet bgs, and 10 to 13 feet bgs. Soil sampling intervals may be adjusted based on field screening results. Groundwater samples will be collected from temporary monitoring wells completed in the direct-push borings. Direct-push soil sampling methods are described in Apex SOP 2.4 (Appendix A).

Based on the results of the direct-push characterization, permanent groundwater monitoring wells will be installed to monitor groundwater and evaluate seasonal trends. Each well will be constructed with 2-inch polyvinyl chloride (PVC) casing, approximately 20 feet deep, with 10 feet of screen. Soil will also be logged and field-screened at minimum 5-foot intervals. Three monitoring wells are shown on Figure 11 at conceptual locations. The final number and location of monitoring wells will be based on the results of the soil borings. Apex will provide Ecology with a field map of proposed well locations and screen intervals for approval prior to installing any groundwater monitoring wells. Monitoring well construction methods are described in Apex SOP 2.13 (Appendix A).

One of the wells installed for the UST area will be placed in an upgradient location where impacts are not observed. In addition to helping determine the gradient in this area, this monitoring well will be used to characterize whether elevated concentrations of dissolved TOC may be present.

5.2.3 Vehicle Repair Shop

Soil investigation is planned to characterize the extent of metals concentrations in the vicinity of the vehicle repair shop. Prior sampling in this area detected concentrations of arsenic, barium, chromium, lead, selenium, and mercury, with concentrations of arsenic, chromium, and lead exceeding soil cleanup levels for human health risk or EISCs in some samples. A groundwater monitoring well will be completed at the area of highest metals concentration. Data from this well will be used to evaluate whether the arsenic concentration detected in temporary well B2 is representative of groundwater conditions.

Six soil borings will be completed to depths of 10 feet bgs to evaluate metals concentrations in this area at the locations shown on Figure 11. Soil samples will be collected from 0.5 to 3.5 feet bgs and 3 to 6 feet bgs. Direct-push soil sampling methods are described in Apex SOP 2.4 (Appendix A).

Based on the results of the boring sampling and analysis, one permanent groundwater monitoring well will be installed to monitor groundwater and evaluate seasonal trends. The well will be constructed with 2-inch PVC casing, approximately 20 feet bgs, with 10 feet of screen. Soil will also be logged and field-screened at minimum 5-foot intervals. The monitoring well shown on Figure 11 is a conceptual location. The final location will be based on the results of the soil boring investigation. Apex will provide Ecology with a field map of proposed well locations and screen intervals for approval prior to installing any groundwater monitoring wells. Monitoring well construction methods are described in Apex SOP 2.13 (Appendix A).

5.2.4 Former Dip Tank Area

The former dip tank area has been previously characterized with soil and groundwater samples. A significant contamination source has not been identified. A permanent monitoring well will be constructed to document groundwater conditions and provide for long term monitoring at the location shown on Figure 11. Geophysical survey and historical maps will be used to locate the former dip tank (the dip tank foundation was previously located using geophysics).

Sampling methods are discussed in the SAP in Appendix A. The anticipated depth to groundwater is approximately 15 feet bgs. The soil boring will be completed to a depth of 20 feet bgs, unless field screening indicates contamination is present at deeper depths. Soil samples will be collected from the monitoring well boring at the following intervals: 0.5 to 3 feet bgs, 5 to 8 feet bgs, and 10 to 13 feet bgs. Soil will also be logged and field-screened at minimum 5-foot intervals. The well will be constructed with 2-inch PVC casing, approximately 20 feet deep, with 10 feet of screen. Sample and well screen intervals may be adjusted based on field screening results. Monitoring well construction methods are described in Apex SOP 2.13 (Appendix A).

5.2.5 Former Waste Mixing Area

The former waste mixing area included a feature termed the “donut” which was formerly used to mix oil-water separator sludges with wood waste that was periodically sold as hog fuel. The area adjacent to the former waste mixing area is the only unpaved and non-utilized area within the main operations area. Soil in this area is covered with a 2- to 3-foot-thick veneer of hummocky soil that includes a proportionally high amount of organics or wood waste. Surface soil sampling from the area detected concentrations of dioxins, expressed as the 2,3,7,8-TCDD TEQ, above the regional background concentration as well as the MTCA Method B cleanup level (in some instances).

A test pit investigation will be completed to characterize the former waste mixing area to depths of approximately 5 feet bgs. Eight test pit excavations will be completed across the area shown on Figure 11. One soil sample will be collected from within the organic-rich surface soil, and one sample will be collected from the first 2 feet of native soil immediately beneath the surface soil veneer.

A permanent monitoring well will be constructed to document groundwater conditions in the area immediately downslope from the former waste mixing area. The well will be completed in order to determine whether groundwater impacts are present in this area and provide for long term monitoring. Soil samples will be collected from the monitoring well boring at the following intervals: surface to 3 feet bgs, 5 to 8 feet bgs, and 10 to 13 feet bgs. Soil will also be logged and field-screened at minimum 5-foot intervals. The well will be constructed with 2-inch PVC casing, approximately 20 feet deep, with 10 feet of screen. Sample and well screen intervals may be adjusted based on field screening results. Monitoring well construction methods are described in Apex SOP 2.13 (Appendix A).

5.2.6 AST Area

The 2023 AST release was contained by the perimeter trench drain and vault system and was not observed to extend to nearby soils. A soil boring and monitoring well adjacent to the vault are proposed in order to determine whether diesel contained in the vault has migrated to adjacent subsurface soils.

Sampling methods are discussed in the SAP in Appendix A. The anticipated depth to groundwater is approximately 15 feet bgs. The soil boring will be completed to a depth of 20 feet bgs, unless field screening indicates contamination is present at deeper depths. Soil samples will be collected from the monitoring well boring.

One permanent groundwater monitoring well will be completed within the soil boring to monitor groundwater and evaluate seasonal trends. Soil samples will be collected from the monitoring well boring at the following intervals: surface to 3 feet bgs, 5 to 8 feet bgs, and 10 to 13 feet bgs. Soil will also be logged and field-screened at minimum 5-foot intervals. The well will be constructed with 2-inch PVC casing, approximately 20 feet bgs, with 10 feet of screen. Sample and well screen intervals may be adjusted based on field screening results. Monitoring well construction methods are described in Apex SOP 2.13 (Appendix A).

5.2.7 Site Stormwater Drainages

Conditions associated with the current drainage system and historical stormwater drainages will be characterized.

The current stormwater drainage system will be characterized by collecting samples of drainage solids/sediment from the downstream end of each of the four branches of the stormwater system that flows into the current stormwater outfall (Figure 14). These data will be used to evaluate whether the stormwater system is a pathway for COPC to migrate in the stormwater system to surface water. Migration of COPC to the stormwater system is possible as a result of surface soil that is incorporated in runoff or cracks in the piping system.

The former stormwater system will be characterized using several lines of investigation. In summary:

- A geophysical survey will be used to identify the location and burial depth of the former stormwater pipe.
- Test pits will be completed to access the historical stormwater line near the former main catch-basin, two locations along the pipe, and the terminus. Discrete samples will be collected from 6 and 12 inches beneath the pipe to evaluate potential migration.
- One composite sample will be prepared from samples collected from within the access points. This composite sample will be used for source characterization and future waste profiling for pipe residuals.
- Four soil borings are proposed to evaluate the extent of COPC near the terminus of the historical stormwater discharge line. Soil borings will be completed to a depth of 10 feet bgs, unless field screening indicates contamination is present at deeper depths. Soil samples will be collected from 0 to 3 feet bgs and from 5 to 8 feet bgs.
- One soil boring is proposed to evaluate the extent of COPC near the primary catch-basin for the historical stormwater discharge line. Soil borings will be completed to a depth of 10 feet bgs, unless field screening indicates contamination is present at deeper depths. Soil samples will be collected from 0 to 3 feet bgs and from 5 to 8 feet bgs.

Test-pit exploration sampling methods are described in Apex SOP 2.3 and direct-push soil sampling methods are described in Apex SOP 2.4 (Appendix A).

In addition to the sampling described above, video surveys will be completed for the current and former stormwater systems. The video will be recorded and retained as part of the record for the Site. Areas of significant sediment accumulation in the storm system will be noted and included in the source evaluation of the storm system.

5.2.8 Drainage Sediment and East Bank Soil Sampling

Concentrations of dioxins, expressed as the 2,3,7,8-TCDD TEQ, exceed the Puget Sound dioxin sediment background concentration in several instances, with the 2,3,7,8-TCDD TEQ ranging from 5.39 to 113 pg/g. These detected concentrations require further evaluation to delineate the lateral and vertical extent of contamination that is known to originate from the East Drainage and possibly other drainages originating from the Property following Washington SMS. Additional discrete samples are required for delineation of the drainage system. Discrete samples are proposed along the banks of the East Drainage based on the documented concentrations of dioxins in the East Drainage.

Drainage Sediment Sampling. Discrete sediment samples will be collected at the locations shown on Figure 12. The proposed sampling plan provides for the following:

- In the East Drainage and tide gate area, sampling density is increased to provide for delineation of the COPC in the East Drainage. In the East Drainage and near the tide gate, samples will be collected approximately every 150 feet.
- In the West Drainage, sample spacing in the north end of the drainage is at approximately 400-to-500-foot intervals based on the location of this area away from mill operations. In areas closer to the operations at the south end of the mill, sampling density is increased.
- In the South Drainage, sample spacing is at approximately 400-to-500-foot intervals (this includes sample station DR-10), with increased density closer to the intersection with the I-5 drainage.
- In the I-5 Drainage, sediment sample locations are near the end of the drainage at the topographic low point of the surrounding area and drainage.

Sediment samples will be collected at the locations shown on Figure 12. Sediment samples will be collected at two intervals: from 0 to 4 inches bml to evaluate risks to the benthic community and from 12 to 24 inches bml to characterize vertical extent. An additional sample will be collected from 24 to 36 inches bml and archived in the event that the extent of contamination extends past 24 inches bml.

Sediment sampling methods are provided in Appendix A.

Bank Soil Sampling. Soil samples will be collected from the slope of the East Drainage to characterize whether COPC are present in bank soils on the edge of the drainage. Samples will be collected near the water line and from an elevation approximately equal to the top of bank. Soil samples will be collected from 0 to 12 inches bgs and 12 to 24 inches bgs. Soil sample locations are shown on Figure 11. A cross section depicting the East Drainage soil and sediment sampling intervals is provided in Figure 13.

Surface soil sampling methods are described in Apex SOP 2.2, and direct-push soil sampling methods are described in Apex SOP 2.4 (Appendix A).

5.2.9 Union Slough

Sediment samples will be collected on the downstream side of the tide gate at two sampling stations shown on Figure 12. Sediment samples will be collected at two intervals: from 0 to 4 inches bml to evaluate risks to the benthic community and from 12 to 24 inches bml to characterize vertical extent. An additional sample will be collected from 24 to 36 inches bml and archived in the event that the contamination extends past 24 inches bml.

Sediment sampling methods are provided in Appendix A.

5.2.10 Log Float Beach

One sediment sampling station is proposed at the Log Float area (Figure 12). The ramp is constructed of rock armoring. The sediment sample station will be located at the edge of the armored area, within river sediments. Sediment samples will be collected at two intervals for current analysis: at the mudline (0 to 4 inches) to evaluate risks to the benthic community and from 12 to 24 inches to characterize vertical extent. An additional sample will be collected from 24 to 36 inches and archived in the event that the contamination extends past 24 inches.

Sediment sampling methods are provided in Appendix A.

5.3 Groundwater Monitoring

Following the installation and development of the permanent monitoring wells, quarterly groundwater monitoring will be initiated. Groundwater sampling will be completed using low flow methods. Groundwater sampling methods are described in Apex SOP 2.4 (Appendix A). The analytical program is discussed in Section 6.0.

6.0 Laboratory Analytical Program

This section describes the analytical testing program including the types of samples and corresponding sample analysis for each media. Fremont Analytical and Ceres Analytical maintain a current certification from NELAP and Ecology's laboratory accreditation program under WAC 173-50. The SAP in Appendix A includes a detailed discussion of the analytical testing plan. Analytical methods that will be used for this project include:

- TPH-Gx by Northwest Method NWTPH-Gx;
- TPH-Dx by Northwest Method NWTPH-Dx;
- TPH-Dx with SGC by Northwest Method NWTPH-Dx;
- VOCs by EPA Method 8260D;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270E;
- Metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel, and zinc by EPA Method 6020;
- PCBs by EPA Method 8082A;
- PAHs by EPA Method 8270-SIM; and
- Dioxins/furans by EPA Method 8290.

SVOC analysis using EPA 8270E includes preliminary COPC such as PAHs and chlorinated phenols, as well as several other chemical groups.

Wood waste characterization will include the following analytical methods:

- Ammonia by SM 4500;
- Sulfide by SM 4500;
- Benzoic acid and benzenemethanol (benzyl alcohol) by EPA Method 8270; and
- TOC by EPA Method 9060.

A summary of the sampling and analysis plan for each media and area of the site is provided below. The table below identifies several sample areas where some analyses will be completed on a discretionary basis. Discretionary analyses are denoted with an asterisk (*) and include the following analyses:

- VOCs – samples will be analyzed for VOCs when field screening with the PID indicates VOCs are present (PID readings in the 5 to 10 ppm range).
- PAHs – PAH analysis will be conducted on the sample with the highest TPH-Dx concentration at each location (if SVOC analysis is not already completed).
- Lead – lead analysis will be completed on the sample with highest TPH-G concentration.
- PCBs – PCB analysis will be completed on the sample with the highest TPH-Dx concentration at each location.

Soil Sampling and Analysis Summary

Sample Area	Depth (ft) Interval (ft)	Number of Samples	Laboratory Analysis
Former UST Area – soil samples from direct-push and monitoring wells	20 0.5 to 3 5 to 8 10 to 13	1 to 3 per boring	TPH-Gx TPH-Dx VOCs TPH-Dx with SGC* PAHs* Lead*
Vehicle Repair Shop – soil samples	10 0.5 to 3 3 to 6	2 per boring	Metals

Sample Area	Depth (ft) Interval (ft)	Number of Samples	Laboratory Analysis
Former Waste Mixing Area – soil samples from surface soil fill and native soil interval Soil samples from monitoring well	6 feet (approx.) Above/below soil contact 20 0.5 to 3 5 to 8 10 to 13	2 per test pit 3 per well	TPH-Dx SVOCs Dioxins/Furans TOC TPH-Dx with SGC Metals* VOCs*
Former PCP Dip Tank – soil samples from monitoring well installation	20 0.5 to 3 5 to 8 10 to 13	1 to 3 per boring	TPH-Dx SVOCs Dioxins/Furans TPH-Dx with SGC* TOC* Metals* VOCs*
Historical Stormwater Line	10 0 to 3 5 to 8	2 per location	TPH-Dx SVOCs Dioxins/Furans Metals TPH-Dx with SGC* TOC* VOCs*
East Drainage Bank Soil	2 0 to 1 5 to 2	2 per location	TPH-Dx SVOCs Dioxins/Furans Metals TOC* TPH-Dx with SGC* PCBs* VOCs*
AST Release area	20 0.5 to 3 5 to 8 10 to 13	1 to 3 per boring	TPH-Dx TPH-DX with SGC* TOC* VOCs* PAHs*

Notes:

* = discretionary analysis based on field screening or initial results

Groundwater Sampling and Analysis Summary

Sample Area	Number of Samples	Approx. Depth (ft)	Laboratory Analysis
Former UST Area Upgradient well used to characterize dissolved TOC	1/temporary well 1/permanent well	10 to 20	TPH-Gx TPH-Dx VOCs TPH-Dx with SGC (from permanent well only) PAHs (from permanent well if TPH-Dx detected) Lead (from permanent well if TPH-G detected) TOC (from permanent well only)
Vehicle Repair Shop	1/permanent well	10 to 20	Metals
Former Waste Mixing Area	1/permanent well	10 to 20	TPH-Dx SVOCs VOCs* TOC* TPH-Dx with SGC* Metals*
AST Release Area	1/temporary well 1/permanent well (if needed)	10 to 20	TPH-Dx TPH-Dx with SGC* TOC* VOCs* PAHs*
Former PCP Dip Tank	1/permanent well	10 to 20	TPH-Dx SVOCs TPH-Dx with SGC* VOCs* TOC* Metals*

Notes:
* = discretionary analysis based on field screening or initial results

Drainage Solids/Sediment Sampling and Analysis Summary

Sample Area	Sample Location	Sample Information	Laboratory Analysis
Former Stormwater System	Composite of four locations along pipe	Discrete subsamples in pipe	TPH-Dx TPH-Dx with SGC SVOCs Metals PCBs

Sample Area	Sample Location	Sample Information	Laboratory Analysis
	Samples beneath pipe	6 to 12 inches below pipe	Dioxins/furans TOC
Current Stormwater System	4 branches current system	Discrete samples each branch	TPH-Dx SVOCs Metals PCBs Dioxins/furans TOC* TPH-Dx with SGC* VOCs*

Notes:

* = discretionary analysis based on field screening or initial results

Sediment Sampling and Analysis Summary

Sample Area	Approx. Depth (inches)	Number of Samples	Laboratory Analysis
East Drainage	0-4 12-24 24-36	6 sampling stations 3 per station 24- to 36-inch sample is archived	TPH-Dx TPH-Dx with SGC SVOCs Dioxins/Furans Metals Ammonia Total sulfides TOC PCBs* VOCs*
South Drainage	0-4 12-24 24-36	3 sampling stations 3/station 24- to 36-inch sample is archived	TPH-Dx TPH-Dx with SGC SVOCs Dioxins/Furans Metals Ammonia Total sulfides TOC PCBs* VOCs*

Sample Area	Approx. Depth (inches)	Number of Samples	Laboratory Analysis
Union Slough Cutoff (West Drainage)	0-4 12-24 24-36	14 sampling stations 3/station 24- to 36-inch sample is archived	TPH-Dx TPH-Dx with SGC SVOCs Dioxins/Furans Metals Ammonia Total sulfides TOC PCBs* VOCs*
I-5 Drainage	0-4 12-24 24-36	2 sampling stations 3/station 24- to 36-inch sample is archived	TPH-Dx TPH-Dx with SGC SVOCs Dioxins/Furans Metals Ammonia Total sulfides TOC PCBs* VOCs*
Union Slough	0-4 12-24 24-36	2 sampling stations 3/station 24- to 36-inch sample is archived	TPH-Dx TPH-Dx with SGC SVOCs Dioxins/Furans Metals Ammonia Total sulfides TOC PCBs* VOCs*
Log Float	0-4 12-24 24-36	1 sampling stations 3/station 24- to 36-inch sample is archived 24- to 36-inch sample is archived	TOC Ammonia Sulfide Benzoic acid Benzenemethanol

Notes:

* = discretionary analysis based on field screening or initial results

7.0 Proposed Risk Assessment

Risk assessment will account for human health and ecological receptors following MTCA and SMS. This phase of the RI includes data collection and evaluation for the receptors and preliminary cleanup levels summarized in Section 3.5. These results will be used to evaluate whether additional data collection to support Site-specific cleanup level development is required and determine the final scope of risk assessment for the Site.

In some cases, more in-depth risk assessment is needed for human health or ecological receptors, particularly when resources or receptors of special sensitivity are present. Additional data collection or evaluation for Site-specific risk assessment could include (but is not limited to) Site-specific terrestrial cleanup levels, sediment cleanup levels based on biological data, and/or vapor intrusion evaluation.

Apex proposes to complete the initial risk assessment scope described in Sections 7.1 through 7.3 as part of the initial data evaluation activities. The initial data evaluation will be discussed with Ecology to finalize the risk assessment scope and need for site specific data or evaluation. Additionally, the scope of the critical areas assessment will be discussed at that time. A Risk Assessment Work Plan will be prepared as an addendum to the RI Work Plan in order to document the final scope and procedures for risk assessment and critical areas assessment (see Section 7.4).

7.1 Human Health

Human health risks for the exposure pathways and receptors described in Section 3.4 will be characterized using default MTCA Method B cleanup levels. In cases where there is a statistically significant number of cleanup level exceedances, the 95% upper confidence of the mean will serve as the exposure point concentration.

7.2 Terrestrial Ecological Evaluation

The proposed terrestrial ecological evaluation is described below and was developed using the Draft Terrestrial Ecological Evaluations under the MTCA guidance (Ecology, 2017).

7.2.1 Characterization of the Site

The Property includes approximately 60.48 acres (Figure 2) along the Union Slough, an estuary of the Snohomish River. The Snohomish River discharges to the Possession Sound within a half mile, and marine water influence is expected in the area. A man-made dike is located to the north between the Union Slough and the Site. A riparian area is located along Union Slough. The operational portion of the Property is paved with asphalt and concrete, which covers approximately 40 acres. The north end of the property is unpaved and vegetated with grass. A drainage system encircles the Property that discharges any collected water to

Union Slough through a tide gate at the north end of the Site. Ponded water is present in the perimeter ditches seasonally, and discharge from the perimeter ditches to Union Slough only occurs when there is a tide of +0.5 feet or less. Vegetation around the perimeter ditch includes grasses and shrubs. According to the United States Fish and Wildlife Service National Wetland Inventory, wetlands are present at the north end of the Site near the East Drainage and Union Slough Cutoff, along the Union Slough, and to the southwest near the South Drainage. Emergent wetlands are present in the southern portion of the Site. The wetlands inventory map is provided as Appendix C. According to Snohomish County, areas with streams, marine environments, and wetlands are required to have buffer zones (Snohomish County Code, Title 30, Chapter 30.62A.320). Adjacent properties generally consist of commercial or industrial businesses with undeveloped land to the west and south and I-5 to the east.

Two parks are located near the Site. Union Slough Saltmarsh and Park is located approximately a half mile to the north and downstream of the Site via Union Slough. This area includes 24 acres with natural trails that were restored by the Port of Everett in 2001. The restoration included removing two dikes and excavating a channel system to allow tidal waters to flood the site.

Snohomish River Estuary Park is located on the east side of I-5, approximately a quarter mile upstream from the Site. The Snohomish River Estuary Park is currently being restored by the Washington Department of Fish and Wildlife to advance the ecosystem. There are over 350 different types of birds and countless mammals and plants that use this area as their habitat. The area adjacent to I-5 to the east is also designated open space by Snohomish County.

Since the area is ecologically diverse, there are several species with protection. Federally designated endangered or threatened species in Snohomish County include Taylor's checkerspot (insect), the gray wolf (mammal), the northern spotted owl (bird), the golden paintbrush (plant), the bull trout (fish), the marbled murrelet (bird), the dolly varden (fish), the whitebark pine (plant), the yellow-billed cuckoo (bird), and the Canada lynx (mammal). Washington State priority species, species of concern, and sensitive species for the area include Townsend's big eared bat (mammal), the marbled murrelet (bird), the Oregon spotted frog (reptile), and the western pond turtle (reptile).

7.2.2 Evaluation of Exclusions

The Site does not qualify for an exclusion from a terrestrial ecological evaluation since surface soil near the former hog fuel mixing area has concentrations of dioxins/furans above natural background. Natural background concentrations for dioxins/furans in Washington soils are established at 5.2 pg/g (Ecology, 2010). The Site is also within an ecologically diverse area and includes approximately 20 acres of contiguous undeveloped land.

7.2.3 Select Evaluation Method

The Site qualifies for a site-specific evaluation based on the potential exposure to wildlife. In addition, concentrations of dioxins/furans in surface soil near the former hog fuel mixing area are above the screening level for a simplified evaluation (WAC 173-340-900, Table 749-2). A Site-specific evaluation will be completed.

7.3 Aquatic Ecological Evaluation

Based on historical sampling results, dioxins appear to be the primary sediment COPC and will drive cleanup decision making. Unless other COPC are identified that represent a significant additional risk, the PQL (5 pg/g) will be used as the SCO to identify COPC and define remedial action areas (See Section 3.5). The 95% upper confidence limit will be used as the exposure point concentration.

7.4 Critical Areas Assessment

A critical areas assessment will be completed for the RI in order to document protected and sensitive species and habitats in the vicinity of the Site. The information will be used to design and evaluate remedial alternatives that avoid, minimize, and compensate for impacts to critical habitats and protected species. The assessment will include:

- Habitat assessment that includes a review of existing information, including but not limited to Washington Department of Fish and Wildlife Priority Habitats and Species Maps and Snohomish County critical areas maps;
- Wetlands delineation per Corps of Engineers and Ecology manuals; and
- Ordinary High Water Mark determination.

The critical areas assessment will be completed once the nature and extent of contamination are better defined. This will provide more certainty that the habitat assessment adequately captures the Site boundary and areas most likely to be disturbed by future remedial activities (i.e., areas with exceedances of preliminary cleanup levels).

The scope and methods for the assessment will be drafted and submitted to Ecology for review and approval as part of the Risk Assessment Work Plan update.

8.0 Schedule and Reporting

8.1 Schedule

The proposed RI schedule is provided below. The RI report will include a schedule for the FS and draft CAP.

Proposed Activity	Anticipated Schedule
Submit Draft RI Work Plan	July 25, 2023
Submit Final RI Work Plan	December 2023
Conduct field work	March and April 2024
Receive data and evaluate	April and May 2024
Draft Risk Assessment Work Plan	May 2024
Data & Interim Results Updates	Monthly
Submit Draft RI Report	July 2024

8.2 Reporting

The RI results will be presented in an RI Report in general accordance with the following outline.

1. Introduction
2. Background
    a. Previous Investigations, Remedial Actions
    b. Historical Data
3. Activities Completed
    a. Pre-field Activities
    b. Geophysical Survey
    c. Soil Sampling and Analysis
    d. Groundwater Sampling and Analysis
    e. Sediment Sampling and Analysis
    f. Drainage Sampling and Analysis
    g. Assessment of Climate Change Vulnerabilities
4. Deviation from Work Plan
5. Chemical Characterization of Uplands
    a. Upland Soil Sampling Results
        i. Tabular and Graphical Representation of Data
        ii. Analytical Results Narrative
6. Chemical Characterization of Sediments
    a. Sediment Results
        i. Tabular and Graphical Representation of Data

ii. Analytical Results Narrative

7. Exposure Pathway Evaluation and Critical Areas Assessment
8. Risk Characterization
9. Conclusion
10. Appendices
    a. Sampling Field Documentation and Exploration Logs
    b. Analytical Laboratory Sample Analysis Report/Quality Assurance Review
    c. Photographs

Data will be uploaded to Ecology's Environmental Information Management database after the QA review.

9.0 References

Apex Companies, LLC (Apex), 2021a. *Phase I Environmental Site Assessment, Buse Timber & Sales, 3812 28th Place Northeast, Everett, WA 98201.* September 15, 2021.

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Table 1
Soil Results: TPH-Dx
Buse Timber & Sales
Everett, Washington

Area	Sample Location ID	Depth (feet)	Date	TPH by NWTPH-Dx with Silica Gel Cleanup: Diesel Range Organics	TPH by NWTPH-Dx with Silica Gel Cleanup: Residual Range Organics	TPH by NWTPH-Dx: Diesel Range Organics	TPH by NWTPH-Dx: Residual Range Organics
				Concentrations in mg/kg			
MTCA Method A Cleanup Level				2,000	2,000	2,000	2,000
Ecological Indicator (EI) Soil Concentrations	Plants			--	--	--	--
	Soil Biota			200	--	200	--
	Wildlife			2000 [10]	--	2000 [10]	--
Vehicle Repair Shop	B1-2.5	2.5	8/17/2018	--	--	<28	<56
	B1-6.5	6.5	8/17/2018	--	--	<25	**91**
	B2-3	3	8/17/2018	--	--	<29	<58
	SB-1(0-5)	2-3	07/01/2021	**4.51** J	**38.1**	--	--
	SB-1(5-10)	6-7	07/01/2021	**8.79** J	**67.3**	--	--
Former Log Pond	SB-2(0-5)	4-5	07/01/2021	<4.80	<12.0	--	--
	SB-2(5-10)	8-9	07/01/2021	<5.88	<14.7	--	--
	SB-3(0-5)	3-4	07/01/2021	<4.97	<12.4	--	--
	SB-3(5-10)	8.5-9.5	07/01/2021	<6.68	**5.61** J	--	--
	SB-9(0-5)	3-4	07/01/2021	**6.74** J	**28.2**	--	--
	SB-9(5-10)	8-9	07/01/2021	**3.83** J	**31.3**	--	--
Current Lube Building/Mechanics Shop Area	SB-4(0-5)	3-4	07/01/2021	<4.94	<12.3	--	--
	SB-4(5-10)	6-7	07/01/2021	<5.01	<12.5	--	--
	SB-5(0-5)	2.5-3.5	07/01/2021	**23.5**	**56.5**	--	--
	SB-5(5-10)	6-7	07/01/2021	**10.7**	**58.6**	--	--
Former Fire Pond	FPD-1 SO0011	2-4	6/18/1998	--	--	<25	**852**
	FPD-2 SO0012	2-4	6/19/1998	--	--	<25	<100
	FPD-3 SO0013	2-4	6/19/1998	--	--	<25	<100
	B5-2.5	2.5	8/17/2018	--	--	<25	**170**
	B5-18	18	8/17/2018	--	--	<25	<50
Former Waste Mixing Area	SB-6(0-5)	3-4	07/01/2021	<5.77	**8.72** J	--	--
	SB-6(5-10)	8-9	07/01/2021	<7.29	<18.2	--	--
	SS-1	0-1	07/01/2021	**13.2**	**175**	--	--
	SS-2	0-1	07/01/2021	**10.0**	**101**	--	--
	SS-3	0-1	07/01/2021	**16.7**	**151**	--	--
Current Dip Tank	SB-7(0-5)	3-4	06/30/2021	<7.05	**6.19** J	--	--
	SB-7(5-10)	8-9	06/30/2021	<8.52	<21.3	--	--
Current Washdown Area	B6-3	3	8/17/2018	--	--	<26	**58**
	SB-8(0-5)	2-3	06/30/2021	**38.5**	**92.4**	--	--
	SB-8(5-10)	8-9	06/30/2021	<6.28	<15.7	--	--
Former Main Plant Drain	SB-10(0-5)	3-4	06/30/2021	<6.09	**5.51** J	--	--
	SB-10(5-10)	6.5-7.5	06/30/2021	**5.93** J	**49.9** J	--	--
Former PCP Dip Tank	SB-11(0-5)	3-4	06/30/2021	<6.99	<17.5	--	--
	SB-11(5-10)	7-8	06/30/2021	<7.75	<19.4	--	--
	SB-12(0-5)	3.5-4.5	06/30/2021	**64.6**	**119**	--	--
	SB-12(5-10)	8-9	06/30/2021	**6.53** J	**39.7**	--	--
Former UST Area	UST-1 SO0004	2-4	6/18/1998	--	--	<25	<100
	UST-2 SO0005	2-4	6/18/1998	--	--	<25	<100
	UST-3 SO0006	2-4	6/18/1998	--	--	**246**	<100
	B3-6.5	6.5	8/17/2018	--	--	<28	<56
	B3-17.5	17.5	8/17/2018	--	--	<25	<50
	SB-13(0-5)	3-4	06/30/2021	<6.33	**6.10** J	--	--
	SB-13(5-10)	6.5-7.5	06/30/2021	**6.06** J	**37.3**	--	--
	SB-13(10-15)	13.5-14.5	06/30/2021	<6.27	<15.7	--	--
AST Area (Current and Former)	AST-1 SO0007	0-2	6/19/1998	--	--	<25	**635**
	AST-2 SO0009	0-2	6/19/1998	--	--	<25	**291**
	SB-14(0-5)	3-4	06/30/2021	<5.62	**11.4** J	--	--
	SB-14(5-10)	7-8	06/30/2021	**3.29** J	**13.9** J	--	--
Current Storm Line Discharge	B4-7	7	8/17/2018	--	--	<31	<62
Stockpiled Soil from Former Fire Pond	FPS-1	2-4	6/19/1998	--	--	<100	**18,200**

Notes:

1. mg/kg = Milligrams per kilogram.
2. Bold values indicate the compound was detected above method detection limits.
3. < = Analyte was not detected above the reporting limit shown.
4. TPH = Total petroleum hydrocarbons.
5. Shaded results exceed the MTCA Method A soil cleanup levels. Method A cleanup levels from 2023 CLARC update (Ecology, updated 2023).
6. EI Soil Concentration revised downward to residual saturation concentration. EI Soil Concentrations from concentrations from Ecology (2017).
7. J = Result is estimated.
8. -- = Not analyzed.
9. TPH = Total petroleum hydrocarbons.
10. Strike-through results have been removed from the site.

Table 2
Soil Results: VOCs and TPH-Gx
Buse Timber & Sales
Everett, Washington

Part 1

Sample Location ID:	B1-2.5	B1-6.5	B2-3	SB-1(0-5)	SB-4(0-5)	SB-4(5-10)	SB-5(5-10)	FPD-1 SO0011	FPD-2 SO0012	FPD-3 SO0013	B5-2.5	B5-18	SB-6(0-5)	SB-6(5-10)	B6-3	SB-2(0-5)	SB-9(0-5)
Area	Vehicle Repair Shop				Current Lube Building/Mechanics Shop Area			Former Fire Pond					Former Waste Mixing Area		Current Washdown Area	Former Log Pond Fill	
Depth (feet):	2.5	6.5	3	2-3	3-4	6-7	6-7	2-4	2-4	2-4	2.5	18	3-4	8-9	3	4-5	3-4
Date:	8/17/2018	8/17/2018	8/17/2018	07/01/2021	07/01/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	8/17/2018	8/17/2018	07/01/2021	07/01/2021	8/17/2018	07/01/2021	07/01/2021
Total Petroleum Hydrocarbons (TPH) by NWTPH-Gx in mg/kg																	
Gasoline	--	--	--	--	--	--	--	<20	<20	<20	--	--	--	--	--	--	--
Naphtha Distillate	--	--	--	--	--	--	--	<20	<20	<20	--	--	--	--	--	--	--
Jet Fuel as JP-4	--	--	--	--	--	--	--	<20	<20	<20	--	--	--	--	--	--	--
PHC as Gasoline	--	--	--	--	--	--	--	<20	<20	<20	--	--	--	--	--	--	--
Non-PHC as Gasoline	--	--	--	--	--	--	--	<20	<20	<20	--	--	--	--	--	--	--
Gasoline Range Organics	<3.0	<3.0	<3.0	--	--	--	--	--	--	--	**3.5**	<3.0	--	--	<3.0	--	--
Volatile Organic Compounds (VOCs) by EPA Method 8260 in mg/kg																	
Acetone	**0.23**	<0.05	**0.38**	**0.312**	<0.0738	<0.0770	**0.0953**	--	--	--	<0.05	<0.05	**0.186**	**0.345**	**0.23**	<0.0710	**0.143**
Acrylonitrile	<0.05	<0.05	<0.05	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.05	<0.05	<0.0249	<0.0345	<0.05	<0.0178	<0.0183
Benzene	<0.005	<0.005	<0.005	**0.00566**	**0.00107** J	**0.00157**	<0.00132	<0.05 UJ	--	--	<0.005	<0.005	**0.00128** J	<0.00276	<0.005	<0.00142	**0.00333**
Bromobenzene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
Bromochloromethane	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	<0.01	<0.01	--	--	<0.01	--	--
Bromodichloromethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Bromoform	<0.01	<0.01	<0.01	<0.0568	<0.0369	<0.0385	<0.0330	--	--	--	<0.01	<0.01	<0.0499	<0.0689	<0.01	<0.0355	<0.0365
Bromomethane	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
n-Butylbenzene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
sec-Butylbenzene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
tert-Butylbenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Carbon Disulfide	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	<0.01	<0.01	--	--	<0.01	--	--
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Chlorobenzene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Chlorodibromomethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Chloroethane	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Chloroform	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Chloromethane	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
2-Chlorotoluene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
4-Chlorotoluene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
1,2-Dibromo-3-Chloropropane	<0.05	<0.05	<0.05	<0.0568	<0.0369	<0.0385	<0.0330	--	--	--	<0.05	<0.05	<0.0499	<0.0689	<0.05	<0.0355	<0.0365
1,2-Dibromoethane	<0.005	<0.005	<0.005	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.005	<0.005	<0.00499	<0.00689	<0.005	<0.00355	<0.00365
1,2-Dichlorobenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
1,3-Dichlorobenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
1,4-Dichlorobenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Dichlorodifluoromethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,1-Dichloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
cis-1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
trans-1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
1,1-Dichloropropene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,3-Dichloropropane	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
cis-1,3-Dichloropropene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
trans-1,3-Dichloropropene	<0.01	<0.01	<0.01	<0.0114	<0.00738	<0.00770	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
2,2-Dichloropropane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
di-Isopropyl Ether	--	--	--	<0.00227	<0.00148	<0.00154	<0.00132	--	--	--	--	--	<0.00199	<0.00276	--	<0.00142	<0.00146
Ethylbenzene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	<0.1 UJ	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	**0.0291**
Hexachloro-1,3-Butadiene	<0.01	<0.01	<0.01	<0.0568	<0.0369	<0.0385	<0.0330	--	--	--	<0.01	<0.01	<0.0499	<0.0689	<0.01	<0.0355	<0.0365
2-Hexanone	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	<0.05	<0.05	--	--	<0.05	--	--
Isopropylbenzene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	**0.0024** J
p-Isopropyltoluene	<0.01	<0.01	<0.01	<0.0114	<0.00738	**0.00644** J	**0.0393**	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	**0.00721**	**0.0849**
2-Butanone (MEK)	<0.15	<0.05	<0.17	**0.387** J+	<0.148	**0.202** J+	**0.179** J+	--	--	--	<0.05	<0.05	**0.249** J+	**0.447** J+	<0.13	**0.158** J+	**0.209** J+
Methylene Chloride	<0.02	<0.02	<0.02	<0.0568	<0.0369	<0.0385	<0.0330	--	--	--	<0.02	<0.02	<0.0499	<0.0689	<0.02	<0.0355	<0.0365
4-Methyl-2-Pentanone (MIBK)	<0.05	<0.05	<0.05	<0.0568	<0.0369	<0.0385	<0.0330	--	--	--	<0.05	<0.05	<0.0499	<0.0689	<0.05	<0.0355	<0.0365
Methyl tert-Butyl Ether	<0.01	<0.01	<0.01	<0.00227	<0.00148	<0.00154	<0.00132	<0.5 UJ	--	--	<0.01	<0.01	<0.00199	<0.00276	<0.01	<0.00142	<0.00146
Naphthalene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
n-Propylbenzene	<0.01	<0.01	<0.01	<0.0114	**0.00226** J	**0.00305** J	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Styrene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
1,1,1,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,1,2,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,1,2-Trichlorotrifluoroethane	--	--	--	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	--	--	<0.00499	<0.00689	--	<0.00355	<0.00365
Tetrachloroethene	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Toluene	<0.01	<0.01	<0.01	**0.0157**	**0.00673** J	**0.0411**	**0.0202**	<0.1 UJ	--	--	<0.01	<0.01	**0.0477**	**0.00783** J	<0.01	**0.00757**	**0.0447**
1,2,3-Trichlorobenzene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
1,2,4-Trichlorobenzene	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,1,2-Trichloroethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Trichloroethene	<0.01	<0.01	<0.01	<0.00227	<0.00148	<0.00154	<0.00132	--	--	--	<0.01	<0.01	<0.00199	<0.00276	<0.01	<0.00142	<0.00146
Trichlorofluoromethane	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
1,2,3-Trichloropropane	<0.01	<0.01	<0.01	<0.0284	<0.0185	<0.0193	<0.0165	--	--	--	<0.01	<0.01	<0.0249	<0.0345	<0.01	<0.0178	<0.0183
1,2,4-Trimethylbenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	**0.0166**	**0.00405** J	--	--	--	**0.013**	<0.01	<0.00997	<0.0138	<0.01	<0.00710	**0.00387** J
1,2,3-Trimethylbenzene	--	--	--	**0.0038** J	<0.00738	**0.00314** J	<0.00659	--	--	--	--	--	<0.00997	**0.00516** J	--	<0.00710	<0.00730
1,3,5-Trimethylbenzene	<0.01	<0.01	<0.01	<0.0114	<0.00738	**0.00339** J	<0.00659	--	--	--	<0.01	<0.01	<0.00997	<0.0138	<0.01	<0.00710	<0.00730
Vinyl Chloride	<0.01	<0.01	<0.01	<0.00568	<0.00369	<0.00385	<0.00330	--	--	--	<0.01	<0.01	<0.00499	<0.00689	<0.01	<0.00355	<0.00365
Xylenes, Total	<0.03	<0.03	<0.03	<0.0148	**0.00638** J	**0.0345**	**0.00510** J	**0.3** J	--	--	<0.03	<0.03	**0.00299** J	<0.0179	<0.03	<0.00923	<0.00949

Part 2

Sample Location ID:	SB-9(5-10)	FDT-2 SO0001	UST-1 SO0004	UST-2 SO0005	UST-3 SO0006	B3-6.5	B3-17.5	SB-13(5-10)	AST-2 SO0009	AST-2 SO00010	B4-7	FPS-1 SO0014	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Soil Method A Cleanup Level (mg/kg)	Ecological Indicator (EI) Soil Concentrations (mg/kg): Plants	Soil Biota	Wildlife
Area	Former Log Pond Fill	Former PCP Dip Tank	Former UST Area						AST Area		Current Storm Line	Stockpiled Soil from Former Fire Pond							
Depth (feet):	8-9	4-6	2-4	2-4	2-4	6.5	17.5	6.5-7.5	0-2	2-4	7	2-4							
Date:	07/01/2021	6/19/1998	6/18/1998	6/18/1998	6/18/1998	8/17/2018	8/17/2018	06/30/2021	6/19/1998	6/19/1998	8/17/2018	6/19/1998							
Total Petroleum Hydrocarbons (TPH) by NWTPH-Gx in mg/kg																			
Gasoline	--	--	<20	<20	<20	--	--	--	<20	<20	--	~~<20~~	--	--	--	30	--	--	--
Naphtha Distillate	--	--	<20	<20	<20	--	--	--	<20	<20	--	~~<20~~	--	--	--	30	--	--	--
Jet Fuel as JP-4	--	--	<20	<20	<20	--	--	--	<20	<20	--	~~<20~~	--	--	--	30	--	--	--
PHC as Gasoline	--	--	<20	<20	<20	--	--	--	<20	<20	--	~~<20~~	--	--	--	30	--	--	--
Non-PHC as Gasoline	--	--	<20	<20	<20	--	--	--	<20	<20	--	~~<20~~	--	--	--	30	--	--	--
Gasoline Range Organics	--	--	--	--	--	<3.0	<3.0	--	--	--	<3.0	--	--	--	--	30	--	100	5,000
Volatile Organic Compounds (VOCs) by EPA Method 8260 in mg/kg																			
Acetone	**0.227**	--	--	--	--	**0.063**	<0.05	<0.263	--	--	<0.05	--	72000	--	29	--	--	--	--
Acrylonitrile	<0.0216	--	--	--	--	<0.05	<0.05	<0.0658	--	--	<0.05	--	--	--	--	--	--	--	--
Benzene	**0.00216**	<0.05	--	<0.05	--	<0.005	<0.005	<0.00527	<0.05	--	<0.005	--	320	18	0.027	--	--	--	--
Bromobenzene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	640	--	0.56	--	--	--	--
Bromochloromethane	--	--	--	--	--	<0.01	<0.01	--	--	--	<0.01	--	--	--	--	--	--	--	--
Bromodichloromethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	1600	16	0.033	--	--	--	--
Bromoform	<0.0433	--	--	--	--	<0.01	<0.01	<0.132	--	--	<0.01	--	1600	130	0.36	--	--	--	--
Bromomethane	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	110	--	0.051	--	--	--	--
n-Butylbenzene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658 UJ	--	--	<0.01	--	4000	--	14	--	--	--	--
sec-Butylbenzene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	8000	--	25	--	--	--	--
tert-Butylbenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	8000	--	20	--	--	--	--
Carbon Disulfide	--	--	--	--	--	<0.01	<0.01	--	--	--	<0.01	--	--	--	--	--	--	--	--
Carbon Tetrachloride	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	320	14	0.041	--	--	--	--
Chlorobenzene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	1600	--	0.86	--	--	--	--
Chlorodibromomethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	1600	12	0.024	--	--	--	--
Chloroethane	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	--	--	--	--	--	--	--
Chloroform	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	800	32	0.074	--	--	--	--
Chloromethane	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	--	--	--	--	--	--	--
2-Chlorotoluene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	1600	--	1.9	--	--	--	--
4-Chlorotoluene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	1600	--	1.9	--	--	--	--
1,2-Dibromo-3-Chloropropane	<0.0433	--	--	--	--	<0.05	<0.05	<0.132	--	--	<0.05	--	--	--	--	--	--	--	--
1,2-Dibromoethane	<0.00433	--	--	--	--	<0.005	<0.005	<0.0132	--	--	<0.005	--	720	0.5	0.00027	--	--	--	--
1,2-Dichlorobenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	7200	--	7	--	--	--	--
1,3-Dichlorobenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	5600	190	1.2	--	--	20	--
Dichlorodifluoromethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	16000	--	38	--	--	--	--
1,1-Dichloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	16000	180	0.041	--	--	--	--
1,2-Dichloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	480	11	0.023	--	--	--	--
1,1-Dichloroethene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	4000	--	0.046	--	--	--	--
cis-1,2-Dichloroethene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	160	--	0.079	--	--	--	--
trans-1,2-Dichloroethene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	1600	--	0.52	--	--	--	--
1,2-Dichloropropane	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	3200	27	0.025	--	--	700	--
1,1-Dichloropropene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	--	--	--	--	--	--	--
1,3-Dichloropropane	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	2400	10	0.002	--	--	--	--
trans-1,3-Dichloropropene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	--	--	--	--	--	--	--
2,2-Dichloropropane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	--	--	--	--	--	--	--
di-Isopropyl Ether	<0.00173	--	--	--	--	--	--	<0.00527	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	<0.00433	<0.1	--	<0.1	--	<0.01	<0.01	<0.0132	<0.1	--	<0.01	--	8000	--	5.9	--	--	--	--
Hexachloro-1,3-Butadiene	<0.0433	--	--	--	--	<0.01	<0.01	<0.132 UJ	--	--	<0.01	--	80	13	0.012	--	--	--	--
2-Hexanone	--	--	--	--	--	<0.05	<0.05	--	--	--	<0.05	--	400	--	0.17	--	--	--	--
Isopropylbenzene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	--	--	--	--	--	--	--
p-Isopropyltoluene	**0.00717** J	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	--	--	--	--	--	--	--
2-Butanone (MEK)	**0.270** J+	--	--	--	--	<0.05	<0.05	**0.374** J+	--	--	<0.05	--	48000	--	20	--	--	--	--
Methylene Chloride	<0.0433	--	--	--	--	<0.02	<0.02	<0.132	--	--	<0.02	--	480	94	0.022	--	--	--	--
4-Methyl-2-Pentanone (MIBK)	<0.0433	--	--	--	--	<0.05	<0.05	<0.132	--	--	<0.05	--	6400	--	2.7	--	--	--	--
Methyl tert-Butyl Ether	<0.00173	<0.5	--	<0.5	--	<0.01	<0.01	<0.00527	<0.5	--	<0.01	--	--	560	0.1	--	--	--	--
Naphthalene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	1600	--	4.5	--	--	--	--
n-Propylbenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	8000	--	16	--	--	--	--
Styrene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	16000	--	2.2	--	300	--	--
1,1,1,2-Tetrachloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	2400	38	0.0098	--	--	--	--
1,1,2,2-Tetrachloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	1600	5	0.0012	--	--	--	--
1,1,2-Trichlorotrifluoroethane	<0.00433	--	--	--	--	--	--	<0.0132	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	480	480	0.05	--	--	--	--
Toluene	**0.0249**	<0.1	--	<0.1	--	<0.01	<0.01	<0.0263	<0.1	--	<0.01	--	6400	--	4.5	--	200	--	--
1,2,3-Trichlorobenzene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658 UJ	--	--	<0.01	--	64	--	0.2	--	--	20	--
1,2,4-Trichlorobenzene	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658 UJ	--	--	<0.01	--	800	34	0.56	--	--	20	--
1,1,1-Trichloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	160000	--	1.5	--	--	--	--
1,1,2-Trichloroethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	320	18	0.017	--	--	--	--
Trichloroethene	<0.00173	--	--	--	--	<0.01	<0.01	<0.00527	--	--	<0.01	--	40	12	0.025	--	--	--	--
Trichlorofluoromethane	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	24000	--	23	--	--	--	--
1,2,3-Trichloropropane	<0.0216	--	--	--	--	<0.01	<0.01	<0.0658	--	--	<0.01	--	320	0.0063	0.0000024	--	--	--	--
1,2,4-Trimethylbenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	800	--	1.3	--	--	--	--
1,2,3-Trimethylbenzene	**0.00327** J	--	--	--	--	--	--	<0.0263	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	<0.00866	--	--	--	--	<0.01	<0.01	<0.0263	--	--	<0.01	--	800	--	1.3	--	--	--	--
Vinyl Chloride	<0.00433	--	--	--	--	<0.01	<0.01	<0.0132	--	--	<0.01	--	240	0.67	0.0017	--	--	--	--
Xylenes, Total	**0.00279** J	<0.1	--	<0.1	--	<0.03	<0.03	<0.0342	<0.1	--	<0.03	--	32000	--	44	--	--	--	--

Notes:

1. mg/kg = Milligrams per kilogram.
2. UST = Underground storage tank.
3. AST = Aboveground storage tank.
4. PCP = Pentachlorophenol
5. PHC = Petroleum hydrocarbons
6. Bold values indicate the compound was detected above method detection limits.
7. Shaded results exceed applicable screening level.
8. < = Analyte was not detected above the reporting limit shown.
9. Soil cleanup levels from the Model Toxics Control Act (MTCA) Regulation chapter 17-340 WAC (August 2023 update).
10. EI Soil Concentration revised downward to residual saturation concentration. EI Soil Concentrations from concentrations from Ecology, 2017).
11. -- = Value not available.
12. J = Result is estimated.
13. UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
14. J+ = Result is estimated and may be biased high.
15. Strike-through results have been removed from the site.

Table 3
Soil Results: Chlorinated Phenols and Metals
Buse Timber & Sales
Everett, Washington

	Vehicle Repair Shop				Former Log Pond Fill		Current Dip Tank		AST Area	Former PCP Dip Tank									Former Waste Mixing Area			Natural Background Concentrations	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator (EI) Soil Concentrations		
Sample Location ID:	B1-2.5	B1-6.5	B2-3	SB-1(0-5)	SB-2(0-5)	SB-3(5-10)	SB-7(0-5)	SB-7(5-10)	SB-9(5-10)	FDT-1 SO0002	FDT-2 SO0001	FDT-3 SO0003	SB-11(0-5)	SB-11(5-10)	SB-12(0-5)	SB-12(5-10)	SB-12A(0-5)	SB-12A(5-10)	SS-1	SS-2	SS-3							
Depth (feet):	2.5	6.5	3	2-3	4-5	8.5-9.5	3-4	6-7	8-9	2-4	4-6	2-4	3-4	7-8	3.5-4.5	8-9	3.5-4.5	8-9	--	--	--							
Date:	8/17/2018	8/17/2018	8/17/2018	07/01/2021	07/01/2021	07/01/2021	06/30/2021	06/30/2021	07/01/2021	6/19/1998	6/19/1998	6/19/1998	06/30/2021	06/30/2021	06/30/2021	06/30/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021					Plants	Soil Biota	Wildlife
Chlorinated Phenols by EPA Method 8270E and 8151A in mg/kg																												
4-Chloro-3-Methylphenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	--	--	--	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	8000		22	--	--	--
2-Chlorophenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	--	--	--	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	400		0.47	--	--	--
2,4-Dichlorophenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	--	--	--	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	240		0.33	--	--	--
Pentachlorophenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	<0.05	**0.04**	<0.05	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	400	3	0.016	--	--	--
2,4,6-Trichlorophenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	<0.02	<0.005	<0.015	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	80	91	0.092	--	10	--
2,4,5-Trichlorophenol	--	--	--	<1.08	<0.399	<1.11	<0.587	<0.709	<0.445	--	--	--	<0.582	<0.645	<0.588	<0.675	<1.41	<0.670	<1.31	<0.690	<1.17	--	8000		58	4	9	--
Metals in mg/kg																												
Arsenic	**35**	**16**	**41**	**18.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7	24	0.67	2.9	10 (As[V])	60 (As[V])	7 (As[III])
Barium	--	--	--	**51.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	--	1600	500	--	102
Cadmium	<0.29	<0.24	<0.30	<1.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	80	--	0.69	4	20	14
Hexavalent Chromium	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19	240	0.38	--	--	
Chromium	**67**	**47**	**70**	**66.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48	120000	--	480000	42	42	67
Lead	**57**	**13**	**31**	**10.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24	--	--	3000	50	500	118
Selenium	--	--	--	**0.809** J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	400	--	5.2	1	70	0.3
Silver	--	--	--	<0.808	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	400	--	14	2	--	--
Mercury	**0.034**	<0.020	**0.09**	**0.0765**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	--	--	2.1	0.3	0.1	5.5

Notes:

1. mg/kg = Milligrams per kilogram.
2. PCP = Pentachlorophenol
3. Bold values indicate the compound was detected above method detection limits.
4. < = Analyte was not detected above the reporting limit shown.
5. -- = Value not available.
6. Shaded results exceed applicable screening level.
7. J = Result is estimated.
8. Soil cleanup levels from the Model Toxics Control Act (MTCA) Regulation chapter 17-340 WAC (August 2023 update).
9. EI Soil Concentration revised downward to residual saturation concentration. EI Soil Concentrations from concentrations from Ecology, 2017).
10. AST = above-ground storage tank

Table 4
Soil Results: Dioxins/Furans
Buse Timber & Sales
Everett, Washington

	Former Log Pond Fill		Current Lube Building/Mechanics Shop Area		Former Main Plant Drain	Former PCP Dip Tank		Former Fire Pond		Former Waste Mixing Area			Former Burn Area	Current Washdown Area	Regional Background Dioxins/Furans	MTCA Method B Cleanup Level	TEE Site-Specific Evaluation Screening Level
Sample Location ID:	SB-2(0-5)	SB-3(5-10)	SB-4(0-5)	SB-5(0-5)	SB-10(0-5)	SB-11(0-5)	SB-12(0-5)	B5-2.5	B5-18	SS-1	SS-2	SS-3	FBA-1 SO0015	B6-3			
Depth (feet):	4-5	8.5-9.5	3-4	2.5-3.5	3-4	3-4	3.5-4.5	2.5	18	0-1	0-1	0-1	1-4	3			
Date:	07/01/2021	07/01/2021	07/01/2021	07/01/2021	06/30/2021	06/30/2021	06/30/2021	8/17/2018	8/17/2018	07/01/2021	07/01/2021	07/01/2021	6/19/1998	8/17/2018			
Dioxins/Furans by EPA Method 8290A in pg/g																	
2,3,7,8-TCDD	<0.12	<0.11	<0.12	<0.10	<0.13	**0.13** J	<0.12	**0.294** JK	**0.323** JK	**0.151** J	<0.12	**0.093** J	<0.059	<0.214	--	--	--
1,2,3,7,8-PeCDD	<0.12	<0.12	<0.10	**0.33** J	<0.13	**0.38** J	**0.3** J	**1.4** J	<0.0599	**2.25** J	**2.26** J	**1.28** J	**0.1**	**0.271** JK	--	--	--
1,2,3,4,7,8-HxCDD	<0.11	<0.14	<0.13	**0.28** J	**0.14** J	**0.28** J	**0.29** J	**1.58** J	<0.0445	**2.70** J	**3.45** J	**1.25** J	**0.14**	<0.180	--	--	--
1,2,3,6,7,8-HxCDD	**0.618** J	**0.14** J	**0.12** J	**1.28** J	<0.17	**4.53** J	**0.46** J	**14.4**	**0.0939** JK	**30.2**	**34.7**	**14.5**	**0.33**	<0.189	--	--	--
1,2,3,7,8,9-HxCDD	**0.352** J	**0.23** J	<0.11	**0.59** J	**0.29** J	**0.72** J	**0.42** J	**4.04**	**0.0859** JK	**9.09**	**6.21**	**4.12** J	**0.37**	<0.180	--	--	--
1,2,3,4,6,7,8-HpCDD	**3.82** J	**2.79** J	**1.56** J	**8.58**	**5.48**	**35.7**	**5.49**	**126**	**3.06** J	**217**	**335**	**106**	**3.5**	**2.61** J	--	--	--
OCDD	**16.7**	**34.7**	**14.3**	**62.1**	**176**	**121**	**48.1**	**589**	**44.9**	**1140**	**1370**	**441**	**62**	**31.8**	--	--	--
2,3,7,8-TCDF	**0.27** J	<0.11	**0.17** J	**0.61** J	<0.29	**1.96** J	**1.91** J	**0.808**	**0.593** J	**1.34** J	**2.72**	**1.25** J	<0.053	**0.499** JK	--	--	--
1,2,3,7,8-PeCDF	<0.13	<0.12	<0.12	**0.25** J	<0.13	**0.52** J	**0.43** J	**0.704** JK	**0.0806** JK	**0.929** J	**4.78** J	**1.57** J	<0.048	**0.264** J	--	--	--
2,3,4,7,8-PeCDF	<0.12	<0.11	<0.11	**0.46** J	**0.13** J	**0.72** J	**0.74** J	**2.01** J	<0.0480	**1.09** J	**4.3** J	**1.39** J	<0.081	**0.811** J	--	--	--
1,2,3,4,7,8-HxCDF	**0.12** J	<0.11	<0.12	**0.31** J	<0.11	**0.75** J	**0.37** J	**3.72**	**0.166** JK	**3.89** J	**19.1**	<5.7 UK	<0.076	**0.243** J+	--	--	--
1,2,3,6,7,8-HxCDF	<0.092	<0.094	<0.11	**0.33** J	<0.10	**0.67** J	**0.3** J	**3.94**	**0.0856** JK	**4.89** J	**9.95**	**3.86** J	<0.041	**0.281** J+	--	--	--
2,3,4,6,7,8-HxCDF	<0.096	<0.099	<0.11	**0.45** J	<0.10	**0.747** J	**0.32** J	**8.89**	**0.064** J	<3.8 UK	**5.98**	<2.3 UK	<0.044	**0.38** J+	--	--	--
1,2,3,7,8,9-HxCDF	<0.11	<0.11	<0.13	**0.19** J	<0.12	<0.11	<0.14	**0.988** J	**0.098** JK	**0.141** J	**1.33** J	**0.44** J	<0.083	**0.15** J+	--	--	--
1,2,3,4,6,7,8-HpCDF	**2.33** J	**0.124** J	**0.32** J	**3.07** J	**0.997** J	**35.4**	**1.14** J	**294**	**0.759** J	**106**	**248**	**64.5**	**0.6**	**0.492** J+	--	--	--
1,2,3,4,7,8,9-HpCDF	<0.12	<0.12	<0.13	**0.27** J	**0.16** J	**0.81** J	**0.12** J	**6.41**	**0.11** JK	**3.92** J	**10.3**	**2.63** J	<0.036	<0.0791	--	--	--
OCDF	**1.89** J	**0.14** J	**0.98** J	**3.81** J	**72.2**	**32.3**	**2.63** J	**669**	**7.13**	**123**	**197**	**49.8**	**1.7**	**0.867** J+	--	--	--
Total HxCDD	**3.63** J	**1.93** J	**0.61** J	**5.79**	**2.61** J	**20.5**	**4.17** J	**--**	**--**	**198**	**131**	**85.2**	**5.4**	**--**	--	160	--
Total Mammal TEQ	**0.364**	**0.244**	**0.217**	**1.07**	**0.399**	**2.48**	**1.09**	**10.8**	**0.538**	**11.8**	**18.5**	**6.66**	**0.30**	**0.853**	5.2	13	--
Chlorinated dibenzofurans - Mammal TEQ	**0.0983** J	**0.0463** J	**0.0629** J	**0.369** J	**0.110** J	**1.02**	**0.545** J	**5.66**	**0.12**	**2.71**	**7.98**	**2.11**	**0.034**	**0.412**	--	--	2
Chlorinated dibenzo-p-dioxins - Mammal TEQ	**0.266**	**0.197**	**0.154**	**0.699**	**0.289**	**1.46**	**0.546**	**5.13**	**0.417**	**9.11**	**10.5**	**4.55**	**0.27**	**0.441**	--	--	2
Chlorinated dibenzofurans - Avian TEQ	**0.387** J	**0.139** J	**0.258** J	**1.26** J	**0.322** J	**3.32**	**2.81** J	**7.71**	**0.676**	**4.72**	**13.7**	**4.30**	**0.09**	**1.45**	--	--	2
Chlorinated dibenzo-p-dioxins - Avian TEQ	**0.170**	**0.149**	**0.123**	**0.481**	**0.190**	**0.689**	**0.431**	**2.51**	**0.371**	**4.08**	**3.93**	**2.14**	**0.19**	**0.398**	--	--	2

Notes:

1. pg/g = Picograms per gram.
2. Bold values indicate the compound was detected above method detection limits.
3. < = Analyte was not detected above the detection limit shown.
4. Shaded results exceed the Model Toxics Control Act (MTCA) Method B Cancer soil cleanup level and the natural background concentration for dioxins/furans.
5. Boxed results are above the Washington State Department of Ecology Terrestrial Ecological Evaluation (TEE) Site-Specific Evaluation screening level for ecological risk assessment (WAC 173-340-7490 through -7494; July 2016).
6. Soil cleanup levels from the MTCA Method B Cancer 173-340 WAC (January 2023 update).
7. Natural background concentration for dioxins/furans from Washington Ecology's technical memorandum *Natural Background for Dioxins/Furans in WA Soil* (August 2010).
8. Mammal toxicity equivalency quotient (TEQ) calculated using 2,3,7,8-TCDD toxicity equivalency factors (TEFs) from *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds* (Van den Berg et. al., 2005). Not detected values added at 1/2 the detection limit.
9. Avian TEQ calculated using 2,3,7,8-TCDD TEFs from *Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs, for Humans and Wildlife* (Van den Berg et al., 1998). Not detected values added at 1/2 the detection limit.
10. -- = Value not available.
11. J = Result is estimated.
12. UK = Estimated maximum possible concentration (EMPC). Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.
13. J+ = Result is estimated and may be biased high.
14. JK = The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. The concentration of this analyte should be considered as an estimate.

Table 5
Groundwater Results
Buse Timber & Sales
Everett, Washington

	Vehicle Repair Shop				Former Log Pond Fill			Current Lube Building/Mechanics Shop Area		Former Fire Pond			Former Waste Mixing Area	Current Dip Tank	Current Washdown Area	Former Main Plant Drain		Former PCP Dip Tank				Former UST Area	Groundwater MTCA Method A Cleanup Level (µg/L)	Ground Water Method B Target Cleanup Level (µg/L)
Sample Location ID:	MSA-1 GW0014	MSA-2 GW0015	B2	SB-1W	SB-2W	SB-3W	SB-9W	SB-4W	SB-5W	FPD-1 GW0011	FPD-2 GW0012	FPD-3 GW0013	SB-6W	SB-7W	SB-8W	SB-10W	NSD-1 GW0017	FDT-4 GW0001	FDT-6 GW0003	SB-11W	SB-12A-W	SB-13W		
Depth (feet):	2-6	2-6	--	15.2	12.7	12.3	21.3	6.8	6.4	2-6	3-7	4-8	11.7	9.7	2.9	16.5	3-7	3-7	4-8	6.8	22	23.5		
Date:	6/18/1998	6/19/1998	8/17/2018	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	07/01/2021	06/30/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	06/30/2021	07/01/2021	06/30/2021		
Total Petroleum Hydrocarbons (TPH) by NWTPH-Dx in µg/L																								
Diesel Range Organics	--	--	**450**	**208**	**1110**	**541**	**76.6** J	**983**	**1450**	--	--	--	**860** J-	**2840** J+	**1060**	**125** J	--	--	--	**1460**	**152** J	**122** J	500	--
Residual Range Organics	--	--	**400**	**246** J	**1450**	**884**	<250	**1250**	**1620**	--	--	--	**673** J-	**2350**	**1440**	**248** J	--	--	--	**1740**	**222** J	<250	500	--
Diesel Fuel	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	500	--
Heavy Fuel Oil	<500	--	--	--	--	--	--	--	--	<500	<500	<500	--	--	--	--	<500	--	--	--	--	--	500	--
Jet Fuel as Jet A	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	500	--
Kerosene	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	500	--
Lube Oil	<500	--	--	--	--	--	--	--	--	<500	<500	<500	--	--	--	--	<500	--	--	--	--	--	500	--
Mineral Spirits	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	500	--
PHC as Diesel	**792** J	--	--	--	--	--	--	--	--	<500	**5010**	**3020**	--	--	--	--	**1900**	--	--	--	--	--	500	--
Non-PHC as Diesel	<500	--	--	--	--	--	--	--	--	**1110**	<500	<500	--	--	--	--	<500	--	--	--	--	--	500	--
TPH by NWTPH-Dx with Silica Gel Cleanup in µg/L																								
Diesel Range Organics	--	--	--	<200	**163** J	**288**	<200	**195** J	**127** J	--	--	--	**92.5** J-	**140** J	**91.8** J	<200	--	--	--	**196** J	<200	<200	500	--
Residual Range Organics	--	--	--	<250	<250	**148** J	<250	**109** J	<250	--	--	--	<250 UJ	<250	<250	<250	--	--	--	**165** J	<250	<250	500	--
TPH by NWTPH-Gx in µg/L																								
Gasoline	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	800	--
Naphtha Distillate	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	800	--
Jet Fuel as JP-4	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	800	--
PHC as Gasoline	<250	--	--	--	--	--	--	--	--	<250	<250	<250	--	--	--	--	<250	--	--	--	--	--	800	--
Non-PHC as Gasoline	<250	--	--	--	--	--	--	--	--	<250	**260**	<250	--	--	--	--	<250	--	--	--	--	--	800	--
Gasoline Range Organics	--	--	**260**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	800	--
Total Metals in µg/L																								
Arsenic	--	--	**77**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5
Mercury	--	--	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2
Cadmium	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5
Chromium	--	--	**9.2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5
Lead	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15
Chlorinated Phenols by EPA Method 8270E in µg/L																								
4-Chloro-3-Methylphenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	--	--	<10.0 UJ	<10.0	--	--	1600
2-Chlorophenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	--	--	<10.0 UJ	<10.0	--	--	40
2,4-Dichlorophenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	--	--	<10.0 UJ	<10.0	--	--	48
Pentachlorophenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	<0.5	<0.5	**58.4** J	<10.0	--	--	1
2,4,6-Trichlorophenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	<0.5	<0.5	**0.869** J	<10.0	--	--	7.95
2,4,5-Trichlorophenol	--	--	--	<10.0	<10.0	<10.0	<10.0	--	--	--	--	--	--	<10.0 UJ	--	--	--	--	--	**2.87** J	<10.0	--	--	1600
Tetrachlorophenols (2,3,4,5 and 2,3,4,6)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<0.5	--	--	--	--	--
PCB-1016	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1221	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1232	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1242	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1248	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1254	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1260	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-1268	--	--	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs) by 8260D in µg/L																								
Acetone	<20	**40**	<25	<1.00 UJ	--	--	--	--	--	--	--	--	--	--	--	--	<20	--	--	--	--	**3.53** J-	--	7,200
Acrylonitrile	--	--	<10	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.500	--	0.081
Benzene	<0.5	<0.5	<2.0	<0.0400	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	**0.05**	--	5
Bromobenzene	<0.5	<0.5	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.500	--	64
Bromodichloromethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	7
Bromoform	<0.5	<0.5	<2.0	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<1.00	--	55
Bromomethane	<0.5	<0.5	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.500	--	11
n-Butylbenzene	<2	<2	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.500	--	400
sec-Butylbenzene	<2	<2	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**0.231** J	--	800
tert-Butylbenzene	<2	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.200	--	800
Carbon Tetrachloride	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	5
Chlorobenzene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	100
Chlorodibromomethane	<0.5	<0.5	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	5
Chloroethane	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	--
Chloroform	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	14
Chloromethane	<0.5	<0.5	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.500	--	--
2-Chlorotoluene	<2	<2	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.100	--	160
4-Chlorotoluene	<2	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.200	--	160
1,2-Dibromo-3-Chloropropane	<2	<2	<10	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<1.00	--	0.144
1,2-Dibromoethane	<2	<2	<0.010	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.100	--	0.05
Dibromomethane	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	0.05
1,2-Dichlorobenzene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	600
1,3-Dichlorobenzene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	--
1,4-Dichlorobenzene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	75
Dichlorodifluoromethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	1,600
1,1-Dichloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	7.68

Please see notes at end of table.

Table 5
Groundwater Results
Buse Timber & Sales
Everett, Washington

	Vehicle Repair Shop				Former Log Pond Fill			Current Lube Building/Mechanics Shop Area		Former Fire Pond			Former Waste Mixing Area	Current Dip Tank	Current Washdown Area	Former Main Plant Drain		Former PCP Dip Tank				Former UST Area	Groundwater MTCA Method A Cleanup Level (µg/L)	Ground Water Method B Target Cleanup Level (µg/L)
Sample Location ID:	MSA-1 GW0014	MSA-2 GW0015	B2	SB-1W	SB-2W	SB-3W	SB-9W	SB-4W	SB-5W	FPD-1 GW0011	FPD-2 GW0012	FPD-3 GW0013	SB-6W	SB-7W	SB-8W	SB-10W	NSD-1 GW0017	FDT-4 GW0001	FDT-6 GW0003	SB-11W	SB-12A-W	SB-13W		
Depth (feet):	2-6	2-6	--	15.2	12.7	12.3	21.3	6.8	6.4	2-6	3-7	4-8	11.7	9.7	2.9	16.5	3-7	3-7	4-8	6.8	22	23.5		
Date:	6/18/1998	6/19/1998	8/17/2018	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	07/01/2021	06/30/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	06/30/2021	07/01/2021	06/30/2021		
Volatile Organic Compounds (VOCs) by 8260D in µg/L, continued																								
1,2-Dichloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	4.81
1,1-Dichloroethene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	7.00
cis-1,2-Dichloroethene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	16
trans-1,2-Dichloroethene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	100
1,2-Dichloropropane	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	5
1,1-Dichloropropene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	--
1,3-Dichloropropane	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	160
cis-1,3-Dichloropropene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	0.438
trans-1,3-Dichloropropene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	--
2,2-Dichloropropane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	--
di-Isopropyl Ether	--	--	--	<0.0400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.0400	--	--
Ethylbenzene	**1.8**	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	700
Hexachloro-1,3-Butadiene	<2	<2	<2.0	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<1.00	--	0.561
Isopropylbenzene	<2	<2	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**0.544**	--	800
p-Isopropyltoluene	<2	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**0.193** J	--	--
2-Butanone (MEK)	<20	<20	<10	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<20	--	--	--	--	<1.00	--	4,800
Methylene Chloride	<1	<1	<5.0	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	<1.00	--	5
4-Methyl-2-Pentanone (MIBK)	<20	<20	<10	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<20	--	--	--	--	<1.00	--	640
Methyl tert-Butyl Ether	--	--	<2.0	<0.0400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.0400	--	24.3
Naphthalene	<2	<2	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**1.94**	--	160
n-Propylbenzene	<2	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**0.766**	--	800
Styrene	<0.5	<0.5	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.500	--	100
1,1,1,2-Tetrachloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	1.68
1,1,2,2-Tetrachloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	0.219
1,1,2-Trichlorotrifluoroethane	--	--	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.100	--	240,000
Tetrachloroethene	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	5
Toluene	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	**0.204**	--	640
1,2,3-Trichlorobenzene	<2	<2	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.500	--	6.4
1,2,4-Trichlorobenzene	<2	<2	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.500	--	15
1,1,1-Trichloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	200
1,1,2-Trichloroethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	3
Trichloroethene	<0.5	<0.5	<2.0	<0.0400	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.0400	--	4
Trichlorofluoromethane	<0.5	<0.5	<2.0	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	2,400
1,2,3-Trichloropropane	<0.5	<0.5	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.500	--	0.0004
1,2,4-Trimethylbenzene	**8**	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<0.200	--	80
1,2,3-Trimethylbenzene	--	--	--	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.942**	--	80
1,3,5-Trimethylbenzene	**3**	<2	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	**0.844**	--	80
Vinyl Chloride	<0.5	<0.5	<0.20	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.100	--	0.3
Xylenes, Total	**11**	<0.5	--	<0.260	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	**0.204** J	--	1,600
Bromochloromethane	<0.5	<0.5	<2.0	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	--	--	--	--	<0.200	--	--
Carbon Disulfide	<0.5	**0.6**	<2.0	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	**1.5**	--	--	--	--	**0.587**	--	800
trans-1,4-Dichloro-2-Butene	--	--	--	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.200	--	--
2-Hexanone	<20	<20	<10	<1.00	--	--	--	--	--	--	--	--	--	--	--	--	<20	--	--	--	--	<1.00	--	40
n-Hexane	--	--	--	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.148** J	--	480
Iodomethane	--	--	--	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.500	--	--
Vinyl Acetate	--	--	--	<0.500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.500	--	800

Please see notes at end of table.

Table 5
Groundwater Results
Buse Timber & Sales
Everett, Washington

	Vehicle Repair Shop				Former Log Pond Fill			Current Lube Building/Mechanics Shop Area		Former Fire Pond			Former Waste Mixing Area	Current Dip Tank	Current Washdown Area	Former Main Plant Drain		Former PCP Dip Tank				Former UST Area	Groundwater MTCA Method A Cleanup Level (µg/L)	Ground Water Method B Target Cleanup Level (µg/L)
Sample Location ID:	MSA-1 GW0014	MSA-2 GW0015	B2	SB-1W	SB-2W	SB-3W	SB-9W	SB-4W	SB-5W	FPD-1 GW0011	FPD-2 GW0012	FPD-3 GW0013	SB-6W	SB-7W	SB-8W	SB-10W	NSD-1 GW0017	FDT-4 GW0001	FDT-6 GW0003	SB-11W	SB-12A-W	SB-13W		
Depth (feet):	2-6	2-6	--	15.2	12.7	12.3	21.3	6.8	6.4	2-6	3-7	4-8	11.7	9.7	2.9	16.5	3-7	3-7	4-8	6.8	22	23.5		
Date:	6/18/1998	6/19/1998	8/17/2018	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	07/01/2021	06/30/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	06/30/2021	07/01/2021	06/30/2021		
Semi-Volatile Organic Compounds (SVOCs) by 8270 in µg/L																								
1,2,4-Trichlorobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.1
1,2-Dichlorobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	600
1,3-Dichlorobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	75
1-Methylnaphthalene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.51
2,4,5-Trichlorophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1600
2,4,6-Trichlorophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.95
2,4-Dichlorophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48
2,4-Dimethylphenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	320
2,4-Dinitrophenol	--	--	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32
2,4-Dinitrotoluene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.129
2,6-Dinitrotoluene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.129
2-Chloronaphthalene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	640
2-Chlorophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40
2-Methylnaphthalene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32
2-Methylphenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	800
2-Nitroaniline	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	160
2-Nitrophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3+4-methylphenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2400
4,6-Dinitro-2-methylphenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.28
4-Bromophenyl phenyl ether	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1600
4-Chloroaniline	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.438
4-Chlorophenyl phenyl ether	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	480
Acenaphthylene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2400
Benz(a)anthracene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2
Benzo(b)fluoranthene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzyl alcohol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1600
Bis(2-chloroethoxy)methane	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48
Bis(2-chloroethyl) ether	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0398
Bis(2-ethylhexyl) phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6
bis(2-Ethylhexyl)adipate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	400
Butyl benzyl phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46.1
Carbazole	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1600
Di-n-octyl phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	160
Dibenz(a,h)anthracene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0219
Diethyl phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.47
Dimethyl phthalate	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.231
Fluoranthene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	800
Fluorene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.8
Hexachlorobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.273
Hexachlorobutadiene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.561
Hexachlorocyclopentadiene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48
Hexachloroethane	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
Indeno(1,2,3-cd)pyrene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isophorone	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	92.1

Please see notes at end of table.

Table 5
Groundwater Results
Buse Timber & Sales
Everett, Washington

	Vehicle Repair Shop				Former Log Pond Fill			Current Lube Building/Mechanics Shop Area		Former Fire Pond			Former Waste Mixing Area	Current Dip Tank	Current Washdown Area	Former Main Plant Drain		Former PCP Dip Tank				Former UST Area	Groundwater MTCA Method A Cleanup Level (µg/L)	Ground Water Method B Target Cleanup Level (µg/L)
Sample Location ID:	MSA-1 GW0014	MSA-2 GW0015	B2	SB-1W	SB-2W	SB-3W	SB-9W	SB-4W	SB-5W	FPD-1 GW0011	FPD-2 GW0012	FPD-3 GW0013	SB-6W	SB-7W	SB-8W	SB-10W	NSD-1 GW0017	FDT-4 GW0001	FDT-6 GW0003	SB-11W	SB-12A-W	SB-13W		
Depth (feet):	2-6	2-6	--	15.2	12.7	12.3	21.3	6.8	6.4	2-6	3-7	4-8	11.7	9.7	2.9	16.5	3-7	3-7	4-8	6.8	22	23.5		
Date:	6/18/1998	6/19/1998	8/17/2018	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	07/01/2021	06/30/2021	07/01/2021	07/01/2021	6/18/1998	6/19/1998	6/19/1998	06/30/2021	07/01/2021	06/30/2021		
Semi-Volatile Organic Compounds (SVOCs) by 8270 in µg/L																								
N-nitrosodipropylamine	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0125
Naphthalene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0461
Nitrobenzene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16
Pentachlorophenol	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.257
Phenanthrene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	640
Pyrene	--	--	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
1. µg/L = Micrograms per liter.
2. Bold values indicate the compound was detected above method detection limits.
3. < = Analyte was not detected above the reporting limit shown.
4. Shaded results exceed the MTCA Method B targer groundwater cleanup level.
5. -- = Value not available.
6. J = Result is estimated.
7. J+ = Result is estimated and may be biased high.
8. J- = Result is estimated and may be biased low.
9. UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
10. PHC = Petroleum hydrrocarbons.
11. PCP = Pentachlorophenol.
12. Groundwater cleanup levels from the MTCA Method A and Method B, chapter 173-340 WAC (August 2023 update).

Table 6
Sediment Results: TPH, PAHs, PCBs, Chlorinated Phenols, and Metals
Buse Timber & Sales
Everett, Washington

	Tide Gate		West Drainage	East Drainage								South Drainage	Former PCP Dip Tank			Vehicle Repair Shop	Puget Sound Natural Background Concentrations	Sediment Management Standards (Benthic)	
Sample Location ID:	USG-1 SD0013	DR-1	WEST DRAINAGE	NDM-1 SD0003	NDM-2 SD0001	NDM-2 SD0002	NDM-3 SD0004	NDM-4 SD0005	NDM-5 SD0006	NDM-6 SD0007	EAST DRAINAGE	SOUTH DRAINAGE	FDT-9 SD0008	FDT-9 SD0010	FDT-10 SD0011	MSA-4 SD0012		Sediment Cleanup Objective	
Depth (inches):	0-4	0-12	0-12	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-12	0-12	Sump	Sump	Sump	Sump			
Date:	6/29/1998	07/02/2021	07/02/2021	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	07/02/2021	07/02/2021	6/29/1998	6/29/1998	6/29/1998	6/29/1998		Freshwater	Marine
Total Petroleum Hydrocarbons (TPH) by NWTPH-Dx in mg/kg																			
Diesel Range Organics	<25	**269**	<507	<50 UJ	**7740** J	**7120** J	**5240** J	**3440** J	<50 UJ	<10 UJ	**454**	**12.9** J	--	--	--	<25	--	340	--
Residual Range Organics	**220**	**1460**	<1270	**8390** J	**45300** J	**31900** J	**23900** J	**20400** J	**761** J	**800** J	**2410**	**26.3** J	--	--	--	**140000**	--	3,600	--
Total Petroleum Hydrocarbons (TPH) by NWTPH-Dx with Silica Gel Cleanup in mg/kg																			
Diesel Range Organics	--	**106** J	<507	--	--	--	--	--	--	--	**305**	<14.5	--	--	--	--	--	340	--
Residual Range Organics	--	**659**	<1270	--	--	--	--	--	--	--	**1730**	**13.3** J	--	--	--	--	--	3,600	--
TPH by NWTPH-Gx in mg/kg																			
Gasoline	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<20 UJ	--	--	--
Naphtha Distillate	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<20 UJ	--	--	--
Jet Fuel as JP-4	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<20 UJ	--	--	--
PHC as Gasoline	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**76** J	--	--	--
Non-PHC as Gasoline	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<20 UJ	--	--	--
Aviation Gasoline Range Hydrocarbons	--	--	--	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	--	--	--	--	--	--	--	--	--
Gasoline Range Organics	--	--	--	**5**	**46** J	**72** J	**54** J	**18** J	<5 UJ	<5 UJ	--	--	--	--	--	--	--	--	--
VM&P Naphtha Range Hydrocarbons	--	--	--	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	--	--	--	--	--	--	--	--	--
Mineral Spirits	--	--	--	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	--	--	--	--	--	--	--	--	--
Gx Range Hydrocarbons (>C12)	--	--	--	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs) by 8260B in µg/kg																			
Dichlorodifluoromethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Chloromethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Vinyl Chloride	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Bromomethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Chloroethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Trichlorofluoromethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Acetone	<100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10000	--	--	--
1,2-Dichloroethene	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Carbon Disulfide	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Methylene Chloride	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
trans-1,2-Dichloroethene	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
1,1-Dichloroethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2500**	--	--	--
2-Butanone	<40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10000	--	--	--
2,2-Dichloropropane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
cis-1,2-Dichloroethene	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**730**	--	--	--
Chloroform	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Bromochloromethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
1,1,1-Trichloroethane	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**560**	--	--	--
1,1-Dichloropropene	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Carbon Tetrachloride	<10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270E-SIM in mg/kg																			
Anthracene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	220
Acenaphthene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	16
Acenaphthylene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	66
Benzo(a)anthracene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	110
Benzo(a)pyrene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	99
Benzo(b)fluoranthene	--	<0.344	<0.793	--	--	--	--	--	--	--	**0.164** J	<0.349	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	<0.344	<0.793	--	--	--	--	--	--	--	**0.308** J	<0.349	--	--	--	--	--	--	31
Benzo(k)fluoranthene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	230
Chrysene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	110
Dibenz(a,h)anthracene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	12
Fluoranthene	--	<0.344	<0.793	--	--	--	--	--	--	--	**0.259** J	<0.349	--	--	--	--	--	--	160
Fluorene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	23
Indeno(1,2,3-cd)pyrene	--	<0.344	<0.793	--	--	--	--	--	--	--	<0.557	<0.349	--	--	--	--	--	--	34
Naphthalene	--	<1.15	<2.64	--	--	--	--	--	--	--	<1.86	<1.16	--	--	--	--	--	--	99
Phenanthrene	--	<0.344	<0.793	--	--	--	--	--	--	--	**0.31** J	<0.349	--	--	--	--	--	--	100
Pyrene	--	<0.344	<0.793	--	--	--	--	--	--	--	**0.637**	<0.349	--	--	--	--	--	--	1000
1-Methylnaphthalene	--	<1.15	<2.64	--	--	--	--	--	--	--	<1.86	<1.16	--	--	--	--	--	--	--
2-Methylnaphthalene	--	<1.15	<2.64	--	--	--	--	--	--	--	<1.86	<1.16	--	--	--	--	--	--	38
2-Chloronaphthalene	--	<1.15	<2.64	--	--	--	--	--	--	--	<1.86	<1.16	--	--	--	--	--	--	--
Total PAHs	--	<1.15	<2.64	--	--	--	--	--	--	--	**1.68**	<1.16	--	--	--	--	--	17	--

Please see notes at end of table.

Table 6
Sediment Results: TPH, PAHs, PCBs, Chlorinated Phenols, and Metals
Buse Timber & Sales
Everett, Washington

	Tide Gate		West Drainage	East Drainage								South Drainage	Former PCP Dip Tank			Vehicle Repair Shop	Puget Sound Natural Background Concentrations	Sediment Management Standards (Benthic)	
Sample Location ID:	USG-1 SD0013	DR-1	WEST DRAINAGE	NDM-1 SD0003	NDM-2 SD0001	NDM-2 SD0002	NDM-3 SD0004	NDM-4 SD0005	NDM-5 SD0006	NDM-6 SD0007	EAST DRAINAGE	SOUTH DRAINAGE	FDT-9 SD0008	FDT-9 SD0010	FDT-10 SD0011	MSA-4 SD0012		Sediment Cleanup Objective	
Depth (inches):	0-4	0-12	0-12	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-12	0-12	Sump	Sump	Sump	Sump			
Date:	6/29/1998	07/02/2021	07/02/2021	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	5/8/1998	07/02/2021	07/02/2021	6/29/1998	6/29/1998	6/29/1998	6/29/1998		Freshwater	Marine
Polychlorinated Biphenyls (PCBs) by EPA Method 8082A in mg/kg																			
PCB 1016	--	<0.128	<0.301	--	--	--	--	--	--	--	<3.22	<1.90	--	--	--	--	--	--	--
PCB 1221	--	<0.128	<0.301	--	--	--	--	--	--	--	<3.22	<1.90	--	--	--	--	--	--	--
PCB 1232	--	<0.128	<0.301	--	--	--	--	--	--	--	<3.22	<1.90	--	--	--	--	--	--	--
PCB 1242	--	<0.128	<0.301	--	--	--	--	--	--	--	<3.22	<1.90	--	--	--	--	--	--	--
PCB 1248	--	<0.0644	<0.151	--	--	--	--	--	--	--	<1.61	<0.954	--	--	--	--	--	--	--
PCB 1254	--	<0.0644	<0.151	--	--	--	--	--	--	--	<1.61	<0.954	--	--	--	--	--	--	--
PCB 1260	--	<0.0644	<0.151	--	--	--	--	--	--	--	<1.61	<0.954	--	--	--	--	--	--	--
Total PCBs	--	<0.128	<0.301	--	--	--	--	--	--	--	<3.22	<1.90	--	--	--	--	--	0.11	12
Chlorinated Phenols by EPA Method 8270E and 8151A in mg/kg																			
4-Chloro-3-Methylphenol	--	<34.4	<44.3	--	--	--	--	--	--	--	<60.3	<37.9	--	--	--	--	--	--	--
2-Chlorophenol	--	<34.4	<44.3	--	--	--	--	--	--	--	<60.3	<37.9	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	<34.4	<44.3	--	--	--	--	--	--	--	<60.3	<37.9	--	--	--	--	--	--	--
Pentachlorophenol	<0.005	<34.4	<44.3	<0.01	--	--	--	--	--	--	<60.3	<37.9	**0.016**	**0.5**	**0.22**	**0.016**	--	1.2	0.36
2,4,6-Trichlorophenol	<0.005	<34.4	<44.3	--	--	--	--	--	--	--	<60.3	<37.9	<0.005	<0.005	<0.005	<0.005	--	--	--
2,4,5-Trichlorophenol	--	<34.4	<44.3	--	--	--	--	--	--	--	<60.3	<37.9	--	--	--	--	--	--	--
Tetrachlorophenols (2,3,4,5 and 2,3,4,6)	<0.005	--	--	--	--	--	--	--	--	--	--	--	<0.005	**0.105**	**0.081**	<0.005	--	--	--
Metals by EPA Method 6020B and 7471B in mg/kg																			
Arsenic	--	**16.0**	**24.2** J+	--	--	--	--	--	--	--	**19.3**	**15.7**	--	--	--	--	11	14	57
Barium	--	**114**	**277**	--	--	--	--	--	--	--	**81.2**	**148**	--	--	--	--	--	--	--
Cadmium	--	<3.75	<8.87	--	--	--	--	--	--	--	**1.43** J	**0.345** J	--	--	--	--	0.8	2.1	5.1
Chromium	--	**60.5**	**37.4** J	--	--	--	--	--	--	--	**54.7**	**66.2**	--	--	--	--	62	72	260
Copper	--	**50.3**	**89.1**	--	--	--	--	--	--	--	**90.3**	**54.0**	--	--	--	--	45	400	390
Lead	--	**12.0**	**13.8** J+	--	--	--	--	--	--	--	**30.9**	**20.9**	--	--	--	--	21	360	450
Nickel	--	**48.7**	**41.7**	--	--	--	--	--	--	--	**63.1**	**52.3**	--	--	--	--	50	26	--
Selenium	--	<9.36	<22.2	--	--	--	--	--	--	--	<16.6	**0.88** J	--	--	--	--	--	11	--
Silver	--	<1.87	<4.43	--	--	--	--	--	--	--	<3.32	<1.81	--	--	--	--	0.24	0.57	6.1
Zinc	--	**124**	**156** J	--	--	--	--	--	--	--	**702**	**134**	--	--	--	--	93	3200	410
Mercury	--	**0.110** J	**0.170** J	--	--	--	--	--	--	--	**0.665**	**0.130** J	--	--	--	--	0.2	0.66	0.41

Notes:

1. mg/kg = Milligrams per kilogram.
2. Bold values indicate the compound was detected above method detection limits.
3. < = Analyte was not detected above the reporting limit shown.
4. Shaded results exceed the Sediment Management Standards.
5. Natural Background Concentrations and Sediment Management Standards from WAC 173-204 and Washington Ecology's *Sediment Cleanup User's Manual* (December 2019 update).
6. -- = Value not available.
7. J = Result is estimated.
8. J+ = Result is estimated and may be biased high.
9. µg/kg = Micrograms per kilogram.
10. UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
11. PCP = Pentachlorophenol.

Table 7
Sediment Results: Dioxins/Furans
Buse Timber & Sales
Everett, Washington

Sample Location ID:	Tide Gate DR-1	South Drainage DR-10	WEST DRAINAGE	EAST DRAINAGE	SOUTH DRAINAGE	Port Gardner Puget Sound Regional Background Dioxins/Furans
Date:	07/02/2021	07/02/2021	07/02/2021	07/02/2021	07/02/2021	
Dioxins/Furans by EPA Method 8290A in pg/g						
2,3,7,8-TCDD	**0.13** J	**0.21** J	<0.29	**1.27** J	**0.173** J	--
1,2,3,7,8-PeCDD	**1.33** J	**0.95** J	**0.97** J	**16.3**	**0.98** J	--
1,2,3,4,7,8-HxCDD	**1.37** J	**1.05** J	**1.12** J	**18.3**	**1.20** J	--
1,2,3,6,7,8-HxCDD	**17.6**	**3.48** J	**9.78** J	**237**	**6.98**	--
1,2,3,7,8,9-HxCDD	**4.40** J	**2.54** J	**3.28** J	**64.9**	**3.14** J	--
1,2,3,4,6,7,8-HpCDD	**136**	**43.6**	**88.2**	**2130**	**74.1**	--
OCDD	**740**	**284**	**382**	**11800**	**378**	--
2,3,7,8-TCDF	**1.67** J	**3.79**	**1.63** J	**16.3**	**2.66**	--
1,2,3,7,8-PeCDF	**0.60** J	**0.89** J	**0.71** J	**6.84**	**0.74** J	--
2,3,4,7,8-PeCDF	**1.00** J	<1.1 UK	**0.88** J	**10.1**	**1.02** J	--
1,2,3,4,7,8-HxCDF	**2.28** J	**1.32** J	**2.12** J	**36.0**	**1.84** J	--
1,2,3,6,7,8-HxCDF	**2.90** J	**0.838** J	**2.18** J	**47.3**	**1.58** J	--
2,3,4,6,7,8-HxCDF	**2.81** J	**0.837** J	**2.12** J	**34.3**	**1.60** J	--
1,2,3,7,8,9-HxCDF	**0.13** J	<0.098	**0.35** J	**2.28** J	**0.14** J	--
1,2,3,4,6,7,8-HpCDF	**91.5**	**11.9**	**69.5**	**2030**	**37.2**	--
1,2,3,4,7,8,9-HpCDF	**3.25** J	**0.617** J	**2.56** J	**53.9**	**1.34** J	--
OCDF	**95.2**	**17.4**	**59.6**	**2120**	**35.8**	--
Total TEQ (ND = 1/2 DL)	**7.65**	**3.39**	**5.39**	**113**	**4.65**	3.9
Total HxCDD	**95.6**	**34.9**	**57.4**	**1550**	**54.1**	--

Notes:
1. pg/g = Picograms per gram.
2. Bold values indicate the compound was detected above method detection limits.
3. < = Analyte was not detected above the detection limit shown.
4. Regional Background Concentrations from Washington Ecology's *Sediment Cleanup User's Manual* (December 2021 update).
5. Shaded results exceed the regional background concentration for dioxins/furans.
6. Soil cleanup levels from the MTCA Method B Cancer 173-340 WAC (August 2023 update).
7. -- = Value not available.
8. J = Result is estimated.
9. UK = Estimated maximum possible concentration (EMPC). Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

Table 8
Preliminary Cleanup Levels: Soil
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Soil Method A (mg/kg)	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Method B Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Background Concentrations	PCUL	Basis
							Plants	Soil Biota	Wildlife			
Total Petroleum Hydrocarbons (TPH) using NW TPH Methods												
Gasoline Range Organics	mg/kg	5	100/300	--	--	--	--	100	2000 [6]	--	100	ES
Diesel Range Organics	mg/kg	50	200	--	--	--	--	200	2000 [6]	--	200	ES
Residual Range Organics	mg/kg	100	200	--	--	--	--	200	2000 [6]	--	200	ES
Volatile Organic Compounds (VOCs) using EPA 8260												
Acetone	mg/kg	0.25	--	72000	--	29	--	--	--	--	29	SPG
Benzene	mg/kg	0.0175	--	320	18	0.027	--	--	--	--	0.027	SPG
Bromobenzene	mg/kg	0.0125	--	640	--	0.56	--	--	--	--	0.56	SPG
Bromodichloromethane	mg/kg	0.025	--	1600	16	0.033	--	--	--	--	0.033	SPG
Bromoform	mg/kg	0.015	--	1600	130	0.36	--	--	--	--	0.36	SPG
Bromomethane	mg/kg	0.025	--	110	--	0.051	--	--	--	--	0.051	SPG
2-Butanone (MEK)	mg/kg	0.3	--	48000	--	20	--	--	--	--	20	SPG
Carbon Tetrachloride	mg/kg	0.025	--	320	14	0.041	--	--	--	--	0.041	SPG
Chlorobenzene	mg/kg	0.015	--	1600	--	0.86	--	40	--	--	0.86	SPG
Chlorodibromomethane	mg/kg	0.015	--	1600	12	0.024	--	--	--	--	0.024	SPG
Chloroethane	mg/kg	0.075	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/kg	0.0175	--	800	32	0.074	--	--	--	--	0.074	SPG
Chloromethane	mg/kg	0.05	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	mg/kg	0.0165	--	1600	--	1.9	--	--	--	--	1.9	SPG
4-Chlorotoluene	mg/kg	0.0165	--	1600	--	1.9	--	--	--	--	1.9	SPG
Isopropylbenzene	mg/kg	0.015	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-Chloropropane	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/kg	0.01	--	720	0.5	0.00027	--	--	--	--	0.01	MRL
1,2-Dichlorobenzene	mg/kg	0.02	--	7200	--	7	--	--	--	--	7	SPG
1,3-Dichlorobenzene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	0.015	--	5600	190	1.2	--	20	--	--	1.2	SPG
Dichlorodifluoromethane	mg/kg	0.015	--	16000	--	38	--	--	--	--	38	SPG
1,1-Dichloroethane	mg/kg	0.025	--	16000	180	0.041	--	--	--	--	0.041	SPG
1,2-Dichloroethane	mg/kg	0.02	--	480	11	0.023	--	--	--	--	0.023	SPG
1,1-Dichloroethene	mg/kg	0.1	--	4000	--	0.046	--	--	--	--	0.1	MRL
cis-1,2-Dichloroethene	mg/kg	0.015	--	160	--	0.079	--	--	--	--	0.079	SPG
trans-1,2-Dichloroethene	mg/kg	0.01	--	1600	--	0.52	--	--	--	--	0.52	SPG
1,2-Dichloropropane	mg/kg	0.025	--	3200	27	0.025	--	700	--	--	0.025	SPG
1,1-Dichloropropene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	mg/kg	0.01	--	1600	--	0.88	--	--	--	--	0.88	SPG
cis-1,3-Dichloropropene	mg/kg	0.015	--	2400	10	0.002	--	--	--	--	0.015	MRL
trans-1,3-Dichloropropene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/kg	0.025	--	8000	--	5.9	--	--	--	--	5.9	SPG
Hexachloro-1,3-Butadiene	mg/kg	0.04	--	80	13	0.012	--	--	--	--	0.04	MLR
2-Hexanone	mg/kg	0.0625	--	400	--	0.17	--	--	--	--	0.17	SPG
n-Hexane	mg/kg	0.0225	--	4800	--	72	--	--	--	--	72	SPG
p-Isopropyltoluene	mg/kg	0.2	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/kg	0.035	--	480	94	0.022	--	--	--	--	0.035	MRL
4-Methyl-2-Pentanone (MIBK)	mg/kg	0.2	--	6400	--	2.7	--	--	--	--	2.7	SPG
Methyl tert-Butyl Ether	mg/kg	0.02	--	--	560	0.1	--	--	--	--	0.1	SPG
Naphthalene	mg/kg	0.1	--	1600	--	4.5	--	--	--	--	4.5	SPG
n-Propylbenzene	mg/kg	0.015	--	8000	--	16	--	--	--	--	16	SPG
Styrene	mg/kg	0.01	--	16000	--	2.2	300	--	--	--	2.2	SPG
1,1,1,2-Tetrachloroethane	mg/kg	0.025	--	2400	38	0.0098	--	--	--	--	0.025	MRL
1,1,2,2-Tetrachloroethane	mg/kg	0.2	--	1600	5	0.0012	--	--	--	--	0.2	MRL
Tetrachloroethene	mg/kg	0.015	--	480	480	0.05	--	--	--	--	0.05	SPG
Toluene	mg/kg	0.03	--	6400	--	4.5	200	--	--	--	4.5	SPG
1,2,3-Trichlorobenzene	mg/kg	0.06	--	64	--	0.2	--	20	--	--	0.2	SPG
1,2,4-Trichlorobenzene	mg/kg	0.06	--	800	34	0.56	--	20	--	--	0.56	SPG
1,1,1-Trichloroethane	mg/kg	0.02	--	160000	--	1.5	--	--	--	--	1.5	SPG
1,1,2-Trichloroethane	mg/kg	0.0125	--	320	18	0.017	--	--	--	--	0.017	SPG
Trichloroethylene	mg/kg	0.015	--	40	12	0.025	--	--	--	--	0.025	SMB
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	0.005	--	2400000	--	7600	--	--	--	--	7600	SPG
1,2,3-Trichloropropane	mg/kg	0.03	--	320	0.0063	0.0000024	--	--	--	--	0.03	MRL
1,2,4-Trimethylbenzene	mg/kg	0.015	--	800	--	1.3	--	--	--	--	1.3	SPG
1,3,5-Trimethylbenzene	mg/kg	0.015	--	800	--	1.3	--	--	--	--	1.3	SPG
Vinyl Chloride	mg/kg	0.025	--	240	0.67	0.0017	--	--	--	--	0.025	MRL
m,p-Xylene	mg/kg	0.05	--	16000	--	27	--	--	--	--	27	SPG
o-Xylene	mg/kg	0.025	--	16000	--	14	--	--	--	--	14	SPG
n-Butylbenzene	mg/kg	0.02	--	4000	--	14	--	--	--	--	14	SPG
sec-Butylbenzene	mg/kg	0.15	--	8000	--	25	--	--	--	--	25	SPG
tert-Butylbenzene	mg/kg	0.015	--	8000	--	20	--	--	--	--	20	SPG

Please see notes at end of table.

Table 8
Preliminary Cleanup Levels: Soil
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Soil Method A (mg/kg)	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Method B Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Background Concentrations	PCUL	Basis
							Plants	Soil Biota	Wildlife			
Semi-Volatile Organic Compounds (SVOCs) using EPA 8270E												
1,2,4-Trichlorobenzene	mg/kg	0.03	--	800	34	0.56	--	20	--	--	0.56	SPG
1,2-Dichlorobenzene	mg/kg	0.04	--	7200	--	7	--	--	--	--	7	SPG
1,3-Dichlorobenzene	mg/kg	0.04	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	0.03	--	5600	190	1.2	--	20	--	--	1.2	SPG
1-Methylnaphthalene	mg/kg	0.03	--	5600	34	0.082	--	--	--	--	0.082	SPG
2,4,5-Trichlorophenol	mg/kg	0.03	--	8000	--	58	4	9	--	--	4	ES
2,4,6-Trichlorophenol	mg/kg	0.03	--	80	91	0.092	--	10	--	--	0.092	SPG
2,4-Dichlorophenol	mg/kg	0.03	--	240	--	0.33	--	--	--	--	0.33	SPG
2,4-Dimethylphenol	mg/kg	0.03	--	1600	--	4.4	--	--	--	--	4.4	SPG
2,4-Dinitrophenol	mg/kg	0.3	--	160	--	0.13	20	--	--	--	0.3	MRL
2,4-Dinitrotoluene	mg/kg	0.06	--	72	1.5	0.002	--	--	--	--	0.06	MRL
2,6-Dinitrotoluene	mg/kg	0.04	--	72	1.5	0.002	--	--	--	--	0.04	MRL
2-Chloronaphthalene	mg/kg	0.03	--	6400	--	34	--	--	--	--	34	SPG
2-Chlorophenol	mg/kg	0.04	--	400	--	0.47	--	--	--	--	0.47	SPG
2-Methylnaphthalene	mg/kg	0.03	--	320	--	1.7	--	--	--	--	1.7	SPG
2-Methylphenol	mg/kg	0.04	--	4000	--	8.1	--	--	--	--	8.1	SPG
2-Nitroaniline	mg/kg	0.05	--	800	--	1	--	--	--	--	1	SPG
2-Nitrophenol	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
3+4-methylphenol	mg/kg	0.03	--	8000	--	22	--	--	--	--	22	SPG
4,6-Dinitro-2-methylphenol	mg/kg	0.25	--	6.4	--	0.024	--	--	--	--	0.024	MRL
4-Bromophenyl phenyl ether	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	0.03	--	8000	--	22	--	--	--	--	22	SPG
4-Chloroaniline	mg/kg	0.03	--	320	5	0.0027	--	--	--	--	0.03	MRL
4-Chlorophenyl phenyl ether	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/kg	0.2	--	--	--	--	--	7	--	--	7	ES
Acenaphthene	mg/kg	0.03	--	4800	--	49	--	--	--	--	49	SPG
Acenaphthylene	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
Anthracene	mg/kg	0.03	--	2400	--	1100	--	--	--	--	1100	SPG
Benz(a)anthracene	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/kg	0.04	--	24	0.19	3.9	--	--	12	--	0.19	MBC
Benzo(b)fluoranthene	mg/kg	0.1	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/kg	0.1	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
Benzyl alcohol	mg/kg	0.15	--	8000	--	7.1	--	--	--	--	7.1	SPG
Bis(2-chloroethoxy)methane	mg/kg	0.03	--	240	--	0.21	--	--	--	--	0.21	SPG
Bis(2-chloroethyl) ether	mg/kg	0.05	--	--	0.91	0.00022	--	--	--	--	0.05	MRL
Bis(2-ethylhexyl) phthalate	mg/kg	0.04	--	1600	71	13	--	--	--	--	13	SPG
bis(2-Ethylhexyl)adipate	mg/kg	0.2	--	48000	830	290	--	--	--	--	290	SPG
Butyl benzyl phthalate	mg/kg	0.05	--	16000	530	13	--	--	--	--	13	SPG
Carbazole	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
Chrysene	mg/kg	0.05	--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	mg/kg	0.03	--	8000	--	57	200	--	--	--	57	SPG
Di-n-octyl phthalate	mg/kg	0.075	--	800	--	450	--	--	--	--	450	SPG
Dibenz(a,h)anthracene	mg/kg	0.1	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	mg/kg	0.03	--	80	--	1.5	--	--	--	--	1.5	SPG
Diethyl phthalate	mg/kg	0.75	--	64000	--	72	100	--	--	--	72	SPG
Dimethyl phthalate	mg/kg	3.5	--	--	--	--	--	200	--	--	200	ES
Fluoranthene	mg/kg	0.03	--	3200	--	630	--	--	--	--	630	SPG
Fluorene	mg/kg	0.03	--	3200	--	51	--	30	80	--	30	ES
Hexachlorobenzene	mg/kg	0.03	--	64	0.63	0.44	--	--	--	--	0.44	SPG
Hexachlorobutadiene	mg/kg	0.03	--	80	13	0.012	--	--	--	--	0.03	MRL
Hexachlorocyclopentadiene	mg/kg	0.1	--	480	--	1.5	10	--	--	--	1.5	SPG
Hexachloroethane	mg/kg	0.04	--	56	25	0.0088	--	--	--	--	0.04	MRL
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	--	--	--	--	--	--	--	--	--	--
Isophorone	mg/kg	0.04	--	16000	1100	0.49	--	--	--	--	0.49	SPG
N-nitrosodipropylamine	mg/kg	0.08	--	--	0.14	0.00012	--	20	--	--	0.08	MRL
Naphthalene	mg/kg	0.04	--	1600	--	4.5	--	--	--	--	4.5	SPG
Nitrobenzene	mg/kg	0.05	--	160	--	0.1	--	40	--	--	0.1	SPG
Pentachlorophenol	mg/kg	0.2	--	400	2.5	0.016	3	6	4.5	--	0.2	MRL
Phenanthrene	mg/kg	0.03	--	--	--	--	--	--	--	--	--	--
Phenol	mg/kg	0.03	--	24000	--	37	70	30	--	--	30	ES
Pyrene	mg/kg	0.15	--	2400	--	330	--	--	--	--	330	SPG
Dioxins/Furans using EPA 8290												
2,3,7,8 TCDD	mg/kg	0.0000005	--	0.000093	0.00001	0.000017	--	--	--	--	0.000013	MBC
1,2,3,7,8 PeCDD	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8 HxCDD	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8 HxCDD	mg/kg	0.0000025	--	--	0.00016	0.0002	--	--	--	--	0.0002	SPG
1,2,3,7,8,9 HxCDD	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8 HpCDD	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
OCDD	mg/kg	0.000005	--	--	--	--	--	--	--	--	--	--
2,3,7,8 TCDF	mg/kg	0.0000005	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8 PeCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8 PeCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9 HxCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8 HpCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9 HpCDF	mg/kg	0.0000025	--	--	--	--	--	--	--	--	--	--
OCDF	mg/kg	0.000005	--	--	--	--	--	--	--	--	--	--
Total TEQ	mg/kg	0.0000050	--	0.0000930	0.0000130	0.0000170	--	--	0.000002	0.0000052	0.0000052	BC

Please see notes at end of table.

Table 8
Preliminary Cleanup Levels: Soil
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Soil Method A (mg/kg)	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Method B Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Background Concentrations	PCUL	Basis
							Plants	Soil Biota	Wildlife			
Polycyclic Aromatic Hydrocarbons (PAHs) using EPA 8270-SIM methods												
Anthracene	mg/kg	0.02	--	24000	--	1100	--	--	--	--	1100	SPG
Acenaphthene	mg/kg	0.02	--	4800	--	49	20	--	--	--	20	EP
Acenaphthylene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/kg	0.03	--	24	0.19	3.9	--	--	12	--	0.19	MBC
Benzo(b)fluoranthene	mg/kg	0.025	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/kg	0.05	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/kg	0.025	--	--	--	--	--	--	--	--	--	--
Chrysene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/kg	0.05	--	--	--	--	--	--	--	--	--	--
Fluoranthene	mg/kg	0.02	--	3200	--	630	--	--	--	--	630	SPG
Fluorene	mg/kg	0.02	--	3200	--	51	--	30	--	--	30	ES
Indeno(1,2,3-cd)pyrene	mg/kg	0.04	--	--	--	--	--	--	--	--	--	--
Naphthalene	mg/kg	0.02	--	1600	--	4.5	--	--	--	--	4.5	SPG
Phenanthrene	mg/kg	0.02	--	--	--	--	--	--	--	--	--	--
Pyrene	mg/kg	0.04	--	2400	--	330	--	--	--	--	330	SPG
1-Methylnaphthalene	mg/kg	0.02	--	5600	34	0.082	--	--	--	--	0.082	SPG
2-Methylnaphthalene	mg/kg	0.02	--	320	--	1.7	--	--	--	--	1.7	SPG
Metals using EPA 6020 methods												
Arsenic	mg/kg	0.25	--	24	0.67	2.9	10	60	132	7	7	BC
Barium	mg/kg	0.5	--	16000	--	1600	500	--	102	--	102	EW
Cadmium	mg/kg	0.02	--	80	--	0.69	4	20	14	1	4	EP
Chromium	mg/kg	0.25	--	--	--	--	42	42	67	48	67	EW
Copper	mg/kg	0.75	--	3200	--	280	100	50	217	36	50	ES
Lead	mg/kg	1	--	--	--	3000	50	500	118	24	50	EP
Mercury	mg/kg	0.2	--	--	--	2.1	0.3	0.1	5.5	0.07	0.2	MRL
Nickel	mg/kg	0.25	--	1600	--	420	30	200	980	48	48	BC
Selenium	mg/kg	1	--	400	--	5.2	1	70	0.3	--	1	MRL
Silver	mg/kg	0.02	--	400	--	14	2	--	--	--	2	EP
Zinc	mg/kg	3.5	--	24000	--	6000	86	200	360	85	200	ES
Wood Waste using SM 4500, EPA 8270, and EPA 9060 methods												
Ammonia	mg/kg	1	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	0.5	--	--	--	--	--	--	--	--	--	--
Benzoic Acid	mg/kg	0.1	--	320000	--	260	--	--	--	--	260	SPG
Benzyl alcohol	mg/kg	0.15	--	8000	--	7.1	--	--	--	--	7.1	SPG
Total Organic Carbon	%	0.15	--	--	--	--	--	--	--	--	--	--

Notes:

1. mg/kg = Milligrams per kilogram.
2. EPA = United States Environmental Protection Agency.
3. -- = Not available or not applicable.
4. MRL = Method Reporting Limit.
5. MBNC = Soil Method B Direct Contact Noncancer.
6. MBC = Soil Method B Direct Cancer Contact.
7. SPG = Soil Protective of Groundwater Vadose @ 13 degrees C.
8. EP = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Plants.
9. ES = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Soil.
10. EW = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Wildlife.
11. BC = Regional Background Concentration.
12. PCUL = Preliminary Cleanup Levels.
13. Soil cleanup levels from the MTCA Method A and B from WAC 173-340 (January 2023 update).
14. SGC = Silica Gel Cleanup.
15. Ecological indicator soil concentration revised downward to account for residual saturation.
16. Backgound concentrations from Natural Background Soil Metals Concentrtations in Washington State Table 1.

Table 9
Preliminary Cleanup Levels: Groundwater
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Groundwater Method A Cleanup Level	Groundwater Method B Target Cleanup Level (µg/L)	PCUL	Basis
Total Petroleum Hydrocarbons (TPH) using NWTPH methods						
Gasoline Range Organics	µg/L	100	800/1000	--	800/100	MA
Diesel Range Organics	µg/L	100	500	--	500	MA
Residual Range Organics	µg/L	100	500	--	500	MA
Volatile Organic Compounds (VOCs) using EPA 8260						
1,1,1,2-Tetrachloroethane	µg/L	0.3	--	1.68	1.68	MB
1,1,1-Trichloroethane	µg/L	0.3	--	200	200	MB
1,1,2,2-Tetrachloroethane	µg/L	0.2	--	0.219	0.219	MB
1,1,2-Trichloroethane	µg/L	0.25	--	3	3	MB
1,1-Dichloroethane	µg/L	0.5	--	7.68	7.68	MB
1,1-Dichloroethene	µg/L	0.5	--	7	7	MB
1,1-Dichloropropene	µg/L	0.5	--	--	--	--
1,2,3-Trichlorobenzene	µg/L	0.7	--	6.4	6.4	MB
1,2,3-Trichloropropane	µg/L	0.4	--	0.00038	0.4	MRL
1,2,4-Trichlorobenzene	µg/L	0.75	--	15.1	15.1	MB
1,2,4-Trimethylbenzene	µg/L	0.5	--	80	80	MB
1,2-Dibromo-3-chloropropane	µg/L	1	--	--	--	--
1,2-Dibromoethane	µg/L	0.2	--	0.05	0.05	MB
1,2-Dichlorobenzene	µg/L	0.5	--	600	600	MB
1,2-Dichloroethane	µg/L	0.5	--	4.81	4.81	MB
1,2-Dichloropropane	µg/L	0.3	--	5	5	MB
1,3,5-Trimethylbenzene	µg/L	0.5	--	80	80	MB
1,3-Dichlorobenzene	µg/L	0.5	--	--	--	--
1,3-Dichloropropane	µg/L	0.3	--	160	160	MB
1,4-Dichlorobenzene	µg/L	0.5	--	75	75	MB
2-Butanone	µg/L	1.5	--	4800	4800	MB
2-Chlorotoluene	µg/L	0.5	--	160	160	MB
2-Hexanone	µg/L	1.25	--	40	40	MB
n-Hexane	µg/L	0.5	--	480	480	MB
4-Chlorotoluene	µg/L	0.5	--	160	160	MB
4-Isopropyltoluene	µg/L	0.5	--	--	--	--
4-Methyl-2-pentanone	µg/L	1	--	640	640	MB
Acetone	µg/L	5	--	7200	7200	MB
Benzene	µg/L	0.44	--	5	5	MB
Bromobenzene	µg/L	0.5	--	64	64	MB
Bromodichloromethane	µg/L	0.25	--	7.06	7.06	MB
Bromoform	µg/L	0.3	--	55.4	55.4	MB
Bromomethane	µg/L	3	--	11.2	11.2	MB
Carbon tetrachloride	µg/L	0.3	--	5	5	MB
Chlorobenzene	µg/L	0.5	--	100	100	MB
Chlorodibromomethane	µg/L	0.3	--	5.21	5.21	MB
Chloroethane	µg/L	1	--	--	--	--
Chloroform	µg/L	0.5	--	14.1	14.1	MB
Chloromethane	µg/L	0.75	--	--	--	--
cis-1,2-Dichloroethene	µg/L	0.5	--	16	16	MB
cis-1,3-Dichloropropene	µg/L	0.35	--	0.438	0.438	MB
Cumene	µg/L	0.5	--	800	800	MB
Dibromomethane	µg/L	0.25	--	80	80	MB
Dichlorodifluoromethane	µg/L	0.5	--	1600	1600	MB
Ethylbenzene	µg/L	0.4	--	700	700	MB
Hexachlorobutadiene	µg/L	0.5	--	0.561	0.561	MB
m,p-Xylene	µg/L	1	--	1600	1600	MB
Methylene chloride	µg/L	0.75	--	5	5	MB
n-Butylbenzene	µg/L	0.5	--	400	400	MB
n-Propylbenzene	µg/L	0.5	--	800	800	MB
Naphthalene	µg/L	1.25	--	160	160	MB
o-Xylene	µg/L	0.5	--	1600	1600	MB
sec-Butylbenzene	µg/L	0.5	--	800	800	MB
Styrene	µg/L	0.5	--	100	100	MB
tert-Butyl Methyl Ether	µg/L	0.35	--	24.3	24.3	MB
tert-Butylbenzene	µg/L	0.5	--	800	800	MB
Tetrachloroethene	µg/L	0.35	--	5	5	MB
Toluene	µg/L	1	--	640	640	MB
trans-1,2-Dichloroethene	µg/L	0.35	--	100	100	MB
trans-1,3-Dichloropropene	µg/L	0.5	--	--	--	--
Trichloroethene	µg/L	0.4	--	4	4	MB
Trichlorofluoromethane	µg/L	0.3	--	2400	2400	MB
Vinyl chloride	µg/L	0.2	--	0.292	0.292	MB

Please see notes at end of table.

Table 9
Preliminary Cleanup Levels: Groundwater
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Groundwater Method A Cleanup Level	Groundwater Method B Target Cleanup Level (µg/L)	PCUL	Basis
Semi-Volatile Organic Compounds (SVOCs) using EPA 8270						
1,2,4-Trichlorobenzene	µg/L	0.1	--	15.1	15.1	MB
1,2-Dichlorobenzene	µg/L	0.1	--	600	600	MB
1,3-Dichlorobenzene	µg/L	0.1	--	--	--	--
1,4-Dichlorobenzene	µg/L	0.1	--	75	75	MB
1-Methylnaphthalene	µg/L	0.1	--	1.51	1.51	MB
2,4,5-Trichlorophenol	µg/L	0.2	--	1600	1600	MB
2,4,6-Trichlorophenol	µg/L	0.2	--	7.95	7.95	MB
2,4-Dichlorophenol	µg/L	0.15	--	48	48	MB
2,4-Dimethylphenol	µg/L	0.15	--	320	320	MB
2,4-Dinitrophenol	µg/L	1.5	--	32	32	MB
2,4-Dinitrotoluene	µg/L	0.1	--	0.129	0.129	MB
2,6-Dinitrotoluene	µg/L	0.15	--	0.129	0.15	MRL
2-Chloronaphthalene	µg/L	0.1	--	640	640	MB
2-Chlorophenol	µg/L	0.3	--	40	40	MB
2-Methylnaphthalene	µg/L	0.1	--	32	32	MB
2-Methylphenol	µg/L	0.2	--	800	800	MB
2-Nitroaniline	µg/L	0.15	--	160	160	MB
2-Nitrophenol	µg/L	0.3	--	--	--	--
3+4-methylphenol	µg/L	1	--	1600	1600	MB
4,6-Dinitro-2-methylphenol	µg/L	2.5	--	1.28	2.50	MRL
4-Bromophenyl phenyl ether	µg/L	0.2	--	--	--	--
4-Chloro-3-methylphenol	µg/L	0.2	--	1600	1600	MB
4-Chloroaniline	µg/L	0.1	--	0.438	0.438	MB
4-Chlorophenyl phenyl ether	µg/L	0.1	--	--	--	--
4-Nitrophenol	µg/L	1	--	--	--	--
Acenaphthene	µg/L	0.1	--	480	480	MB
Acenaphthylene	µg/L	0.1	--	--	--	--
Anthracene	µg/L	0.1	--	2400	2400	MB
Benz(a)anthracene	µg/L	0.15	--	--	--	--
Benzo(a)pyrene	µg/L	0.15	--	0.2	0.2	MB
Benzo(b)fluoranthene	µg/L	0.2	--	--	--	--
Benzo(g,h,i)perylene	µg/L	1	--	--	--	--
Benzo(k)fluoranthene	µg/L	0.2	--	--	--	--
Benzyl alcohol	µg/L	3	--	1600	1600	MB
Bis(2-chloroethoxy)methane	µg/L	0.1	--	48	48	MB
Bis(2-chloroethyl) ether	µg/L	0.4	--	0.0398	0.0398	MRL
Bis(2-ethylhexyl) phthalate	µg/L	1	--	6	6	MB
bis(2-Ethylhexyl)adipate	µg/L	0.75	--	400	400	MB
Butyl benzyl phthalate	µg/L	0.3	--	46.1	46.1	MB
Carbazole	µg/L	0.2	--	--	--	--
Chrysene	µg/L	0.15	--	--	--	--
Di-n-butyl phthalate	µg/L	2	--	1600	1600	MB
Di-n-octyl phthalate	µg/L	0.3	--	160	160	MB
Dibenz(a,h)anthracene	µg/L	1.1	--	--	--	--
Dibenzofuran	µg/L	0.1	--	0.0219	0.0219	MB
Diethyl phthalate	µg/L	0.5	--	5.47	5.47	MB
Dimethyl phthalate	µg/L	1.2	--	0.231	0.231	MB
Fluoranthene	µg/L	0.2	--	800	800	MB
Fluorene	µg/L	0.1	--	12.8	12.8	MB
Hexachlorobenzene	µg/L	0.2	--	0.273	0.273	MB
Hexachlorobutadiene	µg/L	0.15	--	0.561	0.561	MB
Hexachlorocyclopentadiene	µg/L	0.25	--	48	48	MB
Hexachloroethane	µg/L	0.15	--	1.09	1.09	MB
Indeno(1,2,3-cd)pyrene	µg/L	0.2	--	--	--	--
Isophorone	µg/L	0.3	--	92.1	92.1	MB
N-nitrosodipropylamine	µg/L	0.3	--	0.0125	0.3000	MRL
Naphthalene	µg/L	0.1	--	160	160	MB
Nitrobenzene	µg/L	0.5	--	16	16	MB
Pentachlorophenol	µg/L	0.6	--	1	1	MB
Phenanthrene	µg/L	0.2	--	--	--	--
Phenol	µg/L	0.3	--	640	640	MB
Pyrene	µg/L	0.4	--	--	--	MB

Please see notes at end of table.

Table 9
Preliminary Cleanup Levels: Groundwater
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Groundwater Method A Cleanup Level	Groundwater Method B Target Cleanup Level (µg/L)	PCUL	Basis
Polycyclic Aromatic Hydrocarbons (PAHs) using EPA 8270E-SIM methods						
Anthracene	µg/L	0.05	--	2400	2400	MB
Acenaphthene	µg/L	0.05	--	480	480	MB
Acenaphthylene	µg/L	0.05	--	--	--	
Benzo(a)anthracene	µg/L	0.05	--	--	--	
Benzo(a)pyrene	µg/L	0.05	--	0.2	0.2	MB
Benzo(b)fluoranthene	µg/L	0.05	--	--	--	--
Benzo(g,h,i)perylene	µg/L	0.05	--	--	--	--
Benzo(k)fluoranthene	µg/L	0.05	--	--	--	--
Chrysene	µg/L	0.05	--	--	--	--
Dibenz(a,h)anthracene	µg/L	0.05	--	--	--	--
Fluoranthene	µg/L	0.1	--	640	640	MB
Fluorene	µg/L	0.05	--	320	320	MB
Indeno(1,2,3-cd)pyrene	µg/L	0.05	--	--	--	
Naphthalene	µg/L	0.25	--	160	160	MB
Phenanthrene	µg/L	0.05	--	--	--	
Pyrene	µg/L	0.05	--	240	240	MB
1-Methylnaphthalene	µg/L	0.25	--	1.51	1.51	MB
2-Methylnaphthalene	µg/L	0.25	--	32	32	MB
Phenols using EPA 8270 methods						
4-Chloro-3-Methylphenol	µg/L	0.2	--	1600	1600	MB
2-Chlorophenol	µg/L	0.3	--	40	40	MB
2,4-Dichlorophenol	µg/L	0.15	--	48	48	MB
Pentachlorophenol	µg/L	0.6	--	1	1	MB
2,4,6-Trichlorophenol	µg/L	0.2	--	16	16	MB
2,4,5-Trichlorophenol	µg/L	0.2	--	1600	1600	MB
Metals using EPA 6020 and EPA 245.1 methods						
Arsenic	µg/L	0.5	--	5	5	MB
Barium	µg/L	2	--	2000	2000	MB
Cadmium	µg/L	0.1	--	5	5	MB
Chromium	µg/L	0.75	50	--	50	MA
Copper	µg/L	2	--	640	640	MB
Lead	µg/L	0.5	--	15	15	MB
Mercury	µg/L	0.1	--	2	2	MB
Nickel	µg/L	0.5	--	320	320	MB
Selenium	µg/L	0.25	--	50	50	MB
Silver	µg/L	0.2	--	80	80	MB
Zinc	µg/L	2.5	--	4800	4800	MB

Notes:

1. µg/L = Micrograms per liter.
2. Groundwater cleanup levels from the MTCA Method A and B chapter 173-340 WAC (January 2023 update).
3. MRL = Method Reporting Limit.
4. -- = Not available or not applicable.
5. MA = MTCA Method A Cleanup Level.
6. MB = Groundwater Method B Target Cleanup Level.
7. PCUL = Preliminary Cleanup Levels.

Table 10
Preliminary Cleanup Levels: Sediment
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Sediment Cleanup Objective		Natural Background Concentrations	PCUL	Basis
			Freshwater	Marine			
Total Petroleum Hydrocarbons (TPH) using NW TPH methods							
Diesel Range Organics	mg/kg	50	340	--	--	340	SMSF
Residual Range Organics	mg/kg	100	3600	--	--	3600	SMSF
Semi-Volatile Organic Compounds (SVOCs) using EPA 8270E methods							
Phenol	mg/kg	0.0299	0.12	0.42	--	0.12	SMSF
Bis(2-chloroethyl) ether	mg/kg	0.0498	--	--	--	--	--
2-Chlorophenol	mg/kg	0.0398	--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	0.0398	--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	0.0299	--	3.1	--	3.1	SMSM
1,2-Dichlorobenzene	mg/kg	0.0398	--	2.3	--	2.3	SMSM
Benzyl alcohol	mg/kg	0.149	--	0.057	--	0.149	MRL
2-Methylphenol (o-cresol)	mg/kg	0.0398	--	0.063	--	0.063	SMSM
Hexachloroethane	mg/kg	0.0398	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/kg	0.0797	--	11	--	11	SMSM
3&4-Methylphenol (m, p-cresol)	mg/kg	0.0299	0.26	0.67	--	0.26	SMSF
Nitrobenzene	mg/kg	0.0498	--	--	--	--	--
Isophorone	mg/kg	0.0398	--	--	--	--	--
2-Nitrophenol	mg/kg	0.0299	--	--	--	--	--
2,4-Dimethylphenol	mg/kg	0.0299	--	0.029	--	0.029	SMSM
Bis(2-chloroethoxy)methane	mg/kg	0.0299	--	--	--	--	--
2,4-Dichlorophenol	mg/kg	0.0299	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/kg	0.0299	--	0.81	--	0.81	SMSM
Naphthalene	mg/kg	0.0398	--	99	--	99	SMSM
4-Chloroaniline	mg/kg	0.0299	--	--	--	--	--
Hexachlorobutadiene	mg/kg	0.0299	--	3.9	--	3.9	SMSM
4-Chloro-3-methylphenol	mg/kg	0.0299	--	--	--	--	--
2-Methylnaphthalene	mg/kg	0.0299	--	38	--	38	SMSM
1-Methylnaphthalene	mg/kg	0.0299	--	--	--	--	--
Hexachlorocyclopentadiene	mg/kg	0.0996	--	--	--	--	--
2,4,6-Trichlorophenol	mg/kg	0.0299	--	--	--	--	--
2,4,5-Trichlorophenol	mg/kg	0.0299	--	--	--	--	--
2-Chloronaphthalene	mg/kg	0.0299	--	--	--	--	--
2-Nitroaniline	mg/kg	0.0498	--	--	--	--	--
Acenaphthene	mg/kg	0.0299	--	16	--	16	SMSM
Dimethylphthalate	mg/kg	3.49	--	53	--	53	SMSM
2,6-Dinitrotoluene	mg/kg	0.0398	--	--	--	--	--
Acenaphthylene	mg/kg	0.0299	--	66	--	66	SMSM
2,4-Dinitrophenol	mg/kg	0.299	--	--	--	--	--
Dibenzofuran	mg/kg	0.0299	0.2	15	--	0.0299	MRL
2,4-Dinitrotoluene	mg/kg	0.0598	--	--	--	--	--
4-Nitrophenol	mg/kg	0.199	--	--	--	--	--
Fluorene	mg/kg	0.0299	--	23	--	23	SMSM
4-Chlorophenyl phenyl ether	mg/kg	0.0299	--	--	--	--	--
Diethylphthalate	mg/kg	0.747	--	61	--	61	SMSM
4,6-Dinitro-2-methylphenol	mg/kg	0.249	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/kg	0.0299	--	--	--	--	--
Hexachlorobenzene	mg/kg	0.0299	--	0.38	--	0.38	SMSM
Pentachlorophenol	mg/kg	0.199	1.2	0.36	--	0.36	SMSM
Phenanthrene	mg/kg	0.0299	--	100	--	100	SMSM
Anthracene	mg/kg	0.0299	--	220	--	220	SMSM
Carbazole	mg/kg	0.0299	--	--	--	--	--
Di-n-butylphthalate	mg/kg	0.0299	0.38	220	--	0.38	SMSF
Fluoranthene	mg/kg	0.0299	--	160	--	160	SMSM
Pyrene	mg/kg	0.149	--	1000	--	1000	SMSM
Butyl Benzylphthalate	mg/kg	0.0498	--	4.9	--	4.9	SMSM
bis(2-Ethylhexyl)adipate	mg/kg	0.199	--	--	--	--	--
Benz(a)anthracene	mg/kg	0.0299	--	110	--	110	SMSM
Chrysene	mg/kg	0.0498	--	110	--	110	SMSM

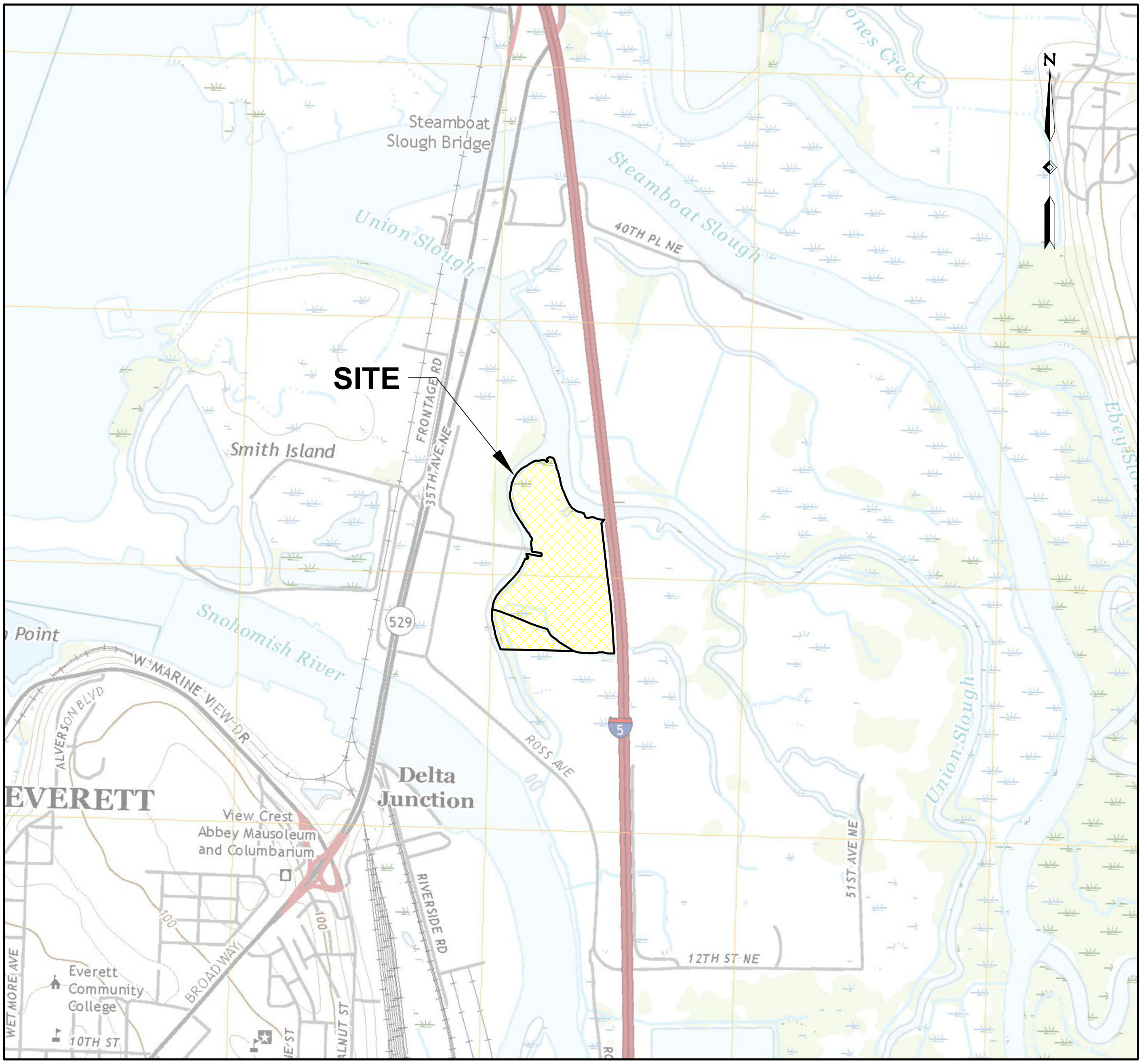
Please see notes at end of table.

Table 10
Preliminary Cleanup Levels: Sediment
Buse Timber & Sales
Everett, Washington

Parameter	Units	Method Reporting Limit	Sediment Cleanup Objective		Natural Background Concentrations	PCUL	Basis
			Freshwater	Marine			
Semi-Volatile Organic Compounds (SVOCs) using EPA 8270E methods							
bis (2-Ethylhexyl) phthalate	mg/kg	0.0398	0.5	47	--	0.5	SMSF
Di-n-octyl phthalate	mg/kg	0.0747	0.039	58	--	0.747	MRL
Benzo(b)fluoranthene	mg/kg	0.0996	--	--	--	--	--
Benzo(k)fluoranthene	mg/kg	0.0299	--	230	--	230	SMSM
Benzo(a)pyrene	mg/kg	0.0398	--	99	--	99	SMSM
Indeno(1,2,3-cd)pyrene	mg/kg	0.199	--	34	--	34	SMSM
Dibenz(a,h)anthracene	mg/kg	0.0996	--	12	--	12	SMSM
Benzo(g,h,i)perylene	mg/kg	0.0996	--	31	--	31	SMSM
Dioxins/Furans using EPA 8290 methods							
2,3,7,8 TCDD	mg/kg	0.0000005	--	--	--	--	--
1,2,3,7,8 PeCDD	mg/kg	0.0000025	--	--	--	--	--
1,2,3,4,7,8 HxCDD	mg/kg	0.0000025	--	--	--	--	--
1,2,3,6,7,8 HxCDD	mg/kg	0.0000025	--	--	--	--	--
1,2,3,7,8,9 HxCDD	mg/kg	0.0000025	--	--	--	--	--
1,2,3,4,6,7,8 HpCDD	mg/kg	0.0000025	--	--	--	--	--
OCDD	mg/kg	0.000005	--	--	--	--	--
2,3,7,8 TCDF	mg/kg	0.0000005	--	--	--	--	--
1,2,3,7,8 PeCDF	mg/kg	0.0000025	--	--	--	--	--
2,3,4,7,8 PeCDF	mg/kg	0.0000025	--	--	--	--	--
1,2,3,4,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--
1,2,3,6,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--
2,3,4,6,7,8 HxCDF	mg/kg	0.0000025	--	--	--	--	--
1,2,3,7,8,9 HxCDF	mg/kg	0.0000025	--	--	--	--	--
1,2,3,4,6,7,8 HpCDF	mg/kg	0.0000025	--	--	--	--	--
1,2,3,4,7,8,9 HpCDF	mg/kg	0.0000025	--	--	--	--	--
OCDF	mg/kg	0.000005	--	--	--	--	--
Total TEQ	mg/kg	0.000005	--	--	0.0000039	0.000005	MRL
Metals using EPA 6020 methods							
Arsenic	mg/kg	0.25	14	57	11	14	SMSF
Barium	mg/kg	0.5	--	--	--	--	--
Cadmium	mg/kg	0.02	2.1	5.1	0.8	2.1	SMSF
Chromium	mg/kg	0.25	72	260	62	72	SMSF
Copper	mg/kg	0.75	400	390	45	390	SMSM
Lead	mg/kg	1	360	450	21	360	SMSF
Mercury	mg/kg	0.2	0.66	0.41	0.2	0.41	SMSM
Nickel	mg/kg	0.25	26	--	50	50	SMSF
Selenium	mg/kg	1	11	--	--	11	SMSF
Silver	mg/kg	0.02	0.57	6.1	0.24	0.57	SMSF
Zinc	mg/kg	3.5	3200	410	93	410	SMSM
Wood Waste using EM 4500, EPA 8270, and EPA 9060 methods							
Ammonia	mg/kg	1	230	--	--	230	SMSF
Sulfide	mg/kg	0.5	39	--	--	39	SMSF
Benzoic Acid	mg/kg	0.1	2.9	0.65	--	0.65	SMSM
Benzyl alcohol	mg/kg	0.15	--	0.057	--	0.15	MRL
Total Organic Carbon	%	0.15	--	--	--	--	--

Notes:

1. mg/kg = Milligrams per kilogram.
2. EPA = United States Environmental Protection Agency.
3. -- = Not available or not applicable.
4. MRL = Method Reporting Limit.
5. SMSF = Sediment Management Standards Sediment Cleanup Objective for Freshwater.
6. SMSM = Sediment Management Standards Sediment Cleanup Objective for Marine.
7. BC = Natural Background Concentration.
8. PCUL = Preliminary Cleanup Levels.
9. Natural Background Concentration from SCUM (Table 10-1).
10. SCUM = Sediment Cleanup User's Manual



Marysville, Washington

United States Geological Survey
7.5 Minute Series Topographic Map
Contour Interval: 20 feet
Scale: 1 inch = 24,000 feet
Date: 2020

0 2,000 4,000
Scale in Feet

WASHINGTON

Site Location Map

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

APEX	Apex Companies, LLC 801 NW 42nd Street, #204 Seattle, Washington 98107	Project Number: 32-21001485	Drawn: JP	Approved: JF
		March 2024		

Figure
1

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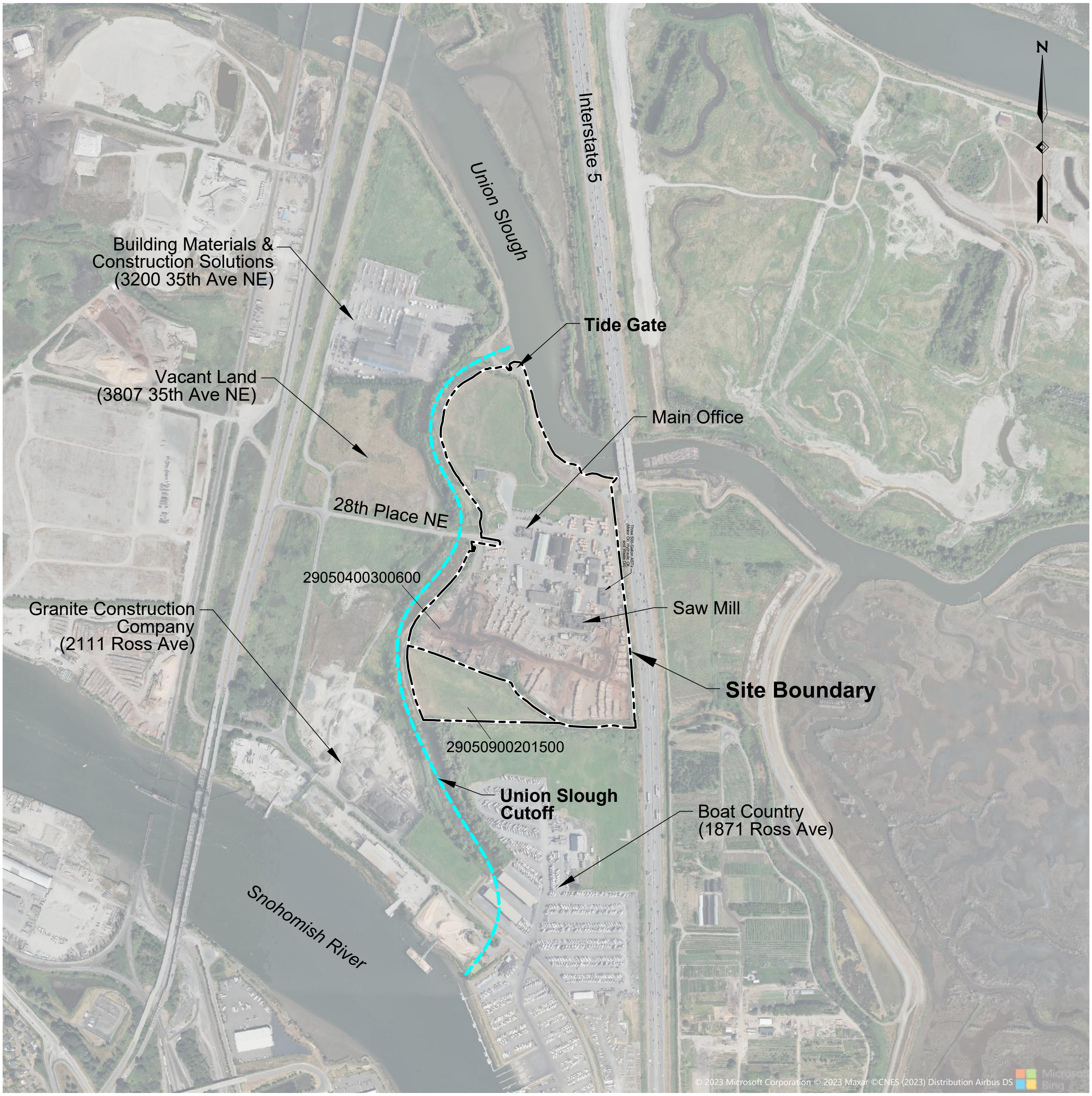

NOTE: Base map prepared from Microsoft Bing imagery.
Parcel information from Snohomish County
(ftp://ftp.snoco.org/assessor/shapefiles/)

0 1,000 2,000
Scale in Feet

Legend:

- - - - - Union Slough Cutoff

Site Vicinity Map

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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Seattle, Washington 98107

Project Number:	Drawn:	Approved:	Figure
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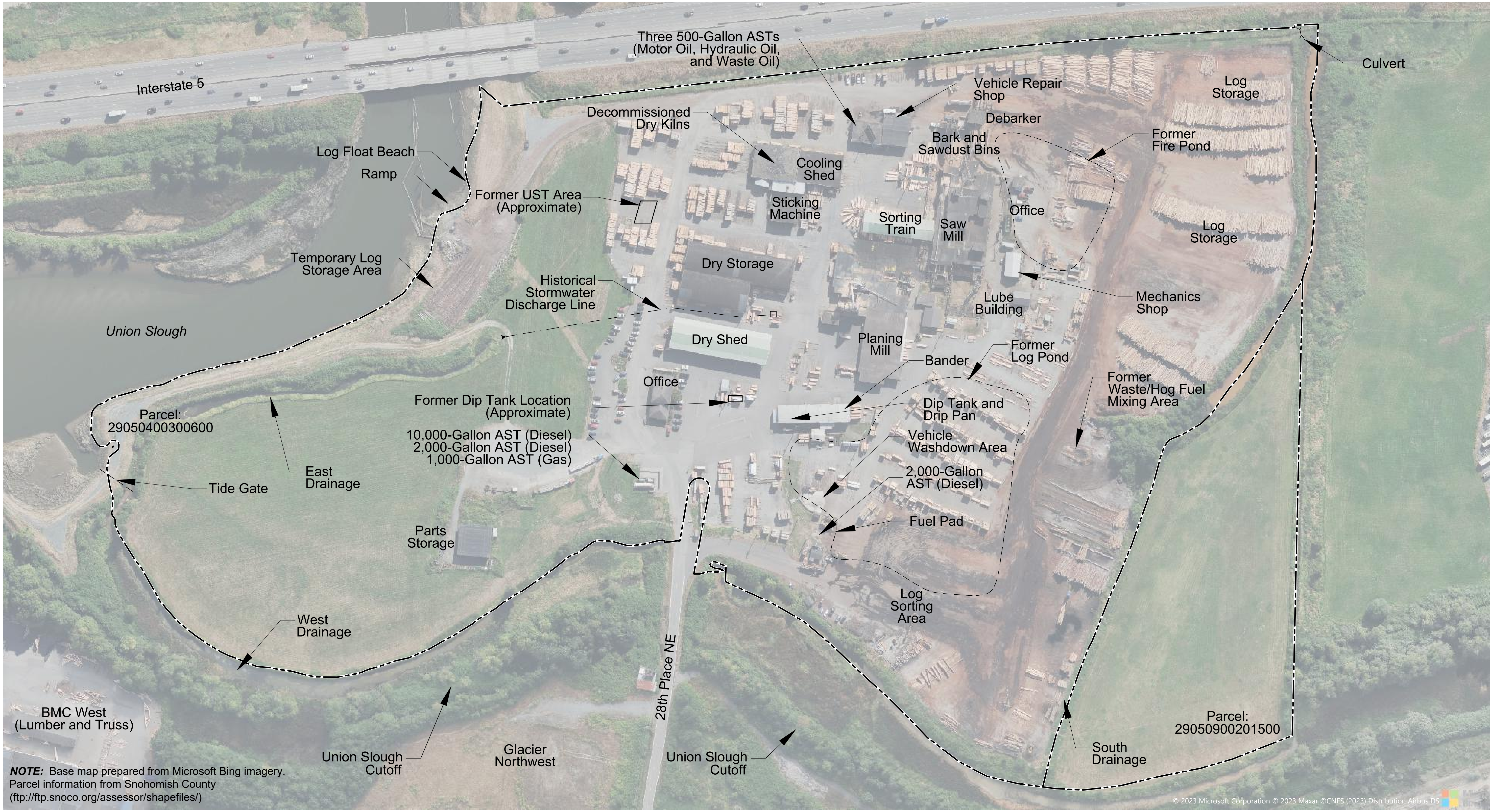
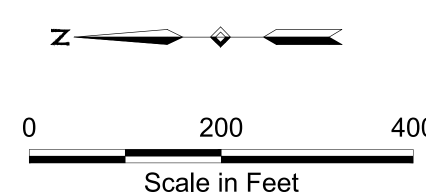


NOTE: Base map prepared from Microsoft Bing imagery. Parcel information from Snohomish County (ftp://ftp.snoco.org/assessor/shapefiles/)



Site Plan

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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Figure **3**

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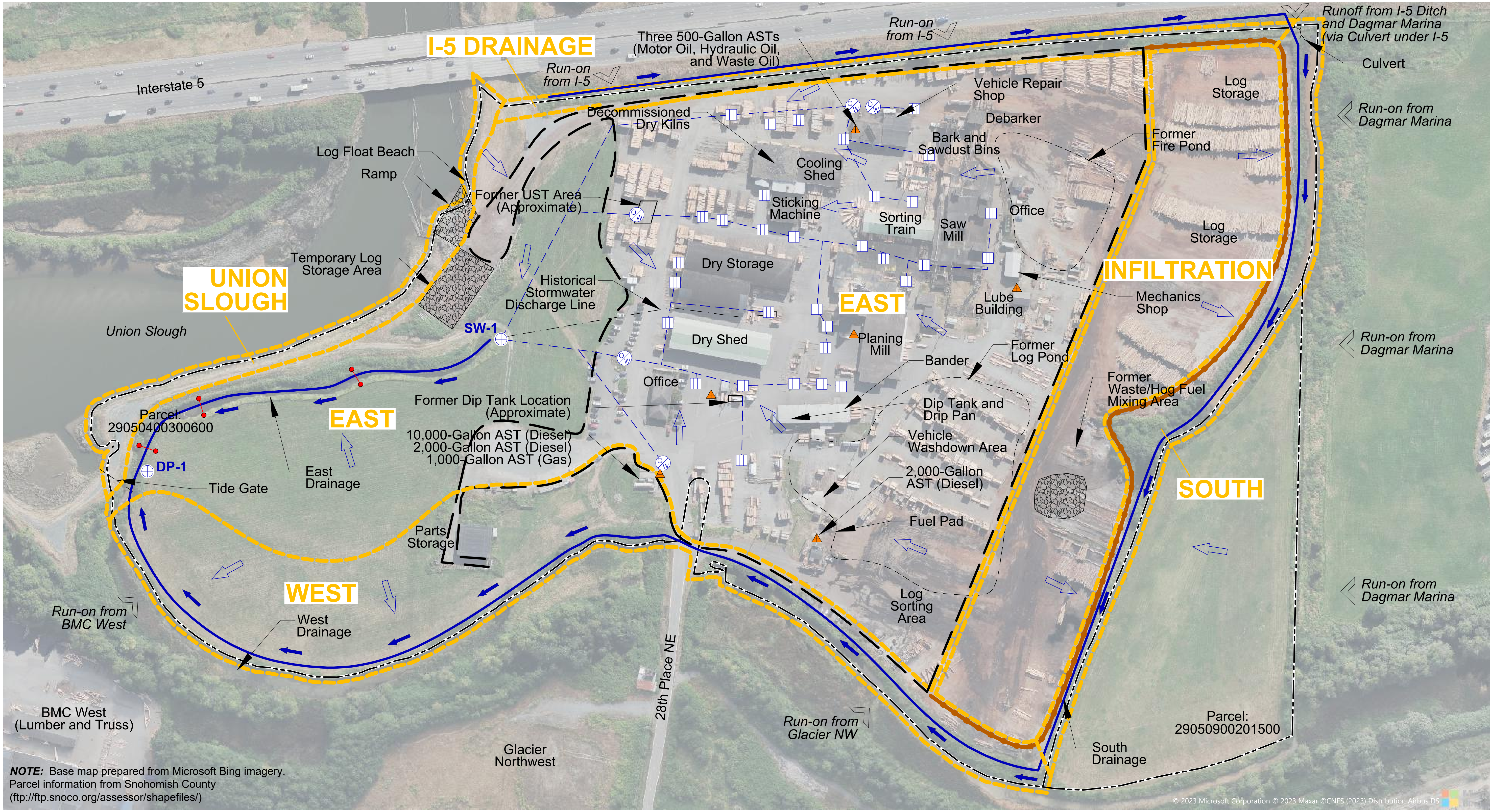

Legend:

- Storm Drain Line
- Stormwater Monitoring Point
- Catch Basin
- Oil/Water Separator
- Stormwater Bioswale/Ditch
- Stormwater Bioswale/Ditch Flow Direction
- Surface Flow Direction
- Silt Curtain
- Spill Kit Location
- Quarry Spalls
- Drainage Basin and Desgnation
- Containment Berm
- Paved Area
- Run-off Area (Potential Pollutants)

N

0 200 400

Scale in Feet

Stormwater System Map

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Everett, Washington

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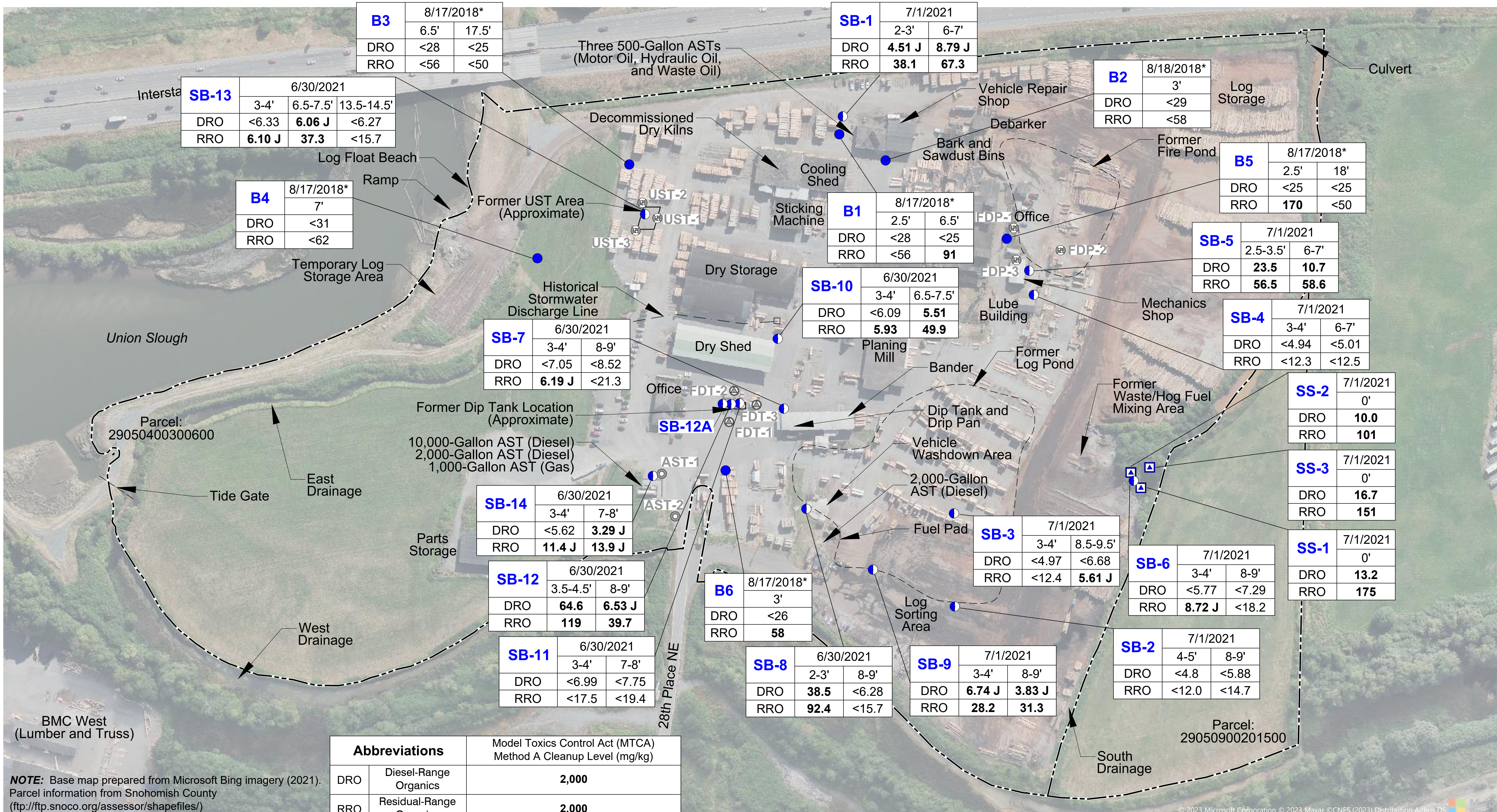

B3	8/17/2018*	
	6.5'	17.5'
DRO	<28	<25
RRO	<56	<50

SB-1	7/1/2021	
	2-3'	6-7'
DRO	**4.51 J**	**8.79 J**
RRO	**38.1**	**67.3**

B2	8/18/2018*
	3'
DRO	<29
RRO	<58

SB-13	6/30/2021		
	3-4'	6.5-7.5'	13.5-14.5'
DRO	<6.33	**6.06 J**	<6.27
RRO	**6.10 J**	**37.3**	<15.7

B5	8/17/2018*	
	2.5'	18'
DRO	<25	<25
RRO	**170**	<50

B4	8/17/2018*
	7'
DRO	<31
RRO	<62

B1	8/17/2018*	
	2.5'	6.5'
DRO	<28	<25
RRO	<56	**91**

SB-5	7/1/2021	
	2.5-3.5'	6-7'
DRO	**23.5**	**10.7**
RRO	**56.5**	**58.6**

SB-10	6/30/2021	
	3-4'	6.5-7.5'
DRO	<6.09	**5.51**
RRO	**5.93**	**49.9**

SB-4	7/1/2021	
	3-4'	6-7'
DRO	<4.94	<5.01
RRO	<12.3	<12.5

SB-7	6/30/2021	
	3-4'	8-9'
DRO	<7.05	<8.52
RRO	**6.19 J**	<21.3

SS-2	7/1/2021
	0'
DRO	**10.0**
RRO	**101**

SS-3	7/1/2021
	0'
DRO	**16.7**
RRO	**151**

SB-14	6/30/2021	
	3-4'	7-8'
DRO	<5.62	**3.29 J**
RRO	**11.4 J**	**13.9 J**

SB-3	7/1/2021	
	3-4'	8.5-9.5'
DRO	<4.97	<6.68
RRO	<12.4	**5.61 J**

SS-1	7/1/2021
	0'
DRO	**13.2**
RRO	**175**

SB-12	6/30/2021	
	3.5-4.5'	8-9'
DRO	**64.6**	**6.53 J**
RRO	**119**	**39.7**

B6	8/17/2018*
	3'
DRO	<26
RRO	**58**

SB-6	7/1/2021	
	3-4'	8-9'
DRO	<5.77	<7.29
RRO	**8.72 J**	<18.2

SB-11	6/30/2021	
	3-4'	7-8'
DRO	<6.99	<7.75
RRO	<17.5	<19.4

SB-8	6/30/2021	
	2-3'	8-9'
DRO	**38.5**	<6.28
RRO	**92.4**	<15.7

SB-9	7/1/2021	
	3-4'	8-9'
DRO	**6.74 J**	**3.83 J**
RRO	**28.2**	**31.3**

SB-2	7/1/2021	
	4-5'	8-9'
DRO	<4.8	<5.88
RRO	<12.0	<14.7

NOTE: Base map prepared from Microsoft Bing imagery (2021). Parcel information from Snohomish County (ftp://ftp.snoco.org/assessor/shapefiles/)

Abbreviations		Model Toxics Control Act (MTCA) Method A Cleanup Level (mg/kg)
DRO	Diesel-Range Organics	2,000
RRO	Residual-Range Organics	2,000

Legend:

- SB-1 ◐ Soil and Temporary Groundwater Monitoring Well Location (Apex 2021)
- SS-1 ▲ Surface Soil Location (Apex 2021)
- B1 ● Approximate Historical Soil Boring (Terracon 2018)
- AST-1 ◎ Approximate Historical Soil Sample (Exponent 1998)
- FDT-2 ◎ Approximate Historical Subsurface Soil Sample (Exponent 1998)
- FDP-1 ◎ Approximate Historical Soil and Groundwater Sample (Exponent 1998)

SB-1	6/30/2021
	2-3'
DRO	**4.51 J**
RRO	**38.1**

Sample Identification
Date Sampled (*Terracon)
Sample Depth in Feet
Concentration in milligrams per kilogram (mg/kg) (J = Estimated Value)
Analyte Sampled

N

0 200 400
Scale in Feet

Total Petroleum Hydrocarbon Concentrations in Soil

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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Project Number:	Drawn:	Approved:	Figure
32-21001485	JP	JF	5
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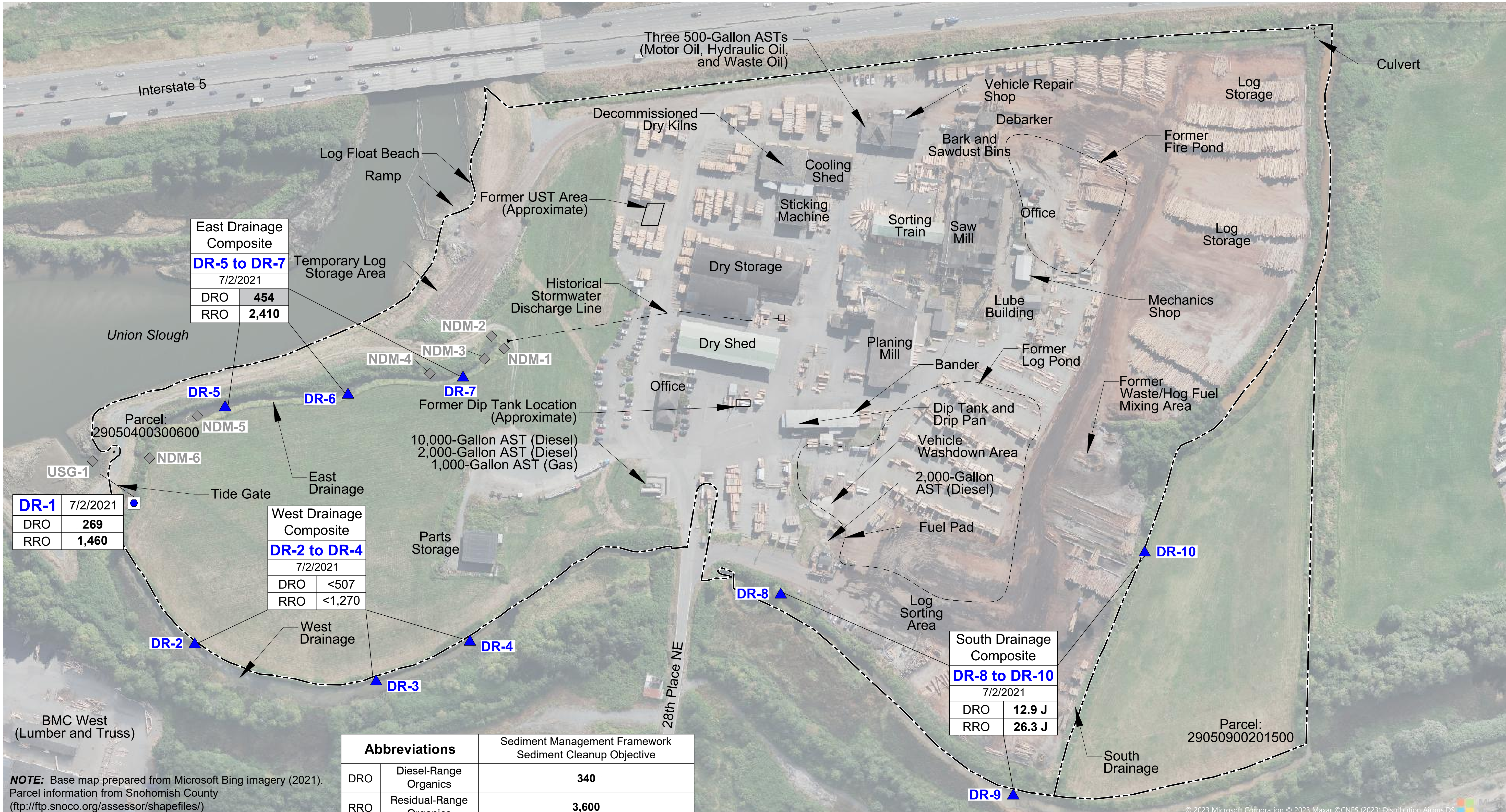

Abbreviations		Sediment Management Framework Sediment Cleanup Objective
DRO	Diesel-Range Organics	340
RRO	Residual-Range Organics	3,600

Legend:

- DR-1 ● Discrete Sediment Location (Apex 2021)
- DR-2 ▲ Drainage Sediment Sub-Sample Location (Apex 2021)
- USG-1 ◆ Approximate Historical Sediment Sample (Exponent 1998)

DR-1	7/2/2021
DRO	269
RRO	1,460

Sample Identification
Date Sampled
Concentration in milligrams per kilogram (mg/kg) (J = Estimated Value)
Analyte Sampled

Shaded Values Exceed Sediment Management Framework Sediment Cleanup Objective

N

0 200 400
Scale in Feet

Total Petroleum Hydrocarbon Concentrations in Drainage Sediment

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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801 NW 42nd Street, #204
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Project Number:	Drawn:	Approved:	Figure
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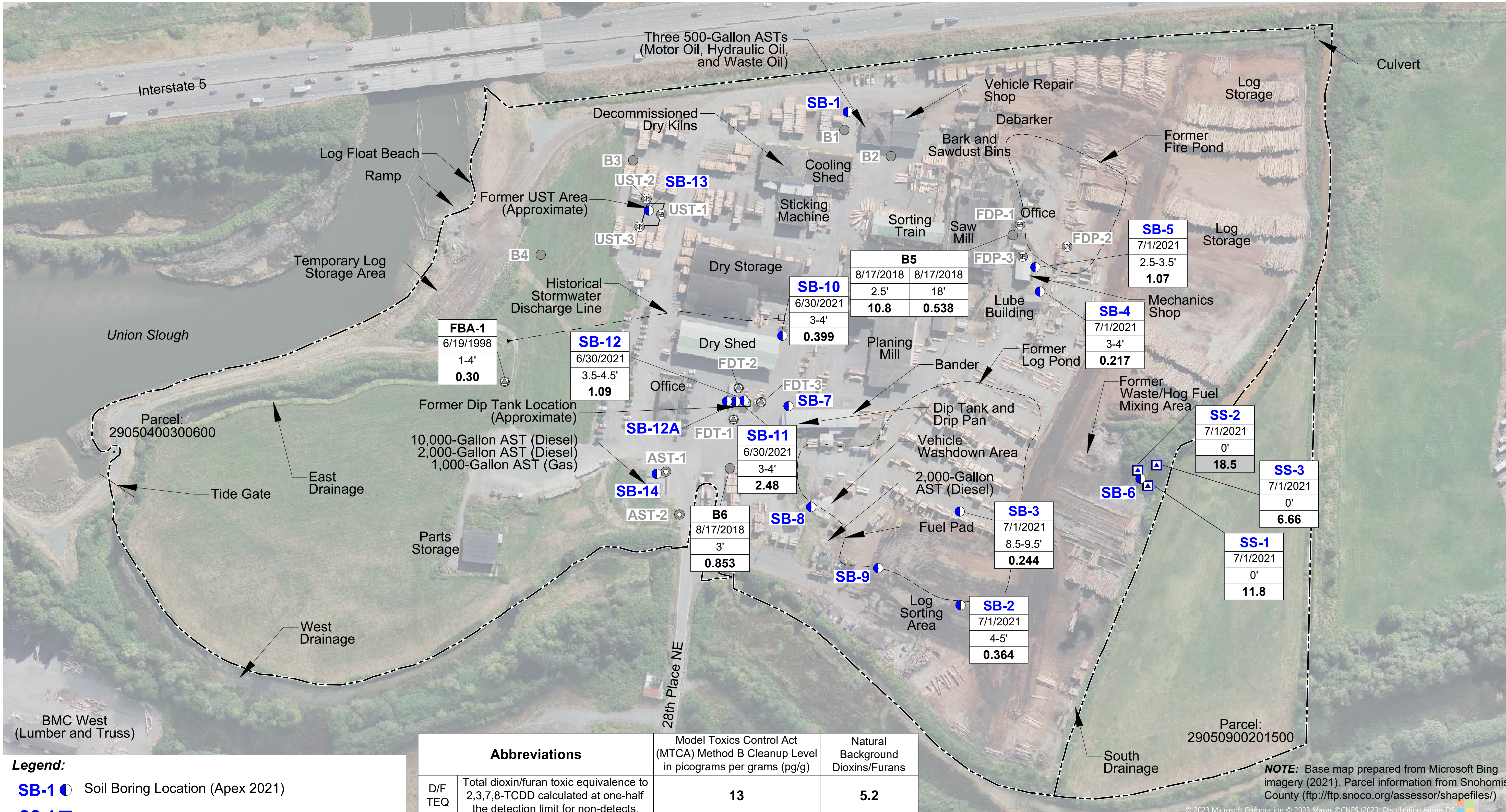
March 2024			



Abbreviations		Model Toxics Control Act (MTCA) Method B Cleanup Level in picograms per grams (pg/g)	Natural Background Dioxins/Furans
D/F TEQ	Total dioxin/furan toxic equivalence to 2,3,7,8-TCDD calculated at one-half the detection limit for non-detects.	13	5.2

NOTE: Base map prepared from Microsoft Bing imagery (2021). Parcel information from Snohomish County (ftp://ftp.snoco.org/assessor/shapefiles/)

Legend:

- SB-1 ◐ Soil Boring Location (Apex 2021)
- SS-1 ◬ Surface Soil Location (Apex 2021)
- B1 ● Approximate Historical Soil Boring (Terracon 2018)
- AST-1 ◎ Approximate Historical Soil Sample (Exponent 1998)
- FDT-1 ◬ Approximate Historical Subsurface Soil Sample (Exponent 1998)
- FDP-1 ⊛ Approximate Historical Soil and Groundwater Sample (Exponent 1998)

FBA-1	Sample Identification
6/19/1998	Date Sampled
1-4'	Sample Depth in Feet
0.30	D/F TEQ Result in picograms per gram (pg/g; parts per trillion)

Shaded Values Exceed the MTCA Method B Cleanup Level

N

0 200 400
Scale in Feet

Dioxins/Furans in Soil

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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Apex Companies, LLC
801 NW 42nd Street, #204
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Project Number:	Drawn:	Approved:	Figure
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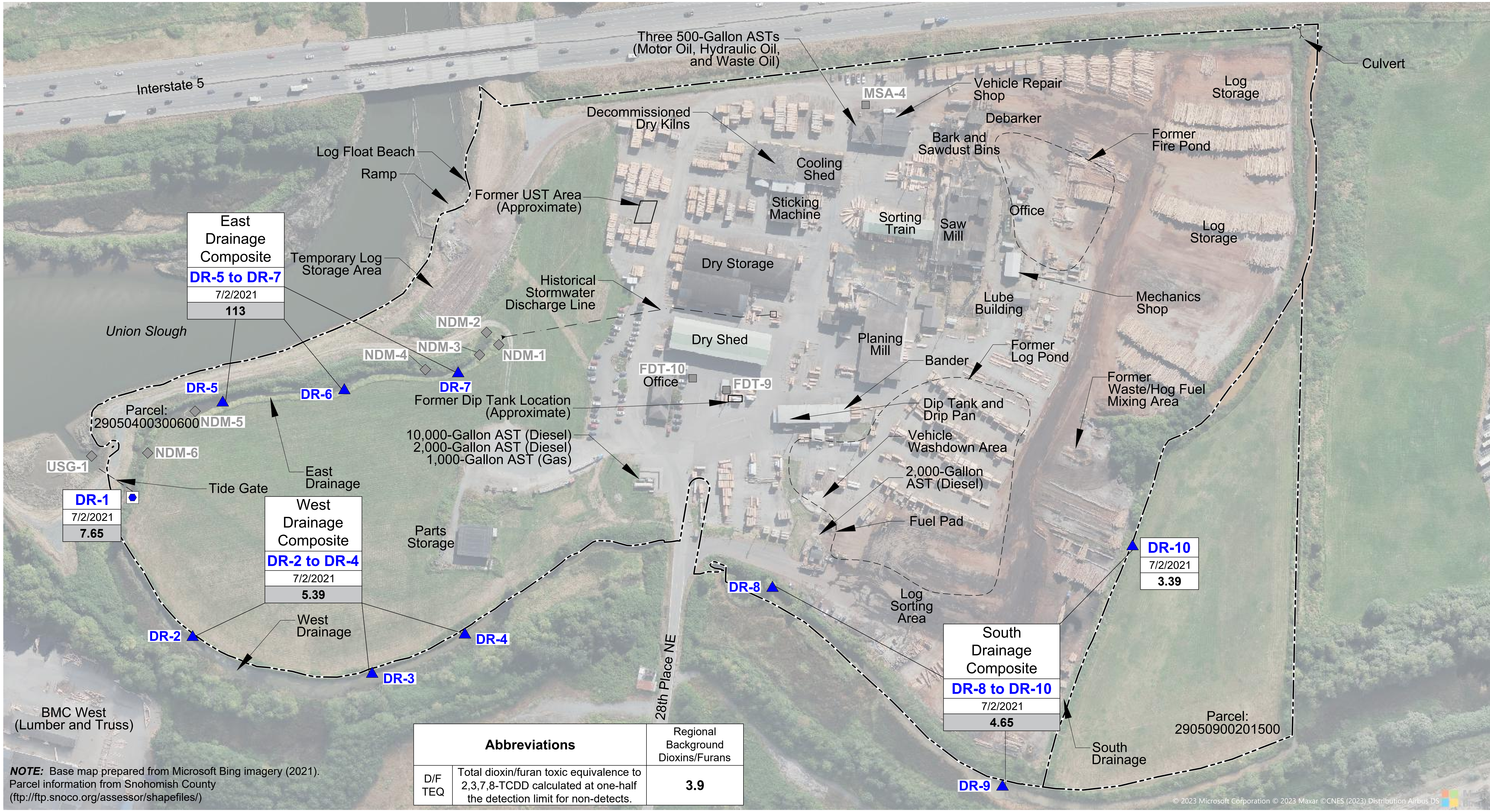

Abbreviations		Regional Background Dioxins/Furans
D/F TEQ	Total dioxin/furan toxic equivalence to 2,3,7,8-TCDD calculated at one-half the detection limit for non-detects.	3.9

NOTE: Base map prepared from Microsoft Bing imagery (2021). Parcel information from Snohomish County (ftp://ftp.snoco.org/assessor/shapefiles/)

Legend:

- **DR-1** ● Discrete Sediment Location (Apex 2021)
- **DR-2** ▲ Drainage Sediment Sub-Sample Location (Apex 2021)
- **USG-1** ◆ Approximate Historical Sediment Sample (Exponent 1998)
- **FDT-9** ■ Approximate Historical Storm Drain Sample (Exponent 1998)

DR-1	Sample Identification
7/2/2021	Date Sampled
7.65	D/F TEQ Result in picograms per gram (pg/g; parts per trillion)

Shaded Values Exceed the Regional Background for Dioxins/Furans

N

0 200 400

Scale in Feet

Dioxins/Furans in Drainage Sediments

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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Apex Companies, LLC
801 NW 42nd Street, #204
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32-21001485	JP	JF	8
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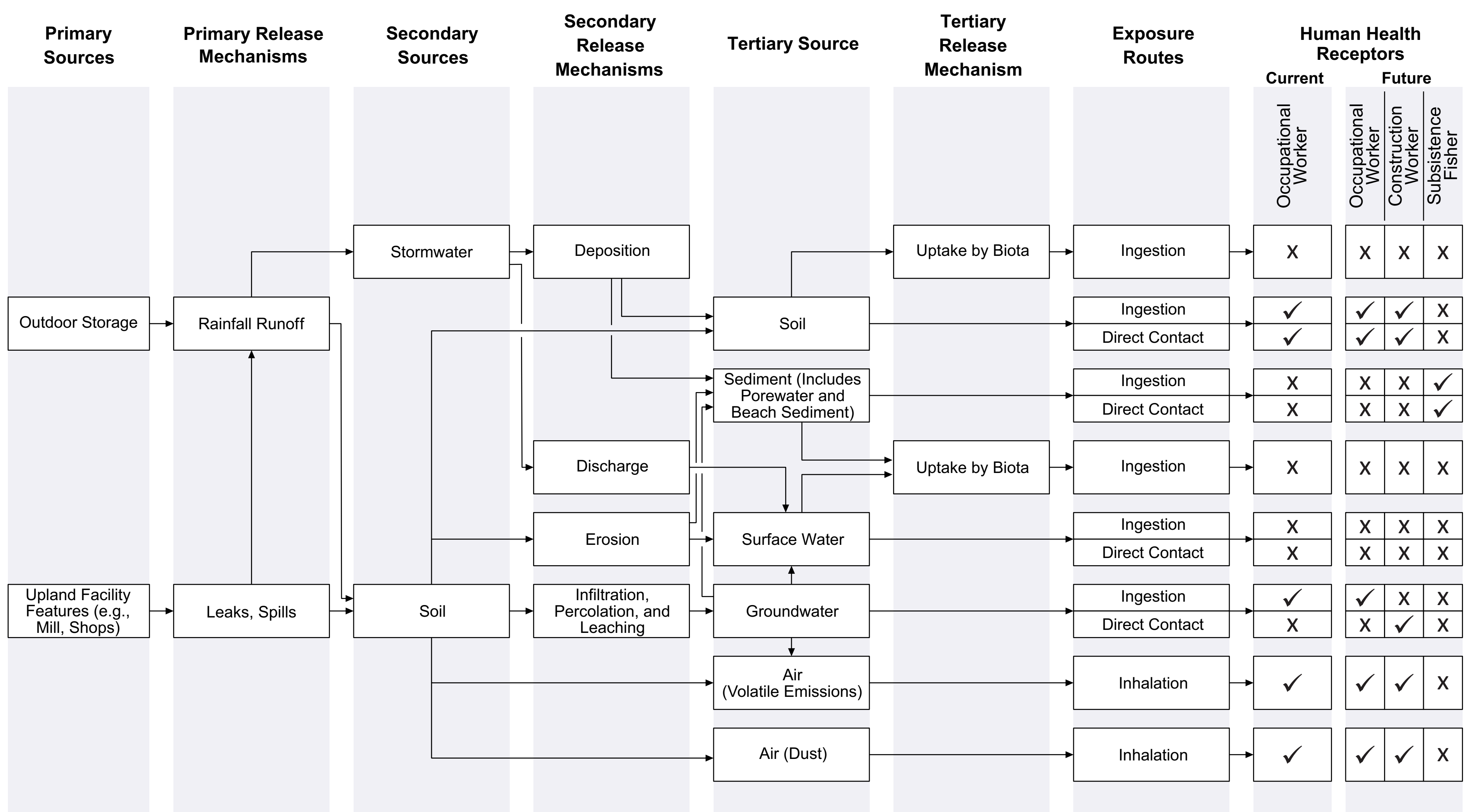

Legend:

✓ Potentially Complete Exposure Pathway at Buse Timber and Sales Site

X Incomplete Pathway at Buse Timber and Sales Site

Conceptual Site Model of Human Health Exposure Pathways

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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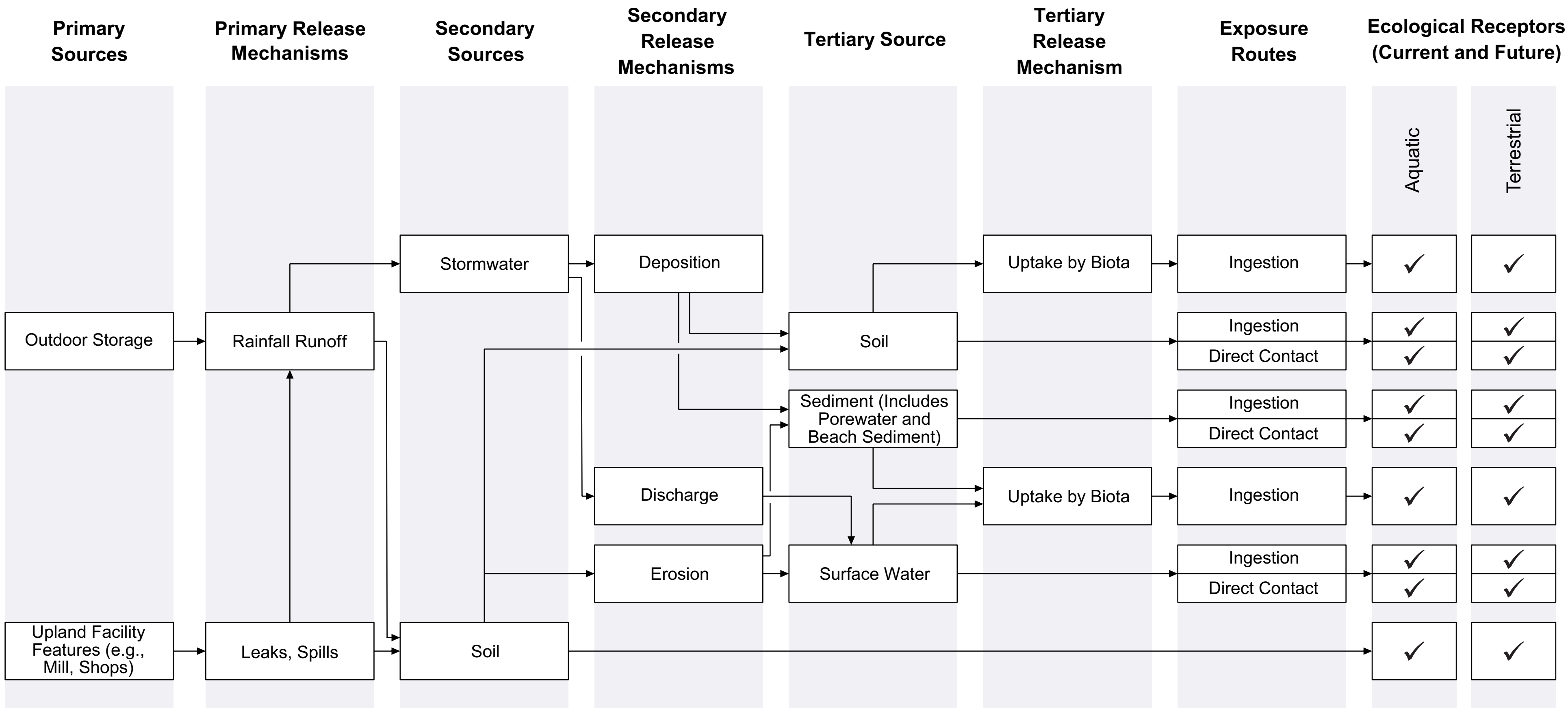

Legend:

✓ Potentially Complete Exposure Pathway at Buse Timber and Sales Site

X Incomplete Pathway at Buse Timber and Sales Site

Conceptual Site Model of Ecological Exposure Pathways

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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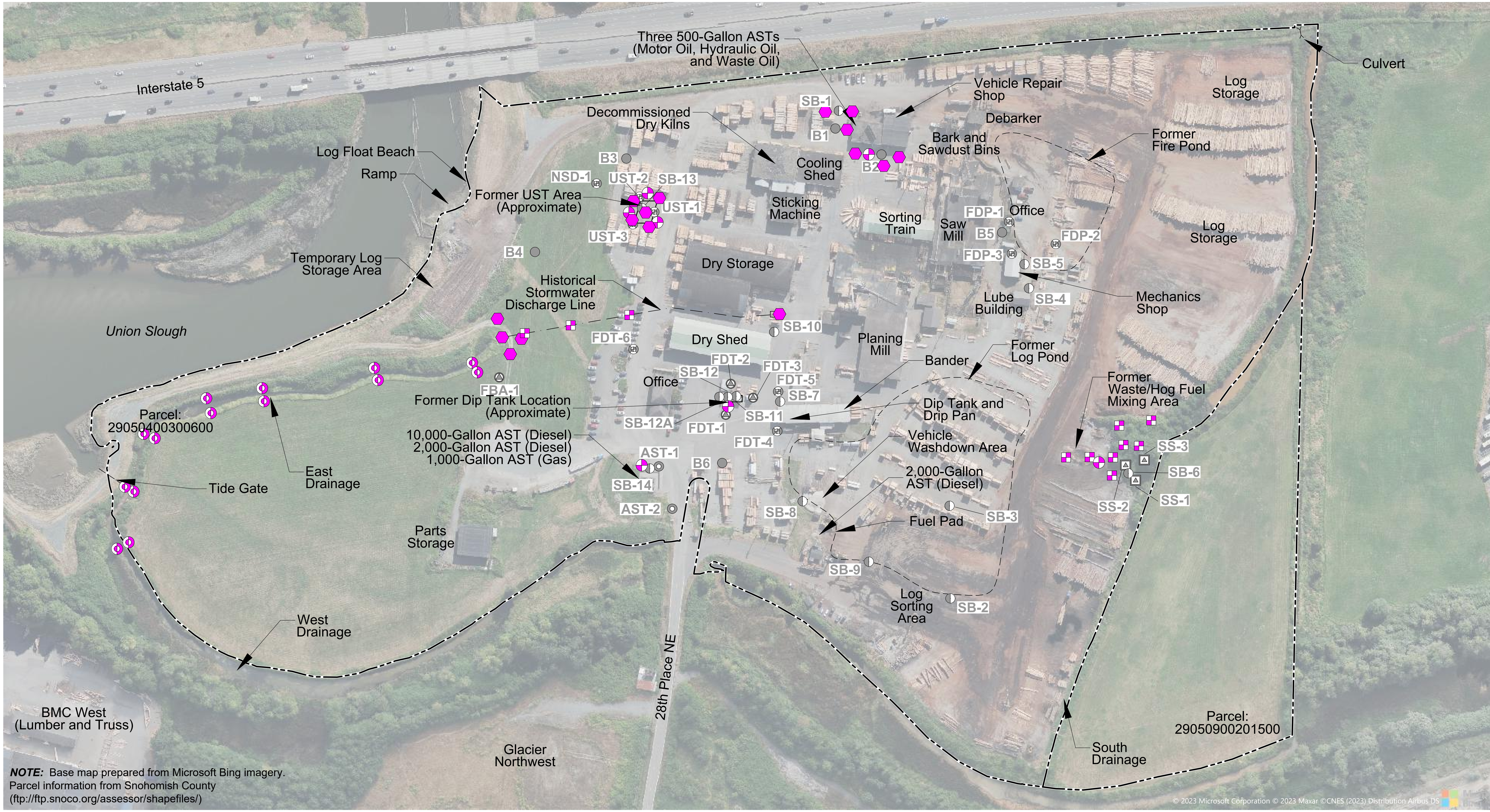
	March 2024			



Legend:

- Two Proposed Soil Borings at Bank Location (See Figure 13 for Typical Sampling)
- Proposed Soil Boring Location
- Proposed Monitoring Well Location
- Proposed Test Pit Location
- SB-1 Soil and Temporary Groundwater Monitoring Well Location (Apex 2021)
- SS-1 Surface Soil Location (Apex 2021)
- B1 Approximate Historical Soil Boring (Terracon 2018)
- AST-1 Approximate Historical Soil Sample (Exponent 1998)
- FDT-1 Approximate Historical Subsurface Soil Sample (Exponent 1998)
- FDP-1 Approximate Historical Soil and Groundwater Sample (Exponent 1998)

N

0 200 400

Scale in Feet

Proposed Soil and Groundwater Sampling Locations

Remedial Investigation Work Plan

Buse Timber & Sales - 3812 28th Place NE

Everett, Washington

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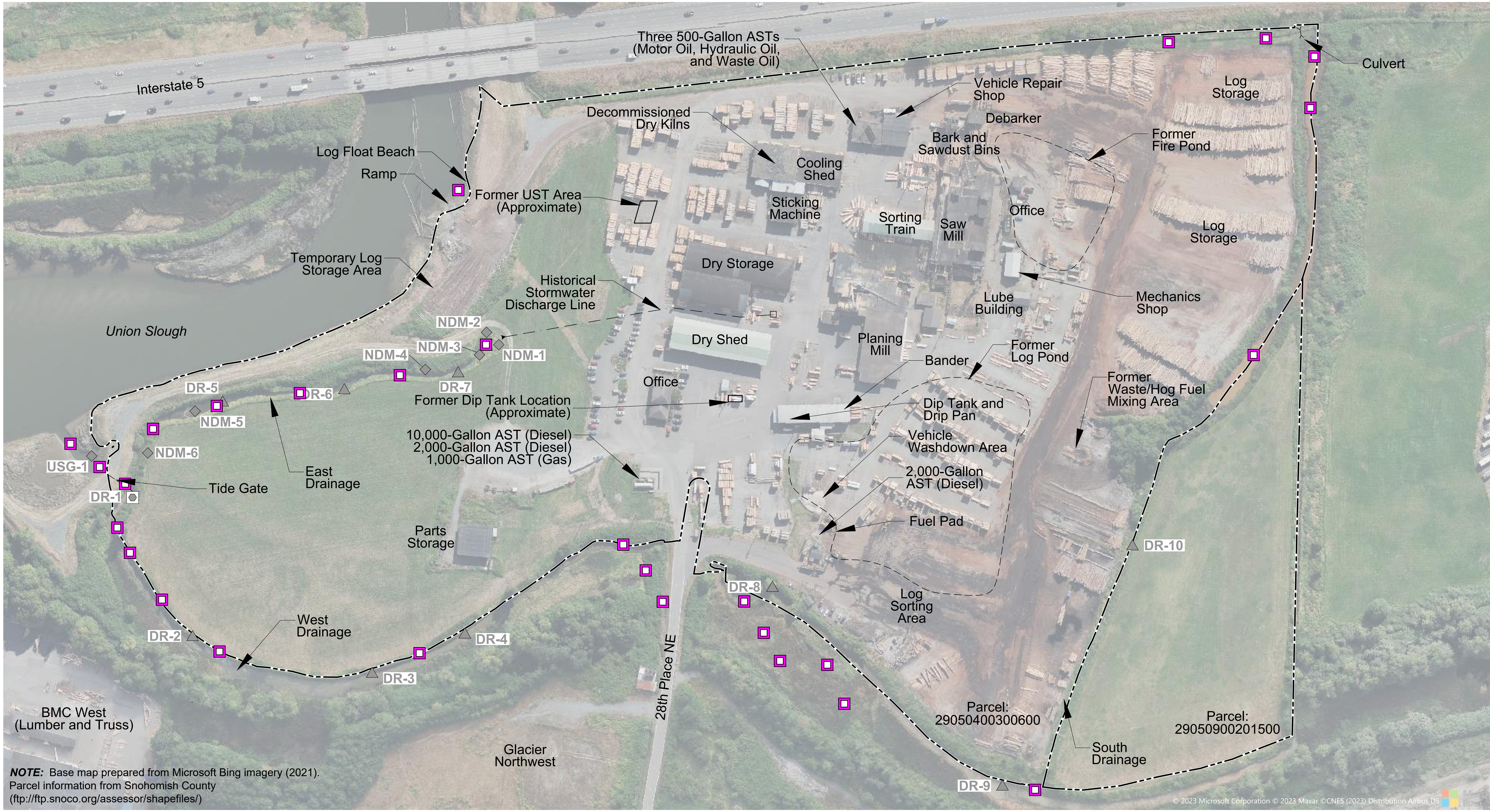

Legend:

- Proposed Sediment Sample Location (See Figure 13 for Typical Sampling)
- DR-1 Discrete Sample Location (Apex 2021)
- DR-2 Drainage Composite Sub-Sample Location (Apex 2021)
- WDM-3 Approximate Historical Sample (Exponent 1998)

N

0 200 400

Scale in Feet

Proposed Sediment Sample Locations

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Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

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801 NW 42nd Street, #204
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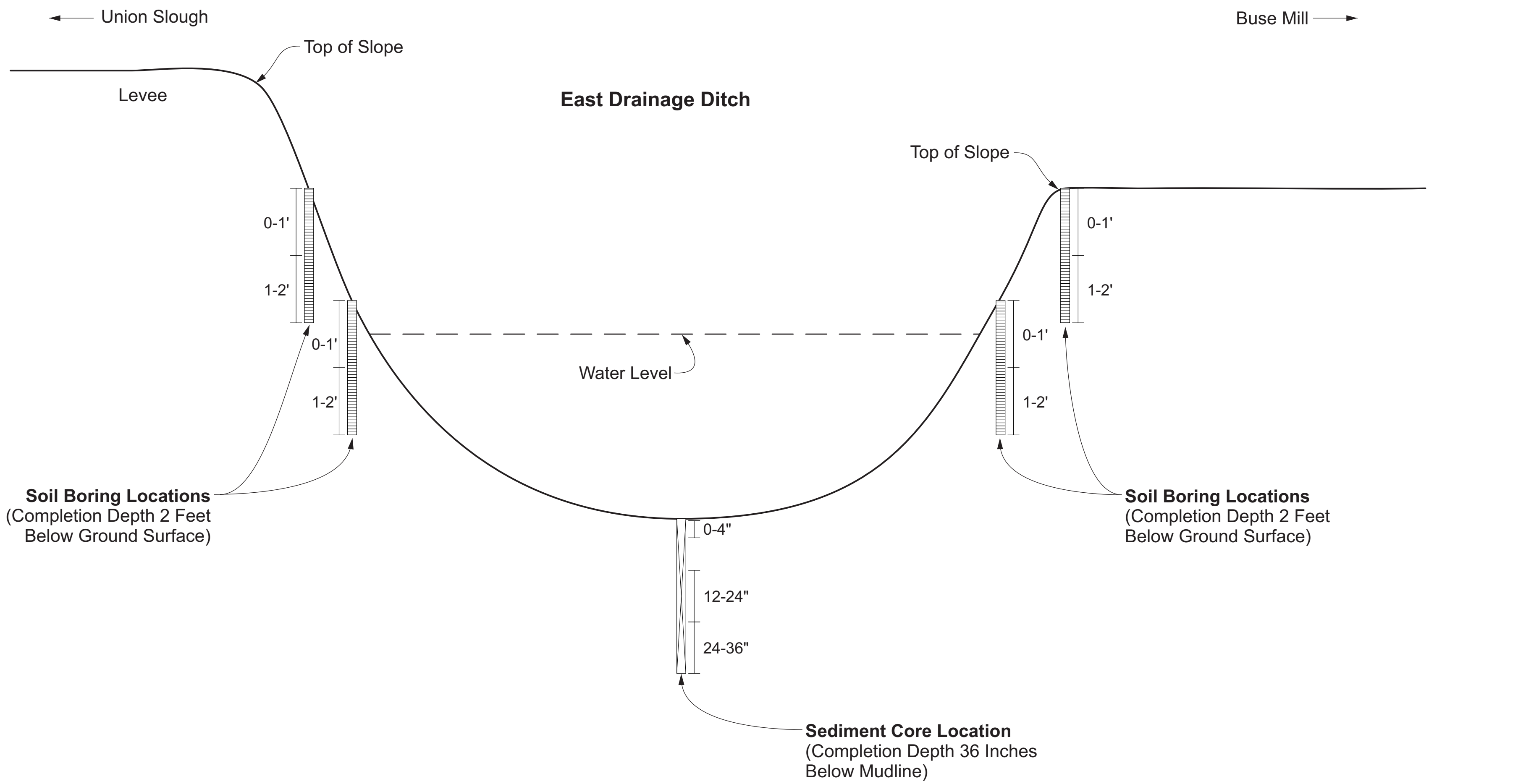


NOT TO SCALE

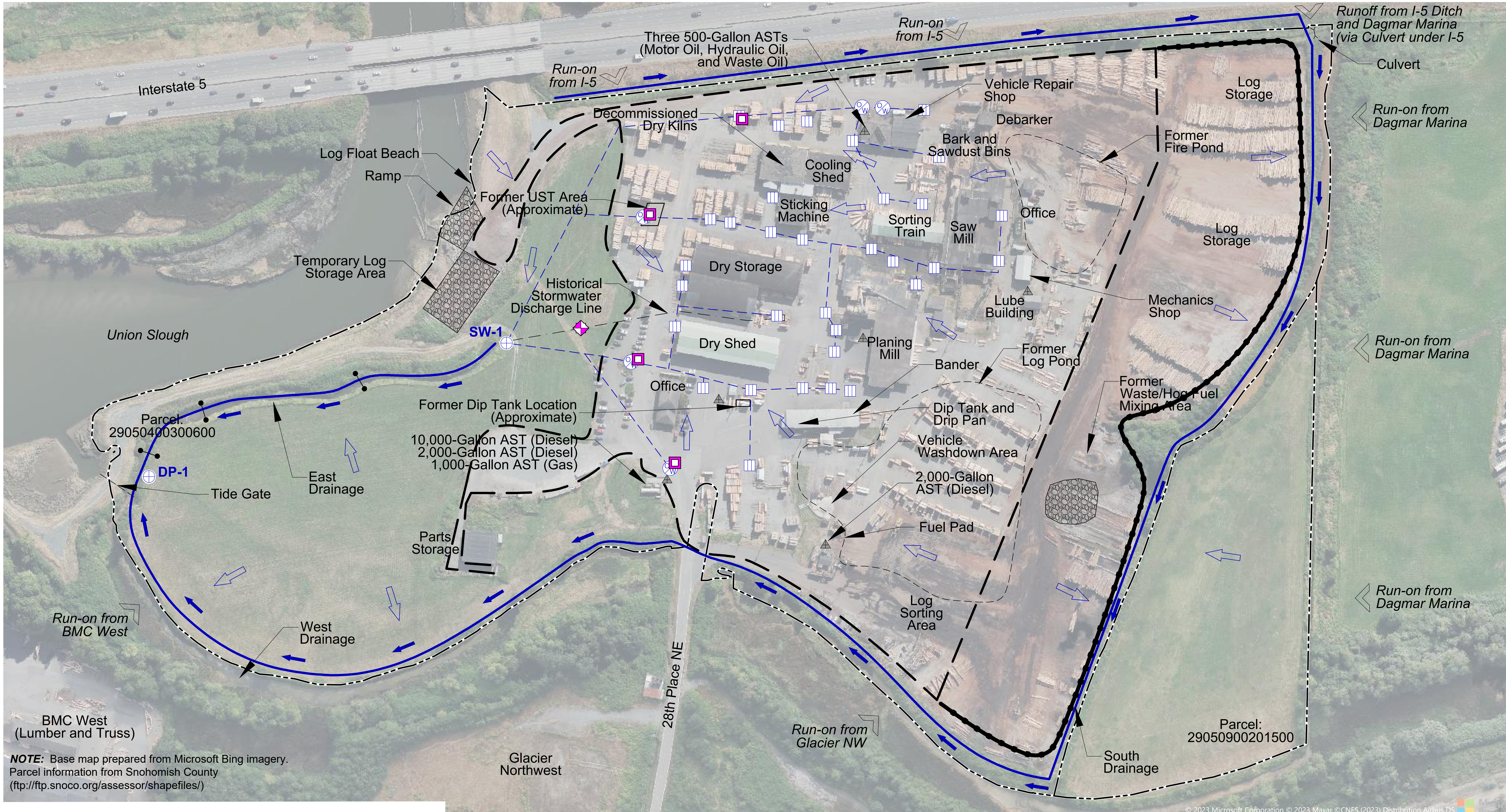
Conceptual East Drainage Sampling Cross-Section

Remedial Investigation Work Plan
Buse Timber & Sales - 3812 28th Place NE
Everett, Washington

APEX	Apex Companies, LLC 801 NW 42nd Street, #204 Seattle, Washington 98107	Project Number: 32-21001485	Drawn: JP	Approved: JF/KE
		March 2024		

Figure
13

I:\Client\Alterra Property Group LLC\Buse Mill - Everett, WA\2023 RI Work Plan\32-21001485 13 (Cross-Section).des



NOTE: Base map prepared from Microsoft Bing imagery. Parcel information from Snohomish County (ftp://ftp.snoco.org/assessor/shapefiles/)

Legend:

- Proposed Discrete Sediment Sample Location
- Proposed Composite Sample Location
- Storm Drain Line
- Stormwater Monitoring Point
- Catch Basin
- Oil/Water Separator
- Stormwater Bioswale/Ditch
- Stormwater Bioswale/Ditch Flow Direction
- Surface Flow Direction
- Silt Curtain
- Spill Kit Location
- Quarry Spalls
- Containment Berm
- Paved Area
- Run-off Area (Potential Pollutants)

N

0 200 400

Scale in Feet

Proposed Stormwater System Samples

Remedial Investigation Work Plan

Buse Timber & Sales - 3812 28th Place NE

Everett, Washington

Apex Companies, LLC
801 NW 42nd Street, #204
Seattle, Washington 98107

Project Number:	Drawn:	Approved:	Figure
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March 2024			

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Appendix A

Sampling and Analysis Plan/Quality Assurance Project Plan

Table of Contents

Tables

1.0 Introduction

This Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) was prepared to present a detailed account of field and laboratory procedures for sampling at Buse Timber & Sales, Inc. (Site) in support of the Remedial Investigation (RI) under the Agreed Order number DE 21518 (AO). This SAP/QAPP was prepared in compliance with Washington Administrative Code (WAC) 173-340-820 and WAC 173-204-600 and includes the sampling and monitoring activities to be conducted during the Remedial Investigation in order to determine the lateral and vertical extent of contamination at the Site. These activities are in support of the Order between the State of Washington Department of Ecology (Ecology) and 3812 Everett Partners, LLC (Everett Partners). The selected remedial action will address the presence of chemicals of potential concern (COPC) in surface and subsurface soil, groundwater, drainage sediment, and surface water sediment.

This SAP is a component of the RI Work Plan and is prepared in accordance with the Order to determine the proposed number of environmental samples and sampling approach based on data gaps and data quality objectives (DQOs). The QAPP within this SAP is prepared in accordance with the Guidance for Preparation of Quality Assurance Project Plans, U.S. Environmental Protection Agency (EPA) Region 10, Quality Data Management Program, QA/R-5 (EPA, 2002). The QAPP also follows Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology, 2016), the Sediment Cleanup User's Manual (Ecology, 2021), and the Guidance on Wood Waste Cleanup (Ecology, 2013).

2.0 Purpose/Background

2.1 Purpose

The purpose of the RI is to gather sufficient information to design the remedial action for the Site. Based on site history and previous environmental investigations, the data gaps on the following page have been identified.

Area & Target Media	Preliminary COPC	Data Gap
Drainage Ditch System **Target Media:** Sediment	Diesel-range total petroleum hydrocarbons (TPH-Dx), arsenic, nickel, mercury, chlorinated phenols, polychlorinated biphenyls (PCBs), and dioxins/furans Total organic carbon (TOC); ammonia; sulfide; benzoic acid; and benzenemethanol	Delineate lateral and vertical extent of COPC above applicable cleanup levels. Perform additional analysis of chlorinated phenols and PCBs where reporting limits are above applicable cleanup levels. Characterize wood waste in sediment and potential affects to benthic community.
Union Slough (downstream tide gate) **Target Media:** Sediment	TPH-Dx, arsenic, nickel, mercury, chlorinated phenols, PCBs, and dioxins/furans TOC; ammonia; sulfide; benzoic acid; and benzenemethanol	Delineate lateral and vertical extent of COPC above applicable cleanup levels. Perform additional analysis of chlorinated phenols and PCBs where reporting limits are above applicable cleanup levels. Characterize wood waste in sediment and potential affects to benthic community.
Log Float Beach **Target Media:** Sediment	TOC; ammonia; sulfide; benzoic acid; and benzenemethanol	Characterize wood waste in sediment and potential affects to benthic community.
Former Waste Mixing Area **Target Media:** Soil Groundwater	Dioxins/furans (soil only), TPH-Dx, chlorinated phenols, polycyclic aromatic hydrocarbons (PAHs), TOC, metals, and volatile organic compounds (VOCs)	Delineate lateral and vertical extent of COPC previously above applicable cleanup levels. Perform additional investigation of COPC associated with past and current Site activities. Include investigation of wood waste, chlorinated phenols, PAHs, and VOCs.
Vehicle Repair Shop **Target Media:** Soil Groundwater	Metals (arsenic, chromium, and lead)	Complete shallow soil sampling in order to define the extent of metals concentrations exceeding cleanup levels. Groundwater conditions associated with elevated metals concentrations.

Area & Target Media	Preliminary COPC	Data Gap
Former Underground Storage Tank (UST) Area **Target Media:** Soil Groundwater	Gasoline-range TPH (TPH-Gx), TPH-Dx, VOCs, PAHs, and lead	Complete additional investigation of this area to characterize the impacts from a documented UST release per Model Toxics Control Act requirements.
Former Pentachlorophenol (PCP) Dip Tank **Target Media:** Soil Groundwater	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Complete additional investigation and monitoring of detections of COPC.
Aboveground Storage Tank (AST) Area **Target Media:** Soil Groundwater	TPH-Dx	Characterize drainage sump/oil-water separator downstream of 2023 AST release area.
Soil at Historical Stormwater Line **Target Media:** Soil	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Limited investigations have been performed near the historical stormwater drainage system. Additional characterization of site COPC is required to determine potential need for remedial action. Review plant files and complete additional interviews to confirm historical drainage locations.
East Drainage Bank Soil **Target Media:** Soil	TPH-Dx, dioxins/furans, metals, chlorinated phenols, PAHs, and VOCs	Impacts from known contaminants in drainage sediment have not been fully delineated in the East Drainage. Additional soil characterization is needed to determine lateral and vertical extent of remedial action, if necessary.

2.2 Background

The Site consists of two parcels of land (Parcel No. 29050400300600 and 29050900201500) comprising approximately 60.48 acres (Figure 2). Buse Timber & Sales Inc. has operated as a lumber mill since the mid-1940s. Current operations include a sawmill facility, log storage, and 11 buildings including the main office and maintenance and storage buildings (Figure 3).

The Site is situated on generally flat terrain at a surface elevation of approximately 1 foot above mean sea level (amsl). The nearest body of water is the Union Slough, located north and west adjacent to the Site. A drainage system encircles the Facility that discharges any collected water to Union Slough through a tide gate at the north end of the Site. Wetlands are present at the north end of the Site near the east and west drainage, along the Union Slough, and to the southwest near the south drainage. Emergent wetlands are present in the southern portion of the Site. Surrounding properties generally consist of commercial or industrial businesses.

3.0 Project Management and Tasks

As part of the RI Work Plan development and implementation, roles and responsibilities will be assigned to experienced scientists and engineers. Responsibilities of the team members, as well as laboratory project managers, are described below.

- Ecology Project Manager: David Horne – Responsible for reviewing and approving work plans and reports pertaining to the remedial investigation at Buse Timber & Sales, Inc.
- Project Coordinator (Apex): John Foxwell – Provides support for execution of Everett Partners responsibilities; responsible for reporting, coordinating subcontractor support, and managing the project schedule and budget.
- Quality Assurance/Quality Control (QA/QC) Manager and Database Coordinator (Apex): Katya English – Responsible for implementing the QA/QC procedures in this QAPP and managing the field and laboratory site database. Provides QA oversight for both the field sampling and laboratory programs, ensuring that samples are collected and documented appropriately, coordinating with the analytical laboratories, ensuring data quality, coordinating with data validation specialists, and supervising project QA coordination.
- Data Validation/Data Quality Review: Laura England-Witt – Responsible for data validation of laboratory and data summary reports. Ensures integrity of data relative to DQOs and that the data is properly validated for use following National Functional Guidelines for Organic Superfund Methods Review (EPA, 2020a) and National Functional Guidelines for Inorganic Superfund Methods Review (EPA, 2020b). Ms. England-Witt is based in Apex's Pleasant Hill, California office and will complete the data validation as an independent third party.

- Field Manager (Apex): Corey Stout – Field director for the remedial investigation. Responsible for coordinating all field activities in accordance with the RI Work Plan and this SAP. The field manager will arrange all sampling containers and oversee sampling, ensure standard operating procedures (SOPs) are being followed in the field, coordinate with the QA/QC manager and the project manager, and assist in managing wastes generated during the investigation.
- Laboratory Data Manager (Fremont Analytical): Brianna Barnes – Project manager for the analytical laboratory contracted for the laboratory analysis. Fremont Analytical is responsible for conducting laboratory analysis and maintains a current certification from the National Environmental Laboratory Accreditation Program (NELAP) and Ecology's laboratory accreditation program under WAC 173-50.
- Laboratory Data Manager (Ceres Laboratories): James Hedin – Director of Operations for the analytical laboratory contracted for the analysis of dioxin/furan samples. Ceres Laboratories is responsible for conducting laboratory analysis and maintains a current certification from NELAP and Ecology's laboratory accreditation program under WAC 173-50.
- Project Scientists, Engineers, and Technicians (Apex): Includes qualified geologists, chemists, engineers, and field technicians supporting data collection, analysis, and reporting.

4.0 Data Quality Objectives

The general DQOs for this project are to develop and implement procedures for obtaining and evaluating data of a specified quality that can be used to evaluate site conditions. Samples will be collected to evaluate where contamination in the upland and drainage systems exceed acceptable levels for both human health and ecology. This will be achieved by conducting chemical characterization on a representative number of samples in order to delineate excess risk to health and the environment.

The objectives of the RI are: (1) define the vertical and lateral extent of contamination in upland soil and drainage sediment that poses excess risk to human and ecological health; (2) determine areas where cleanup may be necessary; (3) refine the conceptual site model (CSM); and (4) generate data to support a Feasibility Study (FS) and draft Cleanup Action Plan (CAP).

4.1 Decision

The decision uses environmental data to determine where remediation is necessary at the Site. Data collected for soil, groundwater, and sediment will be used to evaluate if contamination exceeds applicable cleanup and screening levels. Contaminant concentrations present will determine areas where remediation may be necessary.

The principal study questions include:

1. Are concentrations of COPC above acceptable levels for exposure to human receptors?
2. Are COPC concentrations above acceptable levels for ecological receptors?

Data obtained from this remedial design investigation will help to develop a draft CAP that is protective of human and ecological health.

4.2 Inputs

4.2.1 Information Sources

To support the decision, an evaluation of existing site information will be performed to aid in the identification of representative areas and COPCs. Existing site information will include (if available) a review of previous site reconnaissance, site plans, topographic maps, aerial photographs, lidar maps, geologic maps, soil survey information in the vicinity of the Site, previous investigation data, boring logs, well logs, geotechnical reports, and bathymetry maps for the Union Slough.

4.2.2 Basis of Information Needed

The information generated for this RI will need to represent a large area with multiple receptors. The location of the Site (adjacent to the Union Slough) is within an ecologically rich area that includes birds, mammals, plants, and invertebrates. Plans for changes to future use of the site have not been developed, and the mill is under a long-term operating agreement. To the extent feasible, cleanup decision making will factor in unrestricted land use. This RI will determine COPC concentrations that pose an unacceptable risk to these receptors and will support selection of the subsequent remedial action.

4.2.3 Sampling and Analysis Methods for Information Needed

Sampling procedures will use discrete samples to characterize data gap areas. Additional groundwater monitoring will be performed in areas where groundwater impacts may be present.

COPCs are discussed in Section 2.1. Laboratory preparation and analytical methods were chosen to meet appliable cleanup and screening levels using accredited methods and laboratories for analysis through NELAP and Ecology's environmental laboratory accreditation program.

4.3 Boundaries of Study

The target area includes the upland portion of the Site and perimeter drainage areas. Vertical delineation will be conducted to between 5 and approximately 20 feet below ground surface (bgs).

4.4 Analytical Approach

The analytical approach will be focused on COPC concentrations in comparison to applicable cleanup and screening levels. If COPC concentrations are above risk-based criteria for human or ecological health, then remedial action may be necessary to minimize the risk.

4.5 Acceptance Criteria

Errors in sampling and measurement contribute to the study error and result in corresponding decision error. If COPC concentrations exceed applicable cleanup and screening levels, then confirmation sampling/analysis may be necessary to support appropriate site management decisions. Criteria that will be evaluated include detection and reporting limits in comparison to remediation goals and cleanup levels to ensure that data obtained from chemical analysis is representative of actual Site conditions.

5.0 Sample Process Design

The RI sampling design builds upon previous investigations and evaluations to help develop a detailed CSM and further delineate concentrations to inform remedial actions. The rationale for the proposed sampling is further described in Section 4.0 of the RI Work Plan. Sampling locations are on Figures 11 and 12 of the RI Work Plan and sampling areas are presented with COPCs in Table A-1.

5.1 Direct-Push Sampling

Direct-push investigation is proposed in order to characterize the nature and extent of contamination in the areas of the former USTs. The anticipated depth to groundwater is approximately 15 feet bgs. Soil borings will be completed to the following depths:

- Former UST Area – 20 feet bgs or until field screening results are negative;
- Vehicle repair shop – 10 feet bgs or until field screening results are negative;
- AST release area drainage structure – 20 feet bgs or until field screening results are negative; and
- Historical stormwater line – 10 feet bgs or until field screening results are negative.

Field screening and boring installation will be conducted in accordance with Apex SOP 2.1 and SOP 2.4. Soil samples will be collected in accordance with SOP 2.4 and SOP 2.7. The SOPs are included in this appendix.

5.2 Monitoring Well Construction and Development

Groundwater monitoring wells will be constructed at the former UST area, former dip tank, former waste mixing area, vehicle repair shop, and AST area. One monitoring well will be installed at the former PCP dip tank. The monitoring wells will be constructed with 2-inch polyvinyl chloride (PVC) casing approximately 20 feet deep with 10 feet of screen following SOP 2.13. The field geologist will document the well installation and construction activities. Details to be noted include the following:

- Length of well components;
- Measurements of bentonite, sand, and concrete depths;
- Types, brands, weights, and amounts of materials used;
- Documentation of decontamination; and
- Any deviation from standard procedures or problems encountered during the well installation activities.

The monitoring wells will be developed to establish a connection with the aquifer following SOP 2.14. Well development will be no earlier than 48 hours after well installation is completed. Development will be considered complete when the water is visually clear and field parameters have stabilized to within 10 percent of the previous measurement for three consecutive borehole volumes. Purge water will be drummed and profiled for proper disposal. The top of inner well casing elevation, as well as the x and y location coordinates for the newly installed wells, will be surveyed by a Washington licensed surveyor following well installation activities.

5.3 Test Pit Sampling

A test pit investigation will be completed to characterize the waste mixing area.

Eight test pit excavations will be completed across the area shown on Figure 11 of the RI Work Plan. One soil sample will be collected from within the organic-rich surface soil and one sample will be collected from the native soil immediately beneath the surface soil veneer following SOP 2.2 and SOP 2.3. The field scientist or engineer will log the test pit, describing indications of contamination based on visual inspection and lithology using the USCS in general accordance with ASTM 2487/2488. Other features such as sorting, sedimentary features, mineralogy, degree of weathering, contacts with other soil types, and proportional amount of organic material will be noted. Soil samples will be field screened for the presence of VOCs using olfactory observation, sheen tests, and a photoionization detector (PID). Field screening and test pit installation will be conducted in accordance with Apex SOP 2.1 and SOP 2.3 (attached).

5.4 Surface Soil Sampling

Surface soil samples will be collected along the East Drainage on either side of the drainage channel and the top of bank as per Figure 12 of the RI Work Plan. Sampling locations are shown on Figure 11 of the RI Work Plan, and a cross-section depicting the sampling approach is shown on Figure 13. Surface soil samples will be collected following SOP 2.2.

5.5 Drainage Control Structure Sampling

Catch-basin sediment and sediment within the former stormwater pipe will be collected using grab sampling techniques. When there is no standing water, samples will be collected directly from the drainage control feature using a decontaminated stainless-steel spoon. If standing water is present, an extension pole and bucket will be used to collect the sample, taking necessary steps to ensure fine particles are retained.

Discrete samples will be homogenized in stainless steel bowls prior to filling the sample container. For the composite sample from the former stormwater pipe, equal sample aliquots will be collected at different locations within the pipe. The aliquots will be placed into a stainless-steel bowl, homogenized, and placed into laboratory-supplied containers.

5.6 Sediment Sampling

Sediment sampling will be completed within the perimeter drainage system, and discrete sediment samples will be collected along the center axis of the drainage. Sediment sample locations are shown on Figure 12 of the RI Work Plan. Consistent with Section 3.4 of SCUM, sediment samples will be collected from a depth of 0 to 10 cm to characterize risks to the benthic community. At each sediment station, an additional sample will be collected from 12 to 24 inches below mudline to provide vertical delineation. Sediment samples will be discrete samples.

Sediment samples will be collected at low tide from the shore or a raft-based system. Sediment samples within the drainages will be collected using a miniature vibracore-style sampler called a Vibecore-mini made by Specialty Devices, INC. The Vibecore-mini is a direct push sampler with an electric motor that spins eccentric weights to create vibrations and advance the sample tube into soft sediments. Samples will be retrieved in a 3-inch outer diameter polycarbonate tube with a wall thickness of 0.125 inches. Sample catchers will be used to retain the sample inside the tube during removal from the sediment. In optimal conditions with soft sediments such as those present at the site, the Vibecore-mini is capable of advancing sample tubes up to 12 feet or more. It is anticipated that core recovery will be approximately 90% of the core run.

The sediment sample will be evaluated against the following acceptability criteria:

- Desired penetration depth is achieved;

- The sediment sampler is not overfilled (i.e., core length is equal to or less than penetration depth);
- When comparing the length of the recovered core with the core penetration depth:
    - If the recovered length of the sediment core is more than 60 percent of the penetration depth, keep the core;
    - If an insufficient amount of material is recovered, discard the core. Rinse the corer with drainage ditch water and prepare to make an additional attempt;
- A maximum of three attempts to collect a core are made for a given location; and
- The corer is rinsed with drainage ditch water between consecutive attempts.

If all three attempts to collect a core are unsuccessful based on recovery alone (i.e., less than 60 percent recovery), retain the final core for analysis and indicate that the targeted recovery was not achieved.

5.7 Groundwater Monitoring

5.7.1 Groundwater Elevation Measurements

Water level measurements will be collected in general accordance with Apex's SOP 2.16 for water level measurement procedures, provided in this appendix. Well covers and well caps will be opened, and the water level will be allowed to equilibrate under atmospheric conditions for at least five minutes before water level measurements are taken. Depth to water, depth to product, and/or presence of sheen will be recorded in the field notes. Noticeable odors, damage to wells, or other conditions will also be documented in the field notes.

5.7.2 Collection of Groundwater Samples

Apex will collect groundwater samples from monitoring wells in accordance with the low-flow sampling techniques described in SOP 2.5, included in this appendix. Water level monitoring will be attempted during sampling, and pumping drawdown will be restricted to less than 0.3 feet during groundwater monitoring events.

Groundwater samples will be collected using dedicated tubing and a peristaltic pump within the screened interval. Groundwater will be purged prior to sampling. During purging, groundwater field parameters (pH, oxidation-reduction potential [ORP], dissolved oxygen [DO], specific conductivity, and temperature) will be measured using a flow cell connected to the discharge tubing of the sample pump. Turbidity of the water will be monitored visually with color and clarity being recorded on the sampling data sheet. Purging will be considered complete when the water quality parameters have stabilized to within 10 percent and the water is visually clear for three consecutive three-minute intervals. Sample containers will be provided by the laboratory ready for sample collection. Table A-2 lists sample container requirements.

5.8 Sample Location Control

For all sample locations, horizontal sample location control of the sample increments will be achieved using a high-accuracy, handheld global positioning system device (GPS; Trimble© Gwo7X™) with sub meter accuracy.

Monitoring wells will be surveyed by a licensed surveyor. The survey will include determination of the horizontal location and elevation of the wells (State Plane Coordinate System for horizontal control and NAVD88 or other approved datum for vertical control). The top of bank (each side) and mudline elevation of the East Drainage will also be surveyed.

For the samples collected in Union Slough, a local tide gauge will be identified and slough levels will be monitored prior to sample collection.

5.9 Decontamination Procedures

The objectives of decontamination are to prevent: the introduction of contamination into samples from sampling equipment; cross contamination between stations (i.e., between each subsample); contamination leaving the site via sampling equipment or personnel; and exposure of field personnel to contaminated materials. This section discusses general procedures to be followed that will meet these objectives.

5.9.1 Sampling Equipment

To prevent cross-contamination with sampling equipment, disposable nitrile gloves will be changed between each sampling station and replaced prior to handling decontaminated instruments, equipment, or work surfaces.

Sampling Equipment. Decontamination procedures are designed to remove trace-level contaminants from sampling equipment to prevent cross-contamination between samples and equipment. All sampling equipment (e.g., stainless steel spoons and bowls) will be decontaminated between uses. Cleaning of non-disposable items will consist of washing in a non-phosphate detergent (e.g., Alconox®) solution and rinsing with tap water, followed by a deionized water rinse.

Personnel Decontamination. Personnel decontamination procedures should always be reviewed and evaluated prior to sampling. Based on the baseline sediment data, personal protective equipment (PPE) to prevent chemical exposures is not required. Regardless of the level of protection required, field personnel should thoroughly wash their hands and faces before taking any work breaks and at the end of the day.

6.0 Documentation

Project files including this SAP, SOPs, and other documents used for this project will be kept up-to-date and filed electronically in a central project folder. The most recent documents will only be present in the main project folder, and older versions will be kept at a separate archival location. All project personnel will have access to the main project folder, and any updates to these documents will be communicated electronically with all project staff by the Project Manager.

Records pertaining to the project will include field records, GPS system data, chain-of-custody forms, and laboratory documentation. All project records will be stored and maintained in a secure manner by the Port for a minimum of ten years. The Project Manager is responsible for filing the necessary documents and ensuring their completeness.

6.1 Field Documentation

Field activities and samples must be properly documented during the sampling process. Documentation of field activities provides an accurate and comprehensive record of the work performed sufficient for a technical peer to reconstruct the day's activities and provide certification that all necessary requirements were met. General requirements include:

- Use of project-specific field forms.
    - The specific information requested depends on the nature of the work being performed and on the form being used. Information fields that are not applicable should be noted "N/A" or with other appropriate notations.
- Use of bound, waterproof field books as the primary source for information collection and recording. Field books should be dedicated to the project and appropriately labeled.
    - Appropriate header information documented on each page, including project title, project number, date, weather conditions, changes in weather conditions, other persons (if any) in the field party, and author.
- Field documentation entries using indelible ink.
- Legible data entries. A single line should be drawn through incorrect entries and the corrected entry should be written next to the original strikeout. Strikeouts are to be initialed and dated by the originator.
- Applicable units of measurement with entry values.
- Field records maintained in project files unless otherwise specified by a client or stipulated by a contract.

- Representative photographs of project activities. These photographs should be representative of the work being performed, and specific to the project. There must be sufficient photographs to create a photographic log of events, if necessary, for reporting activities.

6.1.1 Documentation Entries

A chronology of field events will be recorded. General entry requirements include:

- Visitors to the Site;
- Summary of pertinent project communications;
- A description of the day's field activities, in chronological sequence using military time notation (e.g. 9:00 am: 0900, and 5:00 pm: 1700);
- If applicable, calibration of measuring and test equipment and identification of the calibration standard(s) and use of a Calibration Log, if available, with cross-reference entered into the field book;
- Field equipment identification, including type, manufacturer, model number, or other specific information;
- General weather conditions, including temperature, wind speed, and direction readings, including time of measurement and units;
- Safety and/or monitoring equipment readings, including time of measurements and units;
- If applicable, reference in the field notebook to specific forms used for collection of data;
- Other unusual events.

6.1.2 Specific Requirements

Sample Collection. Sample collection data will be documented in a bound field book and/or on a sample collection form. Where both are being used, information contained in one is cross-referenced to the other. Entries include:

- Sample identification number, location taken, depth interval, sample media, sample preservative, collection time, and date;
- Sample collection method and protocol;
- Physical description of the sample (standard classification system for soil – ASTM D2488);
- If a composite sample, the sample's make up, including number and locations (i.e. coordinates) of individual contributing grab samples;
- Quality-control-related samples collected (e.g. duplicates, replicates, field blanks);
- Container description and sample volume;

- Pertinent technical comments; and
- Identification of personnel collecting the sample.

Sample Labeling. Sample labels must be prepared and attached to sample containers. Labels will either be provided by the laboratory performing the analyses or will be generated internally and will be water-proof and self-adhering. The information to be provided includes:

- Sample identification number;
- Sample date and collection time;
- Physical description of the soil sample;
- Analytical parameters;
- Preservatives, if present;
- Sample location; and
- Client.

Soil Logs. The field logbook will include clear information concerning sample collection activities. Sample logging will be completed for each boring and locations where composite samples are collected. Sample logs will be recorded on pre-printed log forms. In addition to standard entries of personnel, date, and time, the log sheet will also include the following information:

- Names(s) of personnel logging the samples;
- Administrative and technical information included in the header;
- Types of equipment used;
- Descriptions of subsurface materials encountered, and the number and type of samples collected, if any;
- Subsurface exploration depth and units of measure;
- Length of recovery, if applicable;
- Sample type and sample number for analytical samples collected (these data are also to be entered on the sample collection log, if used, and the sample label); and
- Narrative description of the soil (using standard classification system) and other pertinent information.

6.2 Analytical Documentation

All records pertaining to analytical data will be kept by the laboratory for a minimum of seven years. Analytical results will be provided as a PDF and electronic data deliverable (EDD) in a Microsoft Excel database format. Laboratory results for sample analysis will be stored electronically by Apex.

6.3 Data Reduction

Reports generated in the field and laboratory will be included with project reports. Data generated by the analytical laboratory will be provided electronically. The QA Manager, Laura England-Witt, will complete data validation of the analytical data package by reviewing for any discrepancies between this SAP, the chain-of-custody, analyses, and quality assurance. If any discrepancies are found, the analytical laboratory will be contacted for additional information.

For reporting purposes, EDDs provided in a database format will be used to generate analytical data tables. All reportable data in tables will be checked against original laboratory reports. Data provided on field notes to be presented in data tables will be entered manually and 100% of manually entered data will undergo a secondary check for accuracy.

6.4 Reporting

Results will be presented in a remedial design investigation report, and the data will be evaluated to determine if cleanup actions are required at the Facility. The remedial investigation report will include the following:

- Summary of field activities including field notes and forms;
- Sampling locations in both tabular and mapped format;
- Sampling results, tables, and discussion;
- Analytical data quality and validation review; and
- Screening of chemical analytical data against human and ecological health criteria.

7.0 Analytical Testing Program

This section summarizes the analytical testing program for upland soil to be collected as part of the RI Work Plan. Analytical testing will be completed in accordance with EPA-approved methods and this SAP. Each analytical testing method has been reviewed to comply with DQOs, as defined in Section 4.0. As such, contract laboratories are expected to meet the following requirements:

- Preparing and analyzing samples in accordance with analytical methods defined in this SAP;
- Reporting requirements for deliverables including electronic data;
- Turnaround times;
- Implementing QA/QC procedures as defined in the SAP and in compliance with laboratory accreditation;
- Communicating any QA/QC errors that may affect data quality; and
- Allowing audits, if necessary.

Table A-1 summarizes the proposed chemical analyses. Analytes, methods, analytical laboratories, method detection limits, minimum reporting limits, and target detection limit goals (applicable cleanup and screening levels) are listed in Tables A-3 through A-5. Method detection limits included in Tables A-3 through A-5 were calculated by each laboratory using instrument-specific MDL study data and statistical analysis.

Analytical methods will be performed by Fremont Analytical of Seattle, Washington and Ceres Analytical of El Dorado Hills, California. Turnaround time for data packages is expected to be between 2 and 3 weeks from the receipt of the last sample; however, turnaround times may be extended if complex matrices are encountered and require additional cleanup or dilution. Analytical data will be reported with standard QA/QC samples (method blanks, laboratory control samples, matrix spikes, laboratory duplicates, and surrogates).

8.0 Sample Containers and Handling

8.1 Container Requirements

Requirements for sample containers are provided in Table A-2. Samples will generally be collected in glass containers with Teflon®-lined lids to minimize adsorption and potential loss of analyte concentration. Containers will be supplied by the analytical laboratory.

8.2 Labeling Requirements

A sample label will be affixed to every sample container before sample collection. Sample labels must be water-proof and self-adhere to sample containers. Labels will be provided by the laboratory and require the following information, as discussed in Section 6.1:

- Sample identification number;
- Sample date and collection time;
- Physical description of the sample (e.g. water, solid, gas);

- Analytical parameters;
- Preservatives, if present;
- Sample location; and
- Client.

8.3 Packaging and Shipping Requirements

Each individual sample container will be wrapped with bubble wrap or other suitable packing material and immediately packed in a cooler with wet ice. One copy of the chain-of-custody form will be placed in a sealed plastic bag taped to the inside of the cooler lid. The samples will be either be delivered to the analytical laboratory by Apex or a courier service, or the laboratory will pick up the samples within 48 hours of collection. Chain-of-custody seals will be used for all samples shipped by courier.

9.0 Decontamination Procedures

Consistent decontamination procedures will be used for all sampling and laboratory procedures. The objectives of decontamination are to prevent the introduction of contamination into samples from sampling equipment or other samples, to prevent contamination from leaving the site via sampling equipment or personnel, to prevent exposure of field personnel to contaminated materials, and to prevent cross-contamination within the laboratory.

9.1 Personnel Decontamination

Personnel decontamination procedures depend on the level of protection specified for a given activity. Regardless of the level of protection required, field personnel should thoroughly wash their hands and faces before taking any work breaks and at the end of the day.

9.2 Sampling Equipment

Decontamination procedures are designed to remove trace-level contaminants from sampling equipment to prevent cross contamination between sample collection locations. To prevent cross contamination between sample locations, clean dedicated (if disposable) or decontaminated sampling equipment (if non-disposable) will be used for each sampling location and discarded or cleaned after use. Cleaning of non-disposable items will consist of washing in a detergent (e.g., Alconox®) solution, rinsing with tap water, followed with a deionized water rinse. This process will be repeated if visual signs of contamination are still present.

9.3 Laboratory Decontamination

Laboratory decontamination will involve strict adherence to laboratory SOPs and best practices. All work areas and equipment must be appropriately cleaned between samples to prevent cross-contamination. The laboratory will certify that laboratory-based contamination is not present by analyzing calibration blanks, instrument blanks, and/or method blanks at method-specified intervals. If contamination is present, then additional instrument cleaning or re-extraction may be necessary.

10.0 Investigation Derived Waste Handling

Investigation-derived waste (IDW) will consist of soil cuttings from drilling, decontamination water, monitoring well purge water, sampling materials (e.g., sample tubing), and PPE. Soil and water IDW will be placed in properly labeled drums and stored at a pre-approved location on the Site, pending receipt of chemical data to be used for profiling the waste for disposal. Based on the results, IDW will be transported to an appropriate facility for disposal or treatment. Sampling materials and PPE will be disposed of as solid waste.

11.0 Quality Assurance Project Plan

11.1 Quality Assurance Objectives for Measured Data

The elements included in this section are consistent with those specified in EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5 (EPA, 2002). The general QA objectives for this project are to develop and implement procedures for obtaining and evaluating data of a specified quality that can be used to evaluate soil conditions. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody procedures.

The DQOs for this project are presented in Section 4.0 and were established based on the EPA Guidance for the Data Quality Objectives Process, EPA QA/G-4 (EPA, 2006). They are the basis for the design of the data collection plan and, as such, the DQOs specify the type, quality, and quantity of data to be collected and how the data are to be used to make the appropriate decisions for the project.

Method detection limits (MDL), minimum reporting limits (RL), and analytical results will be compared to action levels for each COPC in the media of concern as part of the DQOs. The MDLs and RLs listed in Tables A-3 through A-5 are the expected limits based on instrument capabilities. In some cases, sample matrix or high target analyte concentrations may increase these limits. If sample conditions are such that MDLs exceed the screening levels, an acceptable alternative will be determined.

Specific QA objectives are as follows:

1. Establish sampling techniques that will produce analytical data representative of the media being measured.
2. Ensure that data collection and measurement procedures are standardized among all participants.
3. Monitor the performance of the various measurement systems being used in the program to maintain statistical control and provide rapid feedback, so that corrective measures, if needed, can be taken before data quality is compromised.
4. Periodically assess the performance of these measurement systems and their components.
5. Verify that reported data are sufficiently precise, accurate, representative, comparable, and complete, so that they are suitable for their intended use.

Precision, bias, accuracy, representatives, completeness, comparability, and sensitivity parameters are used as data quality indicators (DQI) and are defined below.

11.1.1 Precision

Precision is a measure of the reproducibility of data under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. For duplicate measurements, precision can be expressed as the relative percent difference (RPD). Duplicate measurements can include the following field and laboratory QC samples: field duplicates; laboratory duplicates; matrix spike (MS) and matrix spike duplicate (MSD) batch pairs; and/or laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) batch pairs.

The RPD is calculated using the following equation:

$$RPD = \frac{X_s - X_d}{(X_s + X_d)/2} \times 100\% \tag{1}$$

where:

X_s = analytical result of the primary measurement
X_d = analytical result of the duplicate measurement

11.1.2 Bias

Bias is the persistent distortion of measurement data that can cause an error in either direction (high or low). Bias can be determined from field blanks, trip blanks, equipment blanks, LCS/LCSDs, MS/MSDs, and surrogates.

11.1.3 Accuracy

Accuracy is the measure of error between the measured concentration and the accepted reference value. Accuracy is inferred from the recovery data of laboratory spiked samples. Quality assurance samples used to measure accuracy include: LCS/LCSDs, MS/MSDs, and surrogates. Surrogates are implemented when organic constituents are of interest.

Accuracy is calculated using the following equation:

(2)

$$A = \frac{X_{SS} - X_S}{T} * 100\%$$

where:

A	=	accuracy
X_{SS}	=	analytical result obtained from the spiked sample
X_S	=	analytical result obtained from the sample
T	=	true value of the added spike

11.1.4 Representativeness

Representativeness is a measure of how closely the data reflect the characteristic of a population, variation in parameters at a single location, a process condition, or an environmental condition. This data quality indicator depends on the design and proper implementation of the sampling program. Development of sampling plans include considerations such as site history, geography, demography, waste present, field screening parameters, DQOs, analytical parameters and methods, and sampling approaches. Documentation of field activities will confirm that protocols are followed according to the sampling plan. In addition to documentation, QC samples are also used to show that field screening and laboratory results are representative of actual field conditions. These QC samples may include as appropriate: field blanks, trip blanks, equipment blanks, and field duplicates.

11.1.5 Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is essentially that a sufficient amount of valid data be generated. Completeness will be judged by the Project Quality Assurance Manager and the Project Manager based on laboratory data quality and adherence to field sampling protocols. The completeness goal for this project is 95%.

Completeness (percent complete, or PC) of the data is determined by the following equation:

(3)

$$PC = \frac{\text{Number of samples with valid data}}{\text{Number of planned samples}} * 100\%$$

11.1.6 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The objective is to assure that all data developed during the sampling are comparable. Comparability of the data will be assured by using EPA-defined procedures which specify sample collection, handling, and analytical methods.

11.1.7 Sensitivity

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet project-specific objectives. It is important to be able to detect the target analytes at the levels of interest. Sensitivity requirements include the establishment of various limits, such as MDLs, project-specific RLs, and calibration requirements. The MDLs are normally based on an interference-free matrix (that is, reagent water or purified solid), which does not consider matrix effects and may not be achievable for environmental samples.

11.2 Quality Control

This section includes quality control checks that will be used to determine data quality.

11.2.1 Field Quality Control Samples

Equipment Blanks. An equipment blank is a sample prepared in the field by rinsing equipment with deionized blank water after decontamination. The laboratory then analyzes that rinsate water for target analytes to determine if cross-contamination may have been present in the field. An equipment blank will be collected for each sample collection method and will be analyzed by methods presented in Tables A-3 through A-5. A total of five equipment blanks are projected based on the sampling and processing techniques provided in Section 5.0. If contaminants are present at concentrations greater than the reporting limit, then cross-contamination may have occurred. If target analytes are detected in samples above the reporting limit and less than ten times the equipment blank concentration, then those samples may reflect possible high bias due to contamination and will be 'J+' flagged within data tables provided by Apex. Analytical data may not be corrected based on the concentration found in the equipment blank.

Field Duplicates. A field duplicate is a separate sample collected from the same location as the primary sample to document sampling and analytical precision and representativeness. Field duplicates will be collected at 10 percent of sample locations. The RPD for results greater than five times the reporting limit must be less than 50 percent for organic analytes and less than 35 percent for inorganic analytes (metals). For results that are less than five times the reporting limit, the absolute difference between the two results must be less than ±2 times the reporting limit for organic analytes and ±RL for inorganic analytes. If either of these criteria are exceeded, then detected results will be 'J' flagged as estimated values.

11.2.2 Laboratory Quality Control Checks

Holding Times. The holding time requirements specified in Table A-2 are method derived and must be met to ensure true representation of field conditions. The holding time begins once the sample is collected and is dependent on sample preservation and collection procedures. A secondary holding time may occur for samples that require extraction and includes the time from sample preparation to analysis. Depending on the method, the holding time concludes when the sample is analyzed or when the sample is prepared. If holding times are exceeded detected results will be 'J' flagged and not detected results will be 'UJ' flagged. If gross exceedances occur (greater than two times the original holding time) then results will be 'R' flagged as unusable. Dioxins/furans are stable and persistent in the environment and do not have a recommended holding time; therefore, holding time exceedance will be evaluated based on professional judgement and national guidance.

Instrument Calibration. Instrument calibration includes periodic calibrations at defined intervals and operational calibrations that are performed daily. Qualified personnel will calibrate laboratory instruments prior to sample analysis according to the procedures specified in each method and the Laboratory QA/QC manager is responsible for ensuring that instruments are calibrated in accordance with SOPs. Calibration shall be verified at method-specified intervals throughout the analysis sequence, and standards must be vendor-certified. The frequency and acceptance criteria for calibration are specified for each analytical method. When multipoint calibration is specified, the concentrations of the calibration standards should bracket those expected in the samples. Samples should be diluted, if necessary, to bring analyte responses within the calibration range. Data that exceed the calibration range cannot be reported by the laboratory unless qualified as an estimated value. The initial calibration curve shall be verified as accurate with a standard purchased or prepared from an independent second source. The initial calibration verification involves the analysis of a standard containing all the target analytes, typically in the middle of the calibration range, each time the initial calibration is performed.

Calibration Blanks. A calibration blank or instrument blank will be prepared and analyzed before samples are to be analyzed and at continued method-specified intervals. Detections in the calibration blank must be less than five times the concentration detected in samples. If this is exceeded, the source of the contamination should be identified and corrected, and samples should be reanalyzed.

Instrument Performance Checks. Analysis methods that require a mass spectrometer detector must check instrument performance with an ion abundance standard. The ion abundance standard or tune check solution should meet method and instrument manufacturer guidelines. If the instrument check does not meet these criteria, then analysis should be halted, and the source of the error should be identified and corrected.

Sample Dilution. Dilutions must be made if sample concentrations exceed the upper limit of quantitation. Samples will be diluted to approximately the mid-range of the calibration curve and final dilution results must be above the reporting limit.

Surrogates. Surrogates are organic compounds that are similar in chemical composition to the analytes of interest but are not likely to be found in the environment. They are spiked at a known concentration into environmental and batch QC samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference, sample preparation efficiency, and analysis performance on a sample-specific basis. Surrogates will be controlled according to method and laboratory criteria. If the recovery of the surrogate is above the upper control limit, then detected may be 'J+' flagged as estimated values that may be biased high, and not detected values will not be qualified. If the surrogate recovery is below the lower control limit, then detected values may be 'J-' flagged as estimated values that may be biased low, and not detected values will be 'UJ' flagged as estimated not detected values at the reporting limit. If surrogates are outside of the control limit due to dilution, then results are considered estimated.

Method Blanks. A method blank is a quality control sample prepared by the laboratory from an analyte-free matrix similar to samples within the analytical batch. Method blank samples are analyzed along with environmental and other QC samples. They are prepared and analyzed exactly as other field samples within the analytical batch, following the same initial and final volumes, complete sample preparation, cleanup steps, and analytical procedures. This process is used to assess laboratory contamination or background interferences that might result in elevated concentration levels or false positive data. Results for the method blank must be below the reporting limit unless target analytes are not detected above the reporting limit within associated batch samples or the concentration found in the samples is ten times greater than the method blank concentration. If target analytes are present in the method blank and the sample, sample results must be compared to the method blank results prior to the calculation for dilutions, if a dilution was performed on the sample. Corrective action must be taken by the laboratory if target analytes are detected in batch samples above the reporting limit and less than ten times the method blank concentration. Depending on holding time violations and other factors, samples will need to be re-prepared and re-analyzed to eliminate the contamination source. Any samples that reflect possible high bias due to contamination will be 'B' flagged by the laboratory and 'J+' flagged within data tables provided by Apex. Analytical data may not be corrected based on the concentration found in the method blank.

Laboratory Duplicates. A laboratory duplicate is a secondary aliquot taken from a field sample by the laboratory which is prepared and analyzed by the laboratory by the same method specifications as other samples within the analytical batch. The RPD between the primary and duplicate analysis is calculated and demonstrates the precision of the laboratory. In soil and biphasic samples, it would also indicate homogeneity. RPD values should be less than the method or laboratory criteria. If the RPD control criteria is exceeded, detected results will be 'J' flagged as estimated values.

Laboratory Control Samples. The LCS will consist of analyte-free matrix, depending on the batch matrix, spiked with known amounts of target analytes that come from a source different than that used for calibration standards. The LCS is used to assess laboratory method performance by recovering analytes within a matrix and reflects accuracy within an analytical batch. If LCS results are outside the specified control limits, corrective action must be taken, including sample re-preparation and/or reanalysis, if appropriate. A LCSD is analyzed to assess precision by comparing the primary and duplicate individual analyte results. The RPD between the initial and duplicate LCS is calculated and must be within control limits. Any LCS recovery outside of QC limits affects results within the entire batch and will require qualification and corrective action.

Depending on the recovery of the target analyte, detected results may be 'J+' or 'J-' flagged as estimated values with either a high or low bias, respectively. If a target analyte is detected above the upper control limit and the associated sample is not detected for this same analyte, then no qualification is necessary. If the target analyte is recovered below the lower control limit and the analyte is not detected in the associated sample, then the not detected value is estimated at the reporting limit and is 'UJ' flagged.

If the RPD between the LCS and LCSD exceeds the control limit, then detected results will be 'J' flagged and not detected results will not be qualified.

Matrix Spikes. A matrix spike (MS) is a field sample spiked with target analytes of a known concentration before sample preparation and is analyzed by method specifications like other samples within the analytical batch. The recovery of target analytes indicates possible sample matrix interferences and possible bias can be assumed if recoveries are outside of control limits. A duplicate matrix spike (MSD) is analyzed and individual analyte results are compared to the initial MS, which is expressed as an RPD. If the MS or MSD exceed quality control criteria, then only the sample used as the source will be qualified. If the recovery or RPD of target analyte is outside of the control limit, then the analyte detections in the source sample will be 'J' flagged. If the analyte is not detected in the sample and the analyte recovery is above the upper control limit, then data will not be qualified. If the analyte is not detected in the sample and the analyte recovery is below the lower control limit, then data will be 'UJ' flagged.

11.2.3 Quality Control Flags and Qualifiers

Data qualifier flags, if required, are defined below, and will be applied to the electronic sample results. If multiple flags are required for a result, the most severe flag will be applied to the electronic result. The hierarchy of flags from the most severe to the least severe will be as follows: R, J, UJ, U.

Flag	Definition
J	The reported value is an estimated concentration of analyte in the sample. For dioxin/furan results, the estimated maximum possible concentration (EMPC) will be reported.
J+	Failure of quality control criteria suggest result is estimated and biased high.
J-	Failure of quality control criteria suggest result is estimated and biased low.
R	Quality control criteria was not met, and the resulting data is rejected.
U	This analyte was analyzed for but not detected at or above the specified detection limit.
UJ	The analyte was not detected in the sample, but the quantitation limit is estimated due to quality control failures.

11.3 Sampling Protocols

11.3.1 Methods

Sampling methods are presented in Section 5. These procedures are designed to ensure that:

- All samples collected are consistent with DQOs; and
- Samples are identified, handled, and transported in a manner that does not alter the representativeness of the data from the actual site conditions.

11.3.2 Sample Containers, Preservation, and Holding Times

The contracted analytical laboratory will provide the required sample containers for all samples, including QC. All containers will have been cleaned and certified free of the analytes of concern for this project. Sample containers may not be reused. The contracted laboratory will add analyte-free preservatives to sampling containers in accordance with the specific analytical methods. The case narrative will include any container issues and what corrective action was taken, if any.

The containers, required preservatives, and maximum holding times for project analytes are described in Table A-2.

11.4 Sample and Document Custody Procedures

The various methods used to document field sample collection and laboratory operation are presented below and in Section 6.

11.4.1 Field Chain-of-Custody Procedures

Sample chain of custody refers to the process of tracking the possession of a sample from the time it is collected in the field through the laboratory analysis. A sample is considered to be under a person's custody if:

- It is in a person's physical possession;
- In view of the person after possession has been taken; or
- Secured by that person so that no one can tamper with the sample or secured by that person in an area which is restricted to authorized personnel.

A chain-of-custody form is used to record possession of a sample and to document analyses requested. Each time the sample bottles or samples are transferred between individuals, both the sender and receiver sign and date the chain-of-custody form. When a sample shipment is transported to the laboratory, a copy of the chain-of-custody form is included in the transport container (i.e., ice chest).

The chain-of-custody forms are used to record the following information:

- Sample identification number;
- Sample collector's signature;
- Date and time of collection;
- Description of sample;
- Analyses requested;
- Shipper's name and address;
- Receiver's name and address; and
- Signatures of persons involved in chain-of-custody.

11.4.2 Laboratory Sample Custody

Once the samples reach the laboratory, all information on the chain-of-custody form will be checked against sample labels for discrepancies. The condition, temperature, and appropriate preservation of samples will be checked and documented on the chain-of-custody form. The sample integrity issues in the received samples and their resolution will be documented in laboratory records. All sample information will then be entered into a laboratory information management system, and unique analytical sample identifiers will be assigned.

Sample holding time tracking begins with the collection of samples and continues until the analysis is complete. Subcontracted analyses will be documented with the chain-of-custody form. Temperatures of storage refrigerators will be checked twice daily and recorded by the analytical laboratory. Samples will be stored by the laboratory and disposed of in accordance with applicable local, state, and federal regulations. Disposal records will be maintained by the laboratory.

11.4.3 Analytical Documentation

All records pertaining to analytical data will be kept by the laboratory for a minimum of five years. Where applicable by analytical method, these records may include: calibration data, instrumentation performance checks, matrix checks, internal standard recovery data, surrogate recovery data, qualifier ion and spectra data, blank analysis data, retention times, second-column compound confirmation, method detection limit studies, reporting limit standard recoveries, laboratory analytical batch quality control samples, analytical run logs, analytical batches, bench sheets, sample storage logs, and proficiency testing information.

11.4.4 Corrections to Documentation

All original data are recorded in field notes and on chain-of-custody forms using indelible ink. Documents will be retained even if they are illegible or contain inaccuracies that require correction.

If an error is made on a document, the individual making the entry will correct the document by crossing a line through the error, entering the correct information, and initialing and dating the correction. Any subsequent error discovered on a document is corrected, initialed, and dated by the person who made the entry.

11.5 Instrument/Equipment Testing, Inspection, and Maintenance

This section presents the procedures for testing, inspection, and maintenance for field and laboratory equipment.

11.5.1 Field Instrument/Equipment

Maintenance responsibilities for field equipment are assigned to the field team leader for specific sampling tasks. However, the field team using the equipment is responsible for checking the status of the equipment prior to use and reporting any problems encountered. Field equipment will be inspected daily before the start of work. Maintenance will be performed following manufacturers' guidelines or when equipment is not performing optimally (not calibrating correctly, apparent drift in readings, or giving readings that are not likely for the apparent field condition). Equipment will be tested before leaving for the field site. If any errors are indicated, the field equipment will not be used, and backup equipment will be rented from a reputable rental company until the faulty equipment can be serviced. Any equipment that cannot be serviced will be replaced. Equipment/instruments that may be used in the field include a PID, a handheld global positioning system device (GPS; Trimble© Geo7X™), multi-parameter water quality meters, and the Vibecore-mini sediment sampler.

11.6 Instrument/Equipment Calibration Procedures and Frequency

This section presents the calibration procedures and frequency for field and laboratory equipment.

11.6.1 Field Instrument/Equipment

Field equipment will be calibrated before the start of work. Calibration will be in accordance with procedures and schedules outlined in the manufacturer's operations manual. Calibrated equipment will be uniquely identified by using either the manufacturer's serial number or other means. Equipment that fails calibration or becomes inoperable during use will be removed from service and either segregated to prevent inadvertent use or tagged to indicate it is out of calibration. Such equipment will be repaired and satisfactorily recalibrated. Equipment that cannot be repaired will be replaced.

11.7 Data Reduction, Validation, and Reporting

Data validation will be completed following National Functional Guidelines for Organic Superfund Methods Review (EPA, 2020a) and National Functional Guidelines for Inorganic Superfund Methods Review (EPA, 2020b). Analytical data will be validated using Stage 2B criteria for all analyses except dioxins/furans. This includes a case narrative, sample matrix, collection date/time, receipt date/time, sample results corrected for dilution, dilution factors, detection limits, reporting limits, units, extraction/preparation date/time, analysis date/time, qualifiers with definitions, quality control sample results (surrogates, method blank, laboratory control samples, matrix spikes, laboratory duplicates), quality control sample recovery limits, chain-of-custody documentation, and sample integrity observations upon receipt.

For dioxin/furans, Stage 4 data validation will be completed. This includes the completeness and compliance complete for Stage 2B, as well as recalculation checks and review of actual instrument outputs.

Analytical results will be provided as a PDF and EDD in a Microsoft Excel database format. Hard copy data for Stage 4 data validation will be provided by the laboratory to facilitate recalculation checks and review of instrument outputs. Laboratory results for sample analysis will be stored electronically by Apex.

11.8 Field and Laboratory Corrective Action

Conditions adverse to data quality must be promptly investigated, evaluated, and corrected. Adverse conditions may include instrument malfunctions, deficiencies in quality control criteria, deviations from SOPs, and errors in data reduction, validation, or documentation.

11.8.1 Field Corrective Action

Any project team member may initiate a field corrective action process. The corrective action process consists of identifying a problem, acting to eliminate the problem, monitoring the effectiveness of the corrective action, verifying that the problem has been eliminated, and documenting the corrective action.

Field corrective actions can include such activities as correcting chain of custody forms, solving problems associated with sample collection, re-packing samples to ensure sample integrity, correcting an entry in field notes, or providing a team member with additional training in sampling procedures. More extensive corrective actions might involve re-sampling or evaluating and revising sampling procedures. The field team leader will summarize the problem, establish possible causes, and designate the person responsible for a corrective action. The field team leader will then verify that the initial action has been taken and that it appears to be effective. Finally, the field team leader will follow up at a later time to verify that the problem has been resolved.

If a corrective action could potentially affect the quality of the analytical process, the field team leader must notify the Project Manager immediately.

11.8.2 Laboratory Corrective Action

The analytical laboratories analyze samples according to specific methods with required QC standards. All analytical data are reviewed to ensure that the required QC measures have been taken and that all specified QC standards have been met. Some examples of situations that might require laboratory corrective action include the following:

- QC data are outside the control limit ranges for precision and accuracy established for laboratory samples;
- Blanks contain target analytes above acceptable levels;
- Deficiencies are detected by the laboratory QA director during internal or external audits, or from the results of performance evaluation samples;
- Undesirable trends are detected in QC data;
- There are unusual changes in detection limits; and/or
- Inquiries concerning data quality are received.

If the bench analyst identifies a QC violation, corrective action will be taken immediately. The analyst will notify his or her supervisor of the problem and the investigation. Some examples of analyst-level corrective action can include the following:

- Recalculating mathematical calculations;
- Reanalyzing suspect samples; and/or
- Recalibrating analytical instruments.

If the problem persists or cannot be identified, the matter must be referred to the laboratory supervisor and QA/QC officer for further investigation. All laboratory QC problems that could affect the quality of the final data should be discussed with the Project Manager as part of the corrective action process. Some examples of managerial-level corrective action include the following:

- Evaluating and amending sub-sampling or analytical procedures;
- Resampling and analyzing new samples; and/or
- Qualifying or rejecting the data.

Once resolved, full documentation of the corrective action must be included with the applicable data package prior to submittal to the project manager. Any substantive changes that may affect data quality will be communicated with Ecology.

11.9 Corrective Actions

If the quality control audit detects unacceptable conditions or data, the Project Manager will be responsible for developing and initiating corrective action. Corrective action may include the following:

- Reanalyzing the samples, if holding time criteria permit;
- Resampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and
- Accepting data and acknowledging the level of uncertainty or inaccuracy by flagging the data.

11.10 Laboratory Quality Assurance Review

A QA review will be conducted that presents a QA/QC evaluation of the data collected during the sampling activities for inclusion in the final report. In addition to an opinion regarding the validity of the data, the QA/QC evaluation will address the following:

- Any adverse conditions or deviations from the SAP;

- Assessment of analytical data for precision, accuracy, and completeness evaluated based on criteria developed in this SAP;
- Significant QA problems and recommended solutions; and
- Corrective actions taken for any problems previously identified.

12.0 References

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Table A-1
Proposed Sampling and Analysis Plan
Buse Timber & Sales
Everett, Washington

Area	Matrix	Sampling Frequency	Analysis										
			TPH-Gx	TPH-Dx	TPH-Dx with Silica Gel Cleanup	TOC	VOCs	Metals	SVOCs	PCBs	PAHs	Dioxins/Furans	Wood Waste
Former UST Area	Soil	Single	X	X	D		X	D			D		
	Groundwater	Single	X	X	D		X						
	Groundwater	Quarterly*	X	X	D		D	D			D		
Vehicle Repair Shop	Soil	Single						X					
	Groundwater	Quarterly*						X					
Former Waste Mixing Area	Soil	Single		X	X	X	D	D	X			X	
	Groundwater	Quarterly*		X	D	D	D	D	X				
Former PCP Dip Tank	Soil	Single		X	D	D	D	D	X			X	
	Groundwater	Quarterly*		X	D	D	D	D	X				
AST Release Area	Soil	Single		X	D	D	D				D		
	Groundwater	Quarterly*		X	D	D	D				D		
Historical Stormwater Drain	Soil	Single		X	D	D	D	X	X			X	
	Sediment	Single		X	X	X	D	X	X	X		X	
Current Stormwater System	Sediment	Single		X	D	D	D	X	X	X		X	
East Drainage	Soil	Single		X	D	D	D	X	X	D		X	
	Sediment	Single		X	X	X	D	X	X	D		X	X
South Drainage	Sediment	Single		X	X	X	D	X	X	D		X	X
West Drainage	Sediment	Single		X	X	X	D	X	X	D		X	X
I-5 Drainage	Sediment	Single		X	X	X	D	X	X	D		X	X
Union Slough	Sediment	Single		X	X	X	D	X	X	D		X	X
Log Float Beach	Sediment	Single											X

Notes:

1. VOCs = Volatile organic compounds.
2. PAHs = Polycyclic aromatic hydrocarbons.
3. UST = Underground storage tank.
4. PCBs = Polychlorinated biphenyls.
5. TPH = Total Petroleum Hydrocarbons.
6. SVOCs = Semi-volatile organic compounds.
7. PCP = Pentachlorophenol.
8. TOC = Total Organic Carbon
9. Wood waste = Parameters including ammonia, sulfide, benzoic acid, and benzenemethanol.
10. D = Discretionary analysis based on field screening or preliminary results.
11. X = planned for laboratory analysis.

* = Quarterly sampling will begin after final monitoring well locations have been installed.

Table A-2
Analytical Methods – Sample Container Requirements
Buse Timber & Sales
Everett, Washington

Analysis	Analysis Method	Container	Holding Time
Soil			
TPH-Dx	NWTPH-Dx	1 x 4-ounce glass jar	14 days
Metals	EPA 6020B		180 days
Mercury	EPA 6020B		28 days
SVOCs	EPA 8270E SIM		14 days
Total Organic Carbon	EPA 9060		28 days
Dioxins/Furans	EPA 8290	1 x 4-ounce glass jar	None
TPH-Gx/VOCs	NW TPH-Gx & EPA 8260	2 x 40 mL MeOH glass vial	14 days
Sediment			
TPH-Dx	NWTPH-Dx	1 x 16-ounce glass jar	14 days
Metals	EPA 6020B		180 days
Mercury	EPA 6020B		28 days
SVOCs	EPA 8270E		14 days
Ammonia	SM 4500		28 days
Total Organic Carbon	EPA 9060		28 days
Dioxins/Furans	EPA 8290	1 x 4-ounce glass jar	None
VOCs	EPA 8260	1 x 4-ounce glass jar	14 days
Sulfides	SM 4500	1 x 4-ounce glass jar with Zinc Acetate	7 days
Groundwater			
Metals	EPA 6020B	1 x 250 mL HNO3 HDPE bottle	180 days
Mercury	245.1		28 days
SVOCs	EPA 8270	1 x 1 L amber glass bottle	7 days
TPH-Gx	NWTPH-Gx	3 x 40 mL HCl glass vial	14 days
VOCs	EPA 8260	3 x 40 mL HCl glass vial	14 days
TPH-Dx	NWTPH-Dx	1 x 500 mL HCl Amber	14 days
TPH-Dx with Silica Gel Cleanup	NWTPH-Dx	1 x 500 mL amber glass bottle	14 days

Notes:

1. EPA = United States Environmental Protection Agency.
2. VOCs = Volatile organic compounds.
3. SVOCs = Semi-volatile organic compounds.
4. PAHs = Polycyclic aromatic hydrocarbons.
5. MeOH = Methanol.
6. HNO_3 = Nitric acid.
7. HCl = Hydrochloric acid.
8. TPH = Total petroleum hydrocarbons.
9. Dx = Diesel range organics and heavy oils.
10. Gx = Gaoline range organics.
11. HDPE = High-density polyethylene.

Table A-3
Soil Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Natural or Regional Background Concentrations
									Plants	Soil Biota	Wildlife	
Total Petroleum Hydrocarbons (TPH)												
Gasoline Range Organics	NWTPH-Gx	Fremont Analytical	mg/kg	1.7327	5	--	--	--	--	100	2000 [6]	--
Diesel Range Organics	NWTPH-Dx	Fremont Analytical	mg/kg	13.1469	50	--	--	--	--	200	2000 [6]	--
Residual Range Organics	NWTPH-Dx	Fremont Analytical	mg/kg	18.2345	100	--	--	--	--	200	2000 [6]	--
Diesel Range Organics	NWTPH-Dx-SGC	Fremont Analytical	mg/kg	13.1469	50	--	--	--	--	200	2000 [6]	--
Residual Range Organics	NWTPH-Dx-SGC	Fremont Analytical	mg/kg	18.2345	100	--	--	--	--	200	2000 [6]	--
Dioxins/Furans												
2,3,7,8 TCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000086	0.0000005	0.0000930	0.0000130	0.0000008	--	--	--	--
1,2,3,7,8 PeCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000232	0.0000025	--	--	--	--	--	--	--
1,2,3,4,7,8 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000547	0.0000025	--	--	--	--	--	--	--
1,2,3,6,7,8 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000497	0.0000025	--	--	--	--	--	--	--
1,2,3,7,8,9 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000723	0.0000025	--	--	--	--	--	--	--
1,2,3,4,6,7,8 HpCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000327	0.0000025	--	--	--	--	--	--	--
OCDD	EPA 8290	Ceres Analytical	mg/kg	0.000001185	0.000005	--	--	--	--	--	--	--
2,3,7,8 TCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000105	0.0000005	--	--	--	--	--	--	--
1,2,3,7,8 PeCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000415	0.0000025	--	--	--	--	--	--	--
2,3,4,7,8 PeCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000345	0.0000025	--	--	--	--	--	--	--
1,2,3,4,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000281	0.0000025	--	--	--	--	--	--	--
1,2,3,6,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000311	0.0000025	--	--	--	--	--	--	--
2,3,4,6,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.0000005	0.0000025	--	--	--	--	--	--	--
1,2,3,7,8,9 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000483	0.0000025	--	--	--	--	--	--	--
1,2,3,4,6,7,8 HpCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000376	0.0000025	--	--	--	--	--	--	--
1,2,3,4,7,8,9 HpCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000268	0.0000025	--	--	--	--	--	--	--
Hexachlorodibenzo-p-dioxin, mixture	EPA 8290	Ceres Analytical	mg/kg	0.000000547	0.0000025	--	0.000160	0.00020				
OCDF	EPA 8290	Ceres Analytical	mg/kg	0.00000095	0.000005	--	--	--	--	--	--	--
Total TEQ	Calculated	--	mg/kg	0.000001185	0.0000050	0.0000930	0.0000130	0.0000170	--	--	0.000002	0.0000052
Volatile Organic Compounds (VOCs)												
Acetone	EPA 8260	Fremont Analytical	mg/kg	0.07539	0.25	72000	--	29	--	--	--	--
Benzene	EPA 8260	Fremont Analytical	mg/kg	0.01064	0.0175	320	18	0.027	--	--	--	--
Bromobenzene	EPA 8260	Fremont Analytical	mg/kg	0.00397	0.0125	640	--	0.56	--	--	--	--
Bromodichloromethane	EPA 8260	Fremont Analytical	mg/kg	0.00721	0.025	1600	16	0.033	--	--	--	--
Bromoform	EPA 8260	Fremont Analytical	mg/kg	0.00471	0.015	1600	130	0.36	--	--	--	--
Bromomethane	EPA 8260	Fremont Analytical	mg/kg	0.03523	0.025	110	--	0.051	--	--	--	--
2-Butanone (MEK)	EPA 8260	Fremont Analytical	mg/kg	0.10919	0.3	48000	--	20	--	--	--	--
Carbon Tetrachloride	EPA 8260	Fremont Analytical	mg/kg	0.00545	0.025	320	14	0.041	--	--	--	--
Chlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.00454	0.015	1600	--	0.86	--	40	--	--
Chlorodibromomethane	EPA 8260	Fremont Analytical	mg/kg	0.00471	0.015	1600	12	0.024	--	--	--	--
Chloroethane	EPA 8260	Fremont Analytical	mg/kg	0.02643	0.075	--	--	--	--	--	--	--
Chloroform	EPA 8260	Fremont Analytical	mg/kg	0.00552	0.0175	800	32	0.074	--	--	--	--
Chloromethane	EPA 8260	Fremont Analytical	mg/kg	0.01626	0.05	--	--	--	--	--	--	--
2-Chlorotoluene	EPA 8260	Fremont Analytical	mg/kg	0.00556	0.0165	1600	--	1.9	--	--	--	--
4-Chlorotoluene	EPA 8260	Fremont Analytical	mg/kg	0.00546	0.0165	1600	--	1.9	--	--	--	--
Isopropylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00545	0.015	--	--	--	--	--	--	--
1,2-Dibromo-3-Chloropropane	EPA 8260	Fremont Analytical	mg/kg	0.01044	0.03	--	--	--	--	--	--	--
1,2-Dibromoethane	EPA 8260	Fremont Analytical	mg/kg	0.00342	0.01	720	0.5	0.00027	--	--	--	--
1,2-Dichlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.00633	0.02	7200	--	7	--	--	--	--
1,3-Dichlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.00617	0.02	--	--	--	--	--	--	--
1,4-Dichlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.00432	0.015	5600	190	1.2	--	20	--	--
Dichlorodifluoromethane	EPA 8260	Fremont Analytical	mg/kg	0.00535	0.015	16000	--	38	--	--	--	--
1,1-Dichloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00862	0.025	16000	180	0.041	--	--	--	--
1,2-Dichloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00616	0.02	480	11	0.023	--	--	--	--
1,1-Dichloroethene	EPA 8260	Fremont Analytical	mg/kg	0.02923	0.1	4000	--	0.046	--	--	--	--
cis-1,2-Dichloroethene	EPA 8260	Fremont Analytical	mg/kg	0.00527	0.015	160	--	0.079	--	--	--	--
trans-1,2-Dichloroethene	EPA 8260	Fremont Analytical	mg/kg	0.00434	0.01	1600	--	0.52	--	--	--	--
1,2-Dichloropropane	EPA 8260	Fremont Analytical	mg/kg	0.00803	0.025	3200	27	0.025	--	700	--	--
1,1-Dichloropropene	EPA 8260	Fremont Analytical	mg/kg	0.00721	0.02	--	--	--	--	--	--	--
1,3-Dichloropropane	EPA 8260	Fremont Analytical	mg/kg	0.00287	0.01	1600	--	0.88	--	--	--	--
cis-1,3-Dichloropropene	EPA 8260	Fremont Analytical	mg/kg	0.00523	0.015	2400	10	0.002	--	--	--	--
trans-1,3-Dichloropropene	EPA 8260	Fremont Analytical	mg/kg	0.0062	0.02	2400	10	0.002	--	--	--	--
Ethylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.01343	0.025	8000	--	5.9	--	--	--	--
Hexachloro-1,3-Butadiene	EPA 8260	Fremont Analytical	mg/kg	0.01244	0.04	80	13	0.012	--	--	--	--
2-Hexanone	EPA 8260	Fremont Analytical	mg/kg	0.02319	0.0625	400	--	0.17	--	--	--	--
n-Hexane	EPA 8260	Fremont Analytical	mg/kg	0.00732	0.0225	4800	--	72	--	--	--	--
p-Isopropyltoluene	EPA 8260	Fremont Analytical	mg/kg	0.00606	0.2	--	--	--	--	--	--	--
Methylene Chloride	EPA 8260	Fremont Analytical	mg/kg	0.01644	0.035	480	94	0.022	--	--	--	--
4-Methyl-2-Pentanone (MIBK)	EPA 8260	Fremont Analytical	mg/kg	0.0192	0.2	6400	--	2.7	--	--	--	--
Methyl tert-Butyl Ether	EPA 8260	Fremont Analytical	mg/kg	0.00733	0.02	--	560	0.1	--	--	--	--
Naphthalene	EPA 8260	Fremont Analytical	mg/kg	0.03855	0.1	1600	--	4.5	--	--	--	--
n-Propylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00459	0.015	8000	--	16	--	--	--	--
Styrene	EPA 8260	Fremont Analytical	mg/kg	0.00301	0.01	16000	--	2.2	300	--	--	--
1,1,1,2-Tetrachloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00457	0.025	2400	38	0.0098	--	--	--	--
1,1,2,2-Tetrachloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00625	0.2	1600	5	0.0012	--	--	--	--
Tetrachloroethene	EPA 8260	Fremont Analytical	mg/kg	0.00471	0.015	480	480	0.05	--	--	--	--
Toluene	EPA 8260	Fremont Analytical	mg/kg	0.02072	0.03	6400	--	4.5	200	--	--	--
1,2,3-Trichlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.01847	0.06	64	--	0.2	--	20	--	--
1,2,4-Trichlorobenzene	EPA 8260	Fremont Analytical	mg/kg	0.0193	0.06	800	34	0.56	--	20	--	--
1,1,1-Trichloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00633	0.02	160000	--	1.5	--	--	--	--
1,1,2-Trichloroethane	EPA 8260	Fremont Analytical	mg/kg	0.00386	0.0125	320	18	0.017	--	--	--	--
Trichloroethene	EPA 8260	Fremont Analytical	mg/kg	0.00522	0.015	40	12	0.025	--	--	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Fremont Analytical	mg/kg	0.00661	0.005	2400000	--	7600	--	--	--	--
1,2,3-Trichloropropane	EPA 8260	Fremont Analytical	mg/kg	0.00939	0.03	320	0.0063	0.0000024	--	--	--	--
1,2,4-Trimethylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00538	0.015	800	--	1.3	--	--	--	--
1,3,5-Trimethylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00472	0.015	800	--	1.3	--	--	--	--
Vinyl Chloride	EPA 8260	Fremont Analytical	mg/kg	0.00806	0.025	240	0.67	0.0017	--	--	--	--
m,p-Xylene	EPA 8260	Fremont Analytical	mg/kg	0.02541	0.05	16000	--	13	--	--	--	--
o-Xylene	EPA 8260	Fremont Analytical	mg/kg	0.01136	0.025	16000	--	14	--	--	--	--
n-Butylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00634	0.02	4000	--	14	--	--	--	--
sec-Butylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00536	0.15	8000	--	25	--	--	--	--
tert-Butylbenzene	EPA 8260	Fremont Analytical	mg/kg	0.00527	0.015	8000	--	20	--	--	--	--

Please see notes at end of table.

Table A-3
Soil Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Natural or Regional Background Concentrations
									Plants	Soil Biota	Wildlife	
Semi-Volatile Organic Compounds (SVOCs)												
1,2,4-Trichlorobenzene	EPA 8270	Fremont Analytical	mg/kg	0.01123	0.03	800	34	0.56	--	20	--	--
1,2-Dichlorobenzene	EPA 8270	Fremont Analytical	mg/kg	0.01325	0.04	7200	--	7	--	--	--	--
1,3-Dichlorobenzene	EPA 8270	Fremont Analytical	mg/kg	0.01638	0.04	--	--	--	--	--	--	--
1,4-Dichlorobenzene	EPA 8270	Fremont Analytical	mg/kg	0.01292	0.03	5600	190	1.2	--	20	--	--
1-Methylnaphthalene	EPA 8270	Fremont Analytical	mg/kg	0.00513	0.03	5600	34	0.082		--		--
2,4,5-Trichlorophenol	EPA 8270	Fremont Analytical	mg/kg	0.00885	0.03	8000	--	58	4	9	--	--
2,4,6-Trichlorophenol	EPA 8270	Fremont Analytical	mg/kg	0.01266	0.03	80	91	0.092	--	10	--	--
2,4-Dichlorophenol	EPA 8270	Fremont Analytical	mg/kg	0.00441	0.03	240	--	0.33	--	--	--	--
2,4-Dimethylphenol	EPA 8270	Fremont Analytical	mg/kg	0.00586	0.03	1600	--	4.4	--	--	--	--
2,4-Dinitrophenol	EPA 8270	Fremont Analytical	mg/kg	0.12895	0.3	160	--	0.13	20	--	--	--
2,4-Dinitrotoluene	EPA 8270	Fremont Analytical	mg/kg	0.02424	0.06	72	1.5	0.002	--	--	--	--
2,6-Dinitrotoluene	EPA 8270	Fremont Analytical	mg/kg	0.01446	0.04	72	1.5	0.002	--	--	--	--
2-Chloronaphthalene	EPA 8270	Fremont Analytical	mg/kg	0.00635	0.03	6400	--	34	--	--	--	--
2-Chlorophenol	EPA 8270	Fremont Analytical	mg/kg	0.01444	0.04	400	--	0.47	--	--	--	--
2-Methylnaphthalene	EPA 8270	Fremont Analytical	mg/kg	0.00735	0.03	320	--	1.7	--	--	--	--
2-Methylphenol	EPA 8270	Fremont Analytical	mg/kg	0.01559	0.04	4000	--	8.1	--	--	--	--
2-Nitroaniline	EPA 8270	Fremont Analytical	mg/kg	0.01986	0.05	800	--	1	--	--	--	--
2-Nitrophenol	EPA 8270	Fremont Analytical	mg/kg	0.01282	0.03	--	--	--	--	--	--	--
3+4-methylphenol	EPA 8270	Fremont Analytical	mg/kg	0.01291	0.03	8000	--	22	--	--	--	--
4,6-Dinitro-2-methylphenol	EPA 8270	Fremont Analytical	mg/kg	0.10970	0.25	6.4	--	0.024	--	--	--	--
4-Bromophenyl phenyl ether	EPA 8270	Fremont Analytical	mg/kg	0.01178	0.03	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	EPA 8270	Fremont Analytical	mg/kg	0.01141	0.03	8000	--	22	--	--	--	--
4-Chloroaniline	EPA 8270	Fremont Analytical	mg/kg	0.00891	0.03	320	5	0.0027	--	--	--	--
4-Chlorophenyl phenyl ether	EPA 8270	Fremont Analytical	mg/kg	0.00811	0.03	--	--	--	--	--	--	--
4-Nitrophenol	EPA 8270	Fremont Analytical	mg/kg	0.05395	0.2	--	--	--	--	7	--	--
Acenaphthene	EPA 8270	Fremont Analytical	mg/kg	0.00699	0.03	4800	--	49	--	--	--	--
Acenaphthylene	EPA 8270	Fremont Analytical	mg/kg	0.00627	0.03	--	--	--	--	--	--	--
Anthracene	EPA 8270	Fremont Analytical	mg/kg	0.00554	0.03	2400	--	1100	--	--	--	--
Benz(a)anthracene	EPA 8270	Fremont Analytical	mg/kg	0.00810	0.03	--	--	--	--	--	--	--
Benzo(a)pyrene	EPA 8270	Fremont Analytical	mg/kg	0.01454	0.04	24	0.19	3.9	--	--	12	--
Benzo(b)fluoranthene	EPA 8270	Fremont Analytical	mg/kg	0.01058	0.1	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	EPA 8270	Fremont Analytical	mg/kg	0.02892	0.1	--	--	--	--	--	--	--
Benzo(k)fluoranthene	EPA 8270	Fremont Analytical	mg/kg	0.01002	0.03	--	--	--	--	--	--	--
Benzyl alcohol	EPA 8270	Fremont Analytical	mg/kg	0.05755	0.15	8000	--	7.1	--	--	--	--
Bis(2-chloroethoxy)methane	EPA 8270	Fremont Analytical	mg/kg	0.00566	0.03	240	--	0.21	--	--	--	--
Bis(2-chloroethyl) ether	EPA 8270	Fremont Analytical	mg/kg	0.01531	0.05	--	0.91	0.00022	--	--	--	--
Bis(2-ethylhexyl) phthalate	EPA 8270	Fremont Analytical	mg/kg	0.01125	0.04	1600	71	13	--	--	--	--
bis(2-Ethylhexyl)adipate	EPA 8270	Fremont Analytical	mg/kg	0.07361	0.2	48000	830	290	--	--	--	--
Butyl benzyl phthalate	EPA 8270	Fremont Analytical	mg/kg	0.01473	0.05	16000	530	13	--	--	--	--
Carbazole	EPA 8270	Fremont Analytical	mg/kg	0.00646	0.03	--	--	--	--	--	--	--
Chrysene	EPA 8270	Fremont Analytical	mg/kg	0.01150	0.05	--	--	--	--	--	--	--
Di-n-butyl phthalate	EPA 8270	Fremont Analytical	mg/kg	0.01081	0.03	8000	--	57	--	--	--	--
Di-n-octyl phthalate	EPA 8270	Fremont Analytical	mg/kg	0.01867	0.075	800	--	450	200	--	--	--
Dibenz(a,h)anthracene	EPA 8270	Fremont Analytical	mg/kg	0.03891	0.1	--	--	--	--	--	--	--
Dibenzofuran	EPA 8270	Fremont Analytical	mg/kg	0.00598	0.03	80	--	1.5	--	--	--	--
Diethyl phthalate	EPA 8270	Fremont Analytical	mg/kg	0.24043	0.75	64000	--	72	100	--	--	--
Dimethyl phthalate	EPA 8270	Fremont Analytical	mg/kg	1.61438	3.5	--	--	--	--	200	--	--
Fluoranthene	EPA 8270	Fremont Analytical	mg/kg	0.00882	0.03	3200	--	630	--	--	--	--
Fluorene	EPA 8270	Fremont Analytical	mg/kg	0.00500	0.03	3200	--	51	--	30	--	--
Hexachlorobenzene	EPA 8270	Fremont Analytical	mg/kg	0.00585	0.03	64	0.63	0.44	--	--	--	--
Hexachlorobutadiene	EPA 8270	Fremont Analytical	mg/kg	0.00870	0.03	80	13	0.012	--	--	--	--
Hexachlorocyclopentadiene	EPA 8270	Fremont Analytical	mg/kg	0.02217	0.1	480	--	1.5	10	--	--	--
Hexachloroethane	EPA 8270	Fremont Analytical	mg/kg	0.01259	0.04	56	25	0.0088	--	--	--	--
Indeno(1,2,3-cd)pyrene	EPA 8270	Fremont Analytical	mg/kg	0.06911	0.2	--	--	--	--	--	--	--
Isophorone	EPA 8270	Fremont Analytical	mg/kg	0.01306	0.04	16000	1100	0.49	--	--	--	--
N-nitrosodipropylamine	EPA 8270	Fremont Analytical	mg/kg	0.02747	0.08	--	0.14	0.00012	--	20	--	--
Naphthalene	EPA 8270	Fremont Analytical	mg/kg	0.01222	0.04	1600	--	4.5	--	--	--	--
Nitrobenzene	EPA 8270	Fremont Analytical	mg/kg	0.01528	0.05	160	--	0.1	--	40	--	--
Pentachlorophenol	EPA 8270	Fremont Analytical	mg/kg	0.07165	0.2	400	2.5	0.016	--	--	--	--
Phenanthrene	EPA 8270	Fremont Analytical	mg/kg	0.00791	0.03	--	--	--	--	--	--	--
Phenol	EPA 8270	Fremont Analytical	mg/kg	0.00791	0.03	24000	--	37	70	30	--	--
Pyrene	EPA 8270	Fremont Analytical	mg/kg	0.04784	0.15	2400	--	330	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)												
Anthracene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.002685	0.02	24000	--	1100	--	--	--	--
Acenaphthene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.003679	0.02	4800	--	49	20	--	--	--
Acenaphthylene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.002935	0.02	--	--	--	--	--	--	--
Benzo(a)anthracene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.007103	0.02	--	--	--	--	--	--	--
Benzo(a)pyrene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.009169	0.03	24	0.19	3.9	--	--	12	--
Benzo(b)fluoranthene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.007715	0.025	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.021665	0.05	--	--	--	--	--	--	--
Benzo(k)fluoranthene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.008784	0.025	--	--	--	--	--	--	--
Chrysene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.003497	0.02	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.022652	0.05	--	--	--	--	--	--	--
Fluoranthene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.007295	0.02	3200	--	630	--	--	--	--
Fluorene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.002500	0.02	3200	--	51	--	30	--	--
Indeno(1,2,3-cd)pyrene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.007141	0.04		--	--	--	--	--	--
Naphthalene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.004272	0.02	1600	--	4.5	--	--	--	--
Phenanthrene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.005590	0.02	--	--	--	--	--	--	--
Pyrene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.009139	0.04	2400	--	330	--	--	--	--
1-Methylnaphthalene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.003078	0.02	5600	34	0.082	--	--	--	--
2-Methylnaphthalene	EPA 8270E-SIM	Fremont Analytical	mg/kg	0.003766	0.02	320	--	1.7	--	--	--	--

Please see notes at end of table.

Table A-3
Soil Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	Soil Method B Direct Contact Noncancer (mg/kg)	Soil Method B Direct Contact Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 13 degrees C (mg/kg)	Ecological Indicator Soil Concentrations (WAC Table 749-3)			Natural or Regional Background Concentrations
									Plants	Soil Biota	Wildlife	
Metals												
Arsenic	EPA 6020	Fremont Analytical	mg/kg	0.0511	0.25	24	0.67	2.9	10	60	132	7
Barium	EPA 6020	Fremont Analytical	mg/kg	0.1498	0.5	16000	--	1600	500	--	102	--
Cadmium	EPA 6020	Fremont Analytical	mg/kg	0.0058	0.02	80	--	0.69	4	20	14	1
Chromium	EPA 6020	Fremont Analytical	mg/kg	0.0551	0.25	--	--	--	42	42	67	48
Copper	EPA 6020	Fremont Analytical	mg/kg	0.2121	0.75	3200	--	280	100	50	217	36
Lead	EPA 6020	Fremont Analytical	mg/kg	0.0352	1	--	--	3000	50	500	118	24
Mercury	EPA 6020	Fremont Analytical	mg/kg	0.0117	0.2	--	--	2.1	0.3	0.1	5.5	0.07
Nickel	EPA 6020	Fremont Analytical	mg/kg	0.0371	0.25	1600	--	420	30	200	980	48
Selenium	EPA 6020	Fremont Analytical	mg/kg	0.0682	1	400	--	5.2	1	70	0.3	--
Silver	EPA 6020	Fremont Analytical	mg/kg	0.0048	0.02	400	--	14	2	--	--	--
Zinc	EPA 6020	Fremont Analytical	mg/kg	1.1057	3.5	24000	--	6000	86	200	360	85

Notes:

1. mg/kg = Milligrams per kilogram.
2. EPA = United States Environmental Protection Agency.
3. -- = Not available or not applicable.
4. Soil cleanup levels from the MTCA Method A and B from WAC 173-340 (January 2023 update).
5. SGC = Silica Gel Cleanup
6. Ecological indicator soil concentration revised downward to account for residual saturation.
8. EP = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Plants
9. ES = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Soil
10. EW = Ecological Indicator Soil Concentrations (WAC Table 749-3) for Wildlife
11. Soil cleanup levels from the MTCA Method A and B from WAC 173-340 (January 2023 update).
12. Backgound concentrations from Natural Background Soil Metals Concentrations in Washington State Table 1.

Table A-4
Sediment Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	Sediment Management Standards Sediment Cleanup Objective		Natural or Regional Background Concentrations
						Freshwater	Marine	
Total Petroleum Hydrocarbons (TPH)								
Diesel Range Organics	NWTPH-Dx	Fremont Analytical	mg/kg	13.1469	50	340	--	--
Residual Range Organics	NWTPH-Dx	Fremont Analytical	mg/kg	18.2345	100	3600	--	--
Diesel Range Organics	NWTPH-Dx-SGC	Fremont Analytical	mg/kg	13.1469	50	340	--	--
Residual Range Organics	NWTPH-Dx-SGC	Fremont Analytical	mg/kg	18.2345	100	3600	--	--
Dioxins/Furans								
2,3,7,8 TCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000086	0.0000005	--	--	--
1,2,3,7,8 PeCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000232	0.0000025	--	--	--
1,2,3,4,7,8 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000547	0.0000025	--	--	--
1,2,3,6,7,8 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000497	0.0000025	--	--	--
1,2,3,7,8,9 HxCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000723	0.0000025	--	--	--
1,2,3,4,6,7,8 HpCDD	EPA 8290	Ceres Analytical	mg/kg	0.000000327	0.0000025	--	--	--
OCDD	EPA 8290	Ceres Analytical	mg/kg	0.000001185	0.000005	--	--	--
2,3,7,8 TCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000105	0.0000005	--	--	--
1,2,3,7,8 PeCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000415	0.0000025	--	--	--
2,3,4,7,8 PeCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000345	0.0000025	--	--	--
1,2,3,4,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000281	0.0000025	--	--	--
1,2,3,6,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000311	0.0000025	--	--	--
2,3,4,6,7,8 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.0000005	0.0000025	--	--	--
1,2,3,7,8,9 HxCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000483	0.0000025	--	--	--
1,2,3,4,6,7,8 HpCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000376	0.0000025	--	--	--
1,2,3,4,7,8,9 HpCDF	EPA 8290	Ceres Analytical	mg/kg	0.000000268	0.0000025	--	--	--
OCDF	EPA 8290	Ceres Analytical	mg/kg	0.00000095	0.000005	--	--	--
Total TEQ	Calculated	--	mg/kg	0.000001185	0.000005	--	--	0.0000039
Semi-Volatile Organic Compounds (SVOCs)								
Phenol	EPA 8270E	Fremont Analytical	mg/kg	0.00788	0.0299	0.12	0.42	--
Bis(2-chloroethyl) ether	EPA 8270E	Fremont Analytical	mg/kg	0.0153	0.0498	--	--	--
2-Chlorophenol	EPA 8270E	Fremont Analytical	mg/kg	0.0144	0.0398	--	--	--
1,3-Dichlorobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.0163	0.0398	--	--	--
1,4-Dichlorobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.0129	0.0299	--	3.1	--
1,2-Dichlorobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.0132	0.0398	--	2.3	--
Benzyl alcohol	EPA 8270E	Fremont Analytical	mg/kg	0.0573	0.149	--	0.057	--
2-Methylphenol (o-cresol)	EPA 8270E	Fremont Analytical	mg/kg	0.0155	0.0398	--	0.063	--
Hexachloroethane	EPA 8270E	Fremont Analytical	mg/kg	0.0125	0.0398	--	--	--
N-Nitrosodi-n-propylamine	EPA 8270E	Fremont Analytical	mg/kg	0.0274	0.0797	--	11	--
3&4-Methylphenol (m, p-cresol)	EPA 8270E	Fremont Analytical	mg/kg	0.0129	0.0299	0.26	0.67	--
Nitrobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.0152	0.0498	--	--	--
Isophorone	EPA 8270E	Fremont Analytical	mg/kg	0.013	0.0398	--	--	--
2-Nitrophenol	EPA 8270E	Fremont Analytical	mg/kg	0.0128	0.0299	--	--	--
2,4-Dimethylphenol	EPA 8270E	Fremont Analytical	mg/kg	0.00583	0.0299	--	0.029	--
Bis(2-chloroethoxy)methane	EPA 8270E	Fremont Analytical	mg/kg	0.00564	0.0299	--	--	--
2,4-Dichlorophenol	EPA 8270E	Fremont Analytical	mg/kg	0.00439	0.0299	--	--	--
1,2,4-Trichlorobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.0112	0.0299	--	0.81	--
Naphthalene	EPA 8270E	Fremont Analytical	mg/kg	0.0122	0.0398	--	99	--
4-Chloroaniline	EPA 8270E	Fremont Analytical	mg/kg	0.00887	0.0299	--	--	--
Hexachlorobutadiene	EPA 8270E	Fremont Analytical	mg/kg	0.00867	0.0299	--	3.9	--
4-Chloro-3-methylphenol	EPA 8270E	Fremont Analytical	mg/kg	0.0114	0.0299	--	--	--
2-Methylnaphthalene	EPA 8270E	Fremont Analytical	mg/kg	0.00732	0.0299	--	38	--
1-Methylnaphthalene	EPA 8270E	Fremont Analytical	mg/kg	0.00511	0.0299	--	--	--
Hexachlorocyclopentadiene	EPA 8270E	Fremont Analytical	mg/kg	0.0221	0.0996	--	--	--
2,4,6-Trichlorophenol	EPA 8270E	Fremont Analytical	mg/kg	0.0126	0.0299	--	--	--
2,4,5-Trichlorophenol	EPA 8270E	Fremont Analytical	mg/kg	0.00882	0.0299	--	--	--
2-Chloronaphthalene	EPA 8270E	Fremont Analytical	mg/kg	0.00632	0.0299	--	--	--
2-Nitroaniline	EPA 8270E	Fremont Analytical	mg/kg	0.0198	0.0498	--	--	--
Acenaphthene	EPA 8270E	Fremont Analytical	mg/kg	0.00696	0.0299	--	16	--
Dimethylphthalate	EPA 8270E	Fremont Analytical	mg/kg	1.61	3.49	--	53	--
2,6-Dinitrotoluene	EPA 8270E	Fremont Analytical	mg/kg	0.0144	0.0398	--	--	--
Acenaphthylene	EPA 8270E	Fremont Analytical	mg/kg	0.00624	0.0299	--	66	--
2,4-Dinitrophenol	EPA 8270E	Fremont Analytical	mg/kg	0.128	0.299	--	--	--
Dibenzofuran	EPA 8270E	Fremont Analytical	mg/kg	0.00596	0.0299	0.20	15	--
2,4-Dinitrotoluene	EPA 8270E	Fremont Analytical	mg/kg	0.0241	0.0598	--	--	--

Please see notes at end of table.

Table A-4
Sediment Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	Sediment Management Standards Sediment Cleanup Objective		Natural or Regional Background Concentrations
						Freshwater	Marine	
4-Nitrophenol	EPA 8270E	Fremont Analytical	mg/kg	0.0537	0.199	--	--	--
Fluorene	EPA 8270E	Fremont Analytical	mg/kg	0.00498	0.0299	--	23	--
4-Chlorophenyl phenyl ether	EPA 8270E	Fremont Analytical	mg/kg	0.00808	0.0299	--	--	--
Diethylphthalate	EPA 8270E	Fremont Analytical	mg/kg	0.24	0.747	--	61	--
4,6-Dinitro-2-methylphenol	EPA 8270E	Fremont Analytical	mg/kg	0.109	0.249	--	--	--
4-Bromophenyl phenyl ether	EPA 8270E	Fremont Analytical	mg/kg	0.0117	0.0299	--	--	--
Hexachlorobenzene	EPA 8270E	Fremont Analytical	mg/kg	0.00583	0.0299	--	0.38	--
Pentachlorophenol	EPA 8270E	Fremont Analytical	mg/kg	0.0714	0.199	1.2	0.36	--
Phenanthrene	EPA 8270E	Fremont Analytical	mg/kg	0.00788	0.0299	--	100	--
Anthracene	EPA 8270E	Fremont Analytical	mg/kg	0.00552	0.0299	--	220	--
Carbazole	EPA 8270E	Fremont Analytical	mg/kg	0.00644	0.0299	--	--	--
Di-n-butylphthalate	EPA 8270E	Fremont Analytical	mg/kg	0.0108	0.0299	0.38	220	--
Fluoranthene	EPA 8270E	Fremont Analytical	mg/kg	0.00879	0.0299	--	160	--
Pyrene	EPA 8270E	Fremont Analytical	mg/kg	0.0477	0.149	--	1000	--
Butyl Benzylphthalate	EPA 8270E	Fremont Analytical	mg/kg	0.0147	0.0498	--	4.9	--
bis(2-Ethylhexyl)adipate	EPA 8270E	Fremont Analytical	mg/kg	0.0733	0.199	--	--	--
Benz(a)anthracene	EPA 8270E	Fremont Analytical	mg/kg	0.00807	0.0299	--	110	--
Chrysene	EPA 8270E	Fremont Analytical	mg/kg	0.0115	0.0498	--	110	--
bis (2-Ethylhexyl) phthalate	EPA 8270E	Fremont Analytical	mg/kg	0.0112	0.0398	0.50	47	--
Di-n-octyl phthalate	EPA 8270E	Fremont Analytical	mg/kg	0.0186	0.0747	0.039	58	--
Benzo(b)fluoranthene	EPA 8270E	Fremont Analytical	mg/kg	0.0105	0.0996	--	--	--
Benzo(k)fluoranthene	EPA 8270E	Fremont Analytical	mg/kg	0.00999	0.0299	--	230	--
Benzo(a)pyrene	EPA 8270E	Fremont Analytical	mg/kg	0.0145	0.0398	--	99	--
Indeno(1,2,3-cd)pyrene	EPA 8270E	Fremont Analytical	mg/kg	0.0689	0.199	--	34	--
Dibenz(a,h)anthracene	EPA 8270E	Fremont Analytical	mg/kg	0.0388	0.0996	--	12	--
Benzo(g,h,i)perylene	EPA 8270E	Fremont Analytical	mg/kg	0.0288	0.0996	--	31	--
Metals								
Arsenic	EPA 6020	Fremont Analytical	mg/kg	0.0511	0.25	14	57	11
Barium	EPA 6020	Fremont Analytical	mg/kg	0.1498	0.5	--	--	--
Cadmium	EPA 6020	Fremont Analytical	mg/kg	0.0058	0.02	2.1	5.1	0.8
Chromium	EPA 6020	Fremont Analytical	mg/kg	0.0551	0.25	72	260	62
Copper	EPA 6020	Fremont Analytical	mg/kg	0.2121	0.75	400	390	45
Lead	EPA 6020	Fremont Analytical	mg/kg	0.0352	1	360	450	21
Mercury	EPA 6020	Fremont Analytical	mg/kg	0.0117	0.2	0.66	0.41	0.2
Nickel	EPA 6020	Fremont Analytical	mg/kg	0.0371	0.25	26	--	50
Selenium	EPA 6020	Fremont Analytical	mg/kg	0.0682	1	11	--	--
Silver	EPA 6020	Fremont Analytical	mg/kg	0.0048	0.02	0.57	6.1	0.24
Zinc	EPA 6020	Fremont Analytical	mg/kg	1.1057	3.5	3200	410	93
Wood Waste								
Ammonia	SM 4500	Fremont Analytical	mg/kg	0.272286189	1	230	--	--
Sulfide	SM 4500	Fremont Analytical	mg/kg	0.30568684	0.5	39	--	--
Benzoic Acid	EPA 8270	Fremont Analytical	mg/kg	0.028797106	0.1	2.9	0.65	--
Benzyl alcohol	EPA 8270	Fremont Analytical	mg/kg	0.05754629	0.15	--	0.057	--
Total Organic Carbon	EPA 9060	Fremont Analytical	%	0.041246097	0.15	--	--	--

Notes:

1. mg/kg = Milligrams per kilogram.
2. pg/g = Picogram per gram.
3. EPA = United States Environmental Protection Agency.
4. -- = Not available or not applicable.
5. Sediment cleanup levels from Table 8-1 of Washington Ecology's Sediment Cleanup User's Manual (December 2019 update).
6. Natural Background Concentrations and Sediment Management Standards from WAC 173-204 and Washington Ecology's *Sediment Cleanup User's Manual* (December 2019 update).
7. SGC = Silica Gel Cleanup
8. The Method Repoting Limit (MRL) for total dioxin/furan toxic equivalent (5 pg/g) is above the natural background concentration but below MTCA Method B cleanup level (13 pg/g). Results will only be quantifiable down to the MRL.

Table A-5
Groundwater Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	MTCA Method A Cleanup Level	Ground Water Method B Target Cleanup Level (µg/L)
Total Petroleum Hydrocarbons (TPH)							
Gasoline Range Organics	NWTPH-Dx	Fremont Analytical	µg/L	37	100	800/1000	--
Diesel Range Organics	NWTPH-Dx	Fremont Analytical	µg/L	37	100	500	--
Residual Range Organics	NWTPH-Dx	Fremont Analytical	µg/L	29	100	500	--
Diesel Range Organics	NWTPH-Dx-SGC	Fremont Analytical	µg/L	37	100	500	--
Residual Range Organics	NWTPH-Dx-SGC	Fremont Analytical	µg/L	29	100	500	--
Volatile Organic Compounds (VOCs)							
1,1,1,2-Tetrachloroethane	EPA 8260	Fremont Analytical	µg/L	0.117	0.3	--	1.68
1,1,1-Trichloroethane	EPA 8260	Fremont Analytical	µg/L	0.103	0.3	200	200
1,1,2,2-Tetrachloroethane	EPA 8260	Fremont Analytical	µg/L	0.070	0.2	--	0.219
1,1,2-Trichloroethane	EPA 8260	Fremont Analytical	µg/L	0.081	0.25	--	3
1,1-Dichloroethane	EPA 8260	Fremont Analytical	µg/L	0.146	0.5	--	7.68
1,1-Dichloroethene	EPA 8260	Fremont Analytical	µg/L	0.122	0.5	--	7
1,1-Dichloropropene	EPA 8260	Fremont Analytical	µg/L	0.143	0.5	--	--
1,2,3-Trichlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.295	0.7	--	6.4
1,2,3-Trichloropropane	EPA 8260	Fremont Analytical	µg/L	0.132	0.4	--	0.000384
1,2,4-Trichlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.248	0.75	--	15.1
1,2,4-Trimethylbenzene	EPA 8260	Fremont Analytical	µg/L	0.138	0.5	--	80
1,2-Dibromo-3-chloropropane	EPA 8260	Fremont Analytical	µg/L	0.331	1	--	--
1,2-Dibromoethane	EPA 8260	Fremont Analytical	µg/L	0.062	0.2	--	--
1,2-Dichlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.133	0.5	--	600
1,2-Dichloroethane	EPA 8260	Fremont Analytical	µg/L	0.121	0.5	5	4.81
1,2-Dichloropropane	EPA 8260	Fremont Analytical	µg/L	0.113	0.3	--	5.00
1,3,5-Trimethylbenzene	EPA 8260	Fremont Analytical	µg/L	0.102	0.5	--	80
1,3-Dichlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.140	0.5	--	--
1,3-Dichloropropane	EPA 8260	Fremont Analytical	µg/L	0.092	0.3	--	160
1,4-Dichlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.173	0.5	--	75
2-Butanone	EPA 8260	Fremont Analytical	µg/L	0.474	1.5	--	4800
2-Chlorotoluene	EPA 8260	Fremont Analytical	µg/L	0.130	0.5	--	160
2-Hexanone	EPA 8260	Fremont Analytical	µg/L	0.364	1.25	--	40
4-Chlorotoluene	EPA 8260	Fremont Analytical	µg/L	0.135	0.5	--	160
4-Isopropyltoluene	EPA 8260	Fremont Analytical	µg/L	0.106	0.5	--	--
4-Methyl-2-pentanone	EPA 8260	Fremont Analytical	µg/L	0.354	1	--	640
Acetone	EPA 8260	Fremont Analytical	µg/L	1.265	5	--	7200
Benzene	EPA 8260	Fremont Analytical	µg/L	0.179	0.44	5	5
Bromobenzene	EPA 8260	Fremont Analytical	µg/L	0.112	0.5	--	64
Bromodichloromethane	EPA 8260	Fremont Analytical	µg/L	0.086	0.25	--	7.06
Bromoform	EPA 8260	Fremont Analytical	µg/L	0.099	0.3	--	55.4
Bromomethane	EPA 8260	Fremont Analytical	µg/L	1.256	3	--	11.2
Carbon tetrachloride	EPA 8260	Fremont Analytical	µg/L	0.086	0.3	--	5
Chlorobenzene	EPA 8260	Fremont Analytical	µg/L	0.146	0.5	--	100
Chlorodibromomethane	EPA 8260	Fremont Analytical	µg/L	0.101	0.3	--	5.21
Chloroethane	EPA 8260	Fremont Analytical	µg/L	0.334	1	--	--
Chloroform	EPA 8260	Fremont Analytical	µg/L	0.155	0.5	--	14.1
Chloromethane	EPA 8260	Fremont Analytical	µg/L	0.260	0.75	--	--
cis-1,2-Dichloroethene	EPA 8260	Fremont Analytical	µg/L	0.164	0.5	--	16
cis-1,3-Dichloropropene	EPA 8260	Fremont Analytical	µg/L	0.115	0.35	--	0.438
Cumene	EPA 8260	Fremont Analytical	µg/L	0.122	0.5	--	800
Dibromomethane	EPA 8260	Fremont Analytical	µg/L	0.081	0.25	--	80.00
Dichlorodifluoromethane	EPA 8260	Fremont Analytical	µg/L	0.177	0.5	--	1600
Ethylbenzene	EPA 8260	Fremont Analytical	µg/L	0.143	0.4	700	700
Hexachlorobutadiene	EPA 8260	Fremont Analytical	µg/L	0.192	0.5	--	0.561
n-Hexane	EPA 8260	Fremont Analytical	µg/L	0.188	0.5	--	480
m,p-Xylene	EPA 8260	Fremont Analytical	µg/L	0.375	1	--	1600
Methylene chloride	EPA 8260	Fremont Analytical	µg/L	0.284	0.75	5	5
n-Butylbenzene	EPA 8260	Fremont Analytical	µg/L	0.170	0.5	--	400
n-Propylbenzene	EPA 8260	Fremont Analytical	µg/L	0.124	0.5	--	800
Naphthalene	EPA 8260	Fremont Analytical	µg/L	0.494	1.25	160	160
o-Xylene	EPA 8260	Fremont Analytical	µg/L	0.144	0.5	--	1600
sec-Butylbenzene	EPA 8260	Fremont Analytical	µg/L	0.112	0.5	--	800
Styrene	EPA 8260	Fremont Analytical	µg/L	0.115	0.5	--	100
tert-Butyl Methyl Ether	EPA 8260	Fremont Analytical	µg/L	0.121	0.35	20	24.3
tert-Butylbenzene	EPA 8260	Fremont Analytical	µg/L	0.115	0.5	--	800
Tetrachloroethene	EPA 8260	Fremont Analytical	µg/L	0.125	0.35	5	5
Toluene	EPA 8260	Fremont Analytical	µg/L	0.346	1	1000	640
trans-1,2-Dichloroethene	EPA 8260	Fremont Analytical	µg/L	0.120	0.35	--	100
trans-1,3-Dichloropropene	EPA 8260	Fremont Analytical	µg/L	0.099	0.5	--	--
Trichloroethene	EPA 8260	Fremont Analytical	µg/L	0.135	0.4	5	4
Trichlorofluoromethane	EPA 8260	Fremont Analytical	µg/L	0.113	0.3	--	--
Vinyl chloride	EPA 8260	Fremont Analytical	µg/L	0.116	0.2	0.2	0.292
Semi-Volatile Organic Compounds (SVOCs)							
1,2,4-Trichlorobenzene	EPA 8270	Fremont Analytical	µg/L	0.034	0.1	--	15.1
1,2-Dichlorobenzene	EPA 8270	Fremont Analytical	µg/L	0.026	0.1	--	600
1,3-Dichlorobenzene	EPA 8270	Fremont Analytical	µg/L	0.027	0.1	--	--
1,4-Dichlorobenzene	EPA 8270	Fremont Analytical	µg/L	0.033	0.1	--	75
1-Methylnaphthalene	EPA 8270	Fremont Analytical	µg/L	0.013	0.1	--	1.5
2,4,5-Trichlorophenol	EPA 8270	Fremont Analytical	µg/L	0.047	0.2	--	1600
2,4,6-Trichlorophenol	EPA 8270	Fremont Analytical	µg/L	0.055	0.2	--	7.95
2,4-Dichlorophenol	EPA 8270	Fremont Analytical	µg/L	0.034	0.15	--	48
2,4-Dimethylphenol	EPA 8270	Fremont Analytical	µg/L	0.039	0.15	--	320

Please see notes at end of table.

Table A-5
Groundwater Analytical Methods – Reporting Limit Goals
Buse Timber & Sales
Everett, Washington

Parameter	Method	Analytical Laboratory	Units	Method Detection Limit	Method Reporting Limit	MTCA Method A Cleanup Level	Ground Water Method B Target Cleanup Level (µg/L)
Semi-Volatile Organic Compounds (SVOCs)							
2,4-Dinitrophenol	EPA 8270	Fremont Analytical	µg/L	0.552	1.5	--	32
2,4-Dinitrotoluene	EPA 8270	Fremont Analytical	µg/L	0.033	0.1	--	0.129
2,6-Dinitrotoluene	EPA 8270	Fremont Analytical	µg/L	0.040	0.15	--	0.129
2-Chloronaphthalene	EPA 8270	Fremont Analytical	µg/L	0.027	0.1	--	640
2-Chlorophenol	EPA 8270	Fremont Analytical	µg/L	0.047	0.3	--	40
2-Methylnaphthalene	EPA 8270	Fremont Analytical	µg/L	0.021	0.1	--	32
2-Methylphenol	EPA 8270	Fremont Analytical	µg/L	0.038	0.2	--	800
2-Nitroaniline	EPA 8270	Fremont Analytical	µg/L	0.051	0.15	--	160
2-Nitrophenol	EPA 8270	Fremont Analytical	µg/L	0.051	0.3	--	--
3+4-methylphenol	EPA 8270	Fremont Analytical	µg/L	0.043	1	--	1600
4,6-Dinitro-2-methylphenol	EPA 8270	Fremont Analytical	µg/L	1.066	2.5	--	1.28
4-Bromophenyl phenyl ether	EPA 8270	Fremont Analytical	µg/L	0.039	0.2	--	--
4-Chloro-3-methylphenol	EPA 8270	Fremont Analytical	µg/L	0.059	0.2	--	1600
4-Chloroaniline	EPA 8270	Fremont Analytical	µg/L	0.031	0.1	--	0.438
4-Chlorophenyl phenyl ether	EPA 8270	Fremont Analytical	µg/L	0.025	0.1	--	--
4-Nitrophenol	EPA 8270	Fremont Analytical	µg/L	0.219	1	--	--
Acenaphthene	EPA 8270	Fremont Analytical	µg/L	0.024	0.1	--	480
Acenaphthylene	EPA 8270	Fremont Analytical	µg/L	0.013	0.1	--	--
Anthracene	EPA 8270	Fremont Analytical	µg/L	0.020	0.1	--	2400
Benz(a)anthracene	EPA 8270	Fremont Analytical	µg/L	0.042	0.15	--	--
Benzo(a)pyrene	EPA 8270	Fremont Analytical	µg/L	0.039	0.15	0.1	0.2
Benzo(b)fluoranthene	EPA 8270	Fremont Analytical	µg/L	0.058	0.2	--	--
Benzo(g,h,i)perylene	EPA 8270	Fremont Analytical	µg/L	0.166	1	--	--
Benzo(k)fluoranthene	EPA 8270	Fremont Analytical	µg/L	0.042	0.2	--	--
Benzyl alcohol	EPA 8270	Fremont Analytical	µg/L	0.497	3	--	1600
Bis(2-chloroethoxy)methane	EPA 8270	Fremont Analytical	µg/L	0.028	0.1	--	48
Bis(2-chloroethyl) ether	EPA 8270	Fremont Analytical	µg/L	0.124	0.4	--	0.0398
Bis(2-ethylhexyl) phthalate	EPA 8270	Fremont Analytical	µg/L	0.238	1	--	6
bis(2-Ethylhexyl)adipate	EPA 8270	Fremont Analytical	µg/L	0.201	0.75	--	400
Butyl benzyl phthalate	EPA 8270	Fremont Analytical	µg/L	0.084	0.3	--	46.1
Carbazole	EPA 8270	Fremont Analytical	µg/L	0.036	0.2	--	--
Chrysene	EPA 8270	Fremont Analytical	µg/L	0.037	0.15	--	--
Di-n-butyl phthalate	EPA 8270	Fremont Analytical	µg/L	0.945	2	--	1600
Di-n-octyl phthalate	EPA 8270	Fremont Analytical	µg/L	0.089	0.3	--	160
Dibenz(a,h)anthracene	EPA 8270	Fremont Analytical	µg/L	0.054	1.1	--	--
Dibenzofuran	EPA 8270	Fremont Analytical	µg/L	0.018	0.1	--	8
Diethyl phthalate	EPA 8270	Fremont Analytical	µg/L	0.189	0.5	--	12800
Dimethyl phthalate	EPA 8270	Fremont Analytical	µg/L	0.382	1.2	--	--
Fluoranthene	EPA 8270	Fremont Analytical	µg/L	0.064	0.2	--	640
Fluorene	EPA 8270	Fremont Analytical	µg/L	0.029	0.1	--	320
Hexachlorobenzene	EPA 8270	Fremont Analytical	µg/L	0.034	0.2	--	0.273
Hexachlorobutadiene	EPA 8270	Fremont Analytical	µg/L	0.027	0.15	--	0.561
Hexachlorocyclopentadiene	EPA 8270	Fremont Analytical	µg/L	0.033	0.25	--	0.480
Hexachloroethane	EPA 8270	Fremont Analytical	µg/L	0.038	0.15	--	1.09
Indeno(1,2,3-cd)pyrene	EPA 8270	Fremont Analytical	µg/L	0.048	0.2	--	--
Isophorone	EPA 8270	Fremont Analytical	µg/L	0.101	0.3	--	92.1
N-nitrosodipropylamine	EPA 8270	Fremont Analytical	µg/L	0.075	0.3	--	0.0125
Naphthalene	EPA 8270	Fremont Analytical	µg/L	0.028	0.1	--	160
Nitrobenzene	EPA 8270	Fremont Analytical	µg/L	0.059	0.5	--	1.6
Pentachlorophenol	EPA 8270	Fremont Analytical	µg/L	0.196	0.6	--	1
Phenanthrene	EPA 8270	Fremont Analytical	µg/L	0.044	0.2	--	--
Phenol	EPA 8270	Fremont Analytical	µg/L	0.045	0.3	--	4800
Pyrene	EPA 8270	Fremont Analytical	µg/L	0.115	0.4	--	240
Metals							
Arsenic	EPA 6020	Fremont Analytical	µg/L	0.0926	0.5	5	5
Barium	EPA 6020	Fremont Analytical	µg/L	0.3779	2	--	2000
Cadmium	EPA 6020	Fremont Analytical	µg/L	0.0057	0.1	5	5
Chromium	EPA 6020	Fremont Analytical	µg/L	0.1082	0.75	50	--
Copper	EPA 6020	Fremont Analytical	µg/L	0.1823	2	--	640
Lead	EPA 6020	Fremont Analytical	µg/L	0.0795	0.5	15	15
Mercury	EPA 245.1	Fremont Analytical	µg/L	0.0548	0.1	2	2
Nickel	EPA 6020	Fremont Analytical	µg/L	0.1092	0.5	--	320
Selenium	EPA 6020	Fremont Analytical	µg/L	0.0844	0.25	--	50
Silver	EPA 6020	Fremont Analytical	µg/L	0.0060	0.2	--	80
Zinc	EPA 6020	Fremont Analytical	µg/L	1.1619	2.5	--	4800

Notes:

1. µg/L = Micrograms per liter.
2. Groundwater cleanup levels from the MTCA Method A and B chapter 173-340 WAC (January 2023 update).

Appendix B

Inadvertent Discovery Plan

INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): Buse Timber & Sales Inc. Location: 3812 28th Place NE, Everett, WA

Project Lead/Organization: Apex Companies County: Snohomish

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP should always be kept at the project site** during all project activities. All staff, contractors, and volunteers should be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move.***
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact		Alternate Contact	
Name:	John Foxwell	Name:	
Organization:	Apex Companies	Organization:	
Phone:	503-312-0676	Phone:	
Email:	John.Foxwell@apexcos.com	Email:	

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager		Alternate or Cultural Resource Contact	
Name:	David Horne	Name:	
Program:	Toxics Cleanup Program	Program:	
Phone:	(360)742-1091	Phone:	
Email:	hoda461@ecy.wa.gov	Email:	

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe:	Tulalip Tribes of Washington	Tribe:	Swinomish Indian Tribal Community
Name:	Teri Gobin	Name:	Steve Edwards
Title:	Chair	Title:	Chair
Phone:	360-716-4000	Phone:	
Email:	trgobin@tulaliptribes-nsn.gov	Email:	sedwards@swinomish.nsn.us
Tribe:	Suquamish Tribe	Tribe:	Stillaguamish Tribe of Indians
Name:	Leonard Forsman	Name:	Shawn Yanity
Title:	Chair	Title:	Chair
Phone:	360.598.3311	Phone:	360-652-7362 ext. 228
Email:	lforsman@suquamish.nsn.us	Email:	syanity@stillaguamish.com

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:

Agency:
Name:
Title:
Phone:
Email:

State Agency:

Agency:
Name:
Title:
Phone:
Email:

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: *RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov

(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):
   - Local Medical Examiner or Coroner name and phone: Snohomoish Medical Examiner (425) 438-6200
   - Local Law Enforcement main name and phone: Everett Police Department (425) 257-8400
   - Local Non-Emergency phone number (911 if without a non-emergency number): 425-407-3999

2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. Organizations may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessment are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

The archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the sites and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)
(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Interactive Map of Tribes by Area
(https://dahp.wa.gov/archaeology/tribal-consultation-information)

WSDOT Tribal Contact Website
(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Tribes to contact Snoqualmie Indian Tribe - Robert de los Angeles, bobde@snoqualmietribe.us Sauk-Suiattle Indian Tribe - Norma Joseph (Chair), nJoseph@sauk-suiattle.com, 360-436-0333 Muckleshoot Indian Tribe - Jaison Elkins (Chair), Jaison.elkins@muckleshoot.nsn.us

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.

Stone artifacts from Oregon.

Stone artifacts from Washington.

Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.

Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.

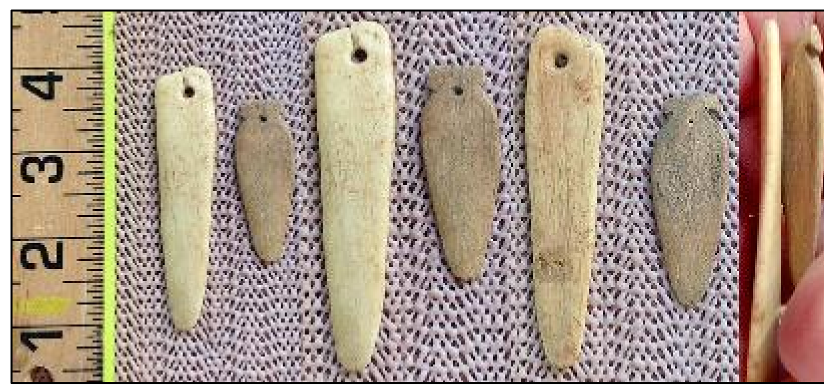
Artifacts from unknown locations (left and right images).

Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.



Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants. Right: Bone Pendants. Both from Oregon and Washington.*

Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.

Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP).*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry*.

Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- “Unusual” accumulations of rock (especially fire-cracked rock).
- “Unusual” shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a “layer cake” appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the “unusual” or out of place (for example, rock piles in areas with otherwise few rocks).

Shell Midden pocket in modern fill discovered in sewer trench.

Underground oven. Courtesy of DAHP.

Shell midden with fire cracked rock.

Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.

Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.

Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Main Image: *Dishes, bottles, workboot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*

Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.

Far Left: .303 British cartridge found by a WCC planting crew on Skagit River. Don't ever touch something like this!
Left: Maker's mark on bottom of old bottle.

Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*

Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).

Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

You see historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.

Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see...

Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.

Directly Above: This is a real discovery at an Ecology sewer project site.

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*

Appendix C

National Wetlands Inventory

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands

May 9, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.