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FINAL WORK PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY AND CLEANUP ACTION PLAN

PORT OF EVERETT
BAY WOOD PRODUCTS SITE
200 WEST MARINE VIEW DRIVE
EVERETT, WASHINGTON 98201

Prepared by:

SLR International Corp

May 4, 2009
Project # 008.0339.00001

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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of R. Scott Miller, Principal Engineer.

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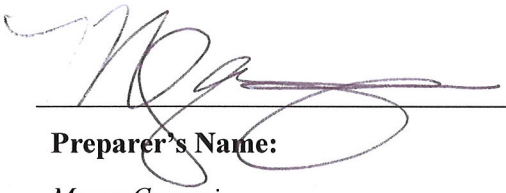

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ACRONYMS AND ABBREVIATIONS

ARARs	applicable or relevant and appropriate requirements
AST	above ground storage tank
bgs	below ground surface
BNAs	semi-volatile organic compounds (sediment)
BTEX	benzene, toluene, ethylbenzene, total xylenes
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
COPC	contaminants of potential concern
CSL	cleanup screening level
DQO	data quality objective
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	Environmental Protection Agency
FS	feasibility study
HASP	health and safety plan
HCID	hydrocarbon identification
ICP	inductively coupled plasma-atomic emission spectroscopy
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
MCL	maximum contaminant level
MSDS	material safety data sheet
MTCA	Model Toxics Control Act
MW	monitoring well
NRCS	National Resource Conservation Service
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCP	Pentachlorophenol
ppm	parts per million
PPMETS	Priority pollutant metals, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, zinc
PPP	Public Participation Plan
PQL	practical quantitation limit
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RI	remedial investigation
SAP	sampling and analysis plan
SAPA	sediment sampling plan appendix
SEPA	State Environmental Policy Act
SHA	site hazard assessment
SLV	screening level values
SMS	Sediment Management Standards

SQS	Sediment Quality Standards
SVOC	semi volatile organic compounds
TEE	Terrestrial Ecological Evaluation
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TPH-Gx	total petroleum hydrocarbons as gasoline
TPH-Dx	total petroleum hydrocarbons as diesel
TVS	total volatile solids
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code
WARM	Washington Ranking Method
WQC	water quality criteria

1. INTRODUCTION

This Work Plan has been prepared to describe the proposed work scope for completing the Remedial Investigation (RI), Feasibility Study (FS) and draft Cleanup Action Plan (CAP) at the Port of Everett Bay Wood Products Site (Site) located at 200 West Marine View Drive, Everett, Washington, 98201 (Bay Wood Site). The Bay Wood Site location is shown on Figure 1.

1.1 PURPOSE

This Work Plan is intended to describe the work scope that will be performed to meet the objectives in the Agreed Order for RI/FS Study and draft CAP dated October 3, 2008. The RI work scope has been developed to assess areas identified as potential environmental concerns based on historical activities to identify and quantify the contaminants of potential concern (COPCs) that may be present in soil, groundwater, surface water and sediments. The FS will evaluate potential alternatives and a preferred alternative for the cleanup of the identified contaminants. A detailed description of the cleanup of site contaminants will be provided in the draft CAP.

1.2 OBJECTIVES

The overall objective of the RI/FS is to identify the hazardous substances which have been released to the environment; assess the nature, extent and distribution of these substances; identify the potential migration pathways and receptors; assess the theoretical risk to human health and the environment; and generate or use data of sufficient quality for site characterization, risk assessment, and the subsequent analysis and selection of remedial alternatives.

1.3 GENERAL BACKGROUND

The Site consists of a 41.32-acre tract of land owned by the Port of Everett (Port) dating back to at least 1948. A Metsker's Atlas of Snohomish County published in 1936 indicated the Site was owned by Parker Lumber and Mill Company at that time. Historical Sanborn maps, reverse index city directories, and City of Everett building permits indicate the Site was occupied by a sawmill operation run by Washington Wood Products (also known as Washington Timber Products, Limited) through 1970. The Washington Wood Products operating areas were primarily located on the eastern approximately 1/3 of the Site. The operations included a sawmill, pre-fab shop, dry kilns, re-saw and planer shed, sorting shed, and numerous lumber storage and transfer sheds. In addition, a dip tank is depicted at the south end of the drying kiln on a 1968 Sanborn map. The western approximately 2/3 of the Site was primarily used for lumber and log storage. A log way was located on the southern portion of the Site and large log rafts were located to the northwest and north of the Site. The Site was subsequently occupied by Publishers Forest Products Company from 1970 to 1976, West Coast Orient Lumber Mills, Inc. from 1976 through 1978, and West Coast Lumber Operations Company from 1978 to 1979. Several additional buildings were constructed on the Property between 1970 and 1979, although the operations appeared to remain substantially the same.

In 1979 the Property was leased by Bay Wood Products, Inc., who dismantled the sawmill and began using the Site as a log storage and processing yard. By 1985 the main operations buildings had been removed from the Site, with the exception of an office/shop building, a large covered shed, and a shop building with three large truck bays. Several small outbuildings also remained on the northern portion of the Site. In 1994 Bay Wood Products concluded their lease of the Site and the remaining buildings were razed.

Between August and October 1995 contractors working on behalf of the Port removed approximately 140,000 cubic yards (yd^3) of bark, rock, and wood chips from the Site. A dike constructed of rock and soil was built around the western approximately 2/3 of the Site with the top of the dike approximately 50 feet from the shoreline. Following removal of the wood debris and rock, the area was filled with approximately 200,000 cubic yards of dredge sediment from maintenance dredging of the Snohomish River Federal Navigation Channel.

The Site has remained vacant since the removal activities in 1995. Sometime between 2005 and 2006 soil and sediment from construction of the Port's 14th Street Bulkhead was placed onto the Site.

1.4 GENERAL SITE INFORMATION

Site Name: Port of Everett Bay Wood Products Site

Site Address: 200 West Marine View Drive

City and State: Everett, WA 98201

County: Snohomish

Township/Range/Section: Section 7, Township 29N, Range 5E of the Willamette Meridian

Latitude: 48º 00' 49.5"

Longitude: 122º 12' 34.5"

Washington State Department of Ecology (Ecology) Facility Site ID Number: 2757

Ecology Region: Northwest Region

Ecology Project Manager: Andy Kallus, Ecology, Toxics Cleanup Program

Ecology Project Coordinator: Isaac Standen, Ecology, Toxics Cleanup Program

Port of Everett Project Manager: Larry Crawford, Port of Everett

Project Coordinator for the Port of Everett: Scott Miller, SLR

2. PROJECT MANAGEMENT PLAN

The project management plan for completing the RI/FS and draft CAP consists of the work scope described in this Work Plan, project communications plan, project schedule, Sampling and Analysis Plans (SAP), Quality Assurance Project Plan (QAPP), and the project specific Health & Safety Plan (HASP).

2.1 PROJECT COMMUNICATIONS

The primary contacts, roles, and contact information for the work scope described in this Work Plan is summarized in the following table:

Ecology	SLR	Port of Everett
Ecology Project Coordinator Mr. Isaac Standen **Role:** Primary Site Contact Washington State Department of Ecology, Toxics Cleanup Program 300 Desmond Drive Lacey, WA 98503 Phone: 360/407-6776 Email Address: ista461@ECY.WA.GOV	Project Coordinator for the Port Mr. Scott Miller **Role:** Project Manager SLR International Corp 1800 Blankenship Road, Suite 440 West Linn, OR 97068 Phone: 503/723-4423 Fax: 503/723-4436 Email Address: smiller@slrcorp.com	Port of Everett Representative Mr. Larry Crawford **Role:** Project Manager Port of Everett P.O. Box 538 Everett, WA 98206 Phone: 425/259-3164 Fax: 425/212-2158 Email Address: LCrawford@portofeverett.com

2.2 RI/FS AND DRAFT CAP SCHEDULE

The following table presents the proposed schedule for completing the RI/FS and draft CAP at the Site. The schedule may change based on the availability of subcontractors, weather conditions, or other factors. Any schedule modifications will be submitted for approval by SLR to the Ecology Project Coordinator.

Task	Proposed Schedule
Port of Everett submits Final RI/FS Work Plan to Ecology:	May 10, 2009
Start RI/FS field work:	June 9, 2009
Receipt of laboratory results from RI/FS study field work:	October 7, 2009
Port of Everett submittal of validated study results to Ecology:	November 6, 2009
Port of Everett Submits 1st Draft RI/FS Report to Ecology:	February 4, 2010
Ecology Review period ends for the 1st Draft RI/FS Report:	March 6, 2010
Port of Everett submits 2nd Draft RI/FS Report to Ecology:	May 5, 2010
Ecology Review period ends for the 2nd Draft RI/FS Report:	June 4, 2010
Port of Everett submits the Draft Final RI/FS Report to Ecology:	June 19, 2010
Port of Everett submits the Draft CAP to Ecology:	July 19, 2010

2.3 SAMPLING AND ANALYSIS PLANS (SAPS)

The upland SAP details the proposed sample collection methods, sampling locations, assessment and sample collection depths, sample analysis, and equipment decontamination procedures. The upland SAP is provided in Appendix A. The sediment SAP details the proposed sediment sampling locations, sample collection methods, sampling equipment, and decontamination procedures. The sediment SAP will be provided in Appendix B. Please note that the sediment SAP is not included with this draft work plan submittal. The sediment SAP will be submitted under separate cover once sediment assessment data from Port Gardner Bay sampling and sampling locations near the Bay Wood Products site becomes available from Ecology.

2.4 QUALITY ASSURANCE PROJECT PLAN (QAPP)

The QAPP contains the Quality Assurance/Quality Control (QA/QC) procedures for both field and laboratory procedures. The QAPP is provided in Section 3 of the upland and sediment SAP, which are provided in Appendix A and Appendix B.

2.5 SITE HEALTH AND SAFETY PLAN (HASP)

The Site HASP contains procedures, tools, and equipment that will be used during field activities to monitor and protect worker health and safety. The HASP is provided in Appendix C.

3. SITE DESCRIPTION AND ENVIRONMENTAL BACKGROUND

3.1 SITE LOCATION

The Site is located at the confluence of the Snohomish River to the north and Port Gardner Bay (Possession Sound) to the west (Figure 1). The Site consists of three adjoining parcels (29050700100300, 29050700100500, and 29050700101000) with a combined land area (both in-water and upland) of approximately 41.32 acres, which includes approximately 13 acres above the tidal mudflats (Figure 2). The northerly 100 feet of the Site are encumbered by an easement to the U.S. Army Corps of Engineers for dike maintenance, encompassing a total of 4.12 acres. Copies of the three Snohomish County Assessor's parcel maps of the Site are included in Appendix D. The Site is bound to the north by vacant land owned by the Kimberly-Clark Worldwide, Inc., to the south by the former Nord Door site (JELD-WEN, inc.), to the east by West Marine View Drive and land owned by the Port of Everett, beyond which is the BNSF railway and vacant marshland (Maulsby Marsh), the western portion of which is owned by BNSF, and to the west by Port Gardner Bay.

The Site lies on an area of fill that extends into Port Gardner Bay. The Site is relatively flat, with a maximum elevation of approximately 15-feet above mean sea level. A portion of the Site lies within the 100-year flood plain.

3.2 SITE HISTORY

Historical activities at the Site have consisted primarily of sawmill, log processing, and lumber storage activities dating back to 1946. Areas on the eastern, northern, and southern portions of the Site were filled in various stages beginning in the late 1800s or early 1900s when the adjacent BNSF railroad, formerly Great Northern Railroad, was laying tracks along Port Gardner Bay. In 1946 the eastern portion of the subject property was occupied by a sawmill operated by Washington Wood Products (later known as Washington Timber Products). At this time the eastern portion of the Site was separated from the western portion of the Site by a channel running roughly through the center of the Site. No activities were apparent on the western portion of the Site. The eastern portion of the Site appeared to be occupied by a series of large buildings in the northeastern corner of the Site, and a smaller building in the southeastern portion of the Site. A rail spur was present along the far southeastern border of the Site. Lumber storage piles were visible across the Site. By the time of a 1955 aerial photograph, several additional large buildings had been constructed on the Site to the south and southwest of the previously existing buildings; including the main sawmill structures in the southwestern corner of the Site. A 1957 Sanborn map identifies on-site buildings to include large lumber sheds and dry kilns on the northeastern portion of the Site; an office building in the southeastern corner of the Site; a saw mill, sorting sheds, pre-fab shop, and hogged fuel bin in the southwestern portion of the Site; and a lumber transit shed located adjacent to the rail spur on the far southern portion of the Site. The western portion of the Site still appeared to be separated from the eastern portion by a channel. By at least 1965 the channel running through the center of the Site had been filled and the western approximately 2/3 of the Site was being used for lumber and log storage. The existing buildings on the eastern portion of the Site remained, although several had been expanded in size. A 1968 Sanborn map depicts a dip tank located on the south end of the dry kiln

building located on the east-central portion of the Site. The Site continues to be occupied by Washington Timber Products at this time.

The Site was subsequently operated by Publishers Forest Products Company from 1970 to 1976, West Coast Orient Lumber Mills from 1976 through 1978, and West Coast Lumber Operations Company from 1978 through 1979. During this time period, operations at the Site appeared to have remained substantially the same, although several additional small storage buildings were visible in aerial photographs to the west of the previously existing buildings. Building permits reviewed at the City of Everett indicate a new boiler building was constructed in the central portion of the Site in 1971. These features are shown on Figure 2 (Site Map with Historical Site Features) and Figure 3 (Site Map – Eastern Portion of the Site).

In 1979 Bay Wood Products, Inc. began occupying the Site for use as a log processing yard. Bay Wood Products dismantled the sawmill operation and removed the majority of the buildings from the Site, including the boiler building, several of the dry kilns, and several of the lumber sheds. Prior to Bay Wood Products commencing operations at the Site there is evidence that the previous tenants applied a geo-textile fabric to stabilize rock fill. The rock fill was reportedly applied to working surface of the Site to allow the heavy log handling equipment to have a stable base for operation. At the time of a 1984 aerial photograph the only buildings which remained on the Site included the office building, one dry kiln building, and one storage building. The dry kiln building and storage buildings were razed in 1991. Bay Wood Products' lease of the Site was discontinued in approximately 1994.

In 1994 Landau Associates (Landau) was contracted by the Port to estimate the amount of bark, rock, and wood debris material located on the upland portion of the Site, both above and below the geo-textile fabric layer. Material above the geo-textile fabric was attributed to activities conducted on-site by Bay Wood Products, while material below was attributed to the former lessees. The initial estimated volume of this log yard wood waste material was approximately 100,000 yd^3, including approximately 79,000 yd^3 which was attributed to Bay Wood Products. Given the quantity of material present on the Site, it was determined that the material needed to be managed in a manner consistent with wood waste provisions, including WAC 173-304, which provides guidance for handling solid waste and wood waste.

Between August and October 1995, contractors working on behalf of the Port removed approximately 140,000 yd^3 of bark, rock, and wood chips from the Site. The material was removed from the upland areas of the Site. A dike constructed of rock and soil was built around the western approximately 2/3 of the Site with the top of the dike approximately 50 feet from the shoreline. Following removal of the wood debris and rock, the area was filled with approximately 200,000 cubic yards of dredge sediment from the maintenance dredging of the Snohomish River Federal Navigation Channel.

The Site has remained vacant since the removal activities in 1995. Sometime between 2005 and 2006 soil and sediment from construction of the Port's 14th Street Bulkhead Replacement project was placed onto the Site. This material was characterized in accordance the Puget Sound Dredged Disposal Analysis (PSDDA) Program for suitability for open-water disposal. This characterization is documented in the *Everett Marian PSDDA Sediment Characterization Report, 14th Street Bulkhead*

Replacement, Everett, Washington, dated February 24, 2005. This report was prepared by The RETEC Group, Inc. and prepared for the Port of Everett and is included as Appendix F.

3.3 ENVIRONMENTAL SETTING

The Site is located at the confluence of the Snohomish River to the north and Port Gardner Bay to the west. The Site is located on an area of fill which extends into Port Gardner Bay. No structures are present on the Site. The Site is adjoined by waterways and/or tidal mudflats to the north, south, and west. A narrow channel separates the Site from the adjacent property to the south. The Site is relatively flat, with a maximum elevation of approximately 15-feet above mean sea level.

According to the Soil Survey of Snohomish County Area, Washington (National Resource Conservation Service [NRCS], dated 1983) soils at the Site are classified as Urban Land. Urban Land is defined as areas that are covered by streets, buildings, parking lots, and other structures that obscure or alter the soils so that identification is not possible. Soils at the Site are likely classified as Urban Land as a result of the historic filling activities. In 1995, approximately 140,000 yd^3 of rock and wood debris were removed from the Site and replaced with dredge soils from the Snohomish River. According to a report summarizing the removal of PCB impacted soils on the eastern portion of the Site, soils encountered in the excavation were comprised of asphalt, crushed rock, wood debris, silt, and sand. No past groundwater sampling has been conducted at the Site. Groundwater flow is inferred to be generally toward Port Gardner Bay to the west.

The Snohomish River in the vicinity of the Site is a low salinity estuary, with flow velocities highly influenced by both tides and river discharges. Tides are diurnal, with two high tides and two low tides in each 24-hour period. Maximum annual flows in the Snohomish River occur from November through February as a result of winter precipitation and in May and June as a result of mountain snowmelt. Low flows occur in August and September. The geology of the lower Snohomish estuary in the vicinity of the Site generally consists of alluvial sand and gravel that may contain silt, clay, and organics.

The western and southern edges of the Site are covered by riprap and logs which slopes moderately down toward the shoreline. Pockets of dune grass are located between the rubble. Lower rubble supports barnacles and mussels and the shore crab. The riparian zone is composed principally of blackberry with a few willow trees. A wooden sea wall extends along the northeastern shoreline of the Site.

According to the Everett Shoreline Master Program dated May 3, 2002 and last updated November 17, 2005, the Snohomish River supports seven species of anadromous salmonids: chinook, coho, chum, pink, steelhead, cutthroat, and Dolly Varden/bull trout. Chinook salmon and bull trout were listed as threatened with extinction under the Endangered Species Act in 1999. Coho salmon are listed as a candidate species for federal protection. Other non-salmonid fish species include juvenile flounder, chub, and sculpin. Sticklebacks, perch, juvenile smelts, and lampreys are also found in the Site area. Less abundant species include candlefish, herring, and pumpkinseed.

The Snohomish River and estuary also provide wildlife habitats for birds (hawks, herons, bald eagles, bulls, kingfishers, turns, and sea ducks), mammals (harbor seals, sea lions, river otters, mink,

muskrats, weasels, beavers, coyotes, raccoons, and deer), and invertebrates (barnacles, mussels, clams, snails, shrimp, crab, isopods, and anemones). In July 2007, the U.S. Fish and Wildlife Service removed the bald eagle from the list of federal endangered and threatened wildlife. The bald eagle became a federal species of concern that no longer warranted protection under the Endangered Species Act (ESA). The bald eagle is currently a State Threatened species in Washington (WAC 232-12-292). The bald eagle is still federally protected under U.S. Codes including the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Site-specific receptors will be evaluated as part of the RI through the completion of Terrestrial Ecological Evaluation (TEE), which will be completed in accordance with WAC 173-340-7490 to 7494. Current information on endangered species will be obtained directly from U.S. Fish and Wildlife and/or Washington State Department of Fish and Wildlife.

The Site is located in the west-central portion of Snohomish County. The climate of Snohomish County area is greatly tempered by winds from the Pacific Ocean. Summers are relatively warm, and winters are cool, but snow and freezing temperatures are uncommon. The average daily temperature in Everett in the summer is 62 degrees Fahrenheit and in the winter is 40 degrees Fahrenheit. During summer, rainfall is extremely light. During the rest of the year, rains are frequent, especially late in fall and in winter. The average annual precipitation in Everett is 36 inches (NRCS, 1983).

3.4 REGULATORY HISTORY AND PREVIOUS INVESTIGATIONS

Since 1989, several environmental assessment events have been completed at the Site to evaluate soil conditions. Activities associated with these investigations and their general findings, including regulatory compliance, are summarized in this section. Where appropriate and available, the analytical results from soil sampling have been included in the summary table (Table 1 – Soil Analytical Summary Table - PCBs). Refer to Figure 2 and Figure 3 for the locations of site features described in the paragraphs below.

September 25, 1989 Phase I Environmental Site Assessment (ESA), Existing Log Yard, Everett, WA, prepared by GeoEngineers for Bay Wood Products, Inc. – The Phase I included an assessment of the Bay Wood Products site, which included approximately two acres of fee land owned by Bay Wood Products, and an additional 11 acres owned by the Port of Everett and leased to Bay Wood Products. The two acres of land owned by Bay Wood Products consisted of a narrow waterway on the south edge of the property. At the time of the assessment the majority of the Site was covered by logs and several large piles of wood and bark residue. Three main buildings were located on the southeastern portion of the Site, which consisted of an office building with an attached shop area, a large covered shed, and an unused shop building with three large truck bays. All of the buildings were observed to have concrete floor slabs. Gravel was present over the concrete slabs in the shop buildings. Several small outbuildings were reported to be scattered across the property. Several aboveground tanks (ASTs) and drums were reported to be located in and around the buildings. No figures were included with the report depicting the location or size of the tanks. The tanks reportedly contained diesel fuel and waste oil. Staining was noted on the gravel and the concrete slab surfaces beneath the tanks. Several 55-gallon drums containing motor oil and hydraulic oil were

observed in the covered shop area attached to the office building. Staining was observed on the gravel and concrete floor surface beneath the drums.

A portion of the concrete slab, roughly circular and approximately 10 feet in diameter, had been removed along the south edge of the covered shed. The concrete was reportedly removed during an EPA-mandated PCB cleanup in 1985, which resulted from a release from an on-site electrical transformer. General Electric (GE) removed the transformer and approximately 10 yd^3 of PCB-contaminated soil. GeoEngineers was not provided documentation of the PCB cleanup at the time of the Phase I ESA. Soil staining was observed in the surface gravel in the area where the concrete slab had been removed. The oil stains were suspected to be the result of vehicles parked in the area.

No evidence of current or former underground storage tanks (USTs) was identified at the Site. Based on a review of regulatory agency databases, GeoEngineers found no evidence that the Site or the immediate vicinity had a known environmental pollution incident. The adjacent property to the south (E.A. Nord Company) was identified as a UST site having five USTs. According to an interview with a representative of the E.A. Nord Company, three of the USTs were no longer in service. The GeoEngineers report made no conclusions about the environmental condition of the Site and provided no recommendations.

June 12, 1992 Letter from GeoEngineers regarding the Bay Wood Products Site –
This letter report appears to be a follow-up to the 1989 Phase I ESA. The letter addresses several issues which were not investigated further following the 1989 report, as well as discussing a recent review of state and federally listed sites, interviewing Bay Wood site personnel regarding current activities at the Site, reviewing representatives of the adjacent property to the south (E.A. Nord Company) regarding the current status of their USTs, a visual reconnaissance of the Site and surrounding properties to identify visible signs of contamination, and additional research regarding the 1986 removal of PCB waste from the Site by GE.

The issues of concern that were not further evaluated as part of the 1989 study included: staining on surface gravel and underlying concrete slab in the vicinity of two unused diesel ASTs and in several other areas of the large covered shed; evidence of spillage from a waste oil AST; the absence of documentation pertaining to the removal of the PCB-contaminated transformer, concrete slab, and associated contaminated soil; and oil stains observed in the surface gravel in the area where the transformer had been removed. According to interviews with Bay Wood personnel, the large covered shed and unused shop building were demolished in August 1991. Stained areas of gravel were removed and the concrete was cleaned when the shed and shop were demolished. GeoEngineers did not observe evidence of staining in the areas of the former buildings. The two former diesel ASTs were removed in early 1990, and the waste oil AST was emptied in early 1990 and has been unused since that time. Two 250-gallon motor oil ASTs and several 10 and 55-gallon drums containing hydraulic oil and waste oil were observed in the covered shed adjacent to the office. The waste oil was reportedly removed regularly by a waste oil contractor. Gravel staining was observed in the covered shop in the vicinity of

the drums and ASTs. The gravel staining was approximately 4 to 6 inches thick and was located over a concrete slab. Limited areas of stained wood debris were observed in the equipment maintenance area west of the covered shop. The wood debris was located over asphalt pavement. The staining appeared to be the result of leaks or drips from equipment parked in the area.

GeoEngineers reviewed records regarding the removal/disposal of PCB transformers and PCB waste from the Bay Wood Site which were obtained from the EPA and GE. The leaking transformer was located along the south edge of the covered shed. An EPA inspector visited the Site in February 1986 and noted dark staining on the soil in front of the transformer, behind the transformer, and at the lower part of the transformer casing. A sample of the transformer oil was collected, and the transformer was confirmed to be PCB-containing. An area of soil approximately 10 feet square and 10 inches deep was removed. No sampling associated with the removal was identified.

The GeoEngineers report recommended the area of the former leaking transformer and PCB-contaminated soil be identified, and shallow soil samples be collected for analysis of PCBs. The report further recommended removal of stained gravel in the covered shop, removal of the limited areas of stained wood debris in the equipment maintenance area, and recommended procedures be put in place to improve housekeeping in the vicinity of oil storage in the covered shop area.

September 1, 1992 Letter from GE Industrial Systems & Services to GeoEngineers regarding Port of Everett, Bay Wood Products Site – The letter was prepared in response to an inquiry from GeoEngineers concerning PCB cleanup activities at the Bay Wood Site. According to the letter, GE assisted Bay Wood Products in the removal of PCB-impacted soils at their site. The letter states that according to GE's field engineer an area 10 feet by 10 feet by 10 inches deep was removed, which included the area of high concentration PCBs. The letter stated that visual evidence was used to determine the spill area and the limit of the excavation. Sampling was not conducted as part of GE's investigation.

February 3, 1993 Environmental Site Assessment and Remedial Excavation, Bay Wood Products Log Yard, Everett, WA, prepared by GeoEngineers for Bay Wood Products, Inc. – At the time of the ESA the Site was operating as a sorting and storing yard for export logs. No milling, planning, cutting, preserving, dipping, painting, or other industrial-type operations were performed at the Site. The office building with attached covered shop area and three outbuildings were present on the Site. Equipment maintenance including lubrication, waste oil removal, and replacement of antifreeze was performed on-site in the vicinity of the covered shop area. Fueling of the on-site equipment was conducted by an outside contractor. The large covered shed and unused shop building with large truck bays described in the 1989 report had been demolished. No evidence of staining was observed in the vicinity of the former buildings, although some of the areas were obscured by logs or wood debris during the site visit.

An investigation of surface soils in the vicinity of the former area of PCB-contaminated soils was conducted as part of the ESA. In September 1992, four soil samples were collected from the boundaries of the former excavation at approximately 0.5 feet below ground surface (bgs) for analysis of PCB. PCBs were identified in all four samples, with concentrations ranging from 0.75 milligrams per kilogram (mg/kg) to 1.18 mg/kg. The concentrations were above the MTCA Method A residential soil cleanup level of 1 mg/kg, but less than the industrial cleanup level of 10 mg/kg. Additional sampling was conducted in October 1992 to identify the lateral and vertical distribution of soil with PCB concentrations greater than 1 mg/kg. Eleven additional soil samples were collected from depths of 0.5 and 1 foot bgs. PCBs were not detected at concentrations above 1 mg/kg in the six samples collected from 1 foot bgs. Three samples from a depth of 0.5 feet bgs identified PCB concentrations in soil ranging from 1.27 mg/kg to 2.32 mg/kg. Based on this analysis approximately 45 cubic yards of soil was excavated from the area where PCB concentrations were above 1 mg/kg. Confirmation samples collected from the base of the excavation identified PCB concentrations raging from 0.068 mg/kg to 0.49 mg/kg, below the MTCA Method A cleanup residential soil cleanup value. These soil sampling results are summarized in Table 1 (attached). No further investigation in the vicinity of the former PCB transformer was recommended.

GeoEngineers concluded that based on their research, site visit, and review of available information, the only significant potential environmental issues observed at the Site was surface staining and storage of petroleum products in the equipment maintenance areas. However, the surface staining, apparently related to equipment maintenance activities at the Site, appeared limited in extent. Based on their observations and experience, it was not considered significantly different from typical surface conditions for industrial type properties. GeoEngineers stated that in their opinion the conditions observed did not pose a significant threat or potential threat to human health and the environment.

July 22, 1994 Letter Report from Landau Associates, Inc. regarding Bay Wood Products Log Yard, Everett, WA, prepared for the Port of Everett – Landau Associates was contracted by the Port to conduct an exploration of site conditions (specifically the depth of bark and wood debris on the uplands portion of the Site), prepare a volume estimate of the bark, wood, and rock debris in the upland portion of the Site which was associated with Bay Wood Products activities, and review the Port lease and selected environmental regulations related to log yard cleanup responsibilities. The Bay Wood Products Site was described to consist of approximately 20 acres total, with approximately 13 acres of upland (above the tidelands) areas. The Site had reportedly been leased by the Port to several different operators dating back to 1959. The operators used the Site for various log handling activities. The most recent tenant was Bay Wood Products, who least the property from 1980 through 1994. It was understood that prior to commencing log handling activities, Bay Wood Products placed a geo-textile fabric and a layer of coarse rock to prepare the Site surface. Based on the excavation of test pits, the volume of bark, rock, and wood debris material in the upland area of the Site (above the geo-textile fabric) was estimated to be approximately 79,000 yd^3. This material was attributed to Bay Wood Products former activities at the Site. A total of 25 test pits were

excavated during this assessment. The approximate locations of these test pits are shown on Figure 3.

Landau reviewed information associated with environmental cleanup responsibilities identified in Bay Wood Products' lease, as well as environmental regulations applicable to wood waste. Landau concluded that lease provisions appeared to require Bay Wood Products to comply with solid waste regulations. These regulations include WAC 173-304, which provides guidance for handling solid waste and wood waste.

November 8, 1995 Letter from Landau Associates, Inc. regarding Estimated Wood Waste Volume, Preston Point Site, Everett, WA, prepared for the Port of Everett – Landau field personnel monitored wood waste excavation activities at the Site from August 25, 1995 through September 26, 1995, and collected elevation measurements to support development of a volume estimate of wood waste located above the geo-textile fabric. The upper layer of fill material at the Site was determined to include significant portions of bark and wood fragments, which were consistent with the Ecology's *Minimum Functional Standards for Solid Waste Handling* (MFS) definition of wood waste. Wood waste is defined by the MFS (WAC 173-304-100[91]) as a "…solid waste consisting of wood pieces or particles generated as a by-product or waste from…handling and storage of raw (forest product) materials…This includes, but is not limited to…log sort yard waste…" Landau determined that the volume of wood waste excavated from the Site during 1995, attributable to Bay Wood Products' activities was approximately 61,000 yd^3.

December 29, 1995 Engineers Report on Observations & Analysis of Excavation of Material from Bay Wood Log Yard, prepared by Forest Industries Engineering Systems (FIES) for Coast Pacific Trading, Inc. – FIES was contracted on behalf of Coast Pacific Trading, Inc. (the parent company of Bay Wood Products) to observe the dike construction and excavation of wood waste material from the Site and prepare an analysis of the types and volumes of materials excavated. The inspections were conducted between August 30, 1995 and October 20, 1995. The report estimated that approximately 85,000 to 90,000 yd^3 of material was removed from the central areas of the Site and 45,000 to 50,000 yd^3 of material was removed from the perimeter areas. The total material removed was estimated to be as much as 140,000 yd^3 of material.

February 24, 2005 Everett Marian PSDDA Sediment Characterization Report, 14th Street Bulkhead Replacement, Everett, Washington, prepared by The RETEC Group, Inc. for the Port of Everett – This report concludes that the sediment from the 14th Street Bulkhead Replacement project was evaluated according Puget Sound Dredge Disposal Analysis (PSDDA) guidelines, and that this material did not contain chemicals detected at a level greater than any of the PSDDA criteria and was suitable for unconfined, open-water disposal. A copy of this report is included as Appendix F.

3.5 CURRENT AND FUTURE LAND AND WATER USE

The Site consists of approximately 41.32 acres of combined in-water and upland areas. The northerly 100 feet of the Site are encumbered by an easement to the U.S. Army Corps of Engineers for dike maintenance, encompassing a total of 4.12 acres (Figure 2).

There are no current operations at the Site. Surface water in the Site vicinity is utilized both commercially and recreationally. The Tulalip Tribes Reservation is located approximately one mile north of the Site, on the north side of the Snohomish River. Tulalip tribal members living on the Tulalip Reservation are engaged in both commercial and subsistence fishing near the confluence of Port Gardner Bay and the Snohomish River. There is no current or proposed future use for groundwater in the Site vicinity.

In June 2006 the Port of Everett and JELD-WEN (adjacent property owner to the south) submitted a joint request for a Comprehensive Plan Map Change and Rezone to the City of Everett. The proposal requested a change to the comprehensive plan designation of the respective properties from their current designation of Maritime Service to Waterfront Commercial. The proposal also requested the zone district be changed from its current designation as Maritime Services (M-S) and Heavy Manufacturing (M-2) to Waterfront Commercial with a Planned Development Overlay Zone allowing for a mix of residential, recreational, and commercial uses. The proposed changes to the Comprehensive Plan Map and Zone District require that the Shoreline Master Program be amended for the area from Urban Maritime Interim, Aquatic and Aquatic Conservancy to Urban Multi-Use. In July 2007 the City of Everett amended the comprehensive plan map as requested. The Port of Everett and JELD-WEN are still working with the City of Everett to achieve the requested changes to the Shoreline Master Program and Zoning Map. Future uses at the Site may include residential, recreational, and/or commercial uses depending on the outcome of the requested changes to the Shoreline Master Program, Comprehensive Plan Map, and Zone District.

3.6 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) incorporates physical and chemical information to understand potential fate and transport mechanisms at the Site. The CSM considers contaminant sources, release mechanisms, transport and exposure pathways, and potential receptors. The CSM developed for the Port of Everett Site (Figure 4) describes the potential release mechanisms from the potential primary sources of hazardous substances to potential secondary and tertiary sources, the exposure media and routes, and the potential human receptors. This model reflects current conditions and possible future development in assessing exposure pathways. The CSM is based on available historical information and site-specific information gathered during historical sampling activities. A summary of the CSM including potential primary sources, release/transport mechanisms, primary exposure media and routes of exposure, and potential receptors are presented below.

- **Potential Primary Sources Of Contamination** – Potential primary sources of contamination identified for the Site include the following:
    - Former Aboveground Storage Tanks – Former ASTs that contained various petroleum fuels (gasoline and diesel), motor oils, and used motor oils. The potential primary release mechanisms from the ASTs may include historic

releases to soil from overfilling, releases from the tanks, or drips/spills during transfer of fluids to/from the tanks.

- Former Drum Storage Area – A former drum storage area was located in the covered shop connected to the office (Figure 3). Drums of motor oils, lubricating oils, waste oil, antifreeze, and hydraulic fluids were likely stored in this former shop area. The potential primary release mechanisms from drum storage may include past overtopping, leaks, or spills.
- Former Stained Soil Area – Soil staining was observed on the wood debris gravel in the covered equipment area (former lumber shed). The stains were suspected to be the result of vehicles parked in the area. Stains were reportedly removed.
- Former Shop Areas – The pre-fab shop and filing room are located north of the former sawmill building. Potential primary release mechanisms associated with former shop activities could include historic spills or releases of hydraulic fluids, cutting oils, fuels (diesel and/or gasoline), and/or solvents to soil or surface pavement.
- Former Oil Shed – A former oil storage shed was identified north of the pre-fab shop on the 1968 Sanborn map. Potential primary release mechanisms associated with the former oil shed could include historic spills or releases of hydraulic fluids, cutting oils, and fuels (diesel and/or gasoline) to soil or surface pavement.
- General Site Operations – Past activities included a hog fuel burner which was formerly used to convert saw dust and wood waste from the sawmill activities into steam. The steam was used in the wood drying kilns. Boiler water treatment chemicals, ash disposal practices, and hydraulic equipment usage have the potential to result in environmental impairment. Potential primary release mechanisms from past activities include; ash disposal, leaks or spills to soil, surface pavement, or stormwater at the Site.

- **Release mechanisms** – A summary of the release mechanisms identified for the Site are provided below.

  - Primary Release Mechanisms – One of the primary means in which contaminants may have been released to the Site includes leaks and spills from primary sources to on-site soil and/or pavement during the Site's historical sawmill operations. Other primary release mechanisms may include stormwater runoff including runoff which would discharge into Port Gardner Bay.

  - Secondary Release/Transport Mechanisms – From on-site soil, secondary release mechanisms may include fugitive dust generation, runoff/overland flow, and leaching, all of which can contribute to the spread of contaminants (if present) in soil across the Site and have the potential to impact Port Gardner Bay. If present, contaminants in on-site soil may also volatilize into air, leach

into on-site groundwater, and or be absorbed into on-site plants and animals through bioaccumulation. For on-site groundwater, secondary release mechanisms may include volatilization of contaminants into air and groundwater migration/seepage, which can be a source for potential surface water and sediment contamination in Port Gardner Bay. Contaminants in Port Gardner Bay, if present, may be further released through the displacement and mixing of sediment particles by aquatic animals or plants (i.e., bioturbation) and through tidal currents. In addition, contaminants in Port Gardner Bay, if present, may be absorbed into aquatic organisms through bioaccumulation.

- **Primary Exposure Media And Routes Of Exposure** – The exposure media are the environmental media through which human or ecological receptors could be exposed to hazardous substances (if present). As depicted in Figure 4, the primary exposure media affected by potentially released hazardous substances at the Bay Wood Site include the following:

    - On-site soil
    - Air
    - On-site groundwater
    - Port Gardner Bay Sediment and Surface Water
    - Terrestrial (e.g., plants and animals) and Aquatic (e.g., fish and invertebrates such as shellfish) Prey Species

  Ingestion and dermal contact with soil, sediment, and surface water, in addition to inhalation and dietary ingestion, are the major routes of exposure through which human receptors may potentially contact contaminated media associated with the Bay Wood Site. The primary means in which terrestrial ecological receptors may potentially come into contact with contaminants are through direct contact with soil, sediment, and surface water, and through dietary ingestion. The primary means in which aquatic ecological receptors may potentially come into contact with contaminants are through direct contact with sediment and surface water and through dietary ingestion.

  Groundwater at the Site does not meet the definition of potable water as outlined in WAC173-340-720(2) based on the following factors: (a) the ground water does not serve as a current source of drinking water; and (b) the ground water is not a potential future source of drinking water given the Site's proximity to surface water that is not suitable as a domestic water supply.

- **Receptors** – Receptors are the human and ecological populations that may be potentially exposed to hazardous substances, considering current and future site land and water use. The potential human and ecological receptors identified for the Bay Wood Products Site on Figure 4 are as follows: future child and adult residents, future industrial workers, future construction workers, tribal subsistence fishers, and terrestrial/aquatic ecological receptors.

3.7 PRELIMINARY CLEANUP LEVELS

The preliminary cleanup levels (PCLs) will be used to verify the COPCs for soil, sediment, and groundwater at the Site as part of the RI. PCLs for soil and groundwater are presented in attachment 2. PCLs for sediment are presented in Table 1 of the Sediment SAP included as Appendix B. PCLs were obtained as defined below:

- **Groundwater** – Because on-site groundwater is non-potable in accordance with WAC 173-340-720(2), groundwater PCLs are based on the most restrictive level between protection of marine and freshwater surface water. The Site is located within an estuary and may contain both freshwater and marine species. The most restrictive cleanup level between MTCA Method A (WAC 173-340-730[2]) and Method B (WAC 173-340-730[3]) was used. If a PCL was not available from the aforementioned sources, then the most restrictive PCL between MTCA Method A (WAC 173-340-720[3]) and Method B (WAC 173-340-720[4]) for potable groundwater was used. PCLs for groundwater are presented in Attachment 2. Attachment 2 provides a summary of the methodology used to generate these groundwater PCLs.
- **Soil** – Soil PCLs were calculated by selecting the most stringent value based on protection of human health (under a future residential scenario), protection of terrestrial ecological receptors, and protection of groundwater. The most restrictive cleanup level between MTCA Method A (WAC 173-340-740[2]) and Method B (WAC 173-340-740[3]) for unrestricted land use was used. MTCA Cleanup Regulations, Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified TEE Procedure, Table 749-2 for unrestricted land use were used. The Simplified TEE cleanup levels were used for the RI, however a Site Specific TEE may be conducted as part of the FS.

  Soil PCLs were calculated using Ecology's three phase partitioning model as described in WAC 173-340-747 to generate soil concentrations which are protective of surface water. The chemical physical parameters were obtained from the CLARC tables. In the event that the calculated PCLs were below the laboratory PQLs, the PCL defaulted to the laboratory PQL. PCLs for soil are presented in Attachment 2. Attachment 2 provides a summary the calculations used to generate the soil PCLs.

- **Sediment –** Sediment PCLs will be based on Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) identified in the Sediment Management Standards (SMS) (Chapter 173-204 WAC). Sediment PCLs will be outlined in the sediment SAP; the sediment SAP will be submitted under separate cover and will be included as Appendix B on the Final Draft version of this Work Plan.

3.8 PURPOSE AND OBJECTIVES

The scope of the field investigation presented in this Work Plan has been developed to allow for completing the RI/FS and development of a draft CAP. The purpose of the field investigation is to collect and analyze adequate samples such that the Site will be sufficiently characterized for completing the RI/FS and developing the draft CAP.

Table 1 summarizes previous PCB soil sampling results and the calculated PCLs for PCBs in soil as presented in Attachment 2. Additional site characterization is needed to evaluate identified data gaps and to help define potentially complete exposure pathways and the extent of impacts. The objective of this section is to describe the work scope and methods for completing the environmental field investigation to meet these stated objectives.

3.9 INVESTIGATION AREAS

Potential contaminant migration pathways and specific areas of interest will be assessed to complete the site characterization. Potential pathways/areas, investigation rational, and proposed sampling is discussed in the following sections. The proposed sampling locations are shown on Figure 5. The upland and sediment SAPs (Appendices A and B, respectively) detail the proposed sample collection methods, sample handling, chain-of-custody procedures, sampling equipment, and decontamination procedures.

The removal of 140,000 cubic yards of material removed from the Site resulted in an average of 4 to 6 feet of material depth removed across the approximately 13 acre upland portion of the Site. This removal activity resulted in the removal of Site structures, surface features, and near surface soil from identified areas of environmental interest. Removed material was replaced with approximately 200,000 cubic feet of dredged sand from the Snohomish River Federal Navigation Channel. Accordingly, soil sampling in the locations presented below target the soil below the imported dredged sand placed on the Site following the material removal in 1995.

3.9.1 FORMER COVERED SHOP ATTACHED TO THE FORMER OFFICE BUILDING

Data Gap: The former covered shop attached to the former office building (Figure 2) was indentified in previous environmental assessment reports as the location for ASTs and drum storage. Areas of surface staining were also noted in previous assessment reports. Approximately one to two feet of soil was removed and replaced with dredge sediment from the maintenance dredging of the Snohomish River Federal Navigation Channel. Surface features and surface soil were removed from nearly the entire Site, including this area.

Proposed Assessment: Two Geoprobe borings (proposed borings PB-1A and PB-1B) will be advanced at the location of the former covered shop as shown on Figure 5. A total of two soil samples will be collected from the soil below the dredge fill from the Geoprobe borings (one from each boring location). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx, priority pollutant metals (PPMETS) using EPA 6000/7000 series methods, Polynuclear Aromatic Hydrocarbons (PAHs) by EPA method 8270, and volatile organic compounds (VOCs) by EPA method 8260 if the HCID shows the presence of this range of hydrocarbons in the sample. Groundwater grab samples will be collected from each of the two boring locations (PB1-A-GW and PB1-B-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PAH and VOC analysis. Groundwater samples from each boring will be collected and held by the laboratory for possible total metals analysis, pending the results of the metals analysis of soil.

3.9.2 FORMER PCB TRANSFORMER AREA

Data Gap: An investigation of surface soils in the vicinity of the former area of PCB-contaminated soils was conducted. Two soil removal events were completed. Confirmation samples collected from the base of the second excavation identified PCB concentrations raging from 0.068 mg/kg to 0.49 mg/kg, below the MTCA Method A cleanup residential soil cleanup value. Approximately one to two feet of soil was removed and replaced with dredge sediment from the maintenance dredging of the Snohomish River Federal Navigation Channel. Surface features and surface soil were removed from nearly the entire Site, including this area. Soil sampling was not completed for total petroleum hydrocarbons and groundwater sampling was not conducted.

Proposed Additional Assessment: One Geoprobe boring (PB-2A) will be advanced in the vicinity of the former transformer area. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for PCBs by EPA method 8082 and for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx. A groundwater grab sample (PB-2A-GW) will be collected and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. A groundwater sample will be collected and held by the laboratory for possible PCB analysis, pending the results of the PCB analysis of soil.

3.9.3 FORMER MILL OPERATION AREAS

Data Gap: Historical activities at the Site have consisted primarily of sawmill, log processing, wood fired boiler(s), lumber drying (drying kilns), and lumber storage activities. The location of the mill buildings and support structures are shown on Figure 3. Former mill operations would have included equipment for log debarking, lumber sawing, boiler(s), conveying equipment, maintenance shop(s), and equipment repair. These operations areas are areas of chemical storage and usage with the potential to release chemicals to the environment.

Proposed Assessment: Four Geoprobe borings (PB-3A, PB-3B, PB-3C, and PB-3D) will be advanced at the location of the former mill operations areas. PB-3A will be advanced at the location of the former boiler building identified in the 1957 and 1968 Sanborn maps. PB-3B will be advanced at the location of the boiler room building identified in the building department records. PB-3C will be advanced at the location of the former pre-fab shop attached to the former sawmill building. PB-3D will be advanced at the location of the former filing room that was also attached to the former sawmill building. These proposed sampling locations are shown on the Figure 5. A total of four soil samples will be collected from the soil below the dredge fill from the Geoprobe borings (one sample from each boring location). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx if the HCID shows the presence of this range of hydrocarbons in the sample. The soil samples will also be submitted for PCBs, priority pollutant metals (PPMETS) using EPA 6000/7000 series methods, and PAHs by EPA method 8270. Groundwater grab samples will be collected from each of the four boring locations (PB-3A-GW, PB-3B-GW, PB-3C-GW, and PB-3D-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PPMETS, PAHs, and VOC analysis.

Soil samples from PB-3A and PB-3B will also be submitted to dioxin and furan analysis (EPA Method 1613B). If dioxin or furan is identified in the soil, then the corresponding groundwater sampled will also be analyzed for dioxin and furans.

3.9.4 FORMER SURFACE STAIN AREA AT DRY STORAGE

Data Gap: A Phase I assessment completed prior to the 1995 removal of materials at the Site identified an area of surface soil stains. All surface material was removed from this area. Assessment at this area will be performed to assess if the chemicals that caused the reported surface stains may have resulted in deeper soil and/or shallow groundwater impacts.

Proposed Assessment: One Geoprobe boring (PB-4A) will be advanced at the location of the former dry storage area (lumber storage sheds). The proposed boring location is shown on Figure 5. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx. The soil samples will also be submitted for PCBs, PPMETS, PAHs, and VOCs. A groundwater grab sample will be collected (PB-4A-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater sample will also be submitted for PPMETS, PAHs, and VOC analysis.

3.9.5 FORMER DIP TANK

Data Gap: The 1968 Sanborn map identifies a dip tank located south of one of the dry kiln buildings (Figure 3). Historical lumber treating using a dip tank has the potential to release wood treating chemicals into the environment. Environmental sampling of this former dip tank location is proposed to assess deeper soil and shallow groundwater for potential impacts from the former wood treating operations. Approximately one to two feet of soil was removed and replaced with dredge sediment from the maintenance dredging of the Snohomish River Federal Navigation Channel.

Proposed Assessment: Two Geoprobe borings (PB-5A and PB-5B) will be advanced in the southeastern portion of the Site, in the vicinity of the former dip tanks identified in a 1968 Sanborn map. One soil sample will be collected from the soil below the dredge fill from each of the two Geoprobe borings (two soil sample total). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx if the HCID shows the presence of this range of hydrocarbons in the sample. The two samples will be analyzed for metals, SVOCs by EPA method 8270 (including pentachlorophenol [PCP]), and VOCs. The soil sample exhibiting the highest concentrations of impacts based on field screening methods and the TPH-HCID results will be analyzed for Dixon & Furans by EPA Method 1613B. Groundwater grab samples will be collected from each of the two boring locations (PB5-A-GW and PB-5B-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for SVOC and VOC analysis. Groundwater samples from each boring will be collected and held by the laboratory for possible Dioxin & Furans analysis if the soil sample identifies Dioxin & Furans.

3.9.6 FORMER OIL STORAGE SHED

Data Gap: The 1968 Sanborn map identifies an oil storage shed west of the mill building (Figure 3). Approximately one to two feet of soil was removed and replaced with dredge sediment from the maintenance dredging of the Snohomish River Federal Navigation Channel. Deeper soil and the shallow groundwater in this area will be sampled to assess if historical oils storage may have resulted in soil and/or shallow groundwater impacts.

Proposed Assessment: One geoprobe boring (proposed boring PB-6A) will be advanced at the location of the former oil storage shed as shown on Figure 5. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx, PPMETS, PCBs, PAHs, and VOCs by EPA method 8260 if the HCID shows the presence of hydrocarbons in the sample. A groundwater grab sample will be collected from the boring (PB-6A-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater sample will also be submitted for PAH, PCBs, and VOC analysis. The groundwater sample will be held by the laboratory for possible total metals analysis, pending the results of the metals analysis of soil.

3.9.7 SOIL STOCK-PILES FROM THE 14TH STREET BULKHEAD CONSTRUCTION

Data Gap: Sometime between 2005 and 2006 soil and sediment from construction of the Port's 14th Street Bulkhead Replacement project was placed onto the Site. These soil piles are visible across the surface of the Site. This material was characterized in accordance the Puget Sound Dredged Disposal Analysis (PSDDA) Program for suitability for open-water disposal. This characterization is documented in the *Everett Marian PSDDA Sediment Characterization Report, 14th Street Bulkhead Replacement, Everett, Washington,* dated February 24, 2005 (Appendix F). Sampling completed for this 2005 characterization report may not be sufficient to characterize the quantity of soil placed on the Site.

Proposed Assessment: Fourteen composite soil samples will be collected from soil piles. The composite samples will be composed of ten subsamples from separate piles. Sampling will be completed in proportion to the amount of soil placed on the Site with approximately seven composite sampled being collected from the eastern portion of the Site, approximately five composite samples being collected from the middle portion of the Site, and two composite samples being collected from the western portion of the Site. The composite samples will be submitted for PPMETS and PAHs. One composite sample from the eastern, middle, and western portion of the Site will be analyzed for SVOC (including PAHs).

3.9.8 SEDIMENTS AND CHANNEL SEGMENT SEDIMENTS

Data Gap: Historical activities at the Site have consisted primarily of sawmill, log processing, and lumber storage activities dating back to 1946. Past activities at the Site have resulted in accumulation of wood debris in the intertidal areas surrounding the Site and channel sediment south of the Site. The accumulation of wood debris in an aquatic environment is known to impose physical and chemical impacts to the biological resources that reside on surface sediments

Proposed Assessment: Assessment of the Site sediments and shoreline swill be performed to characterize the volume of significant woody debris accumulations, verify compliance with SMS using bioassays, and collect data to develop remedial alternatives. The sediment SAP (Appendix B) documents the proposed sediment assessment objects and the scope.

3.9.9 GENERAL HABITAT RESTORATION DATA NEEDS

The RI includes an assessment of potential impacts to the shoreline. If the RI data shows impacts to the shoreline area, supplemental data may be necessary to assess the extent of impacts and evaluate the habitat restoration alternatives. Evaluation of habitat restoration alternatives, if necessary, will be addressed as part of the FS (discussed in Section 4.0 below).

Data Gap: Additional data may be needed to evaluate habitat restoration alternatives if shoreline impact is identified.

Proposed Additional Assessment: To evaluate habitat restoration alternatives, the types, concentrations, and aerial extent of the contaminants present at the Site will need to be understood. This information will be gathered as part of the RI. Supplemental data that may also need to be gathered could include:

a.) the type(s) of substrate or percent fines (muddy soft bottom, coarse, gravelly, cobble, etc.),
b.) vegetation types (terrestrial and aquatic) and locations mapped,
c.) physical artificial impairments, such as over water structures, pilings, or concrete rubble, impacting the natural environment,
d.) the depth level or bathymetry, including the ordinary high water mark (deep subtidal [below -14 feet], shallow subtidal [-14 to -4 feet], intertidal [-4 to +13 feet]),
e.) an evaluation of the terrestrial and aquatic receptors, as well as density in comparison to appropriate reference sites.

3.10 SAMPLING METHODS AND DATA QUALITY OBJECTIVES

The number of sampling locations, sampling depths, types of samples, and types of analysis have been selected to meet the objective of the RI/FS. That is, to identify the hazardous substances which have been released to the environment; assess the nature, extent and distribution of these substances; identify the potential migration pathways and receptors; assess the theoretical risk to human health and the environment; and generate or use data of sufficient quality for site characterization, risk assessment, and the subsequent analysis and selection of remedial alternatives.

The data quality objectives (DQOs) for the RI/FS are designed to ensure that data of sufficient quality and quantity will be available to identify if hazardous compounds are present at the Site and to evaluate risks posed by the presence of hazardous compounds and identify if hazardous compounds may pose unacceptable risks to current and future human and ecological receptors via direct contact or migration. The DQOs will be used to identify the analytical practical quantification limit (PQL) goals and to establish other quality assurance goals. The DQOs are used to obtain appropriate quantification limits and to meet the requirements of WAC 173-340-820, MTCA. The DQOs

are presented in the Sampling and Analysis Plans (SAP). The SAP details the proposed sample collection methods, sampling equipment, and decontamination procedures. The Quality Assurance Project Plan (QAPP) contains the Quality Assurance/Quality Control (QA/QC) procedures for both field and laboratory procedures and is provided in the upland and sediment SAPs.

3.11 CULTURAL RESOURCES

If any archaeological resources are discovered during RI field activities including any excavations (although none are anticipated), work will be stopped immediately and Ecology, the Department of Archaeology and Historic Preservation (DAHP), the City of Everett Planning and Community Development Department, and the Tulalip Tribes Cultural Resources Department will be notified by the close of business. A professional archaeologist will arrange an on-site inspection and invite the parties to attend. The professional archaeologist shall document the discovery and provide a professionally documented site form and report to the above listed parties. In the event of an inadvertent discovery of human remains, work will be immediately halted in the discovery area, the remains will be covered and secured against further disturbance, and the Everett Police Department and Snohomish County Medical Examiner will be immediately contacted, along with DAHP and authorized Tribal representatives. A treatment plan by the professional archaeologist shall be developed in consultation with the above listed parties consistent with RCW 27.44 and RCW 27.53 and implemented according to WAC 25-48.

3.12 REMEDIAL INVESTIGATION REPORT

The RI report will document the findings from the field work described in this work plan and the results from previous assessments. These findings and results will be used to identify the hazardous substances released to the environment; summarize the nature, extent, and distribution of these substances; and identify the potential migration pathways and receptors. Summary tables of the soil, groundwater, and sediment analytical results including the method reporting limits and method detection limits will be provided along with figures depicting the sampling locations.

The general elements of the RI report are as follows:

- Executive Summary
- Introduction with purpose and report organization
- Site background with site description, historical operations and features, and setting
- Conceptual site model / pathway receptor analysis
- Identification of preliminary cleanup levels
- Investigation summary describing sampling methods, data quality, and results for the soil, groundwater, stormwater, and sediment sampling
- Fate and transport discussion
- Summary and conclusion
- Figures, tables, and appendices with supporting information

The purpose of the feasibility study (FS) is to develop and evaluate cleanup action alternatives and to support the selection of a cleanup alternative that will be used to prepare the draft CAP. The FS approach is consistent with WAC 173-340-350.

4.1 ESTABLISHMENT OF PRELIMINARY CLEANUP LEVELS (PCLS)

Preliminary cleanup levels for soil and groundwater at the Site will be established based on the MTCA Cleanup Regulations (chapter 173-340 WAC).

- **Groundwater** – Because on-site groundwater is non-potable in accordance with WAC 173-340-720(2), groundwater PCLs are based on the most restrictive level between protection of marine and freshwater surface water. The Site is located within an estuary and may contain both freshwater and marine species. The most restrictive cleanup level between MTCA Method A (WAC 173-340-730[2]) and Method B (WAC 173-340-730[3]) was be used. If a PCL was not available from the aforementioned sources, then the most restrictive PCL between MTCA Method A (WAC 173-340-720[3]) and Method B (WAC 173-340-720[4]) for potable groundwater was used. PCLs for groundwater are presented in Attachment 2.
- **Soil** – Soil PCLs were calculated by selecting the most stringent value based on protection of human health (under a residential scenario), protection of terrestrial ecological receptors, and protection of groundwater. The most restrictive cleanup level between MTCA Method A (WAC 173-340-740[2]) and Method B (WAC 173-340-740[3]) for unrestricted land use was used. MTCA Cleanup Regulations, Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified TEE Procedure, Table 749-2 for unrestricted land use were used. The Simplified TEE cleanup levels were used for the RI; however, a Site Specific TEE may be conducted as part of the FS.

  Soil PCLs were calculated using Ecology's three phase partitioning model as described in WAC 173-340-747 to generate soil concentrations which are protective of surface water. The chemical physical parameters were obtained from the CLARC tables. In the event that the calculated PCLs were below the laboratory PQLs, the PCL defaulted to the laboratory PQL. PCLs for soil are presented in Attachment 2.
- **Sediment –** Sediment PCLs will be based on Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) identified in the Sediment Management Standards (SMS) (Chapter 173-204 WAC). Sediment PCLs will be outlined in the sediment SAP; the sediment SAP will be submitted under separate cover and will be included as Appendix B on the Final Draft version of this Work Plan.

The cleanup levels will consider all applicable pathways including direct contact (including inhalation), media transfer pathways (leaching to groundwater migration to surface water, etc.), and exposure to terrestrial and/or aquatic ecological receptors.

4.2 DELINEATION OF MEDIA REQUIRING REMEDIAL ACTION

The results from the RI investigation will be compared with the Site cleanup levels to determine the areas of soil, groundwater, and sediment that require remedial action. This evaluation will include the lateral and vertical extent of soil impacts, the extent and potential migration pathways for impacts to groundwater, and the extent of sediment impacts. Areas requiring remedial action will be discussed with Ecology as part of the development of remedial action objectives for the Site (presented below).

4.3 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

Remedial action objectives for the Site will be developed for the contaminants and media of interest following completion of the RI. The remedial action objectives will take into account exposure pathways and receptors, future land uses, and will establish acceptable contaminant levels or range of levels (at particular locations for each exposure route) by eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route.

4.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable Local, State, and Federal Laws (WAC 173-340-710) states that cleanup actions conducted under MTCA shall comply with applicable state and federal laws. The code also addresses applicable relevant and appropriate requirements (ARARs), substantive (as opposed to procedural) requirements, and local government permits and approvals.

The RI/FS will be conducted under MTCA (WAC 173-340), which addresses identification and cleanup of contamination in soils, surface water, and groundwater. For contamination in sediments, MTCA refers to the Sediment Management Standards (SMS) (WAC 173-204), which includes standards for marine sediments.

The Feasibility Study will address regulations that are ARARs including the following:

- Federal Clean Water Act and National Toxics Rule [40 Code of Federal Regulations (CFR) 131], which provides water quality criteria (WQC) for protection of human health and aquatic organisms.
- Federal Safe Drinking Water Act (40 CFR 141), which provides maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLG) for the protection of drinking water.
- Washington State Department of health rules for Public Water Supplies (WAC 246-290-310), which also provides MCLs.
- Water Pollution Control Act (FWPCA) Amendments of 1972, commonly referred to as the Clean Water Act (CWA) (33 USC §1251 et seq.)
- Water Quality Standards For Surface Waters of The State of Washington (173-201A WAC)
- The Endangered Species Act (ESA) of 1973, which protects plant and animal species that are listed by the federal government as “endangered” or “threatened,” as well as critical habitat

necessary for the protection of these species (16 USC 1531-1543 and 50 CFR 10, 13, 17, 222, 226, 402, 424, and 450-453).

4.5 SCREENING OF CLEANUP ALTERNATIVES

The FS process will develop and screen remedial alternatives in accordance with WAC 173-340-360 and based on the risks identified in the RI. This process will result in a range of options that will be evaluated. This range of alternatives will include options in which treatment is used to reduce the toxicity, mobility, or volume of impacted material, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated impacted material are managed; options involving the containment with little or no treatment; options involving both treatment and containment; and a no-action alternative.

Cleanup alternatives will be screened to meet the threshold requirements of WAC-173-340-160 and shall; comply with cleanup standards (WAC 173-340-700 through 173-340-760); comply with applicable state and federal laws; and provide for compliance monitoring, as applicable. Cleanup alternatives will be screened to be protective of human health and the environment and to take into account current and proposed future land uses. When selecting from cleanup action alternatives that fulfill the threshold requirements, the selected action shall use permanent solutions (as outlined in WAC 173-340-360[3]) to the maximum extent practicable, provide for a reasonable restoration time frame (as outlined in WAC 173-340-360[4]), and consider public concerns (as outlined in WAC 173-340-600).

4.6 EVALUATION OF CLEANUP ALTERNATIVES

The cleanup alternatives shall be evaluated on the basis of the requirements and the criteria specified in WAC 173-340-360.

4.7 EVALUATION OF HABITAT RESTORATION ALTERNATIVES

The RI/FS activities are being overseen by Ecology and work is being conducted under the Governor's Puget Sound Initiative. The Initiative focuses on cleaning up contamination as well as restoring the Puget Sound. The Site lies on an area of fill that extends into Port Gardner Bay. The Site is relatively flat, with a maximum elevation of approximately 15-feet above mean sea level. The western and southern edges of the Site are covered by riprap and logs which slopes moderately down toward the shoreline. The riparian zone is composed principally of blackberry with a few willow trees. A wooden sea wall extends along the northeastern shoreline of the Site.

While planning this cleanup and making cleanup decisions, Ecology and the Port will evaluate opportunities to perform remedial actions in a fashion that coincidentally enhances habitat. Elements of the remedial action will be evaluated for restoration opportunities in consultation with Ecology as plans for cleanup are developed. Potential restoration or enhancement alternatives may be achieved by removing environmental stressors at the Site. The work performed as part of the RI will provide sufficient data to allow for an evaluation of restoration alternatives, which will be conducted as part of the FS. The Port will consider specific habitat restoration alternatives as appropriate based on the findings in the RI/FS.

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts to the quality of the environment. The purpose of the checklist is to provide information to help the site owner and the agency identify impacts from the proposal, and to help to agency decide whether and EIS is required. Appendix G contains a SEPA checklist which was prepared on behalf of the Port of Everett for the Bay Wood Products Site and JELD-WEN (adjacent property owner to the south), in 2006 as part of an application for waterfront redevelopment comprehensive plan map change, planned development overlay rezone, and shoreline designation change. While some details of the planned development may have changed since the 2006 application, this SEPA checklist provides relevant information pertaining to potential receptors, habitat, and use. This 2006 SEPA checklist is included as Appendix G.

4.8 FEASIBILITY STUDY REPORT

A FS report will be prepared following completion of the RI. The FS report will be used to evaluate potential alternatives and a preferred alternative for the cleanup of the contamination present at and restoration of the Site. The alternatives evaluation and the preferred cleanup alternative will meet the requirements of WAC 173-340-360.

The general elements of the FS report are as follows:

- Introduction with purpose and report organization
- Description of material requiring remedial action
- Identification of remedial action objectives
- Summary of ARARs
- Site cleanup standards
- Screening and evaluation of cleanup alternatives
- Evaluation of habitat restoration alternatives
- Summary and conclusion

5. DRAFT CLEANUP ACTION PLAN

Upon approval of the final RI/FS report, the Port of Everett will prepare a draft CAP in accordance with WAC 173-340-380 that provides a proposed cleanup action to address the contamination present on the Site. The draft CAP will include the following:

- A general description of the proposed cleanup action (in accordance with WAC 173-340-350 through 173-340-390);
- A summary of the rationale for selecting the proposed action;
- A brief summary of other alternatives evaluated in the RI/FS;
- Cleanup standards and, where applicable, remediation levels, for each hazardous substance and for each medium of concern at the Site;
- The schedule for implementation of the CAP including, if known, restoration time frame;
- Institutional controls, if any, required as part of the proposed cleanup action;
- Applicable state and federal laws, if any, for the proposed cleanup action, when these are known at this step in the cleanup process (this does not preclude subsequent identification of applicable state and federal laws);
- A preliminary determination by the department that the proposed cleanup action will comply with WAC 173-340-360;
- Where the cleanup action involves on-site containment, specification of the types, levels, and amounts of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances.

Cleanup actions which could potentially be considered in the draft CAP may include the following:

Alternative 1 – No action, in which no physical cleanup actions are initiated.

Alternative 2 – Monitored natural attenuation. Periodic Groundwater Monitoring, in which groundwater monitoring wells are sampled periodically to establish that impacted groundwater at the Site is stable and is not negatively affecting nearby surface water, potential receptors, habitat, or use.

Alternative 3 – Containment and Groundwater Monitoring, in which physical barriers are installed to restrict access to and movement of contaminated media. Groundwater monitoring would be conducted to establish that the containment of contaminated groundwater is successful.

Alternative 4 – Removal, in which contaminated media is excavated and removed from the Site.

Alternative 5 – Stabilization and/or chemical oxidation, in which hazardous constituents would be changed into immobile (insoluble) forms, bound in an immobile matrix, and/or bound in a matrix which minimizes the material surface exposed to weathering and leaching.

Other alternatives may be considered upon completion of the RI/FS report. Upon selection of the preferred cleanup alternative and completion of the draft CAP, the Port and Ecology will provide public notice and opportunity for comment on the draft CAP, as required in WAC 173-340-600(13).

5.1 PUBLIC PARTICIPATION /PLAN

Under MTCA, the public is guaranteed meaningful opportunities to learn and provide comment on important cleanup decisions before they are made. Ecology's goal is to encourage public understanding of and participation in the cleanup of sites through a variety of public information and public involvement activities. The requirements for public notice and participation are presented in WAC 173-340. Public involvement activities will be led by Ecology, with support from the Port. Ecology has provided SLR with a draft Public Participation Plan (PPP), dated August 2008. A copy of the draft PPP is included in Appendix E.

6. CLOSING

This Work Plan has been prepared to describe the proposed work scope for completing the RI/FS and draft CAP at the Site in accordance with the Agreed Order between the Port of Everett and Ecology. This Work Plan describes the environmental assessment work scope that will be performed to meet the Work Plan objectives and to comply with the Agreed Order. SLR, on behalf of the Port of Everett, is requesting Ecology's approval of this Work Plan.

FIGURES

REFERENCED FROM : USGS 7.5 MINUTE QUADRANGLE
EVERETT, WASHINGTON

SCALE: 1" = 1500'
WHEN PLOTTED AT 8.5" x 11" PAGE SIZE
0 1500 3000' 4500'

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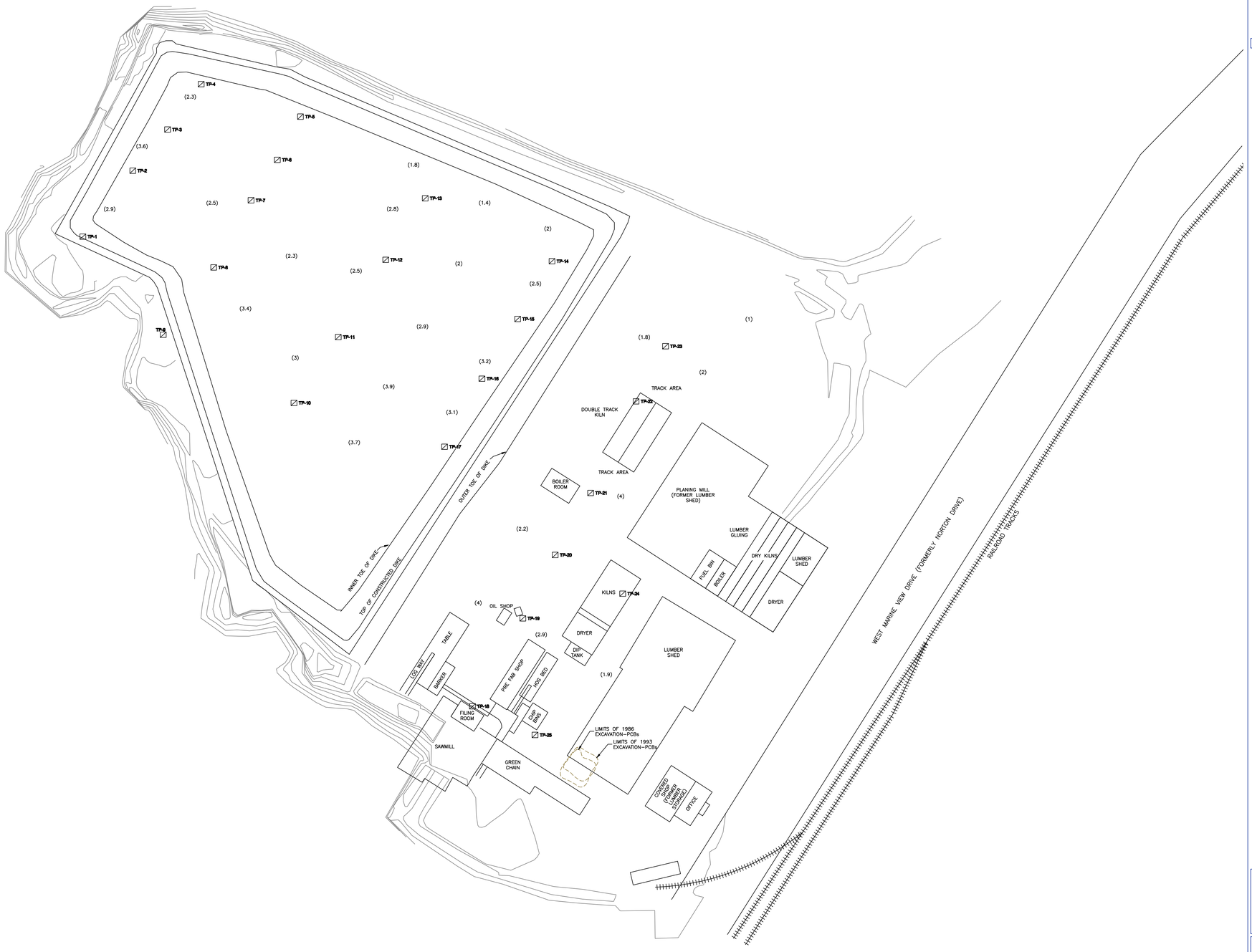
SLR

PORT OF EVERETT
BAY WOOD PRESTON POINT
EVERETT, WASHINGTON

Report
REMEDIAL INVESTIGATION WORK PLAN

Drawing
SITE LOCATION MAP

Date November 17, 2008	Scale AS SHOWN	Fig. No. 1
File Name 008.0339.00001-1	Project No. 008.0339.00001	



NOTES

DRAWING COMPILED FROM:

OCTOBER 1995 PRESTON POINT POST EVACUATION SURVEY COMPLETED BY REID MIDDLETON, LYNWOOD, WASHINGTON.

JANUARY 1, 1971 PUBLISHER FOREST PRODUCTS PLANT LAYOUT

VARIOUS SANBORN MAPS AND AERIAL PHOTOGRAPHS

LEGEND

TP-12	TEST PITS LOCATIONS (LANDAU 1994)
(2.5)	DIFFERENCE IN ELEVATION IN FEET FROM 1995 POST EXCAVATION SURVEY AND 2005 FIELD SURVEY
	FORMER SITE STRUCTURES

SCALE: 1" = 60'
WHEN PLOTTED AT 36" x 48" PAGE SIZE
0 60 120 180'

PORT OF EVERETT
BAY WOOD PRESTON POINT
EVERETT, WASHINGTON

Report
REMEDIAL INVESTIGATION WORK PLAN

Drawing
SITE PLAN WITH HISTORICAL SITE FEATURES

Date November 17, 2008	Scale AS SHOWN	Fig. No. 2
File Name 006.0339.00001 -3	Project No. 006.0339.00001	

SLR

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NOTES

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OCTOBER 1995 PRESTON POINT POST EVACUATION SURVEY COMPLETED BY REID MIDDLETON, LYNWOOD, WASHINGTON.

JANUARY 1, 1971 PUBLISHER FOREST PRODUCTS PLANT LAYOUT

VARIOUS SANBORN MAPS AND AERIAL PHOTOGRAPHS

LEGEND

- **N2** — SOIL SAMPLE
- • — SOIL WAS EXCAVATED FROM THESE AREA AFTER SAMPLING
- **TP-12** — TEST PITS (LANDAU 1994)
- FORMER SITE STRUCTURES

SCALE: 1" = 30'
WHEN PLOTTED AT 24" x 36" PAGE SIZE
0 30 60 90'

PORT OF EVERETT
BAY WOOD PRESTON POINT
EVERETT, WASHINGTON

Report
REMEDIAL INVESTIGATION WORK PLAN

Drawing
SITE PLAN- EASTERN PORTION OF THE SITE

Date November 17, 2008	Scale AS SHOWN	Fig. No. 3
File Name 008.0339.00001 -3	Project No. 008.0339.00001	

SLR

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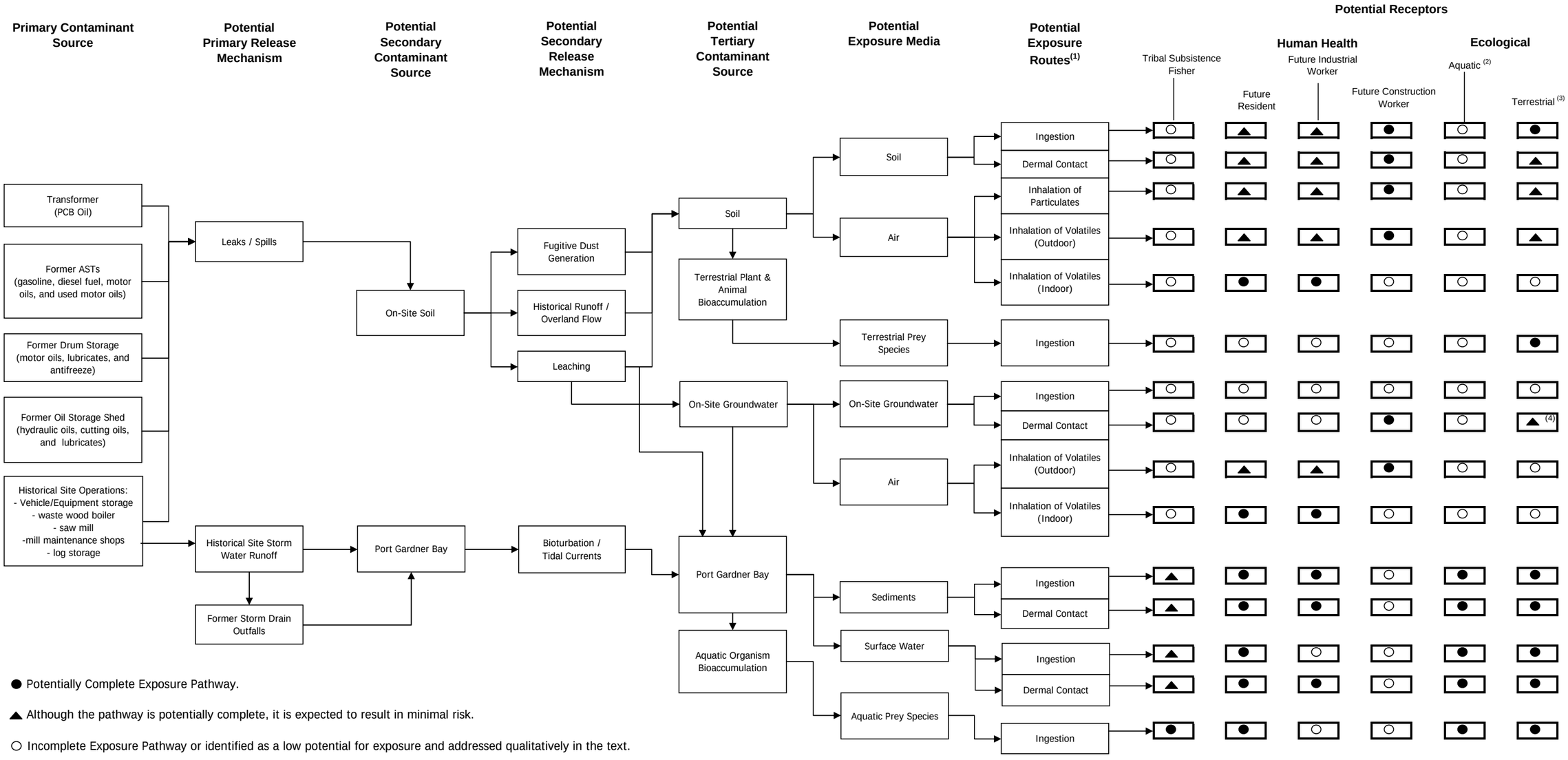
Figure 4: Conceptual Site Model
Bay Wood Products, Port of Everett
Everett, WA



● Potentially Complete Exposure Pathway.

▲ Although the pathway is potentially complete, it is expected to result in minimal risk.

○ Incomplete Exposure Pathway or identified as a low potential for exposure and addressed qualitatively in the text.

(1) Screening levels will be based on unrestricted land use and may not reflect all of the exposure routes that are complete. Screening levels will be based on the most restrictive exposure routes.
(2) Aquatic ecological receptors may include mammals, birds, fish/shellfish, benthic invertebrates, reptiles, amphibians and aquatic vegetation.
(3) Terrestrial ecological receptors may include mammals, birds, reptiles, amphibians, invertebrates and terrestrial vegetation.
(4) This completed pathway is based on terrestrial vegetation (roots) coming into contact with groundwater.

NOTES

DRAWING COMPILED FROM:

OCTOBER 1995 PRESTON POINT POST EVACUATION SURVEY COMPLETED BY REID MIDDLETON, LYNWOOD, WASHINGTON.

JANUARY 1, 1971 PUBLISHER FOREST PRODUCTS PLANT LAYOUT

VARIOUS SANBORN MAPS AND AERIAL PHOTOGRAPHS

LEGEND

- ● N2 — SOIL SAMPLE
- • — SOIL WAS EXCAVATED FROM THESE AREA AFTER SAMPLING
- TP-12 — TEST PITS (LANDAU 1994)
- FORMER SITE STRUCTURES
- PB-4A — PROPOSED BORING LOCATION
  - PB–1A & PB–1B FORMER COVERED SHOP
  - PB–2A FORMER PCB TRANSFORMER AREA
  - PB–3A TO PB–3D FORMER MILL OPERATION AREA
  - PB–4A FORMER SURFACE STAINING
  - PB–5A & PB–5B FORMER DIP TANK
  - PB–6A FORMER OIL STORAGE SHED
- (2.5) — DIFFERENCE IN ELEVATION IN FEET FROM 1995 POST EXCAVATION SURVEY AND 2005 FIELD SURVEY

SCALE: 1" = 30'
WHEN PLOTTED AT 24" x 36" PAGE SIZE
0 30 60 90'

PORT OF EVERETT
BAY WOOD PRESTON POINT
EVERETT, WASHINGTON

Report
REMEDIAL INVESTIGATION WORK PLAN

Drawing
PROPOSED UPLAND SAMPLING LOCATIONS

Date November 17, 2008	Scale AS SHOWN	Fig. No. 5A
File Name 006.0339.00001-3	Project No. 006.0339.00001	

SLR

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

NOTES

AERIAL IMAGE PROVIDED BY WASHINGTON DEPARTMENT OF ECOLOGY, DATED JUNE 26, 2006

LEGEND

LONGITUDINAL LINES (WGS84 DATUM)

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PORT OF EVERETT
BAYWOOD PRESTON POINT
EVERETT, WASHINGTON

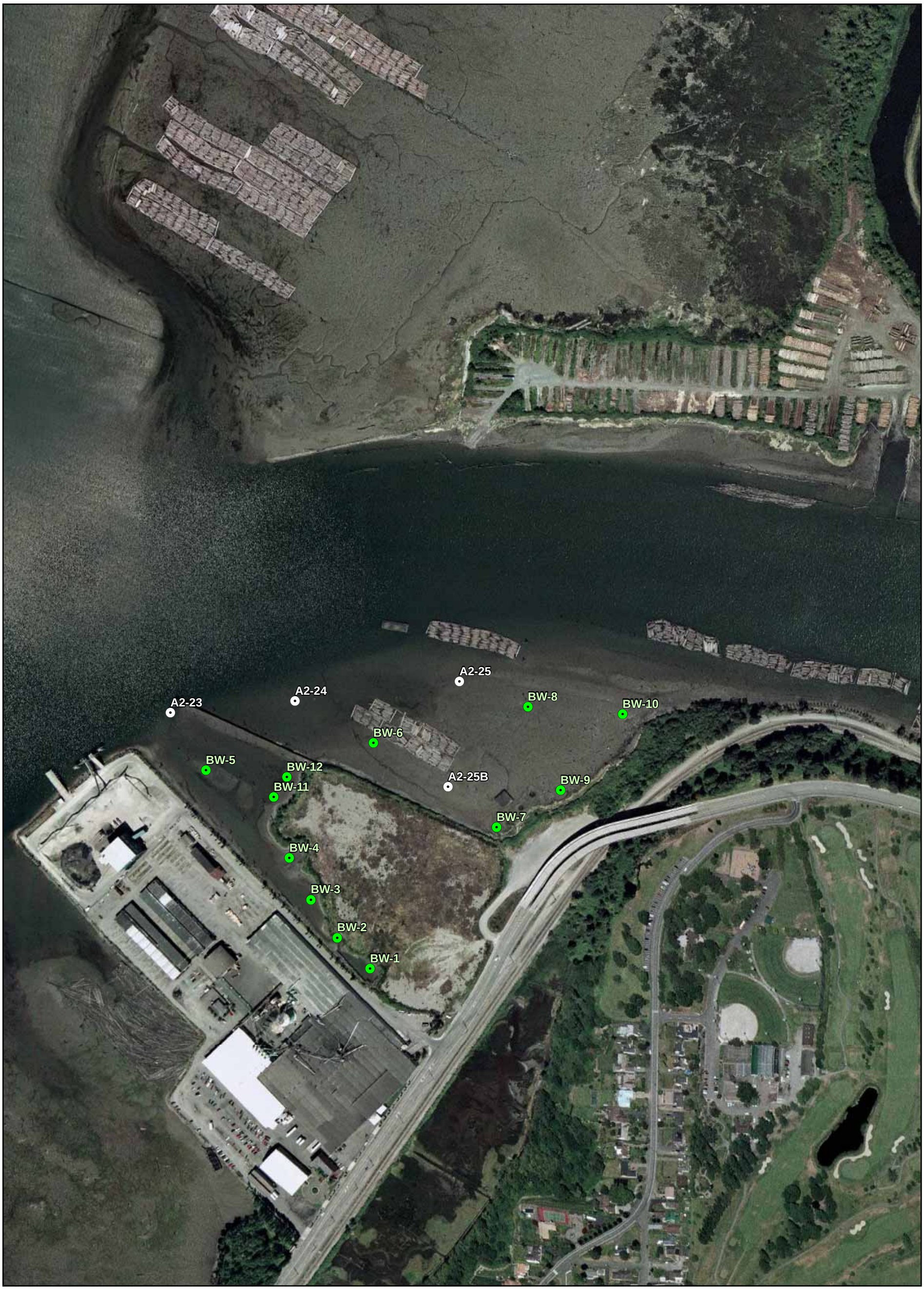
Report
REMEDIAL INVESTIGATION WORK PLAN

Drawing
PROPOSED UPLAND SAMPLING LOCATION
COMPOSITE SOIL SAMPLES

Date	April 22, 2009	Scale	AS SHOWN
File Name	5B-3	Project No.	008.0339.00001

Fig. No. 5B

SLR



Aerial Imagery © 2007 ESRI, i-cubed

Proposed Sediment Sampling Station

Existing Sediment Sampling Station

0 400

Feet

Q:\Jobs\080147-01_Port_Gardner\Maps\2009_01\Fig_1_Proposed_Samples.mxd ckiblinger 03/20/2009 3:31 PM

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 6
Existing and Proposed Sediment Sampling Stations

TABLE 1 – SOIL ANALYTICAL SUMMARY TABLE – PCBS

TABLE 1 - Soil Analytical Summary Table
PCBs
Bay Wood Products
Everett, Washington

SOIL			Polychlorinated Biphenyls [B] (µg/kg)							
Sample Location	**Sample Depth (feet)**	**Sample Date**	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total
GeoEngineers 1993 Report [A]										
NW-1	0.5	9/17/1992	ND (<58)[C]	ND (<58)	ND (<58)	ND (<58)	ND (<58)	770	290	1,060
NE-1	0.5	9/17/1992	ND (<62)	ND (<62)	ND (<62)	ND (<62)	ND (<62)	440	310	750
SW-1	0.5	9/17/1992	ND (<51)	ND (<51)	ND (<51)	ND (<51)	ND (<51)	760	410	1,170
SE-1	0.5	9/17/1992	ND (<52)	ND (<52)	ND (<52)	ND (<52)	ND (<52)	690	490	1,180
NW-2	1.0	10/21/1992	ND (<40)	ND (<40)	ND (<40)	ND (<40)	ND (<40)	90	ND (<40)	90
SW-2	1.0	10/21/1992	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND
SE-2	1.0	10/21/1992	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	170	69	239
N-2	0.5	10/21/1992	ND (<42)	ND (<42)	ND (<42)	ND (<42)	ND (<42)	1,500	360	1,860
N-3	1.0	10/21/1992	ND (<39)	ND (<39)	ND (<39)	ND (<39)	ND (<39)	89	ND (<39)	89
S-2	0.5	10/21/1992	ND (<48)	ND (<48)	ND (<48)	ND (<48)	ND (<48)	1,700	620	2,320
S-3	1.0	10/21/1992	ND (<36)	ND (<36)	ND (<36)	ND (<36)	ND (<36)	470	ND (<36)	470
E-2	0.5	10/21/1992	ND (<44)	ND (<44)	ND (<44)	ND (<44)	ND (<44)	680	180	860
E-3	1.0	10/21/1992	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND
W-2	0.5	10/21/1992	ND (<43)	ND (<43)	ND (<43)	ND (<43)	ND (<43)	960	310	1,270
W-3	1.0	10/21/1992	ND (<38)	ND (<38)	ND (<38)	ND (<38)	ND (<38)	160	54	214
N-4	Surface	12/28/1992	ND (<39)	ND (<39)	ND (<39)	ND (<39)	ND (<39)	490	ND (<39)	490
S-4	Surface	12/28/1992	ND (<37)	ND (<37)	ND (<37)	ND (<37)	ND (<37)	68	ND (<37)	68
W-4	Surface	12/28/1992	ND (<38)	ND (<38)	ND (<38)	ND (<38)	ND (<38)	76	ND (<38)	76
Preliminary Cleanup Levels[D] (PCLs)										
Preliminary Cleanup Levels			0.5[E]	0.5[E]	0.5[E]	0.5[E]	0.5[E]	0.5[E]	0.5[E]	0.5[E]

NOTES:

A - Analytical data from GeoEngineers Environmental Site Assessment and Remedial Excavation Monitoring Report - February 3, 1993

B - Polychlorinated Biphenyls(PCBs) per EPA Method 8080.

C - Not Detected (ND) at or above the laboratory detection limit of 58.0 µg/kg (micrograms per kilogram) - dry unit weight basis.

D - PCLs calculations presented in Attachment 2 of Work Plan

E - PCL for total PCBs

APPENDIX A

UPLAND SAMPLING AND ANALYSIS PLAN

APPENDIX A
UPLANDS
SAMPLING AND ANALYSIS PLAN

Port of Everett
Bay Wood Products Site
200 West Marine View Drive
Everett, Washington
Ecology No. 4438651

Prepared for

Port of Everett

May 4, 2009

Prepared by

SLR International Corp
1800 Blankenship Rd; Suite 440
West Linn, Oregon 97068

Project 008.0339.00001

CONTENTS

ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
bgs	below ground surface
BNAs	semi-volatile organic compounds (sediment)
DQO	data quality objective
Ecology	Washington State Department of Ecology
GC/MS	gas chromatograph/mass spectrophotometer
GRO	gas range organics
HASP	health and safety plan
HCID	hydrocarbon identification
ICP	inductively coupled plasma-atomic emission spectroscopy
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
MLLW	Mean lower low water (datum)
MRLs	method reporting limits
MTCA	Model Toxics Control Act
MW	Monitoring well
NAPL	nonaqueous phase liquid
NAVD	North American Vertical Datum
NGVD	National Geodetic Vertical Datum of 1929
PCB	polychlorinated biphenyl
PCP	Pentachlorophenol
PPMETS	Priority pollutant metals, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, zinc
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
SAP	sampling and analysis plan
SVOC	Semi volatile organic compounds
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TOC	total organic carbon

ACRONYMS AND ABBREVIATIONS (Continued)

TSS	total suspended solids
TPH	total petroleum hydrocarbons
TPH-Gx	total petroleum hydrocarbons as gasoline
TPH-Dx	total petroleum hydrocarbons as diesel
TSS	total suspended solids
TVS	total volatile solids
VOA	volatile organic analysis
WAC	Washington Administrative Code

1 INTRODUCTION

1.1 Purpose

This uplands Sampling and Analysis Plan (uplands SAP) is being prepared as part of the Remedial Investigation (RI) for the former Port of Everett Bay Woods Product Site in Everett, Washington. This SAP is provided to identify the purpose and objectives of the uplands data collection in support of the work plan for remedial investigation/feasibility study (RI/FS) and draft Cleanup Action Plan (CAP) "Work Plan", specify field procedures, identify quality assurance (QA) procedures to be implemented during sampling activities and laboratory analyses, and to meet the requirements of WAC 173-340-820, Model Toxics Control Act (MTCA).

1.2 Sampling and Analysis Plan Organization

The Sampling and Analysis Plan is organized in three sections. A brief description of each section is presented below.

Section 1—Introduction. Section 1 contains an overview of the Uplands Sampling and Analysis Plan.

Section 2—Field Sampling Plan. Section 2 identifies the sampling locations and depths, and presents the procedures to be used in field sampling. Included are procedures for: soil sample and wood ash collection; groundwater sample collection, boring abandonment, water and product measurements, residuals management, sample splitting, sample labeling, shipping, and custody, and temporary well installation.

Section 3—Quality Assurance Project Plan. Section 3 identifies the project organization and includes QA procedures for field activities and laboratory analyses.

1.3 Project Organization and Responsibilities

Noted below are the responsibilities of key project personnel.

Larry Crawford, Project Coordinator for Port of Everett. Responsible for overseeing the implementation of the Agreed Order for the Port of Everett. Coordinates with the Department of Ecology (Ecology) and SLR International Corp (SLR). Provides oversight of program activities. Reviews project work scope, resource needs, and requests.

Isaac Standen, Project Coordinator for Ecology. Responsible for overseeing the implementation of the Agreed Order for Ecology. Coordinates with the Ecology and SLR. Provides oversight of all program activities. Reviews project work scope. Defines and coordinates Ecology resources.

Scott Miller, Project Coordinator, SLR. Provides technical oversight of all SLR project activities at the Site and senior review of all project activities. Oversees project performance and provides technical expertise to accomplish project objectives. Ensures that project tasks are successfully completed within the project time periods. Coordinates with the Port of Everett.

SLR Field Personnel. Geologists, scientists, engineers, and technicians are responsible for implementing the SAP.

Laboratories. Provide analytical support. Perform all required quality control analyses including analytical duplicates, blanks, and matrix spikes. Initiate and document required corrective action. Perform preliminary review of data for completeness, transcription, or analytical errors. Follow U.S. Environmental Protection Agency (EPA) guidelines and good laboratory practices. The project laboratory for the uplands sampling is Environmental Science Corp. (ESC) located in Mt. Juliet, Tennessee. Some of the soil and groundwater samples will be subcontracted by ESC to Analytical Resource, Inc. (ARI) and some samples will be subcontracted to Maxxam Analytics Inc. ARI is located in Tukwila, Washington and Maxxam is located in Burnaby, BC. ESC (Accreditation Number C1915), ARI (Accreditation Number C1235) and Maxxam (Accreditation Number C1192) are accredited by Ecology.

1.4 Remedial Investigation Schedule

The schedule for the uplands sampling that will be completed as part of the RI is presented in the Work Plan (Section 2). Any schedule modifications will be submitted for approval by SLR to the Ecology Project Coordinator.

2 FIELD SAMPLING PLAN

2.1 Sampling Needs and Objectives

The uplands RI sampling activities to be performed at the Site are intended to provide additional information to support site characterization and cleanup decision making. Sampling will supplement the initial results and previous testing conducted on the Site. Specific sampling objectives are as follows:

- Assessment of soil and groundwater in the vicinity of the former covered shop area attached to the former office building where ASTs and drums were previously stored.
- Perform additional assessment at the location of the transformer that contained PCB soil.
- Assessment of soil and groundwater near the former mill operation areas (boiler room(s), pre-fab shop, filing room).
- Assessment of soil and groundwater at the former surface stain area located in the former dry storage area.
- Assessment of soil and groundwater in the vicinity of the former wood treating dip tank.
- Assessment of soil and groundwater at the location of the former oil storage shed.

2.2 Sampling Locations, Types, Frequency, and Analyses

This section generally describes proposed sampling locations. Proposed sample locations are depicted in Figure 5 of the Work Plan. The longitude and latitude of these proposed boring locations are provided in Table 1B. A summary of the proposed sampling areas, proposed sampling location labels, and the proposed analysis is summarized in Table 1A (attached). A description of the samples to be collected at each sampling location, the proposed frequency of sampling, and the analyses to be performed is also described in

this section. Sampling methods and sampling procedures are described in Section 2.3. Examples of field boring logs and sample Chain of Custody are included as Appendix B.

Potential contaminant migration pathways and specific areas of interest will be assessed to complete the site characterization. Potential pathways/areas, investigation rational, and proposed sampling is discussed in the following sections. The proposed sampling locations are shown on Figure 5. Proposed sample collection methods, sample handling, chain-of-custody procedures, sampling equipment, and decontamination procedures are presented in the sections below.

2.2.1 Former Covered Shop Attached to the Former Office Building

Two geoprobe borings (proposed borings PB-1A and PB-1B) will be advanced at the location of the former covered shop as shown on Figure 5. A total of two soil samples will be collected from the soil below the overlaying dredge fill from the Geoprobe borings (one from each boring location). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx, priority pollutant metals (PPMETS) using EPA 6000/7000 series methods, Polynuclear Aromatic Hydrocarbons (PAHs) by EPA method 8270, and volatile organic compounds (VOCs) by EPA method 8260 if the HCID shows the presence of this range of hydrocarbons in the sample. Groundwater grab samples will be collected from each of the two boring locations (PB1-A-GW and PB1-B-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PAH and VOC analysis. Groundwater samples from each boring will be collected and held by the laboratory for possible total metals analysis, pending the results of the metals analysis of soil. The proposed analytical testing is summarized on Table 1A, attached.

2.2.2 Former PCB Transformer Area

One Geoprobe boring (PB-2A) will be advanced in the vicinity of the former transformer area. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for PCBs by EPA method 8082 and for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx. A groundwater grab sample (PB-2A-GW) will be collected and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. A groundwater sample will be collected and held by the laboratory for possible PCB analysis, pending the results of the PCB analysis of soil.

2.2.3 Former Mill Operation Areas

Four Geoprobe borings (PB-3A, PB-3B, PB-3C and PB-3D) will be advanced at the location of the former mill operations areas. PB-3A will be advanced at the location of the former boiler building identified in the 1957 and 1968 Sanborn maps. PB-3B will be advanced at the location of the boiler room building identified in the building department records. PB-3C will be advanced at the location of the former pre-fab shop attached to the former saw mill building. PB-3D will be advanced at the location of the former filing room that was also attached to the former saw mill building. These proposed sampling locations are shown on the Figure 5. A total of four soil samples will be collected from the soil below the dredge fill from the Geoprobe borings (one sample from each boring location). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx if the HCID shows the presence of this range of hydrocarbons in the sample. The soil samples will also be submitted for PCBs, priority pollutant metals (PPMETS) using EPA 6000/7000 series methods, and Polynuclear Aromatic Hydrocarbons (PAHs) by EPA method 8270. Groundwater grab samples will be collected from each of the four boring locations (PB-3A-GW, PB-3B-GW, PB-3C-GW, and PB-3D-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PPMETS, PAHs, and VOC analysis. Soil samples from PB-3A and PB-3B will also be submitted for dioxin and furan analysis (EPA Method 1613B). If dioxin or furan is identified in the soil, then the corresponding groundwater sample will also be analyzed for dioxin and furans.

2.2.4 Former Surface Stain Area at Dry Storage

One Geoprobe boring (PB-4A) will be advanced at the location of the former dry storage area (lumber storage sheds). The proposed boring location is shown on Figure 5. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx. The soil samples will also be submitted for PCBs, PPMETS, PAHs, and VOCs. A groundwater grab samples will be collected (PB-4A-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PPMETS, PAHs, and VOC analysis.

2.2.5 Former Dip Tank

Two Geoprobe borings (PB-5A and PB-5B) will be advanced in the southeastern portion of the Site, in the vicinity of the former dip tanks identified in a 1968 Sanborn map. One soil sample will be collected from the soil below the dredge fill

from each of the two Geoprobe borings (two soil sample total). The soil samples will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx if the HCID shows the presence of this range of hydrocarbons in the sample. The two samples will be analyzed for metals, SVOCs by EPA method 8270 (including pentachlorophenol [PCP]), and VOCs. The soil sample exhibiting the highest concentrations of impacts based on field screening methods and the TPH-HCID results will be analyzed for Dixon & Furans by EPA Method 1613B. Groundwater grab samples will be collected from each of the two boring locations (PB5-A-GW and PB-5B-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for SVOC and VOC analysis. Groundwater samples from each boring will be collected and held by the laboratory for possible Dioxin & Furans analysis if the soil sample identifies Dioxin & Furans.

2.2.6 Former Oil Storage Shed

One geoprobe boring (proposed borings PB-6A) will be advanced at the location of the former oil storage shed as shown on Figure 5 of the main Work Plan. One soil sample will be collected from the soil below the dredge fill from the Geoprobe boring. The soil sample will be submitted for TPH-HCID (NWTPH methods) analysis with follow-up analysis for TPH-Dx and/or TPH-Gx, PPMETS, PCBs, PAHs, and VOCs by EPA method 8260 if the HCID shows the presence of hydrocarbons in the sample. A groundwater grab samples will be collected from the boring (PB-6A-GW) and analyzed for TPH-HCID with follow-up analysis for TPH-Dx and/or TPH-Gx. The groundwater samples will also be submitted for PAH, PCBs, and VOC analysis. The groundwater sample will be held by the laboratory for possible total metals analysis, pending the results of the metals analysis of soil.

2.2.7 Soil Stock-Piles from the 14th Street Bulkhead Construction

Fourteen composite soil samples will be collected from soil piles. The composite samples will be composed of ten subsamples from separate piles. Sampling will be completed in proportion to the amount of soil placed on the Site with approximately seven composite samples being collected from the eastern portion of the Site, approximately five composite samples being collected from the middle portion of the Site, and two composite samples being collected from the western portion of the Site. The composite samples will be submitted for PPMETS and PAHs. One composite sample from the eastern, middle, and western portion of the Site will be analyzed for SVOC (including PAHs).

2.2.8 Field Quality Assurance Samples

Field QA will be maintained through compliance with the sampling plan, collection of field QA samples, and documentation of sampling plan alterations.

2.3 Sampling Methods and Procedures

This section generally describes the methods and procedures for fieldwork associated with the proposed soil and groundwater sampling.

2.3.1 Utility Location

A general check for underground utilities will be completed prior to the start of field activities. Underground utilities are not anticipated, however, boring locations may be moved due to underground or aboveground utilities. The field geologist/engineer may approve relocations within 25 feet of the original site and will notify the SLR project manager. Relocations greater than 25 feet from the original boring location will require approval by both the SLR project manager and the Port of Everett project manager before drilling commences.

2.3.2 Soil Sampling

Soil samples will be collected using the following general procedures:

A. All sampling equipment and reusable materials that will contact the sample will be decontaminated on site in accordance with procedures identified in Section 2.3.8. The field staff will use clean neoprene, nitrile, or vinyl gloves for handling each sample.

B. The sample container labels will be filled out and attached to the appropriate containers as described in Section 2.3.9.

C. Soil samples collected for chemical analysis will be transferred directly from the sampler into sample containers.

D. Laboratory provided glass jars will be filled for analyses at each sample interval, if sample volume permits. If the soil volume from a sampling interval does not adequately fill the soil jars, an additional sample will be collected from the depth interval immediately below it. Soil will be transferred directly from the stainless-steel bowl (composite samples), or from the sampling sleeve (Geoprobe samples) to the sample containers. The soil placed in the containers will be handled carefully to minimize disturbance of the soil. Each container will be filled as full as possible to minimize headspace.

E. A PID will be used to monitor each sample for volatile constituents after the sampler is first opened. The PID reading will be recorded on a Field Sampling Data Form or on a Boring Log Form (Section 3.4).

F. After filling the sample jars, the remaining sample will be logged on a Boring Log Form or a Field Sampling Data Form as described in Section 3.4. If free product contamination is observed in any sample interval, that sample will also be transferred into sample containers. For the purposes of this investigation, free product contamination is defined as a nonaqueous phase liquid that is adsorbed to the soil and is in soil pore spaces, causing staining, iridescent sheens, and an odor characteristic of petroleum or polycyclic aromatic hydrocarbons.

After being filled, the sample container(s) will be placed on ice in a cooler and handled as described in Section 2.3.9. The sample coolers will be sent to the laboratory within 36 hours of sampling.

Soil samples will be identified by the Geoprobe or surface soil sample location which they are collected. The prefix "GP-" will precede all Geoprobe boring numbers and the prefix "SS-" will precede all surface soil boring numbers (if any). Geoprobe soil samples and surface soil samples will be numbered according to the top of the depth range sampled. For example, GP-1A-5 would denote a Geoprobe soil sample from the proposed boring (PB) location 1A collected from a depth of 5 feet bgs.

Geoprobe Soil Borings. The Geoprobe borings will be advanced using a truck-mounted, Geoprobe direct-push drilling rig. The Geoprobe rig will be equipped with nominal 2-foot-long or 4-foot-long, 2-inch-diameter probes fitted with acetate sampling sleeves. The Geoprobe borings will be advanced to approximately 15 feet bgs. As is discussed in Section 2.3.3 below, temporary well screens will be installed in each of the Geoprobe borings. Following sampling, the Geoprobe soil borings will be abandoned as described in Section 2.3.4.

Subsurface soil samples in the eleven Geoprobe borings will be collected continuously from the ground surface to the maximum explored depth of 15 feet bgs. Soil samples will be taken from the continuous core sample (contained within the plastic sample sleeve) by hand packing the soil into a clean glass jar supplied by the project laboratory. Lithologic descriptions of the sampled soil will be recorded on a Boring Log Form. Soil samples will be collected for chemical analyses.

Soil samples from each boring will be field screened for the presence of petroleum hydrocarbons and volatile organic compounds (VOCs) by using visual appearance, odors, and a photoionization detector (PID). The soil samples will be submitted for laboratory analysis based on the highest PID measurement or visual evidence of impacts. If there is

no visual evidence of impact and the PID measurements are below detection limits, the sample will be collected from a depth just above the groundwater table as observed during the field work. Field equipment will be decontaminated according to the procedures outlined in Section 2.3.9 prior to moving to the next sampling location.

2.3.3 Groundwater Sampling Procedures

Geoprobe Borings. Groundwater samples will be collected from temporary well points installed in the Geoprobe borings. The temporary wells will be constructed of ¾ inch diameter PVC blank well casing and machine-slotted well screen. Groundwater samples will be collected using dedicated polyethylene tubing and a peristaltic pump. Approximately three well casing volumes will be purged prior to sampling. Conductivity, pH, and temperature will be monitored during the purging of groundwater from the temporary wells, and the groundwater samples will be collected once these parameters have stabilized. The groundwater samples will be transferred directly from the polyethylene tubing into the laboratory-provided sampling containers, stored on ice, and delivered to project laboratory for analyses. Groundwater samples for PPMETS (metals analysis) will be filtered at the laboratory prior to analysis. Development details, including discharge volume, discharge rate, development parameters, and appearance will be recorded on a Field Sampling Data Form. Development water will be handled as described in Section 2.11.1. After collecting the groundwater samples, the temporary wells will be abandoned as described in Section 2.3.6.

Groundwater samples collected from Geoprobe locations will be suffixed with "GW." For example, GP-1A-GW would denote a groundwater sample from the proposed Geoprobe location PB-1A.

2.3.4 Boring Abandonment

Boring abandonment will be conducted per the requirements of WAC 173-160-560. All soil borings will be abandoned by simultaneously adding bentonite chips to the boring while the probe, auger, or casing is removed. Bentonite chips placed above the water table will be hydrated with water. The abandoned borings will be sealed at the surface with concrete or gravel, depending on the surrounding surface material.

2.3.5 Residuals Management - Handling Procedures

All residual soil, water, product, and used decontamination solutions will be handled appropriately. Residual soil and water will be managed in accordance with all applicable local, state, and federal requirements, and in a manner consistent with *Guidance for Remediation of Petroleum Contaminated Soils* (Ecology, 1995). There are no specific Snohomish Health District requirements for storage of residual soil or water. Used disposable clothing and equipment will be handled as solid waste. Appropriate personal protective clothing will be worn during residuals transfers because of potential skin contact and splash hazards. The following residuals management procedures will be used:

- All soil generated during drilling will be containerized or stockpiled on-site. If possible, soil will be segregated to separate potentially contaminated soil from potentially uncontaminated soil. Soil disposition will be determined by the Port of Everett.

- Water generated from drilling, sampling, and decontamination will be kept separate, to the extent possible, from residual soil. Water will be placed in 55-gallon drums or tanks.

- Drums and tanks will be labeled with a label stating the drum contains investigation derived waste – pending analysis. The label will provide the site name, address, accumulation date, and contents (including approximate quantity).

- Drums and tanks will be sealed and secured daily. An on-site staging area for the accumulation of drums and tanks will be identified by the Port of Everett. Drums and tanks containing water will be stored in the designated temporary holding area as necessary until shipped off site.

- A record of all generated residuals that have been drummed, stockpiled, or otherwise stored will be maintained to expedite characterization and disposal upon completion of field activities.

- Disposable clothing and equipment will be placed in plastic bags and disposed of as solid waste.

- Port of Everett will be responsible for the proper disposal of all wastes. SLR will coordinate with the Port of Everett for appropriate disposal procedures.

2.3.6 Guidelines for Splitting Samples

If requested by Ecology, the Port of Everett's on-site representative will provide for the collection of split or replicate samples. The following sample splitting procedures will be followed:

- Samples will be collected as described above.
- If sufficient sample is available in the Geoprobe or auger barrel from which the Port of Everett's representative is collecting a sample, then either Ecology (or representative) or the Port of Everett's representative will collect a split sample concurrently.
- If insufficient sample is available in the Geoprobe or auger barrel from which the Port of Everett's representative is collecting a sample, then an additional split spoon drive soil sample will be collected in the same sampling interval, if desired by Ecology, or immediately below the Port of Everett sampling interval.

2.3.7 Decontamination Procedures

A decontamination area will be established for cleaning the drilling rig and well materials. All down-hole drilling equipment and the working area of the drill rig will be steam-cleaned or hot water pressure-washed prior to beginning drilling and between drilling each boring. Hand tool equipment, split-spoon samplers, spoons, bowls, and other sampling equipment that will contact samples will be decontaminated prior to initial use, between sampling locations, and between different sampling depths at the same location. Soil, groundwater, and surface water sampling equipment will be decontaminated by following procedure:

- Tap water rinse
- Alcohol rinse (if equipment visibly stained with product)
- Tap water rinse
- Nonphosphatic detergent and tap water wash
- Tap water rinse
- Second alcohol rinse (if equipment visibly stained with product)
- Tap water rinse
- Distilled water rinse

The electric well probe and oil/water interface probe will be rinsed with alcohol and distilled water between uses in different monitoring wells. All labels and binding tape will be removed from well materials prior to steam cleaning or washing. New sampling tubing will be used at each well.

Decontamination of personnel involved in sampling activities will be accomplished as described in the site Health and Safety Plan.

2.3.8 Sample Labeling, Shipping, and Chain-of-Custody

Sample Labeling. Sample container labels will be completed immediately before or immediately after sample collection. Container labels will include the following information:

- Project name
- Sample number (including sample depth, if applicable)
- Name of collector
- Date and time of collection

Sample Shipping. Soil and water samples will be shipped to the selected analytical laboratory as follows:

- Sample containers will be transported in a sealed, iced cooler.
- In each shipping container, glass bottles will be separated by a shock-absorbing and absorbent material to prevent breakage and leakage.
- Ice or "blue ice," sealed in separate plastic bags, will be placed into each shipping container with the samples.
- All sample shipments will be accompanied by a Chain-of-Custody Form. The completed form will be sealed in a plastic bag and taped to the inside lid of the shipping container.
- Signed and dated chain-of-custody seals will be placed on all shipping containers, unless samples will be picked up at the site by the laboratory.
- The analytical laboratory's name and address and SLR's name and office (return) address will be placed on each shipping container prior to shipping.

Chain-of-Custody. Once a sample is collected, it will remain in the custody of the sampler or other SLR personnel until shipment to the laboratory. Upon transfer of sample containers to subsequent custodians, a Chain-of-Custody/Analysis Request Form will be

signed by the persons transferring custody of the sample container. A signed and dated chain-of-custody seal will be placed on each shipping container prior to shipping.

Upon receipt of samples at the laboratory, the shipping container seal will be broken, and the condition of the samples will be recorded by the receiver. Chain-of-custody records will be included in the analytical report prepared by the laboratory.

3 QUALITY ASSURANCE PROJECT PLAN

3.1 Introduction

The purpose of this Quality Assurance Project Plan (QAPP) is to present the quality assurance and quality control activities developed for the SAP. This QAPP covers the soil and groundwater sampling work to be undertaken by SLR International Corp during this investigation.

3.1.1 Project Organization

Primary responsibility for project quality rests with SLR International Corp project Coordinator, Mr. Scott Miller. The PM will review all project deliverables before submittal to Ecology or other appropriate regulatory agency. Where quality assurance problems or deficiencies are observed, the PM will identify the appropriate corrective action to be initiated.

3.1.2 Data Quality Objectives

This section presents the data quality objectives (DQO's) for the Remedial Investigation. This environmental assessment is being conducted to help ensure that data of sufficient quality and quantity will be available to identify if hazardous compounds are present at the Site and to evaluate risks posed by the presence of hazardous compounds in the soil and groundwater at the Site. Information is needed to identify if hazardous compounds associated with historical industrial activities have entered the subsurface and if these compounds, and the previously identified compounds, may pose unacceptable risk to current and future human and ecological receptors via direct contact or migration.

The data collected during the environmental assessment and the previously completed site assessments will be used to assess whether Site related contaminants of interest (COIs) may result in unacceptable risk to human and/or ecological receptors (current or likely future).

The numbers of sampling locations, sampling depths, types of samples, and types of analysis have been selected to meet the DQOs. The sampling proposed in this work plan

represents the minimum sampling required to meet the DQOs. If observations made during the field work indicate a release of chemicals in an assessment area, additional sampling may be completed in that area to help assess the extent of the chemical release in soil and groundwater. These DQOs will be applied to facilitate data adequacy reviews and identify data gaps. Additionally, the DQOs will be used to identify the analytical practical quantification limit (PQL) and to establish other quality assurance goals with the QAPP and the SAP. The PQL is defined as the lowest levels which can be routinely quantified and reported by a laboratory. Thresholds for PQLs from WAC 173-340-707 include that the PQL may be no greater than ten times the laboratory method detection limit (MDL); or that the PQL for a hazardous substance, medium and analytical procedure may be no greater than the PQL established by the US EPA and used in 40 CFR 136, 40 CFR 141 through 143, or 40 CFR through 270. An important DQO for this project is to obtain appropriate quantitation limits and to meet the requirements of WAC 173-340-820, MTCA. The PQLs for the proposed soil and groundwater sample analysis at the Bay Wood Products Site are presented in Work Plan Attachment 2. The Preliminary Cleanup Levels (PCLs) for the Site have been calculated in accordance with MTCA Cleanup Regulation, Chapter 173-340 WAC, as is described in the Work Plan (Section 4.1). As is shown in the tables, the calculated PCLs for some analytes are lower than the PQLs which can be achieved by the laboratory. In these instances the PCL has defaulted to the laboratory PQL. When necessary to meet the PCL, PAHs will be analyzed by EPA Method 8270 SIM SS, which will result in a lower PQL.

3.2 Data Quality Assurance Objectives

The applicable data quality assurance objectives are dictated by the intended use of the data and the nature of the analytical methods. The accuracy, precision, representativeness, completeness, and comparability data quality assurance objectives are explained below.

3.2.1 Accuracy

Accuracy is the agreement between the measured value and the true value. Accuracy can be expressed as the difference between two values or the difference as a percentage of the reference or true value (ratio). Accuracy depends on the magnitude of the systematic (bias) and random (precision) errors in the measurement. Bias due to sample matrix effects will be assessed by spiking samples with known standards and calculating the recovery of the standards.

3.2.2 Precision

Precision is a measurement of mutual agreement among individual measurements of the same property under prescribed similar conditions. It is expressed in terms of the standard deviation or relative percent difference (RPD). Precision is determined through laboratory quality control parameters such as surrogate recoveries, matrix spikes, or

quality control check samples. Separate field control samples will not be collected for this scope of work. Quality control objectives for surrogate recovery, percent recovery, and RPD for matrix spikes will be those currently established by the testing laboratory.

3.2.3 Representativeness

Representativeness is a measure of how closely the measured results reflect the actual concentration or distribution of chemical compounds in the media sampled. Sampling plan design, sampling techniques, and sample handling protocols are included in the SAP to ensure that samples collected are representative of site conditions within the limitations of the collection technologies. Sampling locations were selected based on their representativeness in further assessing the extent of contamination is soil and groundwater at the site. This documentation establishes protocols for assurance of sample identification and integrity.

3.2.4 Completeness

Completeness is a measure of the amount of valid data obtained from the analytical system compared to the total data collected. The completeness of the data will be assessed during quality control reviews. Audits, internal control checks, and preventative maintenance will be implemented to help maintain the above quality assurance objectives.

3.2.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Data comparability will be ensured by monitoring the control of sample collection, analytical methods, and data recording. Comparability of laboratory and field data will be maintained by using EPA-defined procedures, where available. Data comparability will be maintained by use of consistent methods and units. The laboratory predicted method detection limits (MDL) and method reporting limits (MRL) for the proposed sampling protocol are included as Attachment 1 to this document. Actual detection limits will depend on the sample matrix and will be reported as defined for the specific samples.

3.3 Field Data Quality Assurance Objectives

This QAPP also presents the field data quality assurance objectives for the ESA at the Bay Wood Products Site. The field data quality assurance objectives include field measurements and observations, field equipment calibration, chain-of-custody procedures, and sample handling procedures.

3.3.1 Field Measurement and Observation

Field measurements and observations will be recorded in the project log notes. Sufficient information will be recorded so that all field activities can be reconstructed without reliance on personnel memory. Entries will be recorded directly in waterproof ink and legibly and will be signed and dated by the person conducting the work. If changes are made, the changes will not obscure the previous entry, and the changes will be signed and dated. At a minimum, the following data will be recorded:

- Location of activity
- Description of sampling reference point(s)
- Date and time of any activity
- Sample number and volume or number of containers
- Field measurements made
- Calibration records for field instruments
- Relevant comments regarding field activities
- Signatures of responsible personnel

3.3.2 Field Instrument Calibration

The field instruments to be used during field activities will be calibrated at the beginning and as required according to manufacturers' specifications. Calibration records will be recorded in the project log notes including date, project number, instrument make and model, and instrument response to calibration.

3.3.3 Chain-of-Custody Procedures

The management of samples collected in the field will follow specific procedures to ensure sample integrity. To ensure sample integrity, the samples will be handled by as few people as possible and the sample collector will be responsible for the care and custody of the samples. Sample possession will be tracked from collection to analysis. Each time the samples are transferred between parties, both the sender and receiver will sign and date the chain-of-custody form and specify what samples have been transferred. When a sample shipment is sent to the laboratory, the original form will be placed with the samples and transmitted to the laboratory. A copy of the form will be retained in the project files. A chain-of-custody record will be completed for each batch of samples hand delivered or shipped to the laboratory.

The following information will be included on the chain-of-custody form:

- Sample number
- Sampler signature
- Sample collection date and time
- Place of collection
- Sample type
- Inclusive dates of possession
- Signature of sender and receiver

In addition to the chain-of-custody form, other components of sample tracking will include the sample labels and seals, field logs, sample shipment receipt, and laboratory log book. The sample labels and seals will include the following information:

- Project name and number
- Name of sampler
- Date and time of sample collection
- Sample location and number
- Analysis required
- Preservation

3.3.4 Sample Handling Procedures

Sampling plan design, sampling techniques, sampling location, and sample handling protocols are included in the SAP to ensure that samples collected are representative of site conditions within the limitations of the collection technologies.

The following table summarizes the soil sample handling requirements:

Analysis	Sample Container	Container Size	Preservation and Handling	Holding Times
Total Petroleum Hydrocarbon - Diesel (TPH-Dx)	Glass Jar	4 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	14 days
Total Petroleum Hydrocarbon - Gasoline (TPH-Gx)	--	--	Taken from 8260/5035 methanol vial	14 days
Priority Pollutant Metals	Glass Jar	4 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	14 days
Polychlorinated Biphenyl (PCB)	Glass Jar	4 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	14 days

Analysis	Sample Container	Container Size	Preservation and Handling	Holding Times
Volatile Organic Analysis (VOA)	Voa vial	3 Voa vials	1-Methanol and 2-Sodium Bisulfate; keep in dark; cool to 4°C	14 days
Semi-Volatile Organic Compounds	Glass Jar	4 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	14 days
Pentachlorophenol (PCP)	Glass Jar	4 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	14 days
Dioxins & Furans	Glass Jar	8 oz	Fill jar leaving minimal air space; keep in dark; cool to 4°C	30 days

The following table summarizes the groundwater sample handling requirements:

Analysis	Sample Container	Container Size	Preservation and Handling	Holding Times
Total Petroleum Hydrocarbon - Diesel (TPH-Dx)	Amber Glass Bottle	1 Liter	Fill bottle leaving no air space; keep in dark; cool to 4°C; HCL to pH<2	7 days
Total Petroleum Hydrocarbon - Gasoline (TPH-Gx)	Voa Vial	3 Voa Vials	Fill bottle leaving no air space; keep in dark; cool to 4°C; HCL to pH<2	14 days
Priority Pollutant Metals (laboratory filtered)	Plastic Bottle	500 mL	Fill bottle leaving no air space; keep in dark; cool to 4°C; HNO_3 to pH<2	6 Months
Polychlorinated Biphenyl (PCB)	Amber Glass Bottle	1 Liter	Fill bottle leaving no air space; keep in dark; cool to 4°C	7 days
Volatile Organic Analysis (VOA)	Voa Vial	3 Voa Vials	Fill vial leaving no air space; keep in dark; cool to 4°C; HCL to pH<2	14 days
Semi-Volatile Organic Compounds (BNA)	Amber Glass Bottle	1 Liter	Fill bottle leaving no air space; keep in dark; cool to 4°C	7 days
Pentachlorophenol (PCP)	Amber Glass Bottle	1 Liter	Fill bottle leaving no air space; keep in dark; cool to 4°C	7 days
Dioxins & Furans	Plastic Bottle	Two -1 Liter	Fill bottle leaving no air space; keep in dark; cool to 4°C	30 days

3.4 Quality Control

Quality control checks consist of measurements and tests performed in the field and laboratory. The analytical methods that will be performed as a part of this project have routine quality control checks performed to evaluate the precision and accuracy, and to determine whether the data are within the quality control limits.

3.4.1 Laboratory Quality Control Methods

Specific procedures and frequencies for laboratory quality control are detailed by the analytical method in the laboratory's Quality Assurance Plan. A general description of the types of laboratory quality control samples is as follows:

- **Method Blanks –** A minimum of one laboratory method blank will be analyzed per twenty samples or one per batch (whichever is greater) to assess possible laboratory contamination. Method blanks will contain all reagents and undergo all procedural steps used for analysis.
- **Control Samples –** A minimum of one laboratory control sample per twenty samples or one per batch (whichever is greater) will be analyzed for inorganics to verify the precision of the laboratory equipment. The control sample will be at a concentration within the calibration range, but at a different concentration than the standards used to establish the calibration curve.
- **Matrix Spike -** A minimum of one laboratory matrix spike sample will be analyzed per twenty samples or one per batch (whichever is greater) to monitor recoveries and assure that extraction and concentration levels are acceptable for quality assurance and quality control review. The laboratory matrix spike will be analyzed on a separate groundwater sample collected from one of the wells.

3.5 Data Management

This section addresses issues related to data sources, data processing, and data evaluation. Raw data generated in the field or received from analytical laboratories will be validated, entered into a computerized database, and verified for consistency and correctness.

3.5.1 Field Data Management

Accurate documentation of field activities (e.g., field parameters measurements, field notes) will be maintained using field log-books and field data forms. Entries will be made in sufficient detail to provide an accurate record of field activities without reliance on memory.

Field log entries will be dated and include a chronological description of task activities, names of individuals present, names of visitors, weather conditions, etc. All entries will be legibly entered in ink and initialed. A record of drilling, including the boring name and location, sampling intervals, sample names, and lithologic and field screening observations, will be included on a boring log.

Copies of standard SLR field forms are included in Appendix B.

3.5.2 Analytical Data Management

Following validation, all analytical data will be entered into a computerized database. The data may require some manipulation, such as common unit conversions and extraction from support information. To accomplish these manipulations, data reduction and tabulation techniques will be applied to the data and documented.

Several different tabular reports will be generated from the database. All analytical, locational, and tracking data will be stored in the database. Data reports for each type of analysis will be generated to produce standard reports.

All data validation, document control, and locational and analytical information generated by this project will be entered, stored, and generated by PC-compatible machines. Standardized software products will be used.

The volume of digital data anticipated on this project may be accommodated on a single PC work station. Project data backups will be made on a weekly basis or whenever major additions or modifications have been made to the various data management systems. Access to the database will be limited to the data manager and the authorized project personnel.

3.5.3 Sample Management

The sample management system forms the foundation of all other analytical data collection, verification, and validation tasks. Analytical data cannot be considered valid unless all the proper steps have been carried out with respect to sample management. These include:

- Sample properly documented in daily field log
- Chain-of-custody requirements met
- All sample-related documents filed
- Use of unique sample identification numbers

Data that do not pass the validation process either will be assigned data qualifiers to restrict or modify usage, or will be rejected for use. Modifications to the use of data will be documented in data validation reports.

3.5.4 Data Reporting Requirements

Quality assured data will be submitted to Ecology electronically in Environmental Information Management System (EIM) format. The electronic data will be verified to be compatible with EIM prior to delivery to Ecology.

TABLES

Upland SAP Table 1A
Summary Analytical Table
Bay Wood Products Site, Port of Everett
Everett, Washington

Area	Proposed RI Sampling	Matrix	TPH-HCID	TPH-Dx	TPH-Gx	PPMETS Metals	PCBs	PAHs	SVOCs	Dioxins & Furans	VOC
Former Covered Shop Attached to the Former Office Building	2 Geoprobe Borings for soil and groundwater sampling (Locations PB-1A and PB-1B) Figure 5	Soil	2	2(1)	2(1)	2		2			2
		Water	2	2(1)	2(1)			2			2
Former PCB Transformer Area	1 Geoprobe boring for soil and groundwater sampling (Locations PB-2A) Figure 5	Soil	1	1(1)	1(1)		1				
		Water	1	1(1)	1(1)		1(2)				
Former Mill Operation Areas	Four Geoprobe Borings for soil and groundwater sampling (Locations PB-3A through PB-3D) Figure 5	Soil	4	4(1)	4(1)	4	4	4		2	
		Water	4	4(1)	4(1)	4		4		2(3)	4
Former Surface Stain Area at Dry Storage	1 Geoprobe boring for soil and groundwater sampling (Locations PB-4A) Figure 5	Soil	1	1(1)	1(1)	1	1	1			1
		Water	1	1(1)	1(1)	1		1			1
Former Dip Tank Area	2 Geoprobe borings for soil and groundwater sampling (Locations PB-5A and PB-5B) Figure 5	Soil	1	1(1)	1(1)				1	1	1
		Water	1	1(1)	1(1)				1	1(3)	1
Former Oil Storage Shed	1 Geoprobe boring for soil and groundwater sampling (Location PB-6A) Figure 5	Soil	1	1(1)	1(1)	1	1	1			1
		Water	1	1(1)	1(1)		1	1			1
Soil Stock-Piles from the 14th Street Bulkhead Construction (Appendix F document)	14 composite soil samples from the existing soil stock-piles, 7 samples from eastern portion, 5 from middle portion, and 2 from western portion	Soil				14		11	3		
		Water									

Notes:
(1) - Run analysis only if TPH is detected in this range by the TPH-HCID analysis

(2) - Run only if PCBs are found in the soil sample.

(3) - Run only if Dioxins & Furans are found in the soil sample.

Dioxin & Furans - EPA Method 1613B

TPH-Dx- Total Petroleum Hydrocarbons Diesel Range (Ecology Method NWTPH-Dx)

TPH-Gx- Total Petroleum Hydrocarbons Gasoline Range (Ecology Method NWTPH-Gx)

Metals: Arsenic, Cadmium, Total Chromium, Chromium VI, Copper, Lead, Nickel, Selenium, and Zinc (EPA Method 6010B), Mercury- Mercury Cold Vapor Atomic Absorption (EPA Method 7471A)

SVOCs - EPA Method 8270C and PAHs - EPA Method 8270SIM

VOA - Volatile Organic Analysis (EPA Method 8260)

Upland SAP Table 1B
Proposed Boring Locations
Bay Wood Products Site, Port of Everett
Everett, Washington

Proposed Soil Boring Locations

Boring ID	Latitude	Longitude
1A	48.015483°	-122.208392°
1B	48.015385°	-122.208484°
2A	48.015517°	-122.208858°
3A	48.016222°	-122.208259°
3B	48.016430°	-122.208983°
3C	48.015875°	-122.209191°
3D	48.015606°	-122.209461°
4A	48.015678°	-122.208605°
5A	48.015854°	-122.208849°
5B	48.015832°	-122.208798°
6A	48.015952°	-122.209331°

Upland SAP Table 2
Groundwater PQLs and PCLs
SVOCs and PAHs
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (µg/L)	Laboratory PQL [B] (µg/L)	Selected PCL [C] (µg/L)
Semivolatile Organic Compounds [D] (SVOCs)			
acenaphthylene	0.874	10	10
acetophenone	0.107	1	800
atrazine	0.909	1	1
benzaldehyde	1.36	10	800
biphenyl; 1,1-	0.422	1	400
bis(2-chloroethyl)ether	0.146	1	1
bis(2-chloroethoxy) methane	0.129	1	1
bis(2-chloroisopropyl) ether	0.24	1	1,400
bis(2-chloro-1-methylethyl)ether	0.24	1	37
bis(2-ethylhexyl) phthalate	0.162	1	1.2
bromophenyl-phenylether; 4-	0.059	1	1
butyl benzyl phthalate	0.173	1	1,300
caprolactam	0.259	10	8,000
carbazole	0.079	1	4.4
chloro-3-methylphenol;4-	0.116	1	1
chloroaniline;4-	0.191	1	32
chlorophenol;2-	0.109	1	97
chloronaphthalene;2-	0.106	1	1,000
chlorophenyl-phenyl ether;4-	0.097	1	1
dibenzofuran	0.081	1	32
dichlorobenzidine;3,3-	0.221	1	1
dichlorophenol;2,4-	0.101	1	77
diethyl phthalate	0.128	1	17,000
dimethyl phthalate	0.176	1	72,000
dimethylphenol;2,4-	2.97	10	380
di-n-butylphthalate	0.129	1	2,000
di-n-octylphthalate	0.189	1	320
dinitro-2-methylphenol: 4,6-	2.36	10	10
dinitrophenol;2,4-	2.03	10	69
dinitrotoluene;2,4-	1.63	10	10
dinitrotoluene;2,6-	1.27	10	16
hexachlorobenzene	0.126	1	1
hexachlorobutadiene	0.151	1	1
hexachlorocyclopentadiene	2.13	10	40
hexachloroethane	0.191	1	1.4
isophorone	0.141	1	8.4
methylnaphthalene; 2	0.116	1	32
methylphenol;2-	1.71	10	400
methylphenol;4-	0.958	10	40
nitroaniline;2-	1.68	10	10
nitroaniline;3-	1.36	10	10
nitroaniline;4-	0.126	1	1
nitrobenzene	0.128	1	17
nitrophenol;2-	3.14	10	10
nitrophenol;4-	0.823	10	10
nitrosodiphenylamine; N-	0.087	1	3.3
nitroso-di-n-propylamine;N-	0.127	1	1
pentachlorophenol	2.18	10	10
phenol	0.686	10	21,000
tetrachlorobenzene;1,2,4,5-	0.127	1	1
tetrachlorophenol;2,3,4,6-	1.19	10	480
trichlorophenol;2,4,5-	0.171	1	1,800
trichlorophenol;2,4,6-	0.111	1	1.4

Upland SAP Table 2
Groundwater PQLs and PCLs
SVOCs and PAHs
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (µg/L)	Laboratory PQL [B] (µg/L)	Selected PCL [C] (µg/L)
Carcinogenic Polycyclic Aromatic Compounds(cPAHs) [E]			
benzo[a]anthracene	0.0010	0.05	0.05
benzo[a]pyrene	0.0011	0.05	0.05
benzo[b]fluoranthene	0.0010	0.05	0.05
benzo[k]fluoranthene	0.0021	0.05	0.05
chrysene	0.0007	0.05	0.05
dibenzo[a,h]anthracene	0.0010	0.05	0.05
indeno[1,2,3-cd]pyrene	0.0012	0.05	0.05
Non-Carcinogenic PAHs (PAHs) [E]			
acenaphthene	0.00177	0.05	640
anthracene	0.00045	0.05	8,300
benzo[ghi]perylene [F]	0.0011	0.05	830
fluoranthene	0.00065	0.05	90
fluorene	0.00109	0.05	1,100
naphthalene	0.01085	0.05	4,900
phenanthrene [G]	0.00073	0.05	640
pyrene	0.00083	0.05	830

Notes:

A - Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory

B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory

C - Groundwater Preliminary Cleanup Levels (PCLs) calculated as shown in Attachment 2 of Work Plan

D - SVOCs per EPA Method 8270C

E- cPAHs and PAHs will be analyzed per 8270 SIM (low level)

F - Toxicity information is not available for benzo(ghi)perylene. Pyrene has been used as surrogate

G - Toxicity information is not available for phenanthrene. Anthracene has been used as surrogate

Upland SAP Table 3
Soil PQLs and PCLs
SVOCs and PAHs
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (mg/kg)	Laboratory PQL [B] (mg/kg)	Selected PCLs [C] (mg/kg)
Semivolatile Organic Compounds (SVOCs) [D]			
acenaphthylene	0.02844	0.33	0.33
acetophenone	0.11	0.33	8,000
atrazine	0.11	0.33	4.5
benzaldehyde	0.11	0.33	8,000
biphenyl;1,1'-	0.11	0.33	4,000
bis(2-chloroethyl)ether	0.0285	0.33	0.33
bis(2-chloroethoxy) methane	0.03208	0.33	0.33
bis(2-chloroisopropyl)ether	0.03286	0.33	3200
bis(2-chloro-1-methylethyl)ether	0.03286	0.33	14
bis(2-ethylhexyl) phthalate	0.06007	0.33	2.64
p-Bromodiphenyl ether	0.02218	0.33	0.33
butylbenzylphthalate	0.03829	0.33	369
caprolactam	0.11	0.33	40,000
carbazole	0.02861	0.33	0.33
chloro-3-methylphenol;4-	0.03364	0.33	0.33
chloroaniline;4-	0.03626	0.33	0.33
chlorophenol;2-	0.031	0.33	1.15
chloronaphthalene;2-	0.02552	0.33	6,400
chlorophenyl-phenyl ether; 4-	0.02526	0.33	0.33
dibenzofuran	0.02172	0.33	160
dichlorobenzidine;3,3-	0.03062	0.33	0.33
dichlorophenol;2,4-	0.02442	0.33	0.54
diethyl phthalate	0.04057	0.33	95.9
Dimethyl phthalate	0.02628	0.33	80,000
dimethylphenol;2,4-	0.0381	0.33	3.12
di-n-butyl phthalate	0.02729	0.33	72
di-n-octylphthalate	0.03606	0.33	1,600
dinitro-2-methylphenol;4,6-	0.03971	0.33	0.33
dinitrophenol;2,4-	0.04084	0.33	0.33
dinitrotoluene;2,4-	0.02472	0.33	0.33
dinitrotoluene;2,6-	0.02291	0.33	0.33
hexachlorobenzene	0.0247	0.33	0.33
hexachlorobutadiene	0.03257	0.33	0.48
hexachlorocyclopentadiene	0.03489	0.33	160.2
hexachloroethane	0.03302	0.33	0.33
isophorone	0.03804	0.33	0.33
methylnaphthalene;2-	0.02595	0.33	320
methylphenol;2-	0.03302	0.33	2.33
methylphenol;4-	0.03287	0.33	400
nitronaniline;2-	0.0207	0.33	0.33
nitronaniline;3-	0.06465	0.33	0.33
nitronaniline;4-	0.0381	0.33	0.33
nitrobenzene	0.02756	0.33	0.33
nitrophenol;2-	0.02748	0.33	0.33
nitrophenol;4-	0.02672	0.33	0.33
nitrosodiphenylamine; N-	0.03447	0.33	0.33
nitroso-di-n-propylamine;N-	0.033	0.33	0.33
pentachlorophenol	0.03114	0.33	0.33
phenol	0.02879	0.33	96.2
tetrachlorobenzene;1,2,4,5-	0.11	0.33	24
tetrachlorophenol;2,3,4,6-	0.016666	0.05	2,400
trichlorophenol;2,4,5-	0.03019	0.33	64.8
trichlorophenol;2,4,6-	0.0278	0.33	0.33
Carcinogenic Polycyclic Aromatic Compounds (cPAHs) [E]			
benzo[a]anthracene	0.03212	0.006	0.020
benzo[a]pyrene	0.02678	0.006	0.054
benzo[b]fluoranthene	0.03015	0.006	0.067
benzo[k]fluoranthene	0.03117	0.006	0.067
chrysene	0.03531	0.006	0.022
dibenzo[a,h]anthracene	0.02807	0.006	0.101
indeno[1,2,3-cd]pyrene	0.02949	0.006	0.196
Non-Carcinogenic Polycyclic Aromatic Compounds (PAHs) [E]			
acenaphthene	0.02368	0.006	65.3
anthracene	0.023	0.006	3,851
benzo[ghi]perylene [F]	0.02885	0.33	1,132
fluoranthene	0.02404	0.006	88.6
fluorene	0.0226	0.006	173.8
naphthalene	0.02604	0.33	5.0
phenanthrene [G]	0.02475	0.33	65.30
pyrene	0.03562	0.006	1,132

Notes:

A - Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory

B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory

C - Soil Preliminary Cleanup Levels (PCLs) calculated as shown in Attachment 2 of Work Plan

D - SVOCs per EPA Method 8270C

E - cPAHs and PAHs will be analyzed per 8270 SIM (low level)

F - Toxicity information is not available for benzo(ghi)perylene. Pyrene has been used as surrogate

G - Toxicity information is not available for phenanthrene. Anthracene has been used as surrogate

Upland SAP Table 4
Groundwater PQLs and PCLs VOCs
Baywood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (µg/L)	Laboratory PQL [B] (µg/L)	Selected PCL [C] (µg/L)
Volatile Organic Compounds (VOCs) [D]			
acetone	8.92	25	800
benzene	0.288	0.5	1.2
bromochloromethane	0.44	0.5	0.5
bromodichloromethane	0.37	0.5	0.5
bromoform	0.51	0.5	4.3
bromomethane	0.5	0.8900	47
butanone;2- (MEK)	1.42	2.5	4,800
carbon disulfide	0.32	0.5	800
carbon tetrachloride	0.31	0.5	0.5
chlorobenzene	0.26	0.5	130
chloroethane	0.856	0.5	15
chloroform	0.33	0.5	5.7
chloromethane	0.251	0.5	130
cyclohexane	0.3	1	1
dibromo-3-chloropropane;1,2-	0.48	1	1
dibromochloromethane	0.42	0.5	0.5
dibromoethane; 1,2-	0.48	0.5	0.5
dichlorobenzene; 1,2-	0.29	0.5	420
dichlorobenzene; 1,3-	0.189	0.5	320
dichlorobenzene; 1,4-	0.3	0.5	4.9
dichlorodifluoromethane	0.3	0.5	1,600
dichloroethane;1,1-	0.31	0.5	800
dichloroethane;1,2-	0.274	0.5	1
dichloroethylene;1,1-	0.495	0.5	1
dichloroethylene;1,2-,cis	0.38	0.5	80
dichloroethylene;1,2-,trans	0.3	0.5	10,000
dichloropropane;1,2-	0.52	0.5	1
dichloropropene;1,3-,cis	0.26	0.5	0.5
dichloropropene;1,3-,trans	0.24	0.5	0.5
dioxane;1,4-	33	100	100
ethylbenzene	0.222	0.5	530
hexanone-2	1.57	2.5	2.5
isopropylbenzene	0.189	0.5	800
methyl acetate	6.666	20	8,000
methyl-2-pentanone; 4- (MIK)	1.42	2.5	640
methyl tert-butyl ether	0.193	0.5	20
methylene chloride	0.295	0.02	4.6
methylcyclohexane	0.333	1	1
styrene	0.38	0.5	1.5
tetrachloroethane;1,1,2,2-	0.22	0.5	0.5
tetrachloroethylene	0.293	0.5	0.5
toluene	0.269	0.5	1,300
trichloro-1,2,2-trifluoroethane;1,1,2-	0.217	0.5	240,000
trichlorobenzene; 1,2,3-	0.24	7	0.5
trichlorobenzene; 1,2,4-	0.265	0.5	35
trichloroethane; 1,1,1-	0.27	0.5	420,000
trichloroethane; 1,1,2-	0.451	2	1
trichloroethylene	0.37	0.0033	1.5
trichlorofluoromethane	0.286	0.5	2,400
vinyl chloride	0.067	0.2	0.2
xylenes (total)	0.86	1.5	1,000

Notes:

A - Laboratory Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory

B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory

C - Groundwater Preliminary Cleanup Levels (PCLs) calculated as shown in Attachment 2 of Work Plan

D - VOCs per EPA Method 8260

Upland SAP Table 5
Soil PQLs and PCLs
VOCs
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (mg/kg)	Laboratory PQL [B] (mg/kg)	Selected PCLs [C] (mg/kg)
Volatile Organic Compounds (VOCs) [D]			
acetone	0.0170	0.05	3.21
benzene	0.000325	0.001	0.0068
bromochloromethane	0.000447	0.001	0.001
bromodichloromethane	0.000387	0.001	0.0014
bromoform	0.000577	0.001	0.029
bromomethane	0.001284	0.005	0.218
butanone;2- (MEK)	0.002679	0.1	48,000
carbon disulfide	0.001785	0.001	5.6
carbon tetrachloride	0.000320	0.001	0.002
chlorobenzene	0.000250	0.001	1.126
chloroethane	0.000586	0.005	350
chloroform	0.000411	0.005	0.030
chloromethane	0.000562	0.001	77
cyclohexane	0.000333	0.001	0.001
dibromochloromethane	0.000231	0.001	0.002
dibromo-3-chloropropane;1,2-	0.001157	0.005	0.71
dibromoethane; 1,2-	0.000315	0.001	0.005
dichlorobenzene; 1,2-	0.000237	0.001	4.93
dichlorobenzene; 1,3-	0.000379	0.001	0.001
dichlorobenzene; 1,4-	0.000218	0.001	0.081
dichlorodifluoromethane	0.000320	0.001	16,000
dichloroethane;1,1-	0.000259	0.001	4.37
dichloroethane;1,2-	0.000531	0.001	0.002
dichloroethylene;1,1-	0.000742	0.001	0.001
dichloroethylene;1,2-,cis	0.000723	0.001	0.40
dichloroethylene;1,2-,trans	0.000678	0.001	54
dichloropropane;1,2-	0.000751	0.001	0.0026
dichloropropene;1,3-,cis	0.000262	0.001	0.001
dichloropropene;1,3-,trans	0.000360	0.001	0.001
dioxane;1,4-	0.033	0.10	91
ethylbenzene	0.000226	0.001	4.53
hexanone-2	0.001953	0.01	0.01
isopropylbenzene	0.000211	0.001	8,000
methyl tert-butyl ether	0.000278	0.001	0.085
methylene chloride	0.0006	0.005	0.02
methyl acetate	0.006666	0.02	73,903
methylcyclohexane	0.000333	0.001	0.001
methyl-2-pentanone; 4-	0.001397	0.01	6,400
styrene	0.000203	0.001	0.034
tetrachloroethane;1,1,2,2-	0.000329	0.001	0.001
tetrachloroethylene	0.000231	0.001	0.004
toluene	0.001214	0.005	7
trichlorobenzene;1,2,3-	0.000231	0.001	0.001
trichlorobenzene; 1,2,4-	0.000249	0.001	1.33
trichloroethane; 1,1,1-	0.000516	0.001	2
trichloroethane; 1,1,2-	0.000456	0.001	0.0033
trichloro-1,2,2-trifluoroethane; 1,1,2-	0.000247	0.001	2,400,000
trichloroethylene	0.000336	0.001	0.010
trichlorofluoromethane	0.000273	0.005	24,000
vinyl chloride	0.000287	0.001	0.001
xylenes	0.000460	0.003	9

Notes:

A - Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory

B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory

C - Soil Preliminary Cleanup Levels (PCLs) calculated as shown in Attachment 2 of Work Plan.

D - VOCs per EPA Method 8260

Upland SAP Table 6
Groundwater PQLs and PCLs
Metals, PCBs, TPH, and Dioxin/Furan
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (µg/L)	Laboratory PQL [B] (µg/L)	Selected PCL [C] (µg/L)
Metals [D]			
Antimony	0.22	1	5.6
Arsenic	0.15	1	1
Beryllium	0.24	1	270
Cadmium	0.24	1	1
Chromium [E]	0.32	1	10
Copper	0.45	1	2.4
Lead	0.22	1	1
Nickel	0.34	1	8.2
Selenium	0.43	1	5
Silver	0.12	0.5	0.5
Thallium	0.09	1	1
Zinc	2.98	10	32
Mercury	0.0439	0.2	0.2
Polychlorinated Biphenyls [F] (PCBs)			
aroclor 1016	0.077	0.01	0.01
aroclor 1221	0.165	0.01	0.01
aroclor 1232	0.175	0.01	0.01
aroclor 1242	0.099	0.01	0.01
aroclor 1248	0.039	0.01	0.01
aroclor 1254	0.122	0.01	0.014
aroclor 1260	0.155	0.01	0.014
Total Petroleum Hydrocarbons (TPH) [G]			
TPH-Dx	33	100	500
TPH-Gx	31	100	1,000 / 800 [H]
Dioxins / Furans (EPA Method 1613) [I]			
2,3,7,8-Tetra TCDD [J]	1.19E-09	1.00E-08	0.00000001

Notes:

A - Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory

B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory

C - Groundwater Preliminary Cleanup Levels (PCLs) calculated as shown in Attachment 2 of Work Plan

D - Metals per EPA Method 6020, Mercury per EPA Method 7470A

E - Chromium VI

F - PCBs per EPA Method 8082

G - Total Petroleum Hydrocarbons per NWTPH Method

H - Gasoline Range Organics 1,000 µg/L with no detectable benzene in groundwater, 800 µg/L if present in groundwater

I - Dioxins/Furans by EPA Method 1613

J - Per Ecology Comment 44(d) to the Draft Final Work Plan, 2,3,7,8 TCDD has been used as the value for Dioxin/Furan

Upland SAP Table 7
Soil PQLs and PCLs
Metals, PCBs, TPH, Dioxin/Furan
Bay Wood Products Site, Port of Everett
Everett, WA

Analyte	Laboratory MDL [A] (mg/kg)	Laboratory PQL [B] (mg/kg)	Selected PCLs [C] (mg/kg)
Metals[D]			
Antimony	0.315	1	5.1
Arsenic	0.395	1	1
Beryllium	0.025	0.1	25
Cadmium	0.035	0.25	2.0
Chromium [E]	0.115	0.5	3.84
Copper	0.175	1	1.07
Lead	0.12	0.25	108
Nickel	0.49	1	10.69
Selenium	0.46	1	1
Silver	0.125	0.5	0.5
Thallium	0.45	1	1
Zinc	0.44	1.5	39.8
Mercury	0.0015	0.02	0.02
Polychlorinated Biphenyls (PCBs) [F]			
aroclor 1016	0.000077	0.0005	3.89
aroclor 1221	0.000165	0.0005	0.0005
aroclor 1232	0.000175	0.0005	0.0005
aroclor 1242	0.000099	0.0005	0.0005
aroclor 1248	0.000039	0.0005	0.0005
aroclor 1254	0.000122	0.0005	1.11
aroclor 1260	0.000155	0.0005	0.00
Total Petroleum Hydrocarbons (TPH)[G]			
TPH-Gx	-	0.1	100/30 [H]
TPH-Dx	1.3	4	460
Total Dioxin/Furan [I]			
Dioxin/Furan Total	5.10E-08	3.80E-08	0.000011[J]

Notes:

A - Method Detection Limit (MDL) from Environmental Sciences Corp environmental laboratory
B - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory
C - Soil PCLs calculated as shown in Attachment 2 of Work Plan
D - Metals per EPA Method 6020, Mercury per EPA Method 7470A
E - Chromium VI
F - PCBs per EPA Method 8082
G - Total Petroleum Hydrocarbons per NWTPH Method
H - 100 mg/kg for gasoline mixtures without benzene and the total of ethyl benzene, toluene and xylene are less than 1% of the gasoline mixture; 30 mg/kg for all other mixtures
I - Dioxins/Furans by EPA Method 1613
J - MTCA Method B Cleanup Level - Ingestion, per Ecology comment number 89h to DRAFT RI/FS and CAP Work Plan

APPENDIX A

STANDARD SLR FIELD FORMS

Project:		**Boring Location / Sample Name:**
Boring/Sample Location:	**Job #:**	
Drilling Company:	**Logged by:**	
Equipment:	**Start Date/Time:**	
Sampling Method:	**Finish Date/Time:**	
Hammer Weight:	**Monitoring Device:**	
Sample Interval (bgs):	**First Water (bgs):**	

Sample I.D.	Sample Interval	Recovery (%)	PID (ppm)	Blow Counts	Depth (feet bgs)	USCS Code	Graphic Log	Lithologic Description	Boring Abandonment or Well Construction Details
					0 5 10 15 20				

Depth of Boring (bgs):	**Filter Pack:**
Depth of Well (bgs):	**Annulus Seal:**
	Surface Seal:

SLR International Corp

GROUNDWATER SAMPLING FIELD DATA SHEET

PROJECT #: _____ PURGED BY: _____ WELL/BORING I.D.: _____

CLIENT NAME: _____ SAMPLED BY: _____ SAMPLE I.D.: _____

LOCATION: _____ QA SAMPLES: _____

DATE PURGED _____ START (2400hr) _____ END (2400hr) _____

DATE SAMPLED _____ SAMPLE TIME (2400hr) _____

SAMPLE TYPE: Groundwater X Surface Water _____ Treatment Effluent _____ Other _____

CASING DIAMETER:	2"	3"	4"	5"	6"	8"	Other
Casing Volume: (gallons per foot)	(0.17)	(0.38)	(0.67)	(1.02)	(1.50)	(2.60)	( )

DEPTH TO BOTTOM (feet) = _____ CASING VOLUME (gal) = _____

DEPTH TO WATER (feet) = _____ CALCULATED PURGE (gal) = _____

WATER COLUMN HEIGHT (feet) = _____ ACTUAL PURGE (gal) = _____

FIELD MEASUREMENTS

DATE	TIME (2400hr)	VOLUME (L)	TEMP. (degrees C)	CONDUCTIVITY (µS/cm)	pH (units)	DO	ORP	TURBIDITY (visual)

SAMPLE INFORMATION

SAMPLE DEPTH TO WATER: _____ SAMPLE TURBIDITY: _____

80% RECHARGE: ____ YES ____ NO ANALYSES: _____

ODOR: _____ SAMPLE VESSEL / PRESERVATIVE: _____

PURGING EQUIPMENT

____ Bladder Pump
____ Centrifugal Pump
____ Submersible Pump
____ Peristalic Pump
____ Bailer (Teflon)
____ Bailer (PVC)
____ Bailer (Stainless Steel)
____ Dedicated _____

Other: _____

Pump Depth: _____

SAMPLING EQUIPMENT

____ Bladder Pump
____ Centrifugal Pump
____ Submersible Pump
____ Peristalic Pump
____ Bailer (Teflon)
____ Bailer (____ PVC or ____ disposable)
____ Bailer (Stainless Steel)
____ Dedicated _____

Other: _____

WELL INTEGRITY: _____ LOCK#: _____

REMARKS: _____

SIGNATURE: _____ Page ____ of ____

Investigation Derived Waste / Drum Inventory Form

Site Name:	Project Number:
Field Staff:	Date:

Drum Number	Contents	How Full?	Date Generated	Labeled	Boring/Well ID	Chemicals of Interest / Notes
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		
	☐ Soil ☐ Mixture ☐ Water ☐ Other			☐ Yes ☐ No		

Drum placement location:

Drums Sampled, Sample Names, and Analysis:

Notes:

1. Confirm drum placement location with the site contact.
2. Detail the final drum placement location on site map.
3. Confirm final drum count and drum contents.
4. Photograph drum placement location and drum labels.
5. Drum labels should face outward; easy to read.
6. Note any abnormal condition of the drums.
7. Confirm drum sampling requirements with PM.

APPENDIX B

SEDIMENT SAMPLING AND ANALYSIS PLAN

APPENDIX B
SEDIMENT SAMPLING AND ANALYSIS PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY AND DRAFT CLEANUP ACTION PLAN

PORT OF EVERETT
BAY WOOD PRODUCTS SITE
EVERETT, WASHINGTON

Prepared for

Washington Department of Ecology
Olympia, Washington

Port of Everett
Everett, Washington

SLR International Corporation
West Linn, Oregon

Prepared by

Anchor QEA, LLC
Seattle, Washington

May 2009

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%R	percent recovery
ASTM	American Society of Testing and Materials
CAP	Cleanup Action Plan
cm	centimeter
COC	chain of custody
CSL	cleanup screening levels
DGPS	differential global positioning system
DMMP	Dredged Material Management Program
DO	dissolved oxygen
DQOs	data quality objectives
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
GPS	global positioning system
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high density polyethylene
MCUL	minimum cleanup levels
MDL	method detection limit
MLLW	mean lower low water
MS/MSDs	matrix spike/matrix spike duplicates
MTCA	Model Toxics Control Act
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration
PARCC	precision, accuracy, representativeness, comparability, and completeness
PQLs	practical quantitation limits
PSEP	Puget Sound Estuary Program
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RI	Analytical Resources Incorporated
RI/FS	Remedial Investigation/Feasibility Study
RLs	reporting limits
RPD	relative percent difference
SAIC	Science Applications International Corporation
SAP	Sediment Sampling and Analysis Plan

SAPA	Sediment Sampling and Analysis Plan Appendix
SDG	sample delivery group
Site	Bay Wood Products Site
SMARM	Sediment Management Annual Review Meeting
SMS	Sediment Management Standards
SOPs	standard operating procedures
SPI	Sediment profile imaging
SQS	sediment quality standards
SRMs	Standard Reference Materials
TOC	total organic carbon
TVS	total volatile solids
USCS	Unified Soil Classification System
WAC	Washington Administrative Code

1 INTRODUCTION AND BACKGROUND

This Sediment Sampling and Analysis Plan (SAP) has been prepared to describe the proposed scope of work for sediment sampling to support the Remedial Investigation/Feasibility Study (RI/FS) and draft Cleanup Action Plan (CAP) being performed by the Port of Everett at the Bay Wood Products Site (Site) located at 200 West Marine View Drive, Everett, Washington, 98201. The Site may have received releases of hazardous and/or deleterious substances from former on-site tanks and from historical sawmill operations.

This SAP identifies the purpose and objectives of the sediment data collection, and specifies field and quality assurance/quality control (QA/QC) procedures to be implemented during sampling activities and laboratory analyses to meet the requirements of Washington Administrative Code (WAC) 173-340, Model Toxics Control Act (MTCA) and WAC 173-204, Sediment Management Standards (SMS). The Site background and RI/FS objectives are described in the RI/FS Work Plan.

This SAP includes the following:

- Summary of existing data from previous investigations
- Identification of RI/FS data gaps
- Detailed sediment sampling and analysis plans to complete the RI/FS

1.1 Site History

As presented in the draft RI/FS Work Plan (December 18, 2008), to which this SAP is Appendix B, sawmill activities at the Site date back to the 1930s with operations including a sawmill, pre-fabrication shop, dry kilns, re-saw and planer shed, sorting shed, and numerous lumber storage and transfer sheds. The western portion of the upland Site was historically used primarily for lumber storage. A log way was located on the southern portion of the Site and large log rafts were located to the northwest and north of the Site. In 1979, Bay Wood Products, Inc., dismantled the sawmill and began using the Site as a log storage and processing yard.

1.2 Regulatory Framework

Regulation of contaminated sediments in the marine environment of Washington State falls under the authority of the Washington State Department of Ecology (Ecology). In 1991,

Ecology adopted the SMS (Chapter 173-204 WAC) for designating marine sediments that have acute or chronic adverse effects on aquatic organisms. Two sets of standards were established under the SMS: sediment quality standards (SQS) and cleanup screening levels (CSL).

The SQS criteria correspond to sediment quality that will result in no adverse effects, including acute or chronic adverse effects on biological resources and no significant health risk to humans. The SQS includes chemical concentration criteria for 47 chemicals or chemical groups (Table 1). If sediment chemical concentrations exceed SQS chemical concentration criteria, the sediments being evaluated are designated as having a potential adverse effect on biological resources. Sediments exceeding the SQS chemical criteria may be re-evaluated using biological tests described in WAC 173-204-315 and summarized in Table 2 to confirm or refute the original designation.

If sediments exceed SQS chemical or biological criteria, they are subject to sediment cleanup standards set forth in WAC 173-204-520, which establishes sediment chemical and/or biological screening concentrations that determine if contaminated sediments require cleanup. CSLs set the maximum degree of contamination at a site before cleanup is required. Similarly, minimum cleanup levels (MCUL) establish the maximum degree of contamination to be allowed at a site after cleanup and are used in the evaluation of cleanup alternatives as specified in the SMS. Minimum cleanup levels are set at the same concentration as CSLs (see Tables 1 and 2).

There is no promulgated SMS criterion for wood debris in sediment, and cleanup levels for wood debris are approved by Ecology on a case-by-case basis. At several other wood debris sites in Puget Sound, including at the head of the Hylebos Waterway in Tacoma and at the Former Scott Mill in Anacortes, a suite of confirmatory biological tests have been performed on synoptic surface sediment samples collected from locations representing a range of wood debris content with the potential for deleterious effects. These data were then used to develop site-specific sediment cleanup levels for wood debris. Based on Ecology's interpretation of these data, surface sediment total volatile solids (TVS) levels less than approximately 12 percent (dry weight basis) and/or wood debris levels less than 25 percent

(by volume) should have less potential for site-specific effects exceeding SQS biological criteria.

The point of compliance for sediment cleanup is approved by Ecology on a case-by-case basis, but is typically the biologically active zone, which is operationally defined as surface sediments collected across the 0 to 10 centimeter (cm; 0 to 4 inch) interval below the mudline.

1.3 Existing Sediment Quality Data

From July to September 2008, Ecology and Science Applications International Corporation (SAIC) collected samples of sediments and biological tissue from numerous locations throughout Port Gardner Bay to help prioritize cleanup and restoration efforts in this area. Port Gardner Bay is one of seven Puget Sound areas receiving early-action, high-priority attention under the Puget Sound Initiative, a comprehensive effort by state governments and other stakeholders to restore and protect Puget Sound. The Ecology/SAIC sampling in Port Gardner Bay included:

- Sediment profile imaging (SPI), in which a camera penetrated the top 8 to 10 inches of sediments and photographed a cross section of the surface sediment layers
- Collection of fish, clam, and crab tissues for chemical analysis
- Collection of surface sediment grab samples from locations throughout Port Gardner Bay for chemical and biological analyses, with specific station locations selected based on the SPI data
- Video probe and sediment coring at targeted locations for chemical analyses, again based on the SPI data

A total of three surface grabs (Stations A2-23, A2-25, and A2-25B; samples collected 0 to 10 cm below mudline) and one core (Station A2-25; samples collected 1 to 3 feet and 3 to 5 feet below mudline) were collected by Ecology/SAIC in the Site area, and the samples were submitted for a wide suite of physical, chemical, and biological analyses. Station locations are depicted on Figure 1.

The results of the chemical analyses have not been finalized by Ecology, but the data should be available prior to completion of this investigation and the information will be used to augment the data collected by this study.

1.4 Sediment Data Gaps

Based on a review of the available data, and consistent with the discussion in the draft RI/FS and draft CAP Work Plan (SLR, December 18, 2008), the following sediment data gaps have been identified to complete the RI/FS at the Site:

- Characterize the volume of significant wood debris accumulations at the Site particularly at locations close to the former log way on the southern portion of the Site and along the shoreline from the log way around to the western shore where two log transfer facilities were located. The log rafting area to the north and much of the shoreline likely received the greatest log handling activity
- Assess Site sediments for diesel and motor oil-range hydrocarbons and SMS analytes, particularly at locations closest to former oil storage tanks located in the southern portion of the Site
- Verify compliance with SMS using bioassays at locations affected by wood debris and/or petroleum hydrocarbons
- Collect data as necessary to refine comparative analyses of remedial alternatives, including:
    - Performing a shoreline reconnaissance to assess and map the location of woody debris along the Site shoreline
    - Logging the vertical and horizontal distribution of wood debris at the Site to refine prospective remedial actions in this area, as necessary
    - Performing selected physical, chemical, and/or biological analyses to assess disposal options (e.g., potential open-water disposal at the Dredged Material Management Program [DMMP] site in Port Gardiner Bay) and to evaluate the effectiveness of possible cap designs, as appropriate

2 SEDIMENT WORK PLAN RATIONALE AND DESIGN

Based on the information summarized in Section 1, a phased sampling program will be performed, beginning with collection of approximately 12 surface sediment samples located throughout the Site area, and analysis of each sample for conventional parameters (grain size, wood debris percentage, TVS, total organic carbon [TOC], bulk sediment and porewater ammonia and sulfide, and diesel and motor oil-range hydrocarbons). A subset of these samples will be analyzed for the complete SMS suite of chemicals and dioxins/furans. Following collaborative evaluation of the data with Ecology, stations with relatively high wood debris and/or hydrocarbon indicators (e.g., relative to cleanup levels developed for other similar sites) would receive follow-on sampling to refine the nature and extent of wood debris and diesel and motor oil-range hydrocarbons at the Site, including sediment borings to define vertical distributions and confirmatory biological determinations to assess potential sediment toxicity. Figure 1 presents proposed sediment sampling stations for the first phase effort. Additional details on the supplemental sediment investigations are provided in the following sections.

2.1 Sampling Objectives and Design

Specific sampling objectives addressed by this SAP are summarized as follows:

- A shoreline reconnaissance will be performed to assess and map the location of woody debris along the Site shoreline. This assessment will consist of a visual assessment of the presence of woody debris including bark and accumulations of larger woody pieces and logs; hand auger and shovel borings in identified accumulation areas to assess the thickness of the woody debris accumulation; photographic documentation; and mapping of these locations using a global positioning system (GPS) onto the Site base-map. This assessment will include assessment of the upper bank areas and near-shore mudflats (during low tide).
- Using a phased sampling program, complete characterization of the nature and extent of wood debris indicator parameters (grain size, percent solids, wood debris percentage, TVS, TOC, and bulk sediment and porewater ammonia and sulfide) and diesel and motor oil-range hydrocarbons in surface sediments at the 12 stations depicted on Figure 1 (BW-1 to BW-12).
- Assess Site sediments for hazardous substances at concentrations exceeding SQS chemical criteria by performing analysis of the full suite of SMS chemicals (excluding tributyltin) on surface sediment samples collected from Stations BW-1, BW-3, BW-7,

BW-9, BW-11, and BW-12 (see Figure 1). Surface samples collected from Stations BW-1, BW-3, BW-7, BW-9, and either BW-11 or BW-12 (depending on field observations and as agreed upon by Ecology) will also be analyzed for dioxins/furans.

- Based on a collaborative review of these data with Ecology, supplemental sediment borings and confirmatory bioassays may need to be performed to complete characterization of the horizontal and vertical distribution of wood debris and diesel and motor oil-range hydrocarbons.
- If significant wood debris or diesel/motor oil-range hydrocarbons are identified at the Site based during sediment coring, 0 to 4-foot and/or 4 to 8-foot composite sediment samples within the primary accumulation area(s) may be collected and analyzed for a wide range of physical, chemical, and biological parameters to further characterize chemicals of potential concern and to concurrently assess possible open-water disposal options for these materials. Each of these samples may be analyzed for the full suite of DMMP chemical parameters (including dioxins and furans), along with confirmatory sediment bioassays following DMMP protocols.

The supplemental data collection program described herein, when combined with the data currently available for the Site (summarized in Section 1.3), is expected to complete site characterization for the purpose of the RI/FS, and provide data to inform the subsequent CAP and remedial design, as necessary. Sediment sampling at the Site will be completed under the schedule presented in the main Work Plan (Section 2).

The methods and procedures for the collection of field samples, sampling schedule, rationale for the sampling design, and design assumptions for locating and selecting environmental samples are detailed in the following sections. In general, all sampling procedures will comply with Ecology protocols or other approved sample collection standards established for the study area.

3 FIELD SAMPLING METHODS

This supplemental sediment SAP describes activities to complete the RI/FS and plan for possible future sediment cleanup actions at the Site. The methods and procedures described herein will be followed by Anchor QEA, LLC, SLR, and their subcontractors during various data collection activities. Specific sample collection methods are described in the following sections.

3.1 Surface Sample Collection and Processing

This section describes the number and type of surface sediment samples to be collected, the sampling platform, and sample collection and processing techniques.

A minimum of 12 surface grab (0 to 10 cm) samples will be collected for physical and chemical analysis, with sampling locations depicted in Figure 1.

3.1.1 Sampling Platform

Surface sediment samples will be collected with a modified van Veen sampler using a vessel equipped with differential global positioning system (DGPS) and a depth sounder.

3.1.2 Station and Sample Identification

Each individual sediment sample will be assigned a unique alphanumeric identifier using the format described below:

- Each sample is identified by "BW" for Bay Wood sediment sampling
- Individual surface sediment samples at each location will be identified by the same alphanumeric used to identify the station followed by a two digit matrix identifier of SS and the four digit date code YYMMDD format (e.g., BW07-SS-090401 represents the surface sediment sample collected from Station BW07 on April 1, 2009).
- Each sediment surface grab sample for bioassay analyses will be identified by "BIO-" for sediment bioassay analysis, which replaces "SS" in the sample ID
- The homogenization duplicate collected from a surface sediment sample will be followed with -XXSS-YYMMDD, where XX is the station number plus 50, and the date is appended in the YYMMDD format.

3.1.3 Sample Collection and Processing

Surface sediment samples for laboratory analyses from the 0 to 10-cm biologically active zone will be collected for physical, chemical, and biological testing using a van Veen grab sampler in accordance with PSEP (1997) and SAPA (Ecology 2008) protocols or by hand using a stainless steel bowl and spoon.

If samples are collected by hand at a tidal level that exposes the sediments, samples will be collected in the following manner:

- The station will be located.
- Sampling equipment will be decontaminated.
- A square (measuring 1 square meter) will be established.
- Roughly equal volumes of 0 to 10 cm sediment will be collected from each corner of the square using stainless steel trowel and placed in a stainless steel bowl.
- Location coordinates will be recorded.
- Observations (i.e., texture, odor, presence/absence of vegetation, debris, and any other distinguishing characteristics) will be recorded on the sample collection forms.

The van Veen sampler is used to collect large volume, surficial sediment samples. The sampler utilizes a hinged jaw assembly for sample collection. Upon contact with sediments, the jaws are drawn shut to collect the sample. If the van Veen sampler is used samples will be collected in the following manner:

- Vessel will maneuver to proposed location.
- Jaw assembly will be decontaminated and deployed.
- The winch cable to the grab sampler will be drawn taut and vertical.
- Location of the cable hoist will be measured and recorded by the location control personnel.
- The jaw assembly will be closed to collect the sediment sample to a penetration depth of approximately 20 cm.
- The sediment sample will be retrieved aboard the vessel and evaluated against the following PSEP acceptability criteria:
  - Grab sampler is not overfilled (i.e., sediment surface is not against the top of sampler)

  - Sediment surface is relatively flat, indicating minimal disturbance or winnowing (For the wood debris characterization samples, acceptable grab samples will allow for minor surface disturbance)
  - Overlying water is present, indicating minimal leakage
  - Overlying water has low turbidity, indicating minimal sample disturbance
  - Desired penetration depth is achieved
- Overlying water will be siphoned off and a stainless steel trowel or similar device will be used to collect a 0 to 10 cm sediment layer from inside the sampler, taking care not to collect sediment in contact with the sides/surface of the sampler.
- The collected sediment will be placed in a stainless steel mixing container. When sufficient sample volume has been collected, the sediment will be homogenized using a stainless steel spoon.
- Homogenized sediment will be placed immediately into appropriate pre-labeled sample containers (pre-cleaned HDPE) and placed immediately on ice for transport to the appropriate laboratory.

3.2 Sediment Coring

Depending on the results of the sediment grab sampling discussed above and following collaborative evaluation of these data with Ecology, sediment cores may be advanced and sampled for physical, chemical, biological analyses.

3.2.1 Sampling Platform

Core sediment sample collection will be conducted off of a vessel operated under the direction of a qualified operator. The vessel will be equipped with a frame and winch, seawater pumps, DGPS, and a depth sounder. All cores will be processed on land and fully logged.

3.2.2 Station and Sample Identification

Each individual sediment sample will be assigned a unique alphanumeric identifier using the format described below:

- Each sample is identified by "BW" for Bay Wood Product site sediment sampling.

- A two-digit matrix identifier of SC for sediment core.
- The four-digit date code YYMMDD format.
- A core interval identifier of A, B, C, etc., where A represents the top interval, and B represents the second interval, etc. (e.g., BW03-SC-090401-D represents a the sediment core interval collected from Station BW03 on April 1, 2009, from the D interval)
- The homogenization duplicate collected from a sediment sample will be identified by adding 50 to the station number. For example, BW53-SC-090401-D represents the field duplicate for the "D" interval from station BW03.
- One core interval of the native material will be collected. This interval will be designated "Z" and, if possible, will be a 15-cm interval that starts 15 cm below the native interface.
- Surface bioassay samples, as needed, would be designated "BW-BIO-."

3.2.3 Sediment Core Collection

Sediment cores will be collected at each location using a diver operated impact coring device. The corer will use a decontaminated aluminum barrel for collecting the sediment. The corer will be deployed by winch and sent to the bottom, where the unit will then be energized and lowered to the target coring depth. When that depth is reached, the corer will be turned off and returned to the surface for sample processing. During the coring operation, the penetration of the core barrel will be continuously monitored. The following procedure will be used to decontaminate sample tubes prior to use:

- Rinse and pre-clean with potable water
- Wash and scrub the tubes in a solution of laboratory grade, non-phosphate based soap and potable water
- Rinse with potable water
- Rinse three times with distilled water
- Seal both ends of each core tube with aluminum foil

The core tube caps will be removed immediately prior to placement into the coring device. Care will be taken during sampling to avoid contact of the sample tube with potentially contaminated surfaces. Extra sample tubes will be available during sampling

operations for uninterrupted sampling in the event of a potential core tube breakage or contamination. Core tubes suspected to have been accidentally contaminated will not be used. Logs and field notes of all core samples will be maintained as samples are collected and correlated to the sampling location map. The following information will be included in this log:

- Mudline elevation of each boring station sampled relative to MLLW
- Location of each boring station as determined by DGPS
- Date and time of collection of each sediment core sample
- Names of field supervisor and person(s) collecting and logging the sample
- Observations made during sample collection including: weather conditions, complications, ship traffic, and other details associated with the sampling effort
- The sample station number
- Length and depth intervals of each core section relative to MLLW and recovery for each sediment sample; acceptable core samples will achieve a minimum of 70 percent recovery
- Qualitative notation of apparent resistance of sediment column to coring
- Any deviation from the approved sampling plan

Core tubes will be capped and placed on a rack for processing.

3.2.4 Core Processing

The core tube will be cut length-wise with an electric saw. Care will be taken to prohibit contact of the saw blade with the sediment. Each core section will be logged throughout the full penetration depth. A sediment description of each core sample will be recorded on the core log for the following parameters as appropriate and present:

- Sample recovery (depth in feet of penetration and estimated sample compaction)
- Physical soil description in accordance with the Unified Soil Classification System (USCS; includes soil type, density/consistency of soil, color)
- A description of wood debris including size of debris and percent by volume in each core section
- Odor (e.g., hydrogen sulfide, petroleum)
- Vegetation
- Debris

- Any other distinguishing characteristics or features

The cores will be sectioned in representative intervals based on core lithology starting at the mudline, and up to four samples per core will be collected representing non-native material (i.e., wood debris). The last interval of non-native material will end 15 cm above the native interface.

One sample of the native material (Z-layer samples) will also be collected. If possible, the "Z" samples will be collected 15 cm below the native interface and will consist of a 15-cm interval.

The sediment retrieved from each core that will contribute to a given sample will be homogenized by thoroughly mixing with stainless steel utensils until the sediment appears uniform in color and texture, except that porewater samples will not be homogenized. For porewater, homogenization is not performed to minimize disruption of the sample.

The homogenized sample material will be placed into the appropriate sample jars and stored on ice until shipment to the appropriate laboratories. The homogenate will be mixed throughout the process of filling sample jars to ensure that each sample jar is representative of the homogenate mixture. After placement of sample material into sample containers, each container will be firmly sealed, clearly labeled with the name of the project, sample number, type of analysis, date, time, and initials of the person preparing the sample. This information will be recorded in the logbook and on the chain of custody (COC) forms. Following proper sealing and labeling, all sample containers will be placed on ice in a cooler or container and maintained at 4°C.

3.3 Horizontal and Vertical Control

Horizontal positioning at each sampling location will be determined using an on-board DGPS. Station positions will be recorded in latitude and longitude to the nearest 0.01 second. The accuracy of the horizontal coordinates will be within 3 meters. All position coordinates submitted for inclusion in the EIM database will be provided in the NAD 83, Washington State North Zone horizontal datum.

Mudline elevation of each sampling station will be determined relative to MLLW by measuring the water depth with a calibrated fathometer or lead line and subtracting the tidal elevation. Tidal elevations will be determined using predicted tide charts available through Tides and Currents® navigation software.

3.4 Equipment Decontamination Procedures

Sample containers, instruments, working surfaces, technician protective gear, and other items that may come into contact with sediment sample material must meet high standards of cleanliness. All equipment and instruments used that are in direct contact with the sediment collected for analysis will be made of glass, stainless steel, or HDPE, and will be cleaned prior to each day's use and between sampling or compositing events. Decontamination of all items will follow PSEP protocols. The decontamination procedure follows:

- Pre-wash rinse with site water
- Wash with solution of laboratory grade non-phosphate based soap (brush)
- Rinse with site water
- Rinse three times with laboratory grade distilled water
- Cover (no contact) all decontaminated items with aluminum foil
- Store in clean, closed container for next use

3.5 Sample Containers

The analytical lab will provide certified, pre-cleaned, Environmental Protection Agency (EPA) approved containers for all samples. Prior to shipping, the analytical laboratory will add preservative, where required, according to Puget Sound Estuary Program (PSEP) (PSEP 1997) and *Sediment Sampling and Analysis Plan Appendix* (SAPA; Ecology 2008) protocols.

3.6 Sample Identification and Labels

Each sample will have an adhesive plastic or waterproof paper label affixed to the container and will be labeled at the time of collection. The following information will be recorded on the container label at the time of collection:

- Project name
- Sample identification

- Date and time of sample collection
- Preservative type (if applicable)

Samples will be uniquely identified with a sample identification that at a minimum specifies sample matrix, sample number, sample location, and type of sample.

4 SAMPLE HANDLING PROCEDURES

This section describes sample storage requirements, COC procedures, and sample shipping to the analytical laboratory.

4.1 Sample Storage and Chain-of-Custody Requirements

Guidelines for sample handling, storage, and holding times are provided in Table 4.

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with an official seal(s) such that the sample cannot be reached without breaking the seal(s).

COC procedures will be followed for all samples throughout the collection, handling, and analysis process. Each sample will be represented on a COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines/spaces on the COC form will be lined-out, dated, and initialed by the individual maintaining custody.

A COC form will accompany each cooler of samples to the analytical laboratories. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

4.2 Sample Shipping Requirements

All samples will be shipped or delivered to the analytical laboratory no later than the day after collection. Samples collected on Friday may be held until the following Monday for shipment/delivery provided that this does not jeopardize any hold time requirements. Specific sample shipping procedures follow. If samples are hand-delivered to the laboratory, samples will be placed on ice and accompanied by a COC, but other steps will not be required.

- Each cooler or container containing the samples for analysis will be shipped via overnight delivery to the appropriate analytical laboratory. In the event that

Saturday delivery is required, the Field Operations Coordinator will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of coolers shipped and the airbill tracking letters for those coolers. Following each shipment, the Field Operations Coordinator will call the laboratory and verify the shipment from the day before has been received and is in good condition.

- Coolant ice will be sealed in separate double plastic bags and placed in the shipping containers.
- Individual sample containers will be placed in a sealable plastic bag, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock absorbent material (e.g., bubble wrap) to prevent breakage.
- The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container and consultant's office name and address) to enable positive identification.
- The shipping waybill number will be documented on all COC forms accompanying the samples.
- A sealed envelope containing COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- A minimum of two signed and dated COC seals will be placed on adjacent sides of each cooler prior to shipping.
- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up," and will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the lab to track sample handling and final disposition.

5 LABORATORY ANALYTICAL METHODS

This section describes chemical and biological analyses to be performed for this RI/FS.

5.1 Physical and Chemical Testing

ARI, an Ecology-certified laboratory located in Tukwila, Washington, will conduct all physical and chemical testing for sediments (Accreditation # C1235). Sediment samples for dioxin and furan analyses by EPA Method 1613 will be analyzed by Test America Laboratories, located in West Sacramento, California. This laboratory is Ecology-certified for dioxin/furan analysis by EPA Method 1613 (Accreditation # C1281).

All chemical/physical testing will adhere to the most recent PSEP QA/QC procedures (PSEP 1997) and PSEP analysis protocols. Method 9060 (EPA 1986) will be used for the analysis of TOC because the analytical method for TOC in PSEP (1986) is now out of date.

The overall chemistry project data quality objectives (DQOs) for the sediment investigation are summarized in Table 5. The laboratory quality control sample analysis frequencies are provided in Table 6. Sediment chemistry analytical methods and target detection limits are presented in Table 7 and the SAPA suggested analytical methods and cleanup techniques are presented in Table 8 for reference.

In addition to the field QA/QC procedures that will be implemented, one of the samples submitted for chemical analysis will be analyzed as a laboratory matrix spike/matrix spike duplicate (MS/MSD). Additional laboratory quality control will include method blanks, method blank spikes, surrogate compound analysis, and standard reference material analysis.

In completing chemical analyses for this project, the laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in the Quality Assurance Project Plan (QAPP) presented in Section 6, including methods referenced for each analytical procedure
- Provide a detailed discussion to any modifications made to approved analytical methods (e.g., standard operating procedures [SOPs])
- Deliver fax, hard copy, and electronic data as specified

- Meet reporting requirements for deliverables
- Meet turnaround times for deliverables
- Implement QA/QC procedures, including data quality requirements, laboratory QA requirements, and performance evaluation testing requirements
- Allow laboratory and data audits to be performed, if deemed necessary

5.2 Biological Testing

NewFields Northwest, an Ecology-certified laboratory located in Port Gamble, Washington, will conduct the bioassay testing (Accreditation # C2021). Bioassay testing requires that test sediments be matched and run with appropriate reference sediment to factor out background conditions and sediment grain size effects on bioassay organisms. Reference sediments from Carr Inlet will be collected concurrently with the Site samples.

All bioassay sediment samples will be stored at 4°C, with no headspace, or under a nitrogen atmosphere (i.e., nitrogen-purged headspace). All bioassays will commence within 14 days from collection of the first grab sample to be tested. If necessary, retests will commence within 56 days from collection of the first grab sample to be tested. The laboratory will maintain COC procedures throughout biological testing.

Three bioassays, including amphipod mortality, larval development, and juvenile polychaete growth tests, will be conducted on samples identified for biological testing based on collaborative evaluation with Ecology of the initial grab sampling data (Figure 1). All biological testing will be in compliance with PSEP (1995) and the Sediment SAPA (Ecology 2003, revised 2008), with appropriate modifications as specified by the Sediment Management Annual Review Meeting (SMARM). Ammonia reference toxicant tests may be conducted if elevated ammonia concentrations are identified in porewater. General biological testing procedures and specific procedures for each sediment bioassay are summarized in the following sections.

5.2.1 Amphipod Mortality Bioassay

Because of variable porewater salinities anticipated at the Site, the test organism to be used for this SAP is *Ampelisca abdita.* The tests will be run for a 10-day exposure period,

followed by counting of the surviving animals. Daily emergence data and the number of amphipods failing to rebury at the end of the test will be recorded.

5.2.2 Larval Development Bioassay

The blue mussel (*Mytilus galloprovincialis)* or similar seasonally appropriate species, such as the sand dollar, D*endraster excentricus*, will be used for the larval development test. The sediment larval bioassay has a variable endpoint (not necessarily 48 hours) that is determined by the developmental stage of organisms in a sacrificial seawater control (PSEP 1995). At the end of the test, larvae from each test sediment replicate exposure are examined to quantify abnormality and mortality.

5.2.3 Juvenile Polychaete Growth Bioassay

The polychaete (*Neanthes* sp.) will be used for the chronic juvenile polychaete growth test. The sediment juvenile polychaete bioassay will be run for a 20-day exposure period, followed by counting and weighing of the surviving animals (PSEP 1995). At the end of the test, mean individual growth rate is calculated for each replicate exposure as the difference between final and initial weights divided by the exposure duration.

6 QUALITY ASSURANCE PROJECT PLAN

This QAPP establishes QA objectives and functional activities associated with supplemental sediment sampling to complete the RI/FS and plan for possible future sediment cleanup actions at the Site. The methods and QA procedures described herein will be followed during various data collection activities.

The goal of this QAPP is to ensure that data of sufficiently high quality are generated to support the DQOs. This section describes project management responsibilities, sampling and analytical QA/QC procedures, assessment and oversight, and data reduction, validation, and reporting. This QAPP was prepared following Ecology *Guidance for Quality Assurance Project Plans* (Lombard and Kirchmer 2004) and Ecology's SAPA guidance (Ecology 2008). Analytical QA/QC procedures were also developed based on the analytical protocols and quality assurance guidance of the PSEP (PSEP 1986, 1997). The SAPA recommended quality control limits for organic chemicals are presented in Table 9, recommended quality control procedures for metals are presented in Table 10, and recommended quality control procedures for conventionals are presented in Table 11.

Field and laboratory activities must be conducted in such a manner that the results meet specified quality objectives and are fully defensible. Guidance for QA/QC is derived from the protocols developed for the PSEP (1997), EPA SW-846, the EPA Contract Laboratory Program, and the cited methods.

6.1 Field Quality Control

Sampling personnel will identify and label samples in a consistent manner to ensure that field samples are traceable and that labels provide all information necessary for the laboratory to conduct required analyses properly. Samples will be placed in appropriate containers and preserved for shipment to the laboratory.

6.1.1 Field Quality Assurance Sampling

Field QA procedures will consist of following SOPs for acceptable practices for collecting and handling of samples. Adherence to these procedures will be complemented by periodic and routine equipment inspection.

Field QA samples will be collected along with the environmental samples. Field QA samples are useful in identifying possible problems resulting from sample collection or sample processing in the field. The collection of field QA samples includes homogenized field duplicates and MS/MSDs as described below. Field duplicates will be collected at a frequency of one per 10 samples collected. MS/MSD samples will be collected at a frequency of one per sampling event or one in 20 samples processed, whichever is more frequent.

Field duplicate samples will be prepared by homogenizing sufficient sample volume for two sets: one field sample and one blind field duplicate. The blind field duplicate will be labeled with a fictitious sample location name and will be analyzed for the same constituent list as the original sample. The actual sample location will be recorded in the field notes but will not be identified to the analytical laboratory.

The MS/MSD samples will also include the collection of additional sample volume, to ensure that the laboratory has sufficient sample volume to run the program-required analytical QA/QC samples for analysis. MS/MSD samples will be identified as on sample labels and the COC, and will retain the same sample identifier as the original sample. All field QA samples will be documented in the field logbook and verified by the QA/QC Coordinator or designee.

6.1.2 Field Instruments/Equipment

In accordance with the QA program, field staff shall maintain an inventory of field instruments and equipment. The frequency and types of maintenance will be based on the manufacturer's recommendations and/or previous experience with the equipment.

The Field Operations Coordinators will be responsible for the preparation, documentation, and implementation of the preventative maintenance program. The equipment maintenance information will be documented in the instrument's calibration log. The frequency of maintenance is dependent on the type and stability of the equipment, the methods used, the intended use of the equipment, and the recommendations of the manufacturer. Detailed information regarding the calibration

and frequency of equipment calibration is provided in specific manufacturer's instruction manuals.

All maintenance records will be verified prior to each sampling event. The Field Operations Coordinator will be responsible for verifying that required maintenance has been performed prior to using the equipment in the field.

The subcontractor responsible for navigation will confirm proper operation of the navigation equipment daily. This verification may consist of internal diagnostics or visiting a location with known coordinates to confirm the coordinates indicated by the navigation system. No other field equipment requires testing or calibration. The winch line and grab sampler will be inspected daily for fraying, misalignment of jaws, loose connections, and any other applicable mechanical problems. Any problems will be noted in the field logbook and corrected prior to continuing sampling operations.

6.2 Laboratory Quality Control

Laboratory QC procedures, where applicable, include initial and continuing instrument calibrations, standard reference materials, laboratory control samples, matrix replicates, MS, surrogate spikes (for organic analyses), and method blanks. Results of the quality control samples from each sample group will be reviewed by the analyst immediately after a sample group has been analyzed. The quality control sample results will then be evaluated to determine if control limits have been exceeded. If control limits are exceeded in the sample group, the QA Coordinator will be contacted immediately, and corrective action (e.g., method modifications followed by reprocessing the affected samples) will be initiated prior to processing a subsequent group of samples.

6.2.1 Laboratory Instruments/Equipment

In accordance with the QA program, the laboratories shall maintain an inventory of instruments and equipment and the frequency of maintenance will be based on the manufacturer's recommendations and/or previous experience with the equipment.

The laboratory preventative maintenance program, as detailed in their QA Plan, is organized to maintain proper instrument and equipment performance, and to prevent

instrument and equipment failure during use. The program considers instrumentation, equipment, and parts that are subject to wear, deterioration, or other changes in operational characteristics, the availability of spare parts, and the frequency at which maintenance is required. Any equipment that has been overloaded, mishandled, gives suspect results, or has been determined to be defective will be taken out of service, tagged with the discrepancy noted, and stored in a designated area until the equipment has been repaired. After repair, the equipment will be tested to ensure that it is in proper operational condition. The client will be promptly notified in writing if defective equipment casts doubt on the validity of analytical data.

Laboratories will be responsible for the preparation, documentation, and implementation of the preventative maintenance program. All maintenance records will be checked according to the schedule on an annual basis and recorded by the responsible individual. The Laboratory QA Manager, or designee, shall be responsible for verifying compliance.

6.2.2 Laboratory Instrument Calibration

As part of their QC program, laboratories perform two types of calibrations. A periodic calibration is performed at prescribed intervals (i.e., balances, drying ovens, refrigerators and thermometers), and operational calibrations are performed daily, at a specified frequency, or prior to analysis (i.e., initial calibrations) according to method requirements. Calibration procedures and frequency are discussed in the laboratory QA Plan. Calibrations are discussed in the laboratory SOPs for analyses. If the initial or ongoing calibration is out of control, the analysis must come to a halt until the source of the control failure is eliminated or reduced to meet control specifications. All project samples analyzed while instrument calibration was out of control will be reanalyzed.

The Laboratory QA/QC Coordinator will be responsible for assuring that the laboratory instrumentation is calibrated in accordance with specifications. Implementation of the calibration program shall be the responsibility of the respective Laboratory Group Supervisors. Recognized procedures (EPA, ASTM, or manufacturer's instruction) shall be used when available.

Physical standards (i.e., weights or certified thermometers) shall be traceable to nationally recognized standards such as the National Institute of Standards and Technology (NIST). Chemical reference standards shall be NIST Standard Reference Materials (SRMs) or vendor certified materials traceable to these standards.

The calibration requirements for each method and respective corrective actions shall be accessible, either in the laboratory SOPs or the laboratory's QA Plan for each instrument or analytical method in use. All calibrations shall be preserved on electronic media.

6.2.3 Laboratory Replicates/Duplicates

Analytical replicates provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Analytical replicates are subsamples of the original sample that are prepared and analyzed as a separate sample. Analytical duplicates are performed, for example, to confirm an analytical result. The analytical duplicates are therefore two separate tests of the sample run for comparison of results and provide information on the precision of the method and the homogeneity of the sample matrix.

6.2.4 Matrix Spikes and Matrix Spike Duplicates

Analysis of MS samples provides information on the extraction efficiency of the method on the sample matrix. By performing duplicate matrix spike analyses, information on the precision of the method is also provided for organic analyses.

6.2.5 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. The method blank for all analyses must contain less than five times the reporting limit of any single target analyte/compound. If a laboratory method blank exceeds this criterion for any analyte/compound, and the concentration of the analyte/compound in any of the samples is less than five times the concentration found in the blank, analyses must stop and the source of contamination must be eliminated or reduced.

6.2.6 Laboratory Control Samples

Laboratory control samples are analyzed to assess possible laboratory bias at all stages of sample preparation and analysis. The laboratory control sample is a matrix-dependent spiked sample prepared at the time of sample extraction along with the preparation of sample and MSs. The laboratory control sample will provide information on the accuracy of the analytical process, and when analyzed in duplicate, will provide precision information as well.

6.2.7 Laboratory Deliverables

Data packages will be checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested are present. Data quality will be assessed based on PSEP (1997) protocols by considering the following:

- Holding times
- All compounds of interest reported
- Detection and Reporting limits
- Surrogate spike results
- MS/MSD results
- Laboratory control samples/laboratory control sample duplicates
- Standard reference material results
- Method blanks

6.3 Data Quality Objectives and Criteria

The DQO for this project is to ensure that the data collected are of known and acceptable quality so that the project objectives described above can be achieved. The quality of the laboratory data is assessed by precision, accuracy, representativeness, comparability, and completeness (the "PARCC" parameters). Definitions of these parameters and the applicable QC procedures are given below. Applicable quantitative goals for these data quality parameters are listed or referenced below.

6.3.1 Precision

Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling, and in laboratory analysis. The American Society of Testing and Materials

(ASTM 2002) recognizes two levels of precision: repeatability—the random error associated with measurements made by a single test operator on identical aliquots of test material in a given laboratory, with the same apparatus, under constant operating conditions; and reproducibility—the random error associated with measurements made by different test operators, in different laboratories, using the same method but different equipment to analyze identical samples of test material.

In the laboratory, "within-batch" precision is measured using replicate sample or QC analyses and is expressed as the relative percent difference (RPD) between the measurements. The "batch-to-batch" precision is determined from the variance observed in the analysis of standard solutions or laboratory control samples from multiple analytical batches.

Field precision will be evaluated by the collection of blind field duplicates for chemistry samples at a frequency of one in 20 samples. Field chemistry duplicate precision will be screened against a RPD of 50 percent for sediment samples and 35 percent for water samples. However, no data will be qualified based solely on field homogenization duplicate precision.

Precision measurements can be affected by the nearness of a chemical concentration to the method detection limit (MDL), where the percent error (expressed as RPD) increases. The equation used to express precision is as follows:

$$RPD = \frac{(C_1 - C_2) \times 100\%}{(C_1 + C_2)/2}$$

Where:

RPD = relative percent difference

C_1 = larger of the two observed values

C_2 = smaller of the two observed values

6.3.2 Accuracy

Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value. Accuracy is determined by calculating the mean value of results from ongoing analyses of laboratory-fortified blanks, standard reference materials, and standard solutions. In addition, laboratory-fortified (i.e., matrix-spiked) samples are also measured; this indicates the accuracy or bias in the actual sample matrix. Accuracy is expressed as percent recovery (%R) of the measured value, relative to the true or expected value. If a measurement process produces results whose mean is not the true or expected value, the process is said to be biased. Bias is the systematic error either inherent in a method of analysis (e.g., extraction efficiencies) or caused by an artifact of the measurement system (e.g., contamination). Analytical laboratories utilize several QC measures to eliminate analytical bias, including systematic analysis of method blanks, laboratory control samples, and independent calibration verification standards. Because bias can be positive or negative, and because several types of bias can occur simultaneously, only the net, or total, bias can be evaluated in a measurement.

Laboratory accuracy will be evaluated against quantitative matrix spike and surrogate spike recovery performance criteria provided by the laboratory. Accuracy can be expressed as a percentage of the true or reference value, or as a %R in those analyses where reference materials are not available and spiked samples are analyzed. The equation used to express accuracy is as follows:

$$\%R = 100\% \times (S-U)/Csa$$

Where:

%R = percent recovery
S = measured concentration in the spiked aliquot
U = measured concentration in the unspiked aliquot
Csa = actual concentration of spike added

Field accuracy will be controlled by adherence to sample collection procedures outlined in this SAP.

6.3.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represents an environmental condition. For the Bay Wood Products site, the list of analytes has been identified to provide a comprehensive assessment of the potential contaminants in potentially stemming from historical activities at the Site.

6.3.4 Comparability

Comparability expresses the confidence with which one dataset can be evaluated in relation to another dataset. For this program, comparability of data will be established through the use of standard analytical methodologies and reporting formats, and of common traceable calibration and reference materials.

6.3.5 Completeness

Completeness is a measure of the amount of data that is determined to be valid in proportion to the amount of data collected. Completeness will be calculated as follows:

$$C = \frac{\text{(Number of acceptable data points)} \times 100}{\text{(Total number of data points)}}$$

The DQO for completeness for all components of this project is 100 percent. Data that have been qualified as estimated because the QC criteria were not met will be considered valid for the purpose of assessing completeness. Data that have been qualified as rejected will not be considered valid for the purpose of assessing completeness.

6.3.6 Sensitivity

Analytical sensitivities must be consistent with or lower than the regulated criteria values in order to demonstrate compliance with this SAP. When they are achievable, target reporting limits specified in this SAP will be at least a factor of 2 less than the analyte's corresponding regulated criteria value. If reporting limits lower than criteria are not achieved, the QA manager will work with the laboratory to ensure that, if at all possible, re-analyses are performed and reporting limits lower than criteria are achieved.

The MDL is defined as the minimum concentration at which a given target analyte can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. Laboratory MDLs will be used to evaluate the method sensitivity and/or applicability prior to the acceptance of a method for this program. Laboratory reporting limits (RLs) are defined as the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions for that particular method.

The sample practical quantitation limits (PQLs) will be reported by the laboratory and will take into account any factors relating to the sample analysis that might decrease or increase the reporting limit (e.g., dilution factor, percent moisture, sample volume, sparge volume). In the event that the RL and PQL are elevated for a sample due to matrix interferences and subsequent dilution or reduction in the sample aliquot, causing the SMS criteria to be exceeded, the data will be evaluated by Anchor QEA and the laboratory to determine if an alternative course of action is required or possible. If this situation cannot be resolved readily (i.e., detection limits less than criteria achieved), Ecology will be contacted to discuss an acceptable resolution.

6.3.7 Confirmatory Biological Test Interpretation and QA/QC

Test interpretations consist of endpoint comparisons to controls and reference on an absolute percentage basis as well as statistical comparison to reference. The SMS biological effects criteria are summarized in Table 2.

6.3.7.1 Test Quality Assurance/Quality Control

Sediment toxicity tests will incorporate standard QA/QC procedures to ensure that the test results are valid. Standard QA/QC procedures include the use of negative controls, positive controls, reference sediment samples, lab replicates, and measurements of water quality during testing.

6.3.7.2 Negative Controls

The negative control to be used for both sediment toxicity tests will be a clean control, which consists of a clean, inert material and the same seawater used in

testing sediment toxicity. For the tests to be used in this study, the negative control will be the amphipod collection site sediment, which will most likely be sand collected from Yaquina Bay, Oregon. The negative control for the bivalve larval test will be a seawater control.

6.3.7.3 Positive Controls

A positive control will be run for each bioassay using the same batch of organisms used in the test. The positive control to be used for the sediment toxicity test will be a toxic control in which a reference toxicant is used to establish the relative sensitivity of the test organism. The positive control for sediment tests is typically conducted with diluent seawater and without sediment. Cadmium chloride will be used as the reference toxicant for the amphipod and juvenile polychaete tests. Copper sulfate will be used as the reference toxicant for the bivalve larval test.

6.3.7.4 Reference Sediment

Reference sediment will also be included with each bioassay, tested concurrently with test sediments to provide data that can be used to separate toxicant effects from unrelated effects, such as those of sediment grain size. Reference sediment samples will be collected from an area documented to be free from chemical contamination and will represent the range of important natural, physical, and chemical characteristics of the test sediments (e.g., sediment grain size and TOC). For this study, reference sediment samples will be collected from Carr Inlet, Washington (PSEP 1995). All bioassays have performance standards for reference sediments as mentioned above. Failure to meet these standards may result in the requirement to retest.

6.3.7.5 Replicates

Five replicate chambers for each test sediment, reference sediment, and negative controls treatment will be run for each bioassay. A water quality replicate will also be run for each treatment.

6.3.7.6 Water Quality Monitoring

Water quality monitoring will be conducted for the amphipod, larval, and juvenile polychaete bioassays and reference toxicant tests. This consists of daily measurements in each test replicate of salinity, temperature, pH, and dissolved oxygen (DO) for the amphipod and larval tests. These measurements will be made every 3 days for the juvenile polychaete bioassay, with the exception of DO, which will be measured daily. Ammonia and sulfides in the overlying water will be determined at test initiation and termination for all three tests. Monitoring will be conducted for all test and reference sediments and negative controls (including seawater controls).

6.3.7.7 Interpretation

Test interpretation consists of endpoint comparisons of test sediments to the measurements observed in the controls and in reference sediments on an absolute percentage basis, as well as statistical comparison between the test and reference endpoints, where appropriate. Test interpretation will follow the guidelines established through the DMMP/SMS review process.

6.3.7.8 Bioassay Retest

Any bioassay retests must be fully coordinated with, and approved by Ecology, who will be contacted to handle this coordination.

6.3.7.9 Data Deliverables

The laboratory conducting the bioassay tests will be responsible for internal checks on data reporting and will correct errors identified during the quality assurance review. The bioassay laboratory for this study will be required to report results that include all information recommended by PSEP protocols for quality assurance review, as follows:

- A description of any deviations from the methodology or problems with the process and procedures of analyses.
- Test methods used for bioassay testing and statistical analyses.
- Results for survival, growth, reburial, abnormalities, water quality parameters, reference toxicant, and statistical analyses. A reference toxicant

control chart will be submitted for each test organism showing the temporal changes in the mean and the 95 percent CI or positive and negative 2 STD and include the LC50s at each of 12 previous reference toxicant tests to be acceptable.

- Original data sheets for water quality, survival, growth, reburial, abnormalities, reference toxicant, and statistics.
- COC records.

Close contact with the laboratory will be maintained to resolve any QA/QC problems in a timely manner.

6.4 Ecology Coordination

Ecology will be informed on a real-time basis if there are any anomalous results observed with any of the chemical or biological analyses performed. Situations that might require coordination with Ecology include detection limit issues and/or bioassay control issues, but are not limited to these issues. In general, the default assumption will be to inform Ecology in a timely fashion of all issues that require non-routine interaction between the consultant and the laboratory during chemical and biological testing.

7 DATA MANAGEMENT

Field data sheets will be checked for completeness and accuracy by the Field Operations Coordinator prior to delivery to the Project QA Manager. All data generated in the field will be documented on hard copy and provided to the Project QA Manager, who is responsible for the data's entry into the database. All manually entered data will be checked by a second party. Field documentation will be filed in the main project file after data entry and checking are complete.

Laboratory data will be provided to the Project QA Manager in the EQuIS electronic format. Laboratory data that is electronically provided and loaded into the database will undergo a 10 percent check against the laboratory hard copy data. Data will be validated or reviewed manually, and qualifiers, if assigned, will be entered manually. The accuracy of all manually entered data will be verified by a second party. Data tables and reports will be exported from EQuIS to MS Excel tables.

7.1 Assessments and Response Actions

Once data are received from the laboratory, a number of QC procedures will be followed to provide an accurate evaluation of the data quality. Specific procedures will be followed to assess data precision, accuracy, and completeness.

A full data quality review will be performed in accordance with *EPA National Functional Guidelines* (EPA 1999 and 2004). The data will be evaluated in accordance with this QAPP. All chemical data will be reviewed with regard to the following, as appropriate to the particular analysis:

- COC documentation
- Holding times
- Instrument calibration
- Method blanks
- Detection limits
- Reporting limits
- Surrogate recoveries
- MS/MSD recoveries
- Laboratory control sample recoveries

- Laboratory and field duplicate RPDs

The results of the data quality review, including text assigning qualifiers in accordance with the Ecology EIM and a tabular summary of qualifiers, will be generated by the Project QA Manager and assessed for confirmation of the validity of the data. A copy of the validation report will be submitted by the Project QA Manager and will be presented as an appendix to the final sampling and analysis results report. The validated dataset will be submitted to EIM and successful input verified concurrent with submission of the draft data report to Ecology.

7.1.1 Compliance Assessments

Laboratory and field performance audits consist of on-site reviews of QA systems and equipment for sampling, calibration, and measurement. Laboratory audits will not be conducted as part of this study; however, all laboratory audit reports will be made available to the Project QA Manager upon request. The laboratory is required to have written procedures addressing internal QA/QC; these procedures have been submitted and will be reviewed by the Project QA Manager to ensure compliance with this SAP. The laboratory must ensure that personnel engaged in sampling and analysis tasks have appropriate training. The laboratory will, as part of the audit process, provide for consultant's review written details of any and all method modifications planned.

The laboratory is required to comply with their SOPs. The Laboratory QA Manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data.

The Laboratory QA Manager will be notified immediately if any QC sample exceeds the project-specified control limits. The analyst will identify and correct the anomaly before continuing with the sample analysis. The Laboratory QA Manager will document the corrective action taken in a memorandum submitted to the Project QA Manager within 5 days of the initial notification. A narrative describing the anomaly, the steps taken to identify and correct the anomaly, and the treatment of the relevant sample batch (i.e.,

recalculation, reanalysis, and re-extraction) will be submitted with the data package in the form of a cover letter.

7.1.2 Reports to Management

Quality assurance reports to management include verbal status reports, written reports on field sampling activities and laboratory processes, data validation reports, and final project reports. These reports shall be the responsibility of the Project QA Manager.

Progress reports will be prepared by the Field Operation Coordinator following each sampling event. The Project QA Manager will also prepare progress reports after the sampling is completed and samples have been submitted for analysis, when information is received from the laboratory, and when analysis is complete. The status of the samples and analysis will be indicated with emphasis on any deviations from this QAPP. A data report will be written after validated data are available for each sampling event. These reports will be delivered electronically to the SLR Project Coordinator and the Anchor QEA Project Manager.

7.2 Data Validation and Usability

This section describes the processes that will be used to review project data quality.

7.2.1 Data Review, Validation, and Verification

During the validation process, analytical data will be evaluated for method quality control and laboratory quality control compliance, and its validity and applicability for program purposes will be determined. Based on the findings of the validation process, data validation qualifiers may be assigned. The validated project data, including qualifiers will be entered into the project database, thus enabling this information to be retained or retrieved, as needed.

7.2.2 Validation and Verification Methods

Data validation includes signed entries by the field and laboratory technicians on field data sheets and laboratory datasheets, respectively; review for completeness and accuracy by the Field Operations Coordinator and Laboratory QA Manager; review by the Project QA Manager for outliers and omissions; and the use of QC criteria to accept

or reject specific data. All data will be entered into the EQuIS database and a raw data file printed. One hundred percent verification of the database raw data file will be performed by a second data manager or designee. Any errors found will be corrected on the raw data printout sheet. After the raw data is checked, the top sheet will be marked with the date the checking is completed and the initials of the person doing the checking. Any errors in the raw data file will be corrected, and the database established.

All laboratory data will be reviewed and verified to determine whether all DQOs have been met, and that appropriate corrective actions have been taken, when necessary. The Project QA Manager or designee will be responsible for the final review of all data generated from analyses of samples.

The first level of review will take place in the laboratory as the data are generated. The laboratory department manager or designee will be responsible for ensuring that the data generated meet minimum QA/QC requirements and that the instruments were operating under acceptable conditions during generation of data. DQOs will also be assessed at this point by comparing the results of QC measurements with pre-established criteria as a measure of data acceptability.

The analysts and/or laboratory department manager will prepare a preliminary QC checklist for each parameter and for each sample delivery group (SDG) as soon as analysis of an SDG has been completed. Any deviations from the DQOs listed on the checklist will be brought to the attention of the Laboratory QA Manager to determine whether corrective action is needed and to determine the impact on the reporting schedule.

Data packages will be checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested are present. Data quality will be assessed by a reviewer using current Functional Guidelines data validation requirements (EPA 1999 and 2004) by considering the following:

1. Holding times
2. Initial calibrations
3. Continuing calibrations

4. Method blanks
5. Surrogate recoveries
6. Detection limits
7. Reporting limits
8. Laboratory control samples
9. MS/MSD samples
10. Standard reference material results

The data will be validated in accordance with the project specific DQOs described above, analytical method criteria, and the laboratory's internal performance standards based on their SOPs.

7.2.3 Reconciliation with User Requirements

The Project QA Manager will review data after each survey to determine if DQOs have been met. If data do not meet the project's specifications, the Project QA Manager will review the errors and determine if the problem is due to calibration/maintenance, sampling techniques, or other factors. They will suggest corrective action. It is expected that the problem would be able to be corrected by retraining, revision of techniques, or replacement of supplies/equipment; if not, the DQOs will be reviewed for feasibility. If specific DQOs are not achievable, the Project QA Manager will recommend appropriate modifications. Any revisions will require approval by Ecology.

7.3 Documentation and Records

This project will require central project files to be maintained at SLR and Anchor QEA. Project records will be stored and maintained in a secure manner. Each project team member is responsible for filing all necessary project information or providing it to the person responsible for the filing system. Individual team members may maintain files for individual tasks but must provide such files to the central project files upon completion of each task. A project-specific index of file contents is to be kept with the project files. Hard copy documents will be kept on file at SLR and Anchor QEA throughout the duration of the project.

7.3.1 Field Records

All documents generated during the field effort are controlled documents that become part of the project file.

7.3.2 Field Logs

Field team members will keep a daily record of significant events, observations, and measurements in a field log. All field activities will be recorded in a bound, paginated field logbook maintained by the Field Operations Coordinator or a designee for each activity. Field logbooks will be the main source of field documentation for all field activities. The on-site field representative will record in the field logbook information pertinent to the investigation program. The sampling documentation will contain information on each sample collected, and will include at a minimum the following information:

- Project name
- Field personnel on site
- Facility visitors
- Weather conditions
- Field observations and any deviations from the SAP
- Maps and/or drawings
- Date and time samples collected
- Sampling method and description of activities
- Identification or serial numbers of instruments or equipment used
- Deviations from the SAP

Entries for each day will begin on a new page. The person recording information must enter the date and time and initial each entry. Additional specific field reporting requirements and checklists for each study are defined in the SAP. In general, sufficient information will be recorded during sampling to permit reconstruction of the event without relying on the memory of the field personnel.

The field logbooks will be permanently bound and durable for adverse field conditions. All pages will be numbered consecutively. All pages will remain intact, and no page will be removed for any reason. Notes will be taken in indelible, waterproof blue or

black ink. Errors will be corrected by crossing out with a single line, dating, and initialing. The front and inside of each field logbook will be marked with the project name, number, and logbook number. The field logbooks will be stored in the project files when not in use and upon completion of each sampling event.

Sample collection checklists will be prepared prior to each sampling program. The checklist will include location designations, types of samples to be collected, and whether any QC samples are to be collected.

7.3.3 Analytical and Chemistry Records

Analytical data records will be retained by the laboratory and in the Anchor QEA central project files. For all analyses, the data reporting requirements will include those items necessary to complete data validation, including copies of all raw data. The analytical laboratory will be required, where applicable, to report the following:

- Project Narrative. This summary, in the form of a cover letter, will discuss problems, if any, encountered during any aspect of analysis. This summary should discuss, but not be limited to, QC, sample shipment, sample storage, and analytical difficulties. Any actual or perceived problems encountered, and their resolutions, will be documented in as much detail as appropriate.
- Chain of Custody Records. Legible copies of the COC forms will be provided as part of the data package. This documentation will include the time of receipt and condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented on a sample receipt form. The form must include all cooler temperatures measured at the time of sample receipt.
- Sample Results. The data package will summarize the results for each sample analyzed. The summary will include the following information when applicable:
  - Field sample identification code and the corresponding laboratory identification code
  - Sample matrix
  - Date of sample extraction
  - Date and time of analysis
  - Weight and/or volume used for analysis

  - Final dilution volumes or concentration factor for the sample
  - Identification of the instrument used for analysis
  - Method detection limits
  - Method reporting limits accounting for sample-specific factors (e.g., dilution, total solids)
  - Analytical results with reporting units identified
  - Data qualifiers and their definitions
  - A computer disk with the data in a format specified in advance by Anchor QEA
- QA/QC Summaries. This section will contain the results of the laboratory QA/QC procedures. Each QA/QC sample analysis will be documented with the same information required for the sample results (see above). No recovery or blank corrections will be made by the laboratory. The required summaries are listed below; additional information may be requested.
- Calibration Data Summary. This summary will report the concentrations of the initial calibration and daily calibration standards, and the date and time of analysis. The response factor, percent relative standard deviation, percent difference, and retention time for each analyte will be listed, as appropriate. Results for standards to indicate instrument sensitivity will be documented.
- Internal Standard Area Summary. The stability of internal standard areas will be reported.
- Method Blank Analysis. The method blank analyses associated with each sample and the concentration of all compounds of interest identified in these blanks will be reported.
- Surrogate Spike Recovery. This will include all surrogate spike recovery data for organic compounds. The name and concentration of all compounds added, percent recoveries, and range of recoveries will be listed.
- Matrix Spike Recovery. This will report all MS recovery data for organic and metal compounds. The name and concentration of all compounds added, %R, and range of recoveries will be listed. The RPD for all duplicate analyses will be included.
- Matrix Duplicate. This will include the %R and associated RPD for all matrix duplicate analyses.

- Laboratory Control Sample. All laboratory control sample recovery data for organic and metal compounds will be reported. The name and concentration of all compounds added, %R, and range of recoveries will be listed. The RPD for all duplicate analyses will be included.
- Relative Retention Time. This will include a report of the relative retention time of each analyte detected in the samples for both primary and conformational analyses.
- Original Data. Legible copies of the original data generated by the laboratory will include:
  - Sample extraction, preparation, identification of extraction method used, and cleanup logs
  - Instrument specifications and analysis logs for all instruments used on days of calibration and analysis
  - Reconstructed ion chromatograms for all samples, standards, blanks, calibrations, spikes, replicates, and reference materials
  - Enhanced spectra of detected compounds with associated best-match spectra for each sample
  - Printouts of chromatograms and quantitation reports for each instrument used, including reports for all samples, standards, blanks, calibrations, spikes, replicates, and reference materials
  - Original data quantification reports for each sample
  - Original data for blanks and samples not reported

All instrument data shall be fully restorable at the laboratory from electronic backup. Laboratories will be required to maintain all records relevant to project analyses for a minimum of 7 years. Data validation reports will be maintained in the central project files with the analytical data reports.

7.3.4 Data Reduction

Data reduction is the process by which original data (analytical measurements) are converted or reduced to a specified format or unit to facilitate analysis of the data. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final

result. It is the laboratory analyst's responsibility to reduce the data, which are subjected to further review by the Laboratory QA Manager, the Project Manager, the Project QA Manager, and independent reviewers. Data reduction may be performed manually or electronically. If performed electronically, all software used must be demonstrated to be true and free from unacceptable error.

Chemistry data will be presented with accompanying regulatory criteria. Data exceeding the regulatory criteria will be highlighted or boxed, rather than shaded, to allow for photocopying. EIM data deliverables (in the appropriate format) will be submitted and successful input verified concurrent with delivery of the draft data report to Ecology via electronic email.

8 PROJECT MANAGEMENT

This section identifies key project personnel, identifies the studies to be performed and their respective schedules, outlines project DQOs and criteria, lists training and certification requirements for sampling personnel, and describes documentation and record keeping procedures.

8.1 Project Team/Task Organization

Responsibilities of the team members, as well as laboratory project managers, are described in the following paragraphs and this supplements the primary contacts and roles listed in the Work Plan (Section 2.1). Since the individuals listed below may change over time, the SAP has been written to include "designee" as an alternate to the team members listed. The following paragraphs define their functional responsibilities.

Mr. Scott Miller is the Project Coordinator for the Port of Everett and is responsible for project communications with Ecology, the Port of Everett, and subcontractors.

Mr. Clay Patmont of Anchor QEA will be the overall sediment assessment project manager responsible for this sediment assessment portion of this project. Mr. Patmont will be responsible for timely and successful completion of the sediment characterization.

The Field Sampling Supervisor will be responsible for implementation of this SAP. Following plan approval by Ecology, the Field Sampling Supervisor will provide copies of the approved sampling plan to all sampling and testing subcontractors, ensure that laboratory personnel use acceptable protocols for chemical and physical analysis, QA/QC, and reporting.

The Field Operations Coordinator will provide overall direction to the sediment sampling in logistics, personnel assignments, and field operations. The Field Operations Coordinator will supervise field collection of the sediment surface and core samples and will be responsible for ensuring accurate sample positioning; recording sample locations, depths, and identification; ensuring conformity to sampling and handling requirements, including field decontamination procedures; physical evaluation and logging the samples; and COC of the samples. The Field Operations Coordinator is responsible for notifying the laboratory

of sample delivery, ensuring samples are packaged properly for transportation, and ensuring sample delivery to the laboratory or sample pickup by the laboratory.

The samples will be physically evaluated, homogenized, and placed in appropriate sample containers. Appropriate protocols for decontamination, sample compositing, sample preservation, and holding times will be observed. Field staff will be responsible for documenting sample preparation, observations, and COC up until the time the samples are delivered for analysis to the analytical laboratory. Field staff will be responsible for writing a report detailing field sampling activities. This report will include details of the sampling effort, sample preparation, sample storage/transport procedures, and field quality assurance.

Ms. Sue Dunnihoo of Analytical Resources Incorporated (ARI) will be responsible for physical and chemical analyses. Ms. Dunnihoo will coordinate handling and analysis of the submitted samples in accordance with Ecology-approved analytical testing protocols, QA/QC requirements, and requirements as specified in this or a subsequent revised QAPP. A written report of analytical results and QA/QC procedures will be prepared by Ms. Dunnihoo and included as an appendix in the final report in hard copy and electronic format.

Mr. Bill Gardner of NewFields Northwest, Port Gamble, Washington, will be responsible for the sediment bioassays and associated data analyses. Mr. Gardner will also provide oversight during bioassay sample collection. NewFields Northwest will analyze the samples received in accordance with the analytical testing and QA/QC requirements specified by this QAPP. A written report of the bioassay results and QA/QC procedures will be prepared by NewFields Northwest and included as an appendix in the final sampling and analysis results report.

The analytical testing laboratories will be responsible for the following:

- Perform the methods outlined in the SAP, including those methods referenced for each analytical procedure
- Follow documentation, custody, and sample logbook procedures
- Implement QA/QC procedures required by PSEP (1986; 1997) and Ecology (2008)

- Meet all reporting and QA/QC requirements
- Deliver electronic data files as specified in the SAP
- Meet turnaround times for deliverables as described in the SAP
- Allow Ecology and the QA/QC contractor to perform laboratory and data audits

The Project QA Manager will perform QA oversight for both the field sampling and laboratory programs. The Project QA Manager will be kept fully informed of field program procedures and progress during sample collection and laboratory activities during sample preparation. The Project QA Manager will record and correct any activities that vary from the QAPP. Upon completion of the sampling and analytical program, the laboratory QA/QC results and incorporate findings into the final sampling and analysis report will be reviewed. Any QA/QC problems will be brought to the attention of Ecology as soon as possible to discuss issues related to the problem and to evaluate potential solutions. The Project QA Manager will ensure data quality by conducting data review, verification, and validation.

8.1.1 Special Training Requirements/Certifications

For sample preparation tasks, it is important that field crews are trained in standardized data collection requirements, so that the data collected are consistent among the field crew. All field crew are fully trained in the collection and processing of surface and subsurface sediment, decontamination protocols, visual inspections, and COC procedures.

In addition, the 29 CFR 1910.120 Occupational Safety and Health Administration (OSHA) regulations require training to provide employees with the knowledge and skills enabling them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet the OSHA regulations.

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TABLES

Table 1
Summary of Sediment Management Standards Chemical Criteria for Puget Sound

Chemicals	Sediment Quality Standard	Cleanup Screening Level
Conventionals (%)		
Total organic carbon	--	--
Total volatile solids (%)	--	--
Porewater sulfide (mg/L)	--	--
Metals (mg/kg)		
Arsenic	57	93
Cadmium	5.1	6.7
Chromium	260	270
Copper	390	390
Lead	450	530
Mercury	0.41	0.59
Silver	6.1	6.1
Zinc	410	960
PCBs (mg/kg-OC)		
Total PCBs	12	65
LPAHs (mg/kg-OC)		
Naphthalene	99	170
Acenaphthylene	66	66
Acenaphthene	16	57
Fluorene	23	79
Phenanthrene	100	480
Anthracene	220	1,200
2-Methylnaphthalene	38	64
Total LPAH	370	780
HPAHs (mg/kg-OC)		
Fluoranthene	160	1,200
Pyrene	1,000	1,400
Benzo(a)anthracene	110	270
Chrysene	110	460
Total benzofluoranthenes	230	450
Benzo(a)pyrene	99	210
Indeno(1,2,3-cd)pyrene	34	88
Dibenzo(a,h)anthracene	12	33
Benzo(g,h,i)perylene	31	78
Total HPAH	960	5,300
Misc. SVOCs (mg/kg-OC)		
1,2-Dichlorobenzene	2.3	2.3
1,4-Dichlorobenzene	3.1	9
1,2,4-Trichlorobenzene	0.81	1.8
Hexachlorobenzene	0.38	2.3
Dimethylphthalate	53	53
Diethylphthalate	61	110

Table 1
Summary of Sediment Management Standards Chemical Criteria for Puget Sound

Chemicals	Sediment Quality Standard	Cleanup Screening Level
Di-n-butylphthalate	220	1,700
Butylbenzylphthalate	4.9	64
bis(2-ethylhexyl)phthalate	47	78
Di-n-octylphthalate	58	4,500
Dibenzofuran	15	58
Hexachlorobutadiene	3.9	6.2
n-Nitroso-di-phenylamine	11	11
Misc. Ionizable SVOCs (µg/kg)		
Phenol	420	1,200
2-Methylphenol	63	63
4-Methylphenol	670	670
2,4-Dimethylphenol	29	29
Pentachlorophenol	360	690
Benzyl alcohol	57	73
Benzoic acid	650	650

Table 2
Summary of Sediment Management Standards Biological Effects Criteria for Puget Sound

Biological Test	Test Performance Standards	Sediment Quality Standards	Sediment Cleanup Screening Levels, or Minimum Cleanup Levels
Amphipod	The control sediment shall have less than 10 percent mortality over the test period. The reference sediment shall have less than 25 percent mortality.	The test sediment has a significantly higher (t-test, P≤ 0.05) mean mortality than the reference sediment, and the test sediment mean mortality exceeds 25 percent on an absolute basis.	The test sediment has a significantly higher (t-test, P≤ 0.05) mean mortality than the reference sediment, and the test sediment mean mortality is more than 30 percent greater, on an absolute basis, than the reference sediment mean mortality.
Larval	The seawater control sample shall have less than 30 percent combined abnormality and mortality (i.e., a 70 percent normal survivorship at time final).	The test sediment has a mean survivorship of normal larvae that is significantly less (t-test, P≤ 0.05) than the mean normal survivorship in the reference sediment, and the combined abnormality and mortality in the test sediment is more than 15 percent greater, on an absolute basis, than the reference sediment.	The test sediment has a mean survivorship of normal larvae that is significantly less (t-test, P≤ 0.05) than the mean normal survivorship in the reference sediment, and the combined abnormality and mortality in the test sediment is more than 30 percent greater, on an absolute basis, than that in the reference sediment.
Juvenile polychaete	The control sediment shall have less than 10 percent mortality and mean individual growth (MIG) of ≥ 0.72 mg/ind/day per dry weight basis. The reference sediment shall have a MIG that is at least 80 percent of the MIG found in the control sediment.	The MIG of polychaetes in the test sediment is less than 70 percent of the MIG of the polychaetes in the reference sediment, and the test sediment MIG is significantly different (t-test, P≤ 0.05) from the reference sediment MIG	The MIG of polychaetes in the test sediment is less than 50 percent of the MIG of the polychaetes in the reference sediment, and the test sediment MIG is significantly different (t-test, P≤ 0.05) from the reference sediment MIG.
Benthic infauna	The reference benthic macroinvertebrate assemblage shall be representative of areas of Puget Sound removed from significant sources of contaminants, and to the extent possible shall reflect seasonality and natural physical-chemical conditions and normally abundant species.	The test sediment has less than 50 percent of the reference sediment mean abundance of any one of the following major taxa: Class Crustacea, Phylum Mollusca, or Class Polychaeta, and the test sediment abundance is statistically different (t-test, P≤0.05) from the reference sediment abundance.	The test sediment has less than 50 percent of the reference sediment mean abundance of any two of the following major taxa: Class Crustacea, Phylum Mollusca, or Class Polychaeta, and the test sediment abundance is statistically different (t-test, P≤0.05) from the reference sediment abundances.

Source: Washington State Department of Ecology. 1995. Sediment Management Standards - Chapter 173-204 WAC

Table 3
Proposed Sediment Sampling Location Coordinates and Summary of Laboratory Testing

Sample Type	Station ID	NAD 1983 Washington North (ft)		Wood debris indicator parameters (grain size; TS; TVS; TOC; total and porewater ammonia; and total and porewater sulfide)	WTPH-Dx	Dioxins & Furans [2]	SMS chemical analysis suite [1]	SMS bioassays (2 acute and 1 chronic)	SMS bioassays at Background locations
		X	Y						
Surface Grab	BW-1	1303524.6	373457.4	1	1	1	1	Approximately **5 site samples** to be selected jointly by the Port and Ecology based on field observations and wood debris indicator analyses	Approximately **2 background samples** (Carr Inlet) based on grain size variability of the site samples submitted for bioassay analyses
Surface Grab	BW-2	1303348.4	373589.3	1	1				
Surface Grab	BW-3	1303271.6	373751.4	1	1	1	1		
Surface Grab	BW-4	1303180.0	373929.4	1	1				
Surface Grab	BW-5	1302823.7	374304.6	1	1				
Surface Grab	BW-6	1303538.3	374421.1	1	1				
Surface Grab	BW-7	1304064.1	374061.2	1	1	1	1		
Surface Grab	BW-8	1304198.6	374576.4	1	1				
Surface Grab	BW-9	1304337.7	374219.1	1	1	1	1		
Surface Grab	BW-10	1304602.5	374545.4	1	1				
Surface Grab	BW-11	1303112.8	374189.8	1	1	1[3]	1[3]		
Surface Grab	BW-12	1302168.9	374276.0	1	1				
			Totals:	**12**	**12**	**5**	**5**	**5**	**2**

NOTES:

1. Sediment Management Standards (SMS) analysis suite, Table 1 Sediment Sampling and Analysis Plan Appendix (Ecology Publication No. 03-09-043, February 2008). Metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc), semivolatiles and low-level semivolatiles, VOCs, pesticides and PCBs (does not include Dioxin/Furans)
2. Dioxins/Furans by EPA Method 1613.
3. One sample from location BW-11 or BW-12 will be selected for SMS chemical analysis and Dioxin/Furan analysis based upon field observations

Table 4
Guidelines for Sample Handling and Storage

Sample Type	Container Size and Type	Holding Time	Preservation Technique
Grain size	16-oz Glass	6 months	Cool/4°C
Total solids (TS),Total Volatile Solids (TVS), and Total Organic Carbon (TOC)	8-oz Glass	14 days	Cool/4°C
		6 months	Freeze/ -18°C
Ammonia Porewater	32-oz glass	7 days to porewater extraction	Cool/4°C
		28 days to analysis	Cool/4°C; H_2SO_4 to pH<2
Sulfide Porewater	from ammonia porewater container	7 days to porewater extraction	Cool/4°C
		7 days to analysis	Cool/4°C; NaOH/ZnAC to pH>9
Ammonia	4-oz Glass	7 days	Cool/4°C
Sulfide	2-oz Glass, no headspace	7 days	Cool/4°C; NaOH/ZnAC to pH>9
Metals	4-oz Glass	6 months; 28 days for Hg	Cool/4°C
		2 years; 28 days for Hg	Freeze/ -18°C
Diesel/Motor Oil	8-oz Glass	14 days until extraction	Cool/4^{o} C
		1 year until extraction	Freeze -20°C
		40 days after extraction	Cool/4^{o} C
Dioxins/Furans	8-oz Glass	14 days until extraction	Cool/4^{o} C
		1 year until extraction	Freeze -20°C
		40 days after extraction	Cool/4^{o} C
Semivolatile Organics (SVOCs) and Polychlorinated Biphenyls (PCBs)	16-oz Glass	14 days until extraction	Cool/4^{o} C
		1 year until extraction	Freeze -20°C
		40 days after extraction	Cool/4^{o} C

Table 5
Data Quality Objectives

Parameter	Units	Precision	Accuracy	Completeness
Grain size	%	±20 RPD	NA	95%
Total solids	%	±20 RPD	NA	95%
Total volatile solids	%	±20 RPD	NA	95%
Total organic carbon	%	±20 RPD	65-135 %R	95%
Ammonia Porewater	mg/L	±20 RPD	75-125 %R	95%
Sulfide Porewater	mg/L	±20 RPD	65-135 %R	95%
Ammonia	mg/kg	±30 RPD	75-125 %R	95%
Sulfide	mg/kg	±30 RPD	65-135 %R	95%
Metals	mg/kg	±30 RPD	65-135 %R	95%
PCDD/PCDF	ng/kg	±40 RPD	50-140% R	95%
Diesel/Motor Oil	mg/kg	±40 RPD	50-140% R	95%
SVOCs	µg/kg	±40 RPD	50-140% R	95%
PCBs	µg/kg	±40 RPD	50-140% R	95%

Notes:

RPD = Relative percent difference

%R = Percent recovery

NA = Not applicable

Table 6
Laboratory Quality Control Sample Analysis Minimum Frequencey Requirements

Analysis Type	Initial Calibration[b]	Ongoing Calibration	Standard Reference Material[e]	Replicates	Matrix Spikes	Matrix Spike Duplicates	Method Blanks	Surrogate Spikes	Laboratory Control Samples
Grain size	Each batch[a]	NA	NA	1 per 20 samples	NA	NA	NA	NA	NA
Total solids	Each batch	NA	NA	1 per 20 samples	NA	NA	NA	NA	NA
Total volatile solids	Each batch	NA	NA	1 per 20 samples	NA	NA	NA	NA	NA
Total organic carbon	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	Each batch	NA	1 per 20 samples
Ammonia (Porewater & Bulk)	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	Each batch	NA	1 per 20 samples
Sulfide (Porewater & Bulk)	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	Each batch	NA	1 per 20 samples
Metals	Daily	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	Each batch	NA	1 per 20 samples
PCDD/PCDF	As needed[c]	Prior to 12 hour analytical batch	1 per 20 samples	NA	1 per 20 samples	1 per 20 samples	Each batch	Every sample	1 per 20 samples
Diesel/Motor Oil	As needed [c]	1 per 10 samples	1 per 20 samples	NA	1 per 20 samples	1 per 20 samples	Each batch	Every sample	1 per 20 samples
Semivolatile organics	As needed[c]	Prior to 12 hour analytical batch	1 per 20 samples	NA	1 per 20 samples	1 per 20 samples	Each batch	Every sample	1 per 20 samples
PCBs[d]	As needed[c]	1 per 10 samples	1 per 20 samples	NA	1 per 20 samples	1 per 20 samples	Each batch	Every sample	1 per 20 samples

Note:
NA - not applicable.
a - Calibration and certification of drying ovens and weighing scales are conducted bi-annually.
b - Initial calibration verification and calibration blank must be analyzed at the beginning of each batch.
c - Initial calibrations are considered valid until the ongoing continuing calibration no longer meets method specifications. At that point, a new initial calibration is performed.
d - Pesticides/PCB will have all detects confirmed via second column confirmation. The second column must be of a dissimilar stationary phase from the primary column and meet all method requirements for acceptance. Primary column is considered the column which contains the highest value with the least interference. Primary column is considered the column which contains the highest value with the least interference.
e - When an SRM is available.
NA - Not applicable.

Table 7
Chemical Physical Analysis Methods and Target Detection Limits

Parameter	Target Reporting Limits	Analytical Method
Conventionals		
Total solids, % wet weight	0.10	EPA 160.3
Total volatile solids, % dry weight	0.01	ASTM D-2974C
Grain size, % dry weight	0.10	PSEP
Total organic carbon, % dry weight	0.10	EPA 9060
Ammonia, mg/kg dry weight	1.0	EPA 350.1
Sulfide, mg/kg dry weight	1.0	PSEP
Ammonia porewater, mg/L	0.10	EPA 350.1
Sulfide porewater, mg/L	1.0	EPA 9030B
Metals, mg/kg dry weight		
Antimony	15	EPA 6010/6020
Arsenic	10	EPA 6010/6020
Cadmium	0.40	EPA 6010/6020
Chromium	5.0	EPA 6010/6020
Copper	0.40	EPA 6010/6020
Lead	5.0	EPA 6010/6020
Mercury	0.10	EPA 7471A
Nickel	14	EPA 6010/6020
Silver	0.60	EPA 6010/6020
Zinc	0.80	EPA 6010/6020
Nonionizable Organic Compounds, µg/kg dry weight		
LPAHs		
Naphthalene	20	EPA 8270
Acenaphthylene	20	EPA 8270
Acenaphthene	20	EPA 8270
Fluorene	20	EPA 8270
Phenanthrene	20	EPA 8270
Anthracene	20	EPA 8270
2-Methylnaphthalene	20	EPA 8270
HPAHs		
Fluoranthene	20	EPA 8270
Pyrene	20	EPA 8270
Benzo(a)anthracene	20	EPA 8270
Chrysene	20	EPA 8270
Benzo(b)fluoranthene	20	EPA 8270
Benzo(k)fluoranthene	20	EPA 8270
Benzo(a)pyrene	20	EPA 8270
Indeno(1,2,3-cd)pyrene	20	EPA 8270
Dibenzo(a,h)anthracene	20	EPA 8270
Benzo(g,h,i)perylene	20	EPA 8270
Chlorinated Organic Compounds		
1,2-Dichlorobenzene	5	EPA 8270 SIM
1,3-Dichlorobenzene	20	EPA 8270
1,4-Dichlorobenzene	5	EPA 8270 SIM
1,2,4-Trichlorobenzene	5	EPA 8270 SIM
Hexachlorobenzene	1	EPA 8081A
Phthalates		
Dimethyl phthalate	20	EPA 8270
Diethyl phthalate	20	EPA 8270
Di-n-butyl phthalate	20	EPA 8270

Table 7
Chemical Physical Analysis Methods and Target Detection Limits

Parameter	Target Reporting Limits	Analytical Method
Butyl benzyl phthalate	20	EPA 8270
Bis(2-ethylhexyl)phthalate	20	EPA 8270
Di-n-octyl phthalate	20	EPA 8270
Miscellaneous Extractables		
Dibenzofuran	20	EPA 8270
Hexachlorobutadiene	1	EPA 8081A
N-Nitroso-diphenylamine	20	EPA 8270
Ionizable Organic Compounds, µg/kg dry weight		
Phenol	20	EPA 8270
2-Methylphenol	20	EPA 8270
4-Methylphenol	20	EPA 8270
2,4-Dimethylphenol	20	EPA 8270
Pentachlorophenol	20	EPA 8270
Benzyl alcohol	20	EPA 8270
Benzoic acid	200	EPA 8270
Polychlorinated Biphenyls (PCBs), µg/kg dry weight		
Aroclor 1016	10	EPA 8082
Aroclor 1221	10	EPA 8082
Aroclor 1232	10	EPA 8082
Aroclor 1242	10	EPA 8082
Aroclor 1248	10	EPA 8082
Aroclor 1254	10	EPA 8082
Aroclor 1260	10	EPA 8082
Aroclor 1268	10	EPA 8082
Total PCBs	10	EPA 8082
Total Petroleum Hydrocarbons (TPH), mg/kg dry weight		
Diesel	10	NWTPH-DX
Motor Oil	25	NWTPH-DX
Dioxins/Furans, ng/kg dry weight		
2,3,7,8-TCDD	1	1613B
1,2,3,7,8-PeCDD	5	1613B
1,2,3,4,7,8-HxCDD	5	1613B
1,2,3,6,7,8-HxCDD	5	1613B
1,2,3,7,8,9-HxCDD	5	1613B
1,2,3,4,6,7,8-HxCDD	5	1613B
OCDD	10	1613B
2,3,7,8-TCDF	1	1613B
1,2,3,7,8-PeCDF	5	1613B
2,3,4,7,8-HxCDF	5	1613B
1,2,3,4,7,8-HxCDF	5	1613B
1,2,3,6,7,8-HxCDF	5	1613B
1,2,3,7,8,9-HxCDF	5	1613B
2,3,4,6,7,8-HxCDF	5	1613B
1,2,3,4,5,6,8-HpCDF	5	1613B
1,2,3,4,7,8,9-HPCDF	5	1613B
OCDF	10	1613B

Notes:

LPAH = Low molecular weight polynuclear aromatic hydrocarbon

LPAH = Low molecular weight polynuclear aromatic hydrocarbon

Table 8
SAPA Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Practical Quantitation Limits for Sediments

	Recommended Sample Preparation Methods [a]	Recommended Sample Cleanup Methods [b]	Recommended Analytical Methods[c]	Recommended Practical Quantiation Limits[d,e]
Metals (mg/kg dry weight)				
Antimony	PSEP/3050B	--	6010B/6020/B7041	50
Arsenic	PSEP/3050B	--	6010B/6020/7061A	19
Cadmium	PSEP/3050B	--	6010B/6020/7131A	1.7
Chromium	PSEP/3050B	--	6010B/6020/7191	87
Copper	PSEP/3050B	--	6010B/6020	130
Lead	PSEP/3050B	--	6010B/6020	150
Mercury	--[f]	--	7471A/245.5	0.14
Nickel	PSEP/3050B		6010B/6020	47
Silver	PSEP/3050B	--	6010B/6020	2
Zinc	PSEP/3050B	--	6010B/6020	137
Nonionizable Organic Compounds (µg/kg dry weight or as listed)				
LPAH Compounds				
Naphthalene	3540C/3550B/3545	3640A/3660B	8270C/1625C	700
Acenaphthylene	3540C/3550B/3545	3640A/3660B	8270C/1625C	433
Acenaphthene	3540C/3550B/3545	3640A/3660B	8270C/1625C	167
Fluorene	3540C/3550B/3545	3640A/3660B	8270C/1625C	180
Phenanthrene	3540C/3550B/3545	3640A/3660B	8270/1625C	500
Anthracene	3540C/3550B/3545	3640A/3660B	8270C/1625C	320
2-Methylnaphthalene	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
HPAH Compounds				
Fluoranthene	3540C/3550B/3545	3640A/3660B	8270C/1625C	567
Pyrene	3540C/3550B/3545	3640A/3660B	8270C/1625C	867
Benz[a]anthracene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	433
Chrysene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	467
Total benzofluoranthenes[g]	3540C/3550B/3545	3640A/3660B	8270[h]/1625C	1067
Benzo[a]pyrene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	533
Indeno[1,2,3-cd]pyrene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	200
Dibenz[a,h]anthracene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	77
Benzo[ghi]perylene	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
Chlorinated Benzenes				
1,2-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	35
1,3-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	57
1,4-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	37
1,2,4-Trichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	31
Hexachlorobenzene	3540C/3550B/3545	3640A/3660B	8270C[h]/1625C	22
Phthalate Esters				
Dimethyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	24
Diethyl phthalate	3540C/3550B/3545	3640/A3660B	8270C/1625C	67
Di-n-butyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	467
Butyl benzyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	21
Bis[2-ethylhexyl]phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	433
Di-n-octyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	2067

Table 8
SAPA Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Practical Quantitation Limits for Sediments

	Recommended Sample Preparation Methods [a]	Recommended Sample Cleanup Methods [b]	Recommended Analytical Methods[c]	Recommended Practical Quantiation Limits[d,e]
Miscellaneous Extractable Compounds (µg/kg dry weight oras listed)				
Dibenzofuran	3540C/3550B/3545	3640A/3660B	8270C/1625C	180
Hexachlorobutadiene	3540C/3550B/3545	3640A/3660B	8270C/1625C	11
Hexachloroethane	3540C/3550B/3545	3640A/3660B	8270C/1625C	47
N-nitrosodiphenylamine	3540C/3550B/3545	3640A/3660B	8270C/1625C	28
PCBs				
PCB Aroclors®	3540/3550	3620B/3640A/3660B	8082	6
Chlorinated Pesticides				
DDD	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	3.3
DDE	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	2.3
Total DDT	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	6.7
Aldrin	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Chlordane	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Dieldrin	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	2.3
Heptachlor	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Lindane	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Compounds				
Ethylbenzene	--[i]	--	8260B/1624C	3.2
Tetrachloroethene	--[i]	--	8260B/1624C	3.2
Total xylene	--[i]	--	8260B/1624C	3.2
Trichloroethene	--[i]	--	8260B/1624C	3.2
Compounds				
Phenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	140
2-Methylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	63
4-Methylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
2,4-Dimethylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	29
Pentachlorophenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	120
Benzyl alcohol	3540C/3550B/3545	3640A/3660B	8270C/1625C	57
Benzoic acid	3540C/3550B/3545	3640A/3660B	8270C/1625C	217
Variables				
Ammonia	--[j]	--	Plumb (1981)	100 mg/L
Grain size	--[j]	--	Plumb (1981)	1%
Total solids	--[j]	--	PSEP	0.1% (wetwt)
Total organic carbon (TOC)	--[j]	--	9060	0.10%
Total Volatile Solids[k]	--[j]	--	PSEP	0.10%
Site Specific Compounds (µg/kg dry weight or as listed)				
Ammonia	--[j]	--	See above	100
Other potentially toxic metals (e.g., antimony, beryllium, nickel)	PSEP	--	See above	Sb 50, Ni 47
Organotin complexes			Bulk sediment: Krone (1989); Interstitial water: Krone (1989) extraction, performance based	1 - 5 3 - 5 ug/L

Table 8
SAPA Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Practical Quantitation Limits for Sediments

	Recommended Sample Preparation Methods [a]	Recommended Sample Cleanup Methods [b]	Recommended Analytical Methods[c]	Recommended Practical Quantiation Limits[d,e]
Pesticides, herbicides	3540C/3550B	3620B/3640A/3660B	8081A/8085/8151A	1.7-6.7
Petroleum compounds (e.g., benzene, toluene, ethylbenzene, xylene)	--	--	8021**B**/8260B/1624C	50
Total petroleum hydrocarbons	--	--	8440 Ecology method - pub. 97-602 (1997)	20 mg/kg (gasoline), 50 mg/kg (#2 diesel), 100 mg/kg (lmotor oil) based on 100% solids
Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs)	--	--	1613	1 - 10 ng/kg
Guaiacols	3540C	--	NCASI Method CP – 86.02 Chlorinated Phenols	50-100
Resin acids	3540C (using acetone)	--	NCASI Method RA/FA 85.02	50-100
Radioactive substances, Explosive compounds	8330	--	8095/8330	250-2200 (method 8330)

Table 8
SAPA Recommended Sample Preparation Methods, Cleanup Methods, Analytical Methods, and Practical Quantitation Limits for Sediments

Note:

AVS - acid volatile sulfide

EPA - U.S. Environmental Protection Agency

GPC - gel permeation chromatography

HPAH - high molecular weight polycyclic aromatic hydrocarbon

LPAH - low molecular weight polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

PSEP - Puget Sound Estuary Program

TOC - total organic carbon

a - Recommended sample preparation methods are:

PSEP (1997a)

Method 3050B and 3500 series - sample preparation methods from SW-846 (U.S. EPA 1996) and subjected to changes by EPA

b - Recommended sample cleanup methods are:

Sample extracts subjected to GPC cleanup follow the procedures specified by EPA SW-846 Method 3640A. Special care should

If sulfur is present in the samples (as is common in most marine sediments), cleanup procedures specified by EPA SW-846

All PCB extracts should be subjected to sulfuric acid/permanganate cleanup as specified by EPA SW-846 Method 3665A.

Additional cleanup procedures may be necessary on a sample-by-sample basis. Alternative cleanup procedures are described

c - Recommended analytical methods are:

Method 6000, 7000, 8000, and 9000 series - analytical methods from SW-846 (U.S. EPA 1986) and updates

The SW-846 and updates are available from the web site at:

http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm

Method 1613 - analytical method from U.S. EPA-821/B-94-005 (1994)

Method 1624C/1625C - isotope dilution method (U.S. EPA 1989)

NCASI – analytical methods from the National Council for Air and Stream Improvement, Inc.

Plumb (1981) - U.S. EPA/U.S. Army Corps of Engineers Technical Report EPA/CE-81-1

PSEP (1986a)

Acid volatile sulfide method for sediment (U.S. EPA 1991).

Krone (1989) – Krone, C. A., D. W. Brown, D. G. Burrows, R. G. Bogar, S. L. Chan and U. Varanasi, 1989. A Method for theAnalysis of Butyltin Species and the Measurement of Butyltins in Sediment and English Sole Livers from Puget Sound. Marine Environmental

To achieve the recommended practical quantitation limits for organic compounds, it may be necessary to use a larger sample

e - The recommended practical quantitation limits are based on a value equal to one third of the 1988 dry weight lowest apparent

f - The sample digestion method for mercury is described in the analytical method (Method 7471A, September 1994).

g - Total benzofluoranthenes represent the sum of the b, j, and k isomers.

h - Selected ion monitoring may improve the sensitivity of method 8270C and is recommended in cases when detection limits

i - Sample preparation methods for volatile organic compound analyses are described in the analytical methods.

j - Sample preparation methods for sediment conventional analyses are described in the analytical methods.

k - Replaced Acid Volatile Sulfides listed in SAPA table 5

Table 9
SAPA Recommended Quality Control Procedures for Organic Analyses

Quality Control	Frequency	Control Limit	Corrective Action
Instrument Quality Assurance/Quality Control			
Initial Calibration[a]	See reference method(s) in Table 5	See reference method(s) in Table 7	Laboratory to recalibrate and reanalyze affected samples
Continuing Calibration[a]	See reference method(s) in Table 5	See reference method(s) in Table 7	Laboratory to recalibrate if correlation coefficient or responsefactor does not meet method requirements
Method Quality Assurance/Quality Control			
Holding Times[ab]	Not applicable	See Table 5	Qualify data or collect fresh samples in cases of extreme holding time or temperature exceedance
Detection Limits[ab]	Annually	See Table 9	Laboratory must initiate correctiveactions (which may include additional cleanup steps as well as other measures, see Table 5) and contact the QA/QC coordinator and/or project manager
Method Blanks[ab]	One per sample batch or every 20 samples, whichever is more frequent, or when there is a change in reagents	Analyte concentration < PQL	Laboratory to eliminate or greatly reduce laboratory contamination due to glassware or reagents or analytical system; reanalyze affected samples
Analytical (Laboratory) Replicatesab and Matrix Spike Duplicates [ab]	1 duplicate analysis with every sample batch or every 20 samples, whichever is more frequent; Use analytical replicates when samples are expected to contain target analytes. Use matrix spike duplicates when samples are not expected to contain target analytes	Compound and matrix specific RPD ≤ 35 % applied when the analyte concentration is > PQL	Laboratory to redigest and reanalyze samples if analytical problems suspected, or to qualify the data if sample homogeneity problems suspected and the project manager consulted
Matrix Spikes [ab]	One per sample batch or every 20 samples, whichever is more frequent; spiked with the same analytes at the same concentration as the LCS	Compound and matrix specific	Matrix interferences should be assessed and explained in case narrative accompanying the data package.
Surrogate Spikes [ab]	Added to every organics sample as specified in analytical protocol	Compound specific	Follow corrective actions specified in SW-846.

Table 9
SAPA Recommended Quality Control Procedures for Organic Analyses

Quality Control	Frequency	Control Limit	Corrective Action
Laboratory Control Samples (LCS), Certified or Standard Reference Material [ab]	One per analytical batch or every 20 samples, whichever is more frequent	Compound specific, recovery and relative standard deviation for repeated analyses should not exceed the control limits specified in the method of Table 5 or performance based intralaboratory control limits, whichever is lower	Laboratory to correct problem to verify the analysis can be performed in a clean matrix with acceptable precision and recovery; then reanalyze affected samples
Field Quality Assurance/Quality Control			
Field Replicates	At project manager's discretion	Not applicable	Not applicable
Field Blanks	At project manager's discretion	Analyte concentration ≤ PQL	Compare to method blank results to rule out laboratory contamination; modify samplecollection and equipment decontamination procedures

Notes

CLP - Contract Laboratory Program (EPA)
COV - coefficient of variation
EPA - U.S. Environmental Protection Agency
PCB - polychlorinated biphenyl
PQL - practical quantitation limit
RPD - relative percent difference
RSD - relative standard deviation
SVOC - semivolatile organic compound
VOC - volatile organic compound
a - Subject to QA2 review
b - Subject to QA1 review

Table 10
SAPA Recommended Quality Control Procedures for Metal Analyses

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Instrument Quality Assurance/Quality Control			
Initial Calibration[a]	Daily	Correlation coefficient ≥0.995	Laboratory to optimize and recalibrate the instrument and reanalyze any affected samples
Initial Calibration Verification[a]	Immediately after initial calibration	90–110 % recovery for ICP-AES, ICP-MS and GFAA (80–120 % for mercury), or performance based intralaboratory control limits, whichever is lower	Laboratory to resolve discre-pancy prior to sample analysis
Continuing Calibration Verification [a]	After every 10 samples or every 2 hours, whichever is more frequent, and after the last sample	90–110 % recovery for ICP-AES and GFAA, 85-115 % for ICP-MS (80–120 % for mercury)	Laboratory to recalibrate and reanalyze affected samples
Initial and Continuing Calibration Blanks [a]	Immediately after initial calibration, then 10 percent of samples or every 2 hours, whichever is more frequent, and after the last sample	Analyte concentration < PQL	Laboratory to recalibrate and reanalyze affected samples
ICP Interelement Interference Check Samples [a]	At the beginning and end of each analytical sequence or twice per 8 hour shift, whichever is more frequent	80–120 percent of the true value	Laboratory to correct problem, recalibrate, and reanalyze affected samples
Method Quality Assurance/Quality Control			
Holding Times [ab]	Not applicable	See Table 5	Qualify data or collect fresh samples
Detection Limits [ab]	Not applicable	See Table 9	Laboratory must initiate corrective actions and contact the QA/QC coordinator and/or the project manager immediately
Method Blanks [ab]	With every sample batch or every 20 samples, whichever is more frequent	Analyte concentration ≤ PQL	Laboratory to redigest and reanalyze samples with analyte concentrations < 10 times the highest method blank
Analytical (Laboratory) Replicates[ab] and Matrix Spike Duplicates [ab]	1 duplicate analysis with every sample batch or every 20 samples, whichever is more frequent; Use analytical replicates when samples are expected to contain target analytes. Use matrix spike replicates when samples are not expected to contain target analytes	RPD ≤ 20 % applied when the analyte concentration is > PQL	Laboratory to redigest and reanalyze samples if analyticalproblems suspected, or to qualify the data if sample homogeneity problems suspected and the project manager consulted
Matrix Spikes [ab]	With every sample batch or every 20 samples, whichever is more frequent	75–125 % recovery applied when the sample concentration is < 4 times the spiked concentration for a particular analyte	Laboratory may be able to correct or minimize problem; or qualify and accept data

Table 10
SAPA Recommended Quality Control Procedures for Metal Analyses

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Laboratory Control Samples, Certified or Standard Reference Material [ab]	Overall frequency of 5 percent of field samples	80– 20 % recovery, or performance based intralaboratory control limits, whichever is lower	Laboratory to correct problem toverify the analysis can be performed in a clean matrix withacceptable precision and recovery; then reanalyze affected samples
Field Quality Assurance/Quality Control			
Field Replicates	At project manager's discretion	Not applicable	Not applicable
Field Blanks	At project manager's discretion	Analyte concentration ≤ PQL	Compare to method blank results to rule out laboratory contamination; modify sample collection and equipment decontamination procedures

Note:

CLP - Contract Laboratory Program (EPA)
EPA - U.S. Environmental Protection Agency
GFAA - graphite furnace atomic absorption
ICP-MS - inductively coupled plasma/mass spectrometry
ICP-AES - inductively coupled plasma/atomic emission spectrometry
PQL - practical quantitation limit
RPD - relative percent difference
a - Subject to QA2 review
b - Subject to QA1 review

Table 11
SAPA Recommended Quality Control Procedures for Conventional Analyses

Analyte	Suggested Control Limit						
	Initial Calibration[a]	Continuing Calibration[a]	Calibration Blanks[a]	Laboratory Control Samples	Matrix Spikes[ab]	Laboratory Triplicates [ab]	Method Blank[ab]
Ammonia	Correlation coefficient ≥0.995	90–110 percent recovery	Analyte con-centration ≤ PQL	80–120 percent recovery	75–125 percent recovery	20 % RSD	Analyte concentration ≤ PQL
Grain size	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	20 % RSD	Not applicable
Total organic carbon	Correlation coefficient ≥0.995	90–110 percent recovery	Analyte concentration ≤ PQL	80–120 percent recovery	75–125 percent recovery	20 % RSD	Analyte concentration ≤ PQL
Total sulfides	Correlation coefficient ≥0.990	85–115 percent recovery	Not applicable	65–135 percent recovery	65–135 percent recovery	20 % RSD	Analyte concentration ≤ PQL
Total solids	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	20 % RSD	Analyte concentration ≤ PQL

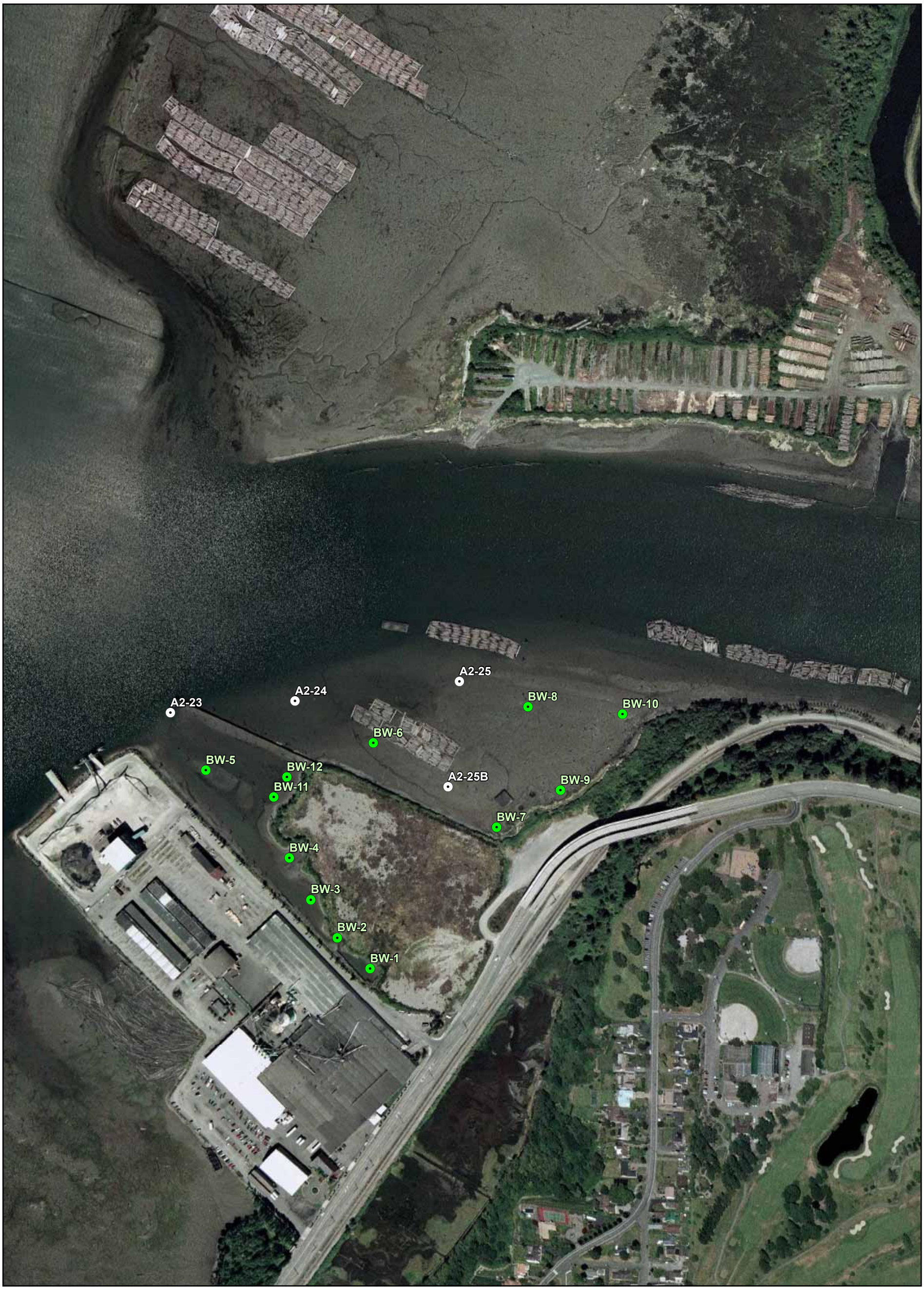
Note:

EPA - U.S. Environmental Protection Agency
PSEP - Puget Sound Estuary Program
PQL - practical quantitation limit
QA/QC - quality assurance and quality control
RSD - relative standard deviation
a - Subject to QA2 review
b - Subject to QA1 review

EPA and PSEP control limits are not available for conventional analytes. The control limits provided above are suggested limits only. They are based on EPA control limits for metals analyses (see Table 12), and an attempt has been made to take into consideration the expected analytical accuracy using PSEP methodology. Corrective action to be taken when control limits are exceeded is left to the Project Manager's discretion. The corrective action indicated for metals in Table 12 may be applied to conventional analytes.

When applicable, the QA/QC procedures indicated in this table should be completed at the same frequency as for metals analyses (see Table 12)

FIGURES



Aerial Imagery © 2007 ESRI, i-cubed

Proposed Sediment Sampling Station

Existing Sediment Sampling Station

0 400

Feet

Q:\Jobs\080147-01_Port_Gardner\Maps\2009_01\Fig_1_Proposed_Samples.mxd ckiblinger 03/20/2009 3:31 PM

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1
Existing and Proposed Sediment Sampling Stations

APPENDIX C

SITE HEALTH AND SAFETY PLAN

Health and Safety Plan
Site Walk
Port of Everett Bay Wood Products Site
Everett, Washington

1.0 REVIEW AND APPROVAL

This Health and Safety Plan (HASP) has been written for the use of SLR International Corp and its employees. It may also be used as a guidance document by properly trained and experienced SLR subcontractors. However, SLR does not guarantee the health or safety of any person entering this site. Questions regarding the applicability of this HASP to personnel other than SLR employees should be referred to Steve Locke at (503) 723-4423.

Due to the potential hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The health and safety guidelines in this HASP were prepared specifically for the Port of Everett Bay Wood Products Site in Everett, Washington and should not be used on any other site without prior research by trained health and safety specialists.

SLR claims no responsibility for the use of this HASP by others. The HASP was written for the specific site conditions, purposes, dates, and personnel specified and must be amended if these conditions or work scope change.

Client: _____

Site Name: _____

Project Name: _____

Project Number: _____

Start Date: _____

Project Manager: _____

Signature: _____

Date: _____

Site Health and Safety Officer: _____

Signature: _____

Date: _____

2.0 HEALTH AND SAFETY PERSONNEL

2.1 Project Manager

The Project Manager (PM) for the Port of Everett Bay Wood Products Site is Scott Miller. The PM has the following responsibilities:

- Ensure the HASP is complete prior to beginning field work.
- Ensure that all equipment and supplies to perform the items in the HASP are available.
- Manage all contract requirements, including ensuring the availability of the health and safety resources.
- Coordinate all project activities with the client, subcontractors, and SLR staff.

2.2 Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) for the Port of Everett Bay Wood Products Site is Chris Kramer, Chris Lee, or Kim Saganski. The SHSO has the following responsibilities:

- Ensure the HASP is completed and enforced on the first day of on-site work.
- Day to day on-site implement of the HASP. The SHSO has the authority to stop work or prohibit any personnel from working on the site at any time for not complying with any aspect of the Plan.
- Day to day communication with the PM and any other pertinent staff to ensure efficient coordination of health and safety activities with other planned field activities.

The SHSO should have the following training:

- 40-hour Health and Safety Training
- First Aid and CPR Training
- Supervisor Training
- Medical Surveillance

2.3 Site Personnel

Each person on the site has responsibility for their own health and safety, as well as assisting others in carrying out the items in the HASP. Any person observed to be in violation of the HASP should be assisted in complying with the requirements, or reported to the SHSO. Any site personnel may shut down field activities if there is a real or perceived immediate danger to life or health.

3.0 GENERAL SITE REQUIREMENTS AND BACKGROUND INFORMATION

3.1 Location, Operations, and Approximate Size of Site

Site Name and Address: Port of Everett Bay Wood Products Site (Site)
200 West Marine View Drive
Everett, Washington 98201

Current Site Owners: Port of Everett

Current Site Operators: The site is currently unused

Approximate Size of Site: Approximately 13 acres

The Site is located on the east bank of the Snohomish River and the confluence with Puget Sound. A Site Location Map has been included as Figure 1 and a Site Plan has been included as Figure 2 (Attachment 1). The Site is located in the Section 7, Township 29N, Range 5E of the Willamette Meridian. The Site is located in Everett Washington in Snohomish County. The Site is relatively flat with the maximum elevation at approximately 15 feet above mean sea level.

3.3 Description of Planned Activities

SLR will be conducting environmental assessment activities at the Port of Everett – Bay Wood Products Site. The field activities to be performed by SLR and SLR's subcontractors will include:

- Installation of Geoprobe borings
- Soil sampling
- Groundwater sampling
- Sediment sampling from a vessel

3.4 Schedule of Planned Activities

It is anticipated that the schedule for the proposed field activities will follow the project schedule presented in Section 2.2 of the main Work Plan (RI/FS and Draft CAP Schedule) and that field work will start around June 9, 2009. All activities will be performed during daylight hours.

3.5 Geoprobe Borings

Geoprobe (direct push) sampling will be performed as part of the environmental assessment activities to collect soil and groundwater samples. Approximately 11 Geoprobe borings will be completed using a truck-mounted Geoprobe rig, ranging in depths from approximately 15 to 20 feet.

3.6 Soil Sampling

Soil samples will be collected from the recovered Geoprobe boring cores and from the soil piles on the Site using hand tools.

3.7 Groundwater Sampling

Groundwater samples will be collected from the Geoprobe borings using a 12-volt direct current powered peristaltic pump and disposable tubing. Groundwater samples will be transferred from the peristaltic pump tubing directly into the laboratory provided sample containers.

3.8 Sediment Sampling

Sediment samples will be collected from approximately ten locations using a vessel operated under the direction of a qualified operator. The vessel will be equipped with a frame, winch, and sediment sampling tools. Personnel on the vessel will be required to wear a certified personal flotation device (life jacket).

3.9 Hazardous Material Usage

No hazardous materials will be used at the site during field activities. Small quantities of isopropyl alcohol may be used for decontamination of upland sampling equipment if the equipment is visibly stained with product. If isopropyl alcohol is used for equipment decontamination the decontamination waste is stored and disposed of as described under waste generation (below).

3.10 Waste Generation

SLR anticipates both solid and liquid waste generation as a part of the field work at the site. All investigation derived waste materials will be placed into 55-gallon steel drums, labeled and left on-site pending laboratory analysis. The waste will be characterized and property disposed of in accordance with State and Federal regulations.

4.0 SITE HEALTH AND SAFETY HAZARDS

Site health and safety hazards include known or potential chemical contaminants and physical hazards that may occur during field activities. Overall, the health and safety hazards of the anticipated activities at the Site have a rating of low. The greatest potential hazards are expected to be from field conditions (slips, trips, and falls).

4.1 Chemical Hazards

Based on the past site activities and facility processes and limited environmental sampling, the following have been designated as the primary chemical contaminants of human health concern.

- Wood debris which may result in releases of ammonia, hydrogen sulfide, or phenols (4-methyphenol, 2,4-dimethylphenol).
- Petroleum hydrocarbons (gasoline and diesel) related to the former aboveground storage tanks (ASTs).
- Potential hazardous substances released during historic sawmilling operations including petroleum hydrocarbons and polynuclear aromatic hydrocarbons (PAHs).

The following tables summarize the potential hazards from the above listed primary chemical contaminants of human health concern.

Contaminant of Concern:	Ammonia
Soil Concentration:	Unknown
Groundwater Concentration:	Unknown
PEL:	35 mg/m3 8-hour TWA
TLV:	17 mg/m3 8-hour TWA
IDLH:	300 ppm
Warning Properties:	Pungent odor at ~5 ppm; eye irritation at 20 ppm
Routes of Exposure:	Inhalation, skin/eye contact, ingestion
Acute Health Effects:	Corrosive injury to the mucous membranes of the eyes, lungs, and gastrointestinal tract and to the skin due to the alkaline pH and the hygroscopic nature of ammonia.
Chronic Health Effects:	Chronic irritation of the respiratory tract, eye membranes and dermatitis, chronic cough, asthma and lung fibrosis.

Contaminant of Concern:	Hydrogen Sulfide
Soil Concentration:	Unknown
Groundwater Concentration:	Unknown
PEL:	20 ppm (ceiling) with the following exception: if no other measurable exposure occurs during the 8-hour work shift, exposures may exceed 20 ppm, but not more than 50 ppm (peak), for a single time period up to 10 minutes
TLV:	10 ppm, 14 mg/m^3 8-hour TWA; 15 ppm, 21 mg/m^3 STEL
IDLH:	100 ppm

Warning Properties:	Not dependable; characteristic rotten-egg odor detectable at about 0.5 ppb, but olfactory nerve fatigue occurs in 2 to 15 minutes at concentrations over 100 ppm
Routes of Exposure:	Inhalation, skin/eye contact, ingestion
Acute Health Effects:	Nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, and skin and eye irritation
Chronic Health Effects:	Low blood pressure, headache, nausea, loss of appetite, weight loss, ataxia, eye-membrane inflammation, chronic cough, psychological disorders

Contaminant of Concern:	Phenols
Soil Concentration:	Unknown
Groundwater Concentration:	Unknown
PEL:	TWA 5 ppm (19 mg/m^3) [skin]
TLV:	TWA 5 ppm (19 mg/m^3) C 15.6 ppm (60 mg/m^3) [15-minute] [skin]
IDLH:	250 ppm
Warning Properties:	Sweet, acrid odor
Routes of Exposure:	Inhalation, skin absorption, ingestion, skin and/or eye contact
Acute Health Effects:	Irritation to eyes, nose, throat; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; skin burns; dermatitis; tremor, convulsions, twitching
Chronic Health Effects:	Cyanosis; liver, kidney damage

Contaminant of Concern:	TPH-G (Total Petroleum Hydrocarbons – Gasoline Range)
Soil Concentration:	Unknown
Groundwater Concentration:	Unknown
PEL:	0.2 ppm 8-hour TWA
TLV:	0.2 ppm 8-hour TWA
IDLH:	N.D. (not determined)
Warning Properties:	Characteristic gasoline odor
Routes of Exposure:	Inhalation, dermal contact, ingestion
Acute Health Effects:	Eye, skin, and mucus membrane irritation; blurred vision, dizziness, confusion and slurred speech.
Chronic Health Effects:	Kidney and liver damage, central nervous system damage, and benzene can cause blood changes including leukemia and anemia.

Contaminant of Concern:	TPH-Dx (Total Petroleum Hydrocarbons – Diesel Range)
Soil Concentration:	Unknown
Groundwater Concentration:	Unknown
PEL:	25 ppm 8-hour TWA
TLV:	100 mg/m3 8-hour TWA
IDLH:	Not Applicable

Warning Properties:	Diesel odor
Routes of Exposure:	Inhalation, dermal contact, ingestion
Acute Health Effects:	Coughing, dizziness, nausea, skin and eye irritation, diarrhea, vomiting, abdominal discomfort
Chronic Health Effects:	Dermatitis, benzene can cause blood changes including leukemia and anemia

PAHs are a group of chemicals that are formed during the incomplete combustion of coal, oil, and gas. Most PAHs do not dissolve easily. Typically, PAHs tend to attach to particulates in water or absorb to soil. Naphthalene is the most common PAH and benzo(a)pyrene is the most studied PAH and is ranked as an A2 suspected human carcinogen. The following table summarizes the potential hazards of PAHs:

Contaminant of Concern:	Naphthalene and benzo(a)pyrene (assumed for all PAHs)
Soil Concentration:	6,100 µg/mg (dibenzo(a,h)anthracene)
Groundwater Concentration:	1.13 µg/L (naphthalene)
PEL:	50 mg/m3 8-hour TWA (naphthalene)
TLV:	50 mg/m3 8-hour TWA (naphthalene)
IDLH:	500 ppm (naphthalene)
Warning Properties:	None
Routes of Exposure:	Inhalation, incidental ingestion, and dermal contact (PAHs have low volatilization potentials, therefore inhalation usually occurs through intake of PAHs absorbed to particulates)
Acute Health Effects:	Skin, respiratory and eye irritant, change color and properties of skin
Chronic Health Effects:	Bladder, skin and lung cancer, and reproductive damage

4.2 Physical Hazards

The following table summarizes the potential physical hazards that could occur during the activities at the site:

Physical Hazard	Yes	No
Overhead/underground hazards		
● Overhead	X	
● Underground	X	
Equipment hazards		
● Drilling	X	
● Excavation	X	
● Machinery		X
Heat exposure	X	
Cold exposure	X	

Physical Hazard	Yes	No
Oxygen deficiency		X
Confined space *		X
Noise	X	
Ionizing radiation		X
Non-ionizing radiation		X
Fire/Explosion		X
Biological	X	
Safety		
● Holes/ditches	X	
● Steep grades	X	
● Slippery surfaces	X	
● Uneven terrain	X	
● Water hazard	X	
● Unstable surfaces (slippery/muddy)	X	
● Elevated work surfaces		X
Shoring/Scaffolding		X

* SLR personnel are forbidden from entering any confined space, including excavation pits.

4.3 Task Specific Hazards

The following table summarizes the potentially hazards from each specific tasks:

Task	Hazard Rating	Identified/Anticipated Hazards
Site Walk / Reconnaissance	Low	Water hazard, biological (snakes, etc.), slip-trip-fall safety
Geoprobe (direct-push) Borings	Low	Heavy equipment, noise, weather stress, aboveground and underground utilities, chemical exposure, and slip-trip-fall safety
Soil Sampling	Low	Fatigue, noise, chemical exposure, biological (snakes, etc.), weather stress, and slip-trip-fall safety
Groundwater Sampling	Low	Fatigue, noise, chemical exposure, biological (snakes, etc.), weather stress, and slip-trip-fall safety
Sediment Sampling from a Vessel	Medium	Water hazards, physical hazards (vessel run into submerged objects, mud, equipment cables, motor fuels, etc.), chemical exposure, slip-trip-falls from vessel motion and slippery surfaces

4.4 Utilities

Before Geoprobe drilling at the site, the public utility locating service (one-call service) and a private locating service will be contacted to locate subsurface utilities at the site. A Utility Clearance Log (included as Attachment 2 to this HASP) will be completed prior to beginning any subsurface work. The following precautions will be followed to prevent injuries and damage to utilities:

- Located utility lines at the site will be noted and emphasized on the boring logs and site plans.
- All electrical wires at the site will be considered live and dangerous. If there are any questions concerning the safety of drilling in the vicinity of a power line, the power company will be contacted prior to drilling activities in that location.
- At least 20 feet of clearance will be maintained from overhead power lines, or ten feet if the lines are padded (shielded with plastic cover)

5.0 SITE HEALTH AND SAFETY PROCEDURES

No field work is proposed as part of the site walk. The HASP will be updated prior to initiation of any field work activities.

5.1 Daily Site Safety Meetings

Site safety meetings will be held daily before initiating any field activity. The safety meetings will be mediated by the SHSO. Site safety meetings will also be held at any other time, as necessary, to ensure the safety and health of the employee on-site. A Daily Safety Meeting Log has been included as Attachment 3.

Prior to beginning any work at the site, each worker will be given an informal training on how the project will progress. The SHSO will inform the workers of the following information:

- Proposed work activities for the day and the potential hazards
- Provisions of this Plan
- Dry runs of the emergency procedures, including location of the medical facility
- Dry runs of the decontamination procedures, if applicable
- Chemical exposures expected at the site
- Site lay-out and zone delineation
- Warning signals and evacuation procedures

5.2 Site Security

The SHSO is responsible for preventing unauthorized entry into the work area and for knowing who is on-site at all times. Access to the work site will be controlled in the following manner:

- Cones, barricades, and/or caution tape will be used to delineate work area near areas with public access.

5.3 Work Limitations and Restrictions

The following work limitation and restrictions will be employed by the SHSO:

- No eating, drinking, or smoking on-site.
- No contact lenses on-site. Workers requiring vision correction must wear glasses in environments with chemicals.
- No facial hair that would interfere with respirator fit.
- The SHSO will monitor weather broadcasts before the start of work each day, and more frequently as necessary. No work will be done outdoors in inclement weather (snow, sleet, etc.) without authorization from the SHSO.

5.4 Decontamination Procedures

The following decontamination procedures will be followed:

- Personnel: Personnel will wash with soap and water before leaving the site.
- Field Equipment: Field equipment will be decontaminated prior to and after use by following these procedures:
    1. Wash equipment with detergent.
    2. Rinse with tap water.
    3. Triple rinse with purified water.
    4. Air dry.
    5. Wrap in clean polyethylene plastic, when necessary.
- Heavy Equipment: Heavy equipment will be steam cleaned or boom-cleaned, if necessary.

5.5 General Health and Safety Procedures

The following general health and safety procedures will be followed at the site:

- The Utility Clearance Log will be completed prior to beginning any subsurface work.
- Determine wind direction and try to remain upwind when collecting samples.
- Daily safety meetings will be held by the SHSO.
- Potable water must always be available at the work site.
- If toilet facilities are not located within a 5-minute walk from the decontamination facilities, either provide a chemical toilet and hand washing facilities or have a vehicle available (not the emergency vehicle) for transport to nearby facilities.
- Provide dust control by spraying soils with water or a surfactant/water solution.
- Use ground fault circuit interrupters for plug-in electrical devices and extension cords (3-pin plugs only).
- Be aware of tripping hazards with extension cords, tools, hoses, augers, etc.
- If an on-site command post is necessary, ensure that it is located upwind from sources, give prevailing winds, and locate/identify on Site Map.
- On-site personnel must be able to call off-site via a telephone within 150 feet of work.
- Designate at least one vehicle for emergency use.

5.6 Perimeter Identification

The perimeters of the different field activities are included on Figure 2, Site Plan (Attachment 1). There are four classifications of "zones" or "boundaries" that could be required at a job site:

1. **Exclusion Zone**: Required when workers within that zone must wear personal protective equipment (PPE).
2. **Contamination Reduction Zone**: Required when decontamination of people and equipment leaving the Exclusion Zone is required.
3. **Support Zone**: The location where administrative and other support activities are conducted.
4. **Work Area Boundary**: Excludes non-workers from entering a potentially hazardous environment.

All tasks that are being proposed at the site are classified as Work Area Boundaries.

5.7 Personnel Protective Equipment

Personnel protective equipment (PPE) is designed to protect the body against contact with known or anticipated toxic chemicals. PPE has been designated into four different levels:

1. **Level A:** Self-contained breathing apparatus (SCBA), totally encapsulating suit, two-way radio communications.
2. **Level B:** SCBA or supplied-air respirator with an escape bottle, chemically resistant PPE, two-way radio communications.
3. **Level C:** Full- or half-face air respirator (with safety goggles), chemically resistant PPE.
4. **Level D:** No respiratory protection. Safety glasses, hard hat, steel-toe boots, long-sleeved shirt and pants. Hearing protection, gloves, and other PPE as required.

The Port of Everett Bay Wood Products Site is classified as a Level D PPE site. There is little to no risk of workers being in contact with contaminants. Level D PPE includes:

- Hard Hat (ANSI Z89.1 approved)
- Steel Toed and Shank Boots (ANSI Z41.1 approved)
- Safety Glasses (ANSI Z87.1 approved)
- Gloves
- Close Fitting Clothing
- Hearing Protection (optional)

Environmental and personnel monitoring will be conducted to evaluate the level of contamination to which site personnel or the surrounding environment are being exposed. The results of the monitoring will form the basis by which the SHSO will determine the level of PPE required for a particular operation. A photo ionization detector (PID) will be used to monitor the presence of organic vapors or gases. The PID will be used during borings and test pit excavations according to the following guide:

- 0 to 20 units (ppmv) above background – Continue work
- 20 to 50 units above background – Investigate cause and continue work if PPE adequate

- Over 50 units above background – Stop work and investigate; use ventilation to reduce levels

5.8 Safety Equipment

The following safety equipment and supplies will be available at the site at all times during field work:

- Reflective vests to be available to wear around moving vehicles, if any
- At least one 20-pound ABC-type fire extinguisher
- First Aid Kit
- Emergency eyewash
- Hearing protection in the form of disposable ear plugs to be worn around heavy equipment, machinery, or when two individuals five feet or less apart need to shout to be heard
- Soap gel or disposable wipes
- Disposable towels
- Plastic sheeting
- Cleaning brushes and tubs
- Life vest / flotation equipment (sediment sampling)

6.0 CONTIGENCY PLAN

In the unlikely event of a fire or explosion, or uncontrolled release of a contaminant, prompt action to limit the extent of the impact will be required. The SHSO shall evaluate all emergency situations and inform personnel by use of a signal horn, visual, or verbal contact, as appropriate. All personnel must know ahead of time what their duties would be in the event of an emergency.

6.1 Injury or Illness

If an injury of illness occurs at the job site, take the following action:

- Get first aid for the person immediately. Call 911 if needed.
- Notify the SHSO. The SHSO is responsible for preparing and submitting the Incident Report within 24 hours.
- The SHSO will assume charge during an emergency situation.

The location of the nearest hospital, with driving instruction, has been included as Attachment 4 to this plan. The hospital is located at:

Providence Everett Medical Center
900 Pacific Avenue
Everett, Washington 98021
(425) 261-2000

6.2 Emergency Telephone Numbers

Project Personnel

Name	Title	Cell Phone	Work Phone
Scott Miller	SLR Project Manager	(503) 572-1124	(503) 723-4423
Chris Kramer	SLR SHSO	(503) 341-2187	(503) 723-4423

Governmental Agency Contacts

Agency	Phone Number
Office of Emergency Services	(800) 852-7550
National Response Center	(800) 424-8802
One Call (Utility Locate)	(800) 424-5555
APS (Private Locater)	(425) 888-2590

Attachment 1

Figures

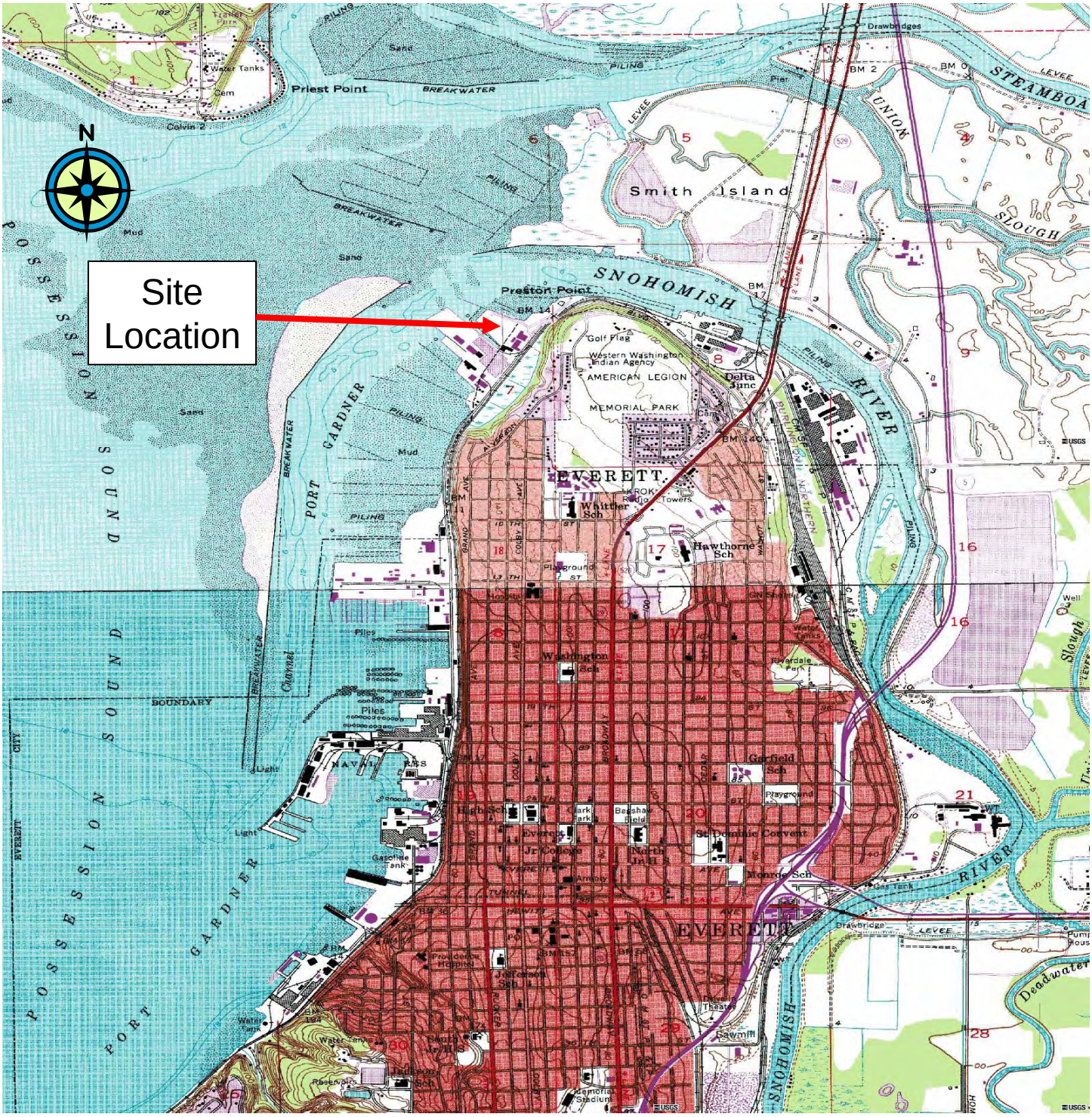


Figure 1
Vicinity Map
Bay Wood Products Site

QUADRANGLE LOCATION

Source: USGS 7.5 Minute Quadrangle Maps (Everett and Marysville Quadrangle Maps; Photo Revised – 1968 and 1973)

Figure 2
Site Plan - Bay Wood Products Site

Source: Imagery: I-Cubed, 2006; Acquired: Via ArcGIS Explorer by ESRI on 1/25/2008.

Attachment 2

Utility Clearance Log

ATTACHMENT 2

PRE-DRILLING/EXCAVATION CHECKLIST AND UTILITY CLEARANCE LOG

PROJECT:		DATE:	
LOCATION:		UTILITY LOCATOR PHONE:	
UTILITY LOCATOR:		LOCATOR CALL REFERENCE:	
DATE OF LOCATOR REQUEST:		SLR FIELD TECHNICIAN:	

Instructions: This checklist is to be completed by SLR personnel prior to initiation of filed activites as a safety measure to insure that underground structures and aboveground power lines are clearly marked in the area selected for boring or excavation. **Drilling or excavation work may not proceed until One Call has been contacted and this checklist has been completed. If any of the questions answered below are answered "no," then the project manager must be contacted and concerns/issues discussed.** "No" answers should be documented on the back of the form.

Type of Utilities and Structures	Not Present	Present	Marking (Flags, Paint, Stakes)

YES	NO	PRE-MOBILIZATION
		Is a scaled site plan, map, or drawing showing the proposed borehole locations attached?
		Does each location allow for clear entry and exit, adequate workspace, and a clear path for raising and lowering all equipment? 20 feet minimum clearance must be maintained between raised equipment and electrical lines.
		Are all of the locations and associated areas of pavement cutting at least 3 feet from any subsurface or aboveground utilities shown on client's building plans?
		Are all of the locations and associated areas of pavement cutting at least 3 feet from any subsurface or aboveground utilities shown on public right-of-way street improvement or other public property plan or site map?
		Has the Site Representative indicated no knowledge of any subsurface or aboveground utilities within 3 feet of the proposed locations? Is the Site Representative qualified to make such a determination?
		Are all of the proposed locations and associated areas of pavement cutting at least 3 feet from any subsurface utilities identified during a geophysical survey?
		Have all Utility Locating Service providers notified by the public line locator marked out their facilities in the vicinity of the locations or otherwise notified SLR that they do not have any facilities near the proposed locations?
		Are all proposed locations and associated areas of pavement cutting at least 3 feet from a visual line connecting two similar looking manhole covers?
		Are all proposed locations and associated areas of pavement cutting at least 3 feet from a visual line perpendicular to the street from the water, gas, and electrical meters?
		Are all proposed locations and associated areas of pavement cutting clear of pavement joints, curbs, crash posts, or other engineered structures?
		Does the pavement lack signs of previous excavation (e.g. no pavement subsidence, difference in pavement texture or relief, or pavement patching)? If there are signs, determine the purpose of the previous excavation.
		Before drilling, has an exploratory hole been dug to 5 feet below grade with a hole diameter greater than the outer diameter of the drilling auger?
		Does the soil encountered in the hand-dug hole appear to be native material (i.e. free of gravel, clean sand, aggregate base, or other non-native looking material)?
		Have all expected utilities been identified and all missing utilities explained?

Have any concerns noted above been discussed with the SLR Project Manager?	**Yes**	**No**
Have any concerns noted above been discussed with the client?	**Yes**	**No**

Approval to proceed:	Client Rep Name:	Title and Date:
Approval to proceed:	SLR Rep Name:	Title and Date:

Attachment 3

Daily Safety Meeting Log

ATTACHMENT 3

DAILY SAFETY MEETING LOG

PROJECT:		DATE:	
LOCATION:		START TIME:	

ISSUES DISCUSSED:	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

ATTENDEES:

	PRINTED NAME	COMPANY	SIGNATURE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			

MEETING CONDUCTION BY:	SIGNATURE:
SITE HEALTH AND SAFETY OFFICER:	SIGNATURE:

Attachment 4

Location of Hospital and Driving Instructions

MAPQUEST

A: 200 W Marine View Dr, Everett, WA 98201-1029

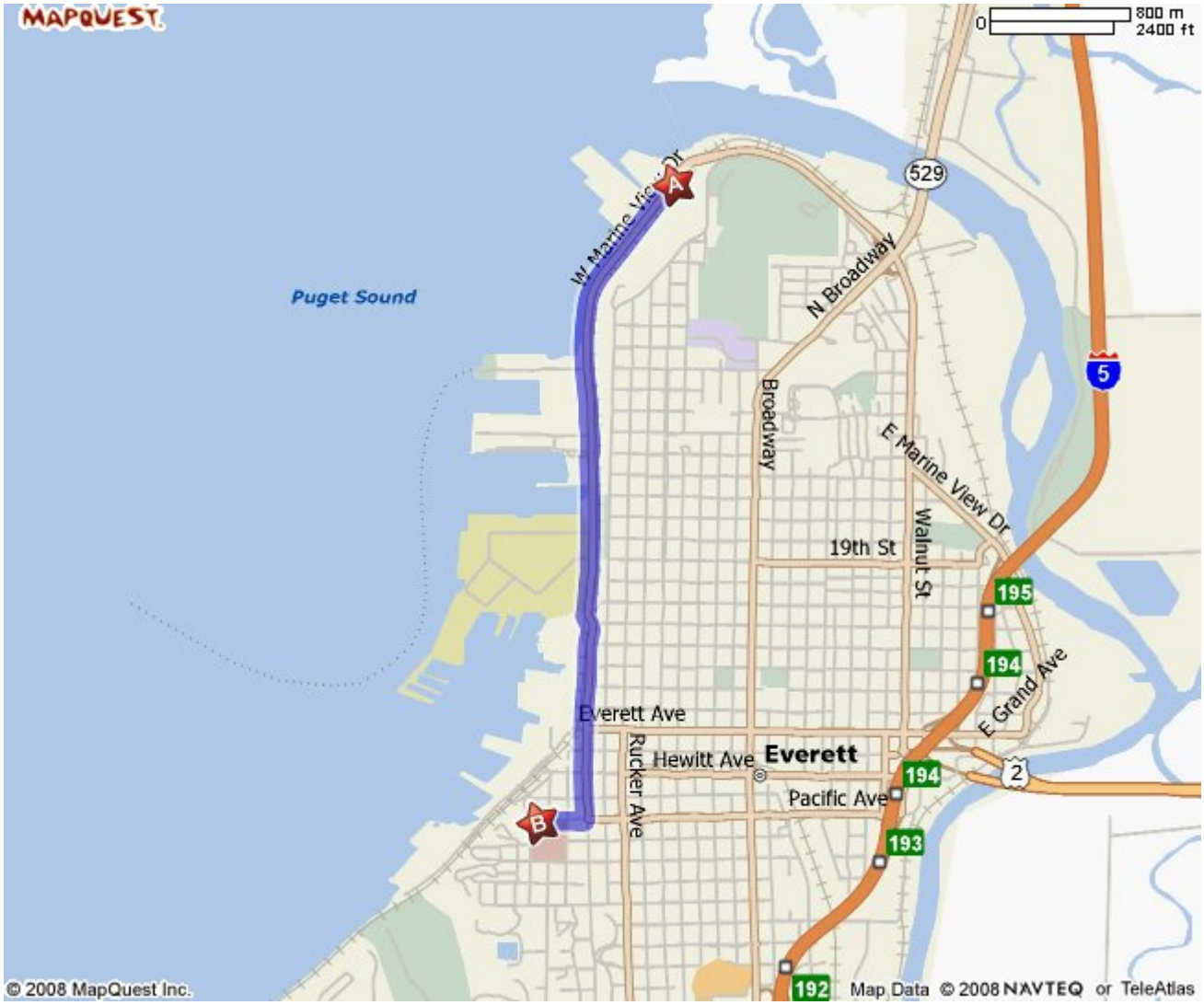
START	**1:** Start out going SOUTH on W MARINE VIEW DR/WA-529 toward 10TH ST. Continue to follow W MARINE VIEW DR.	2.8 mi
	2: Turn RIGHT onto PACIFIC AVE.	0.2 mi
END	**3:** End at 900 Pacific Ave Everett, WA 98201-4168	

Estimated Time: 6 minutes Estimated Distance: 3.01 miles

B: 900 Pacific Ave, Everett, WA 98201-4168

Total Time: 6 minutes Total Distance: 3.01 miles

Get help on the go! MapQuest directions now by phone with **1-800-FREE411** (1-800-373-3411).



APPENDIX D

PARCEL INFORMATION

Snohomish County Washington Online Government Information & Services

* R E A L * Property Information

County Home Assessor Home Treasurer Home Information on which Department to contact

Please view Disclaimer **If you have questions, comments or suggestions, please Contact Us.**

Date/Time:1/25/2008 3:18:37 PM Answers to Frequently Asked Questions about Parcel Data (opens as new window)

Return to Property Information Entry page

Parcel Number **29050700100300** Prev Parcel Reference **07290510030000**

View Map of this parcel (opens as new window)

General Information

Taxpayer Name || Address (contact the Treasurer if you have questions)

EVERETT PORT OF || PO BOX 538 - - - EVERETT, WA 98206

If the above mailing address is incorrect and you want to make a change, see the information on Name and Address Changes

Owner Name || Address (contact the Assessor if you have questions)

EVERETT PORT OF || PO BOX 538 - - - EVERETT, WA 98206

If the above name and address is incorrect due to a recent sale, please see the information on Name and Address Changes After a Sale

Street (Situs) Address (contact the Assessor if you have questions)

200 W MARINE VIEW DR - - - EVERETT, WA 98201-1029

Parcel Legal Description

SEC 07 TWP 29 RGE 05 RT-4) BEG AT 1/4 COR ON E BDY OF SEC TH W 675.81 FT TO W BDY NPRR R/W TPB TH SLY ALG SD R/W LN 75.47FT TH ANG N45*47 22W FOR 549.75FT TH ANG S44*12 38W FOR 49FT TH ANG N45*47 22W FOR 1360.73FT TO E GOVT PIER HEAD LN TH ANG N64*00 00E FOR 744.24FT TH ANG N77*00 00E FOR 380.87FT TH ANG S72*10 22E FOR 944.45FT TH ANG S30*28 38W FOR 670.17FT TH ANG L 76*16 FOR 300FT TO W BDY OF NPRR R/W TH SLY ALG SD R/W LN FOR 615. 03FT TPB LESS ST TO EV ALSO LESS FDP BEG E 1/4 COR SEC 7-29-5 TH S88*58 38W ALG 1/4 LN 675.81FT TO W BDY LN NPRR R/W TH S32*42 38W ALG W BDY LN 75.47FT TH N45*47 22W 40.82 FT TPB TH CONT N45*47 22W 58.51 FT TAP ON A/C C/PT FR WH BEARS N04*05 55W WITH RAD OF 381.17FT TH NELY ALG A/C TO L CONCENTRIC WITH & 8FT SLY FR C/L OF NPRR SPURR AS IT EXISTS ON TH GROUND FOR78.13 FT TH S32*42 38W FOR 64.54 FT TPB

Go to top of page

Treasurer's Tax Information

Taxes **For answers to questions about Taxes, please contact the** Treasurer's office (opens as new window)

Tax Information will be unavailable from January 11 through February 12 due to tax extension posting taxes and assessments. Tax Information should be available again on February 12.

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Assessor's Property Data

Characteristics and Value Data below are for 2008 tax year.

Please contact the Treasurer's office **for answers to questions about Taxes** (opens as new window)

For questions ONLY about property characteristics or property values (NOT taxes), please contact the Assessor's Office

Property Values

Values do not reflect adjustments made due to an exemption, such as a senior or disabled persons exemption.
Reductions for exemptions are made on the property tax bill.

Tax Year	Market Land	Market Improvement	Market Total
2008	$5,427,400	$0	$5,427,400

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Valuation and Property Tax History

View History (opens as new window)

Go to top of page

Property Characteristics

Tax Code Area (TCA) **00010** View Taxing Districts for this Parcel (opens as new window)

Use Code **910 Undeveloped (Vacant) Land**

Size Basis **ACRE** Size **38.63** (Size may include undivided interest in common tracts and road parcels)

Exemption **Government Property**

Go to top of page

Property Structures

No structures found for this parcel

Go to top of page

Property Sales since 7/31/1999

Explanation of Sales Information (opens as new window)

Sales data is based solely upon excise affidavits processed by the Assessor.

No sales for this parcel have been recorded since 7/31/1999

Go to top of page

Property Maps Township/Range/Section/Quarter, links to maps

Neighborhood **5306000** Explanation of Neighborhood Code (opens as new window)

Township **29** Range **05** Section **07** Quarter **NE** Find parcel maps for this Township/Range/Section

View Map of this parcel (opens as new window)

Snohomish County Washington Online Government Information & Services

* R E A L * Property Information

County Home Assessor Home Treasurer Home Information on which Department to contact

Please view Disclaimer **If you have questions, comments or suggestions, please Contact Us.**

Date/Time:1/25/2008 3:20:11 PM Answers to Frequently Asked Questions about Parcel Data (opens as new window)

Return to Property Information Entry page

Parcel Number **29050700100500** Prev Parcel Reference **07290510050008**

View Map of this parcel (opens as new window)

General Information

Taxpayer Name || Address (contact the Treasurer if you have questions)

PORT OF EVERETT || PO BOX 538 - - - EVERETT, WA 98206

If the above mailing address is incorrect and you want to make a change, see the information on Name and Address Changes

Owner Name || Address (contact the Assessor if you have questions)

PORT OF EVERETT || ATTN BANNAN PHILIP B - PO BOX 538 - - EVERETT, WA 98206

If the above name and address is incorrect due to a recent sale, please see the information on Name and Address Changes After a Sale

Street (Situs) Address (contact the Assessor if you have questions)

UNKNOWN UNKNOWN - - -

Parcel Legal Description

SEC 07 TWP 29 RGE 05 RT 5A-) BEG AT E1/4 CN SEC TH S88*58 38 W 675.81FT TH S32*42 38W 75.41FT TH N45*47 22W 121.70FT TO PT 8.0FT NLY OF & PLLWITH C/L OF RR SPUR SD PT BEING ON CRV TPB TH CONT N45*47 22W 428.04FT TH S44* 12 38W 49.0FT TH N45*47 22W 1360.73FT TO INT GOV PIER HEAD LN TH S64*00 00W ALG SD GOV PIER HEAD LN 60.85FT TH S45*47 22E 1631.04FT TO INT LN 8.9FT NLY & PLL WITH C/L OF RR SPUR SD PT BEING ON CRV TO L TH THRU LAST DESC PT ANG L 17*30 00TO PTN TANGENCY OF SD CRV TO L TH ALG TH ARC OF SD CRV TO L HAV RAD OF 513. 67FT & CONS AN ANG 09*13 38 FOR DIST OF 82.75FT TO PT OF COMPOUND WITH CRV TO L TH ALG SD COMP CRV TO L HAV RAD OF 375.06FT & CONS ANG OF 19*25 05 127.11 TO TPB BEING PTN OF GOV LOT 1 & PTN OF EV IMP TDLES IN SEC 7-29-5 CONT 2.67 AC

Go to top of page

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Taxes For answers to questions about Taxes, please contact the Treasurer's office (opens as new window)

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Go to top of page

Assessor's Property Data

Characteristics and Value Data below are for 2008 tax year.

Please contact the Treasurer's office **for answers to questions about Taxes** (opens as new window)

For questions ONLY about property characteristics or property values (NOT taxes), please contact the Assessor's Office

Values do not reflect adjustments made due to an exemption, such as a senior or disabled persons

Property Values

exemption.
Reductions for exemptions are made on the property tax bill.

Tax Year	Market Land	Market Improvement	Market Total
2008	**$315,400**	**$0**	**$315,400**

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Valuation and Property Tax History

View History (opens as new window)

Go to top of page

Property Characteristics

Tax Code Area (TCA) **00010** View Taxing Districts for this Parcel (opens as new window)

Use Code **242 Sawmills & Planing Mills**

Size Basis **ACRE** Size **2.66** (Size may include undivided interest in common tracts and road parcels)

Exemption **Government Property**

Go to top of page

Property Structures

No structures found for this parcel

Go to top of page

Property Sales since 7/31/1999

Explanation of Sales Information (opens as new window)

Sales data is based solely upon excise affidavits processed by the Assessor.

No sales for this parcel have been recorded since 7/31/1999

Go to top of page

Property Maps Township/Range/Section/Quarter, links to maps

Neighborhood **5306000** Explanation of Neighborhood Code (opens as new window)

Township **29** Range **05** Section **07** Quarter **NE** Find parcel maps for this Township/Range/Section

View Map of this parcel (opens as new window)

Snohomish County Washington Online Government Information & Services

* R E A L * Property Information

County Home Assessor Home Treasurer Home Information on which Department to contact

Please view Disclaimer **If you have questions, comments or suggestions, please Contact Us.**

Date/Time:1/25/2008 3:21:06 PM Answers to Frequently Asked Questions about Parcel Data (opens as new window)

Return to Property Information Entry page

Parcel Number **29050700101000** Prev Parcel Reference **07290510100001**

View Map of this parcel (opens as new window)

General Information

Taxpayer Name || Address (contact the Treasurer if you have questions)

PORT OF EVERETT || PO BOX 538 - - - EVERETT, WA 98206

If the above mailing address is incorrect and you want to make a change, see the information on Name and Address Changes

Owner Name || Address (contact the Assessor if you have questions)

PORT OF EVERETT || ATTN BANNAN PHILIP B - PO BOX 538 - - EVERETT, WA 98206

If the above name and address is incorrect due to a recent sale, please see the information on Name and Address Changes After a Sale

Street (Situs) Address (contact the Assessor if you have questions)

UNKNOWN UNKNOWN - - -

Parcel Legal Description

SEC 07 TWP 29 RGE 05 RT 4-1) TH PTN GOVT LOTS 1 & 2 DAF COM AT E 1/4 COR OF SD SEC TH S88*58 38W ALG1/4 LN FOR 675.81FT TO WLY BDY OF OLD NP/RR R/W TH S32*42 38W ALG SD WLY BDY 75.41FT TH N45*47 22W 42.86FT TO WLY BDY OF ESE TO CITY OF EV FOR RD & TPB TH CONT N45*47 22W 57.08FT TAP ON ARC OF CRV SD PT BEING 8FT SLY OF AS MEAS AT R/A TO C/L R/R SPUR TR TH ANG TO R 131*38 41 TO BECOME TANG TO CRV TH ON CRV TO L CONCENTRIC WITH & 8FT SLY OF C/L SD R/R SPUR TR HAV RAD 391.06FT & CONS ANG OF 11*07 05 FOR 75.88FT TO SD WLY BDY ESE TO CITY EV TH S32*42 38W ALG SD WLY BDY FOR 62.48FT TO TPB

Go to top of page

Treasurer's Tax Information

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Assessor's Property Data

Characteristics and Value Data below are for 2008 tax year.

Please contact the Treasurer's office **for answers to questions about Taxes** (opens as new window)

For questions ONLY about property characteristics or property values (NOT taxes), please contact the Assessor's Office

Property Values

Values do not reflect adjustments made due to an exemption, such as a senior or disabled persons exemption.
Reductions for exemptions are made on the property tax bill.

Tax Year	2008	Market Land	$12,600	Market Improvement	$0	Market Total	$12,600

Go to top of page

Valuation and Property Tax History

View History (opens as new window)

Go to top of page

Property Characteristics

Tax Code Area (TCA) **00010** View Taxing Districts for this Parcel (opens as new window)

Use Code **910 Undeveloped (Vacant) Land**

Size Basis **ACRE** Size **0.03** (Size may include undivided interest in common tracts and road parcels)

Exemption **Government Property**

Go to top of page

Property Structures

No structures found for this parcel

Go to top of page

Property Sales since 7/31/1999

Explanation of Sales Information (opens as new window)

Sales data is based solely upon excise affidavits processed by the Assessor.

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Township **29** Range **05** Section **07** Quarter **NE** Find parcel maps for this Township/Range/Section

View Map of this parcel (opens as new window)

APPENDIX E

ECOLOGY'S DRAFT PUBLIC PARTICIPATION PLAN

Site Cleanup:

BAY WOOD PRODUCTS SITE

200 West Marine View Drive
Everett, Washington

PUBLIC PARTICIPATION PLAN

Prepared by:
Washington State Department of Ecology

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

August 2008

This plan is for you!

This Public Participation Plan is prepared for the Bay Wood Products Site cleanup as part of the requirement of the Model Toxics Control Act (MTCA). The plan provides information about MTCA cleanup actions and requirements for public involvement, and identifies how Ecology and the Port of Everett will support public involvement throughout the cleanup. The plan is intended to encourage coordinated and effective public involvement tailored to the community's needs at the Bay Wood Products Site.

For additional copies of this document, please contact:

Washington State Department of Ecology
Isaac Standen, Site Manager
Toxics Cleanup Program
PO Box 47600
Olympia, WA 98504-7600
(360) 407-7209
Email: ista461@ecy.wa.gov

If you need this publication in an alternate format, please call the Toxics Cleanup Program at (360) 407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call (877) 833-6341 (TTY).

Table of Contents

1.0: Introduction and Overview of the Public Participation Plan

This Public Participation Plan explains how you can become involved in improving the health of your community. It describes public participation opportunities that will be conducted during cleanup of a site on the Everett waterfront - the Bay Wood Products Site (Site). These opportunities are part of a cooperative agreement between the Washington State Department of Ecology (Ecology) and the Port of Everett (Port). The current agreement, called an Agreed Order, is a legal document in which the Port and Ecology agree to decide on cleanup actions for the Bay Wood Products Site. Bay Wood Products is located at 200 West Marine View Drive, on Port Gardner Bay, Everett, Washington.

Cleanup actions and the public participation process that helps guide them are established in Washington's Model Toxics Control Act (MTCA).[1] Under MTCA, Ecology is responsible for providing timely information and meaningful chances for the public to learn about and comment on important cleanup decisions before they are made. The goals of the public participation process are:

- To promote understanding of the cleanup process so that the public has the necessary information to participate.
- To encourage involvement through a variety of public participation opportunities.

This Public Participation Plan provides a framework for open dialogue about the cleanup among community members, Ecology, cleanup site owners, and other interested parties. It outlines basic MTCA requirements for community involvement activities that will help ensure that this exchange of information takes place during the investigation and cleanup, which include:

- Notifying the public about available reports and studies about the site.
- Notifying the public about review and comment opportunities during specific phases of the cleanup investigation.
- Providing appropriate public participation opportunities such as fact sheets to learn about cleanup documents, and if community interest exists, holding meetings to solicit input and identify community concerns.
- Considering public comments received during public comment periods.

[1] The Model Toxics Control Act (MTCA) is the hazardous waste cleanup law for the State of Washington. The full text of the law can be found in Revised Code of Washington (RCW), Chapter 70.105D. The legal requirements and criteria for public notice and participation during MTCA cleanup investigations can be found in Washington Administrative Code (WAC), Section 173-340-600.

In addition to these basic requirements, the plan may include additional site-specific activities to meet the needs of your community. Based upon the type of the proposed cleanup action, the level of public concern, and the risks posed by the site, Ecology may decide that additional public involvement opportunities are appropriate.

These opportunities form the basis for the public participation process. The intent of this plan is to:

- Provide complete and current information to all interested parties.
- Let you know when there are opportunities to provide input.
- Listen to concerns.
- Address those concerns.

Part of the Puget Sound Initiative

Bay Wood Products is one of several sites in the Everett area and is part of a larger cleanup effort called the Puget Sound Initiative (PSI). Governor Chris Gregoire and the Washington State Legislature authorized the PSI as a regional approach to protect and restore Puget Sound. The PSI includes cleaning up 50-60 contaminated sites within one-half mile of the Sound. These sites are grouped in several bays around the Sound for "baywide" cleanup efforts. As other sites in the Everett baywide area move forward into investigation and cleanup, information about them will be provided to the community as well as to interested people and groups.

Roles and Responsibilities

Ecology will lead public involvement activities, with support from the Port. Ecology maintains overall responsibility and approval authority for the activities outlined in this plan. The Port is responsible for cleanup at this site. Ecology will ultimately oversee all cleanup activities, and ensure that contamination on this site is cleaned up to concentrations that are established in state regulations and that protect human health and the environment.

Organization of this Public Participation Plan

The sections that follow in this plan provide:

- Section 2: Background information about the Bay Wood Products Site.
- Section 3: An overview of the local community that this plan is intended to engage.

- Section 4: Public involvement opportunities in this cleanup.

This Public Participation Plan addresses current conditions at the site, but it is intended to be a dynamic working document that will be reviewed at each phase of the cleanup, and updated as needed. Ecology and the Port urge the public to become involved in the cleanup process.

2.0: Site Background

Site Description and Location

The Bay Wood Products Site is generally located at 200 West Marine View Drive, in Everett, Snohomish County, Washington (see Figures 1 and 2). It is west of the Legion Memorial Golf Course and the American Legion Memorial Park (see Figure 1). The upland portion of the site is about 13 acres in size. It is bounded by the JELD-WEN facility (also a PSI cleanup site) to the south, mudflats to the north, Burlington Northern Railroad and West Marine View Drive to the east, and Port Gardner Bay to the west. The site is located in the vicinity of where the Snohomish River flows into Port Gardner Bay. It is currently vacant industrial property.

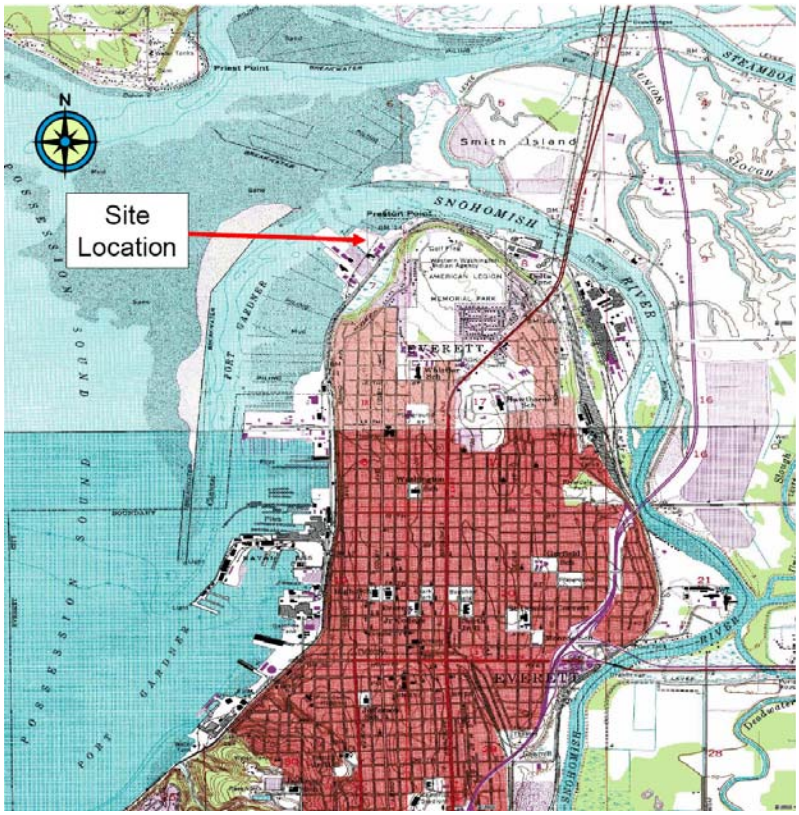


Figure 1: The Bay Wood Products Site, shown in the above map with an arrow, is generally located at 200 West Marine View Drive, on Port Gardner Bay, Everett, WA. (Photo Source: USGS 7.5 Minute Quadrangle Maps (Everett and Marysville Quadrangle Maps; Photo Revised – 1968 and 1973)

Figure 2: An enlarged view of the Bay Wood Products Site.
(Photo Source: Imagery: I-Cubed, 2006; Acquired: Via ArcGIS Explorer by ESRI on 1/25/2008)

The City of Everett Comprehensive Plan land use map[2] indicates that the site is zoned industrial, for maritime services. Zoning to the east includes a small agricultural area and residential single-family homes. Zoning to the west includes open water and parks (Jetty Island). The site is not located within the Everett Smelter area of historic arsenic contamination.

General Site History and Contaminants

The Bay Wood Products Site is located on fill that was placed in Port Gardner Bay. Lumber and mill operations began on this Site around 1936. In 1979, Bay Wood Products removed the sawmill and used the Site for log handling and storage until 1994. Site features during Bay Wood Products operations included office and shop buildings, a covered shed, oil drums, electrical transformers, above-ground fuel storage tanks, and log rafts. These features have been removed, and the Site is currently vacant. The following contaminants have been found on the Site in upland soil:

- Polychlorinated biphenyls (PCBs).
- Petroleum products.

[2] Planning and Community Development, City of Everett, WA
http://www.everettwa.org/Get_PDF.aspx?pdfID=339 (Accessed January 24, 2008)

In addition, wood waste was also found in upland soil and adjacent in-water areas (imbedded in the sediments). Wood waste smothers near-shore habitat and animals such as clams, and can cause changes in water chemistry that can harm marine and sediment ecosystems.

PCB-contaminated soil was removed from the Site in 1985 and 1993. Much of the wood waste accumulated in the upland portion of the Site was removed in 1995. However, Ecology believes more study is needed to fully characterize the contamination at the Bay Wood Products Site.

The Cleanup Process

Washington State's cleanup process and key opportunities for you to provide input are outlined in Figure 3. The general cleanup process includes the following steps:

- Remedial Investigation (RI) - investigates the site for types, locations, and amounts of contaminants.
- Feasibility Study (FS) - identifies cleanup options for those contaminants.
- Cleanup Action Plan (CAP) - selects the preferred cleanup option and explains how cleanup will be conducted.

Each of these steps will be documented in reports and plans that will be available for public review. Public comment periods of at least 30 calendar days are usually conducted for the following documents:

- Draft RI report
- Draft FS report
- Draft CAP

These cleanup steps and documents are described in greater detail in the following subsections.

Interim Actions

Interim actions may be conducted during the cleanup if required by Ecology. An interim action partially addresses the cleanup of a site, and may be required if:

- It is technically necessary to reduce a significant threat to human health or the environment.
- It corrects a problem that may become substantially worse or cost substantially more to fix if delayed.
- It is needed to complete another cleanup activity, such as design of a cleanup plan.

Interim actions are not currently anticipated on the Bay Wood Products Site.

Remedial Investigation/Feasibility Study Report

The Port has agreed to conduct an RI on the Site. The RI determines which contaminants are on the Site, where they are located, and whether there is a significant threat to human health or the environment. The draft RI report provides baseline data about environmental conditions that will be used to develop cleanup options. The FS and report then identify and evaluate cleanup options, in preparation for the next step in the process.

The RI and FS processes typically include several phases:

- Scoping.
- Site characterization.
- Development and screening of cleanup alternatives.
- Treatability investigations (if necessary to support decisions).
- Detailed analysis.

The RI and FS reports are expected to be combined into a draft Bay Wood Products Site RI/FS report. The draft report is anticipated to be completed in late 2009 or early 2010 and will be made available for public review and comment.

Cleanup Action Plan

The Port and Ecology have agreed to develop a CAP for the site. After public comment on the draft RI/FS report, a preferred cleanup alternative will be selected. The draft CAP explains the cleanup standards that will be applied at the site, selects the preferred cleanup alternative(s), and outlines the work to be performed during the actual site remediation. The CAP may also evaluate the completeness and effectiveness of any interim actions that were performed on the site. The draft CAP will be available for public review and comment. Once public comments are reviewed and any changes are made, Ecology provides final approval and site cleanup can begin. Cleanup is anticipated to be completed in spring 2011.

3.0: Community Profile

Community Profile

Everett is Snohomish County's largest city and the sixth largest city in the State of Washington. The current population of Everett is approximately 98,000[3] situated within 47.7 square miles. Located on Port Gardner Bay, Everett hosts the West Coast's second largest marina, U.S. Navy Homeport Naval Station Everett, and The Boeing Company's assembly plant. The city's 2006 labor workforce was more than 80,000, employed predominantly in technology, aerospace, and service-based industries.[4]

Key Community Concerns

An important part of the Public Participation Plan is to identify key community concerns for each cleanup site. The Bay Wood Products Site is located near a residential area. The proximity of the community to the site is likely to raise questions about how daily life and the future of the community will be affected during and after cleanup of the site.

Many factors are likely to raise community questions, such as the amount of contamination, how the contamination will be cleaned up, or future use of the site. Community concerns often change over time, as new information is learned and questions are answered. Identifying site-specific community concerns at each stage of the cleanup process is helpful to ensure that they are adequately addressed. On-going key community concerns will be identified for the Bay Wood Products Site through public comments and other opportunities as detailed in Section 4.

[3] US Census Bureau, City & Towns Estimates Data for July 1, 2006. http://www.census.gov/popest/estimates.php (Accessed September 12, 2007)
[4] City of Everett. http://www.everettwa.org/default.aspx?ID=314 (Accessed September 12, 2007)

4.0: Public Participation Opportunities

Ecology and the Port invite you to share your comments and participate in the cleanup in your community. As we work to meet our goals, we will evaluate whether this public participation process is successful. This section describes the public participation opportunities for this site.

Measuring Success

We want this public participation process to succeed. Success can be measured, at least in part, in the following ways:

- Number of written comments submitted that reflect understanding of the cleanup process and the site.
- Direct "in-person" feedback about the site cleanup or public participation processes, if public meetings are held.
- Periodic updates to this plan to reflect community concerns and responses.

If we are successful, this process will increase:

- Community awareness about plans for cleanup and opportunities for public involvement.
- Public participation throughout the cleanup.
- Community understanding regarding how their input will be considered in the decision-making process.

Activities and Information Sources

Ecology Contacts

Ecology is the lead contact for questions about the cleanup in your community. The Ecology staff person identified in this section is familiar with the cleanup process and activities at the site. For more information about public involvement or the technical aspects of the cleanup, please contact:

Isaac Standen
Ecology Site Manager
WA State Dept. of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: (360) 407-6776

E-mail: ista461@ecy.wa.gov

Ecology's Webpage

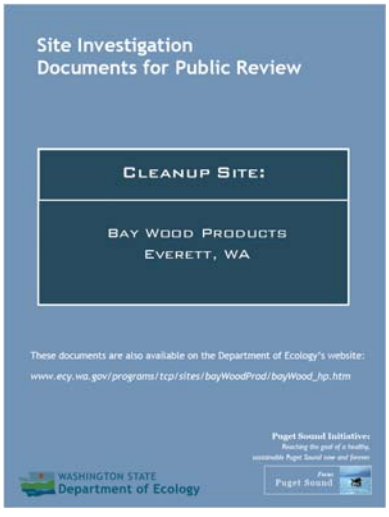
Ecology has created a webpage to provide convenient access to information. Documents such as the Agreed Order, draft reports, and cleanup plans, are posted as they are issued during the investigation and cleanup process. Visitors to the webpage can find out about public comment periods and meetings; download, print, and read information; and submit comments via e- mail. The webpage also provides links to detailed information about the MTCA cleanup process. The Bay Wood Products Site webpage is available at the following address:
http://www.ecy.wa.gov/programs/tcp/sites/bayWoodProd/bayWood_hp.htm

Information Centers/Document Repositories

The most comprehensive source of information about the Bay Wood Products Site is the information center, or document repository. Two repositories provide access to the complete list of site-related documents. All Bay Wood Products investigation and cleanup activity reports will be kept in print at those two locations and will be available for your review. They can be requested on compact disk (CD) as well. Document repositories are updated before public comment periods to include the relevant documents for review. Documents remain at the repositories throughout the investigation and cleanup. For this site, the document repositories and their hours are:

- **Everett Public Library**
  2702 Hoyt Ave.
  Phone: (425) 257-8010
  Hours: Mon.-Wed. 10 a.m.-9 p.m.,
  Thurs.-Sat. 10 a.m.-6 p.m., Sun. 1-5 p.m.

- **WA Department of Ecology Headquarters**
  300 Desmond Drive SE
  Lacey, WA 98503
  By appointment. Please contact Carol Dorn at (360) 407-7224 or cesg461@ecy.wa.gov.



Look for document covers such as the illustration on the right.

Public Comment Periods

Public comment periods provide opportunities for you to review and comment on major documents, such as the Agreed Order, draft Public Participation Plan, and the draft RI/FS report. The typical public comment period is 30 calendar days.

Notice of Public Comment Periods

Notices for each public comment period will be provided by local newspaper and by mail. These notices indicate the timeframe and subject of the comment period, and explain how you can submit your comments. For the Bay Wood Products Site, newspaper notices will be posted in The Daily Herald.

Notices are also sent by regular mail to the local community and interested parties. The community typically includes all residential and business addresses within one-quarter mile of the site, as well as potentially interested parties such as public health entities, environmental groups, and business associations.

Fact Sheets

One common format for public comment notification is the fact sheet. Like the newspaper notice, fact sheets explain the timeframe and purpose of the comment period, but also provide background and a summary of the document under review. A fact sheet has been prepared for the Bay Wood Products Site explaining the Agreed Order and this Public Participation Plan (See Appendix A). Future fact sheets will be prepared at key milestones in the cleanup process.

MTCA Site Register

Ecology produces an electronic newsletter called the MTCA Site Register. This semi-monthly publication provides updates of the cleanup activities occurring throughout the state, including public meeting dates, public comment periods, and cleanup-related reports. Individuals who would like to receive the MTCA Site Register can sign up three ways:

- Call (360) 407-6069
- Send an email request to ltho461@ecy.wa.gov or
- Register on-line at http://www.ecy.wa.gov/programs/tcp/pub_inv/pub_inv2.html

Mailing Lists

Ecology maintains both an e-mail and regular mail distribution list throughout the cleanup process. The list is created from carrier route delineations for addresses within one-quarter mile of the site, potentially interested parties, public meeting sign-in sheets,

and requests made in person, or by regular mail or e-email. You may request to be on the mailing list by contacting the Ecology staff person listed earlier in this section.

Optional Public Meetings

A public meeting will be held during a comment period if requested by ten or more people, or if Ecology decides it would be useful. Public meetings provide additional opportunity to learn about the investigation or cleanup, and to enhance informed comment. If you are interested in a public meeting about the Bay Wood Products Site, please contact the Ecology staff person listed earlier in this section.

Submitting Comments

You may submit comments by regular mail or e-mail during public comment periods to the Ecology project manager listed earlier in this section.

Response to Comments

Ecology will review all comments submitted during public comment periods, and will modify documents as necessary. You will receive notice by regular mail or e-mail that Ecology has received your comments, along with an explanation about how the comments were addressed.

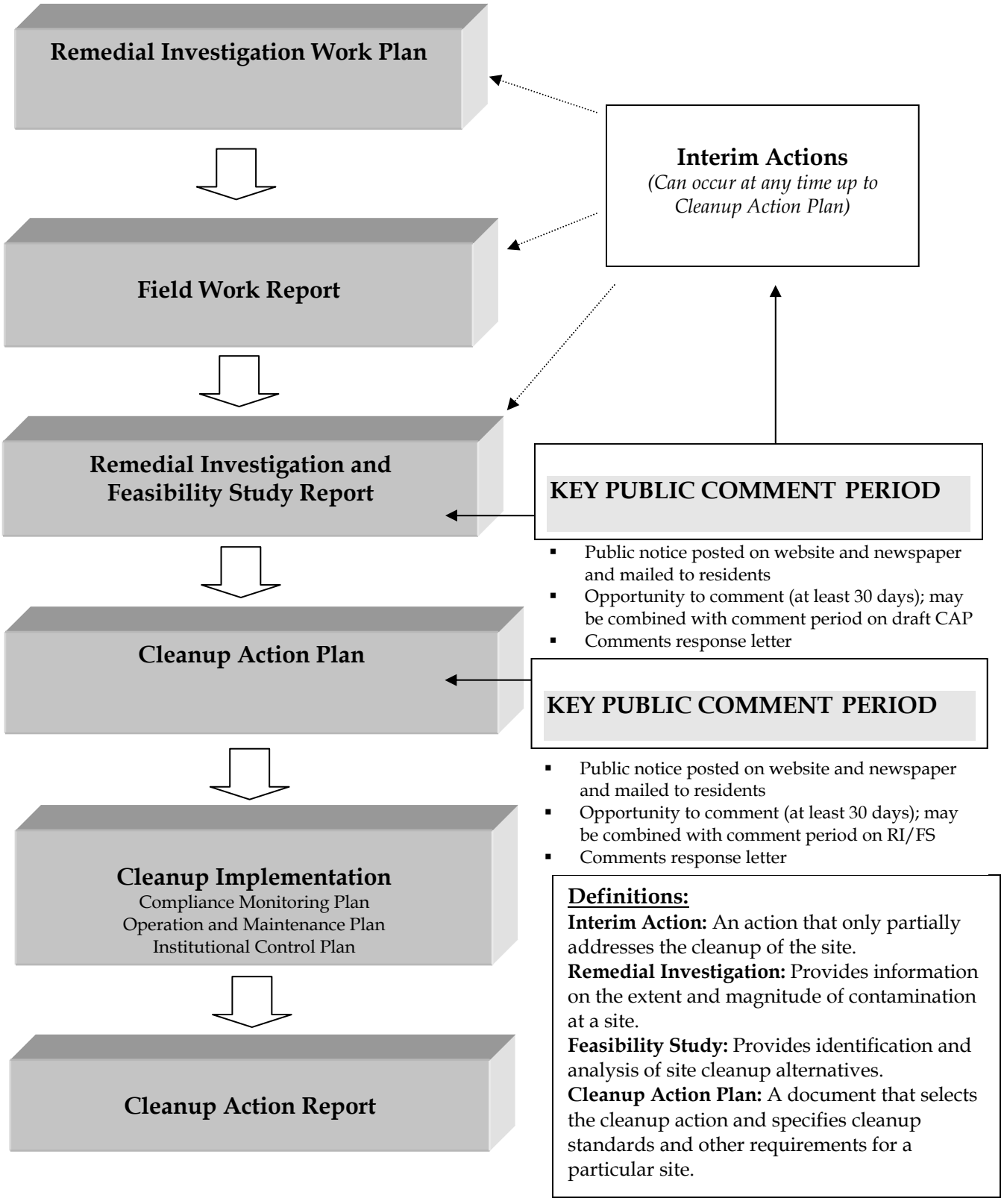
Other

Ecology and the Port are committed to the public participation process and will consider additional means for delivering information and receiving comments, including combining public comment periods for other actions (such as those associated with the State Environmental Policy Act).

Public Participation Grants

You may be eligible to apply for a Public Participation Grant from Ecology to provide additional public participation activities. Those additional activities will not reduce the scope of the activities defined by this plan. Activities conducted under this plan would coordinate with the additional activities defined under the grant.

Figure 3: Washington State Cleanup Process



Glossary

Cleanup: The implementation of a cleanup action or interim action.

Cleanup Action: Any remedial action except interim actions, taken at a site to eliminate, render less toxic, stabilize, contain, immobilize, isolate, treat, destroy, or remove a hazardous substance that complies with MTCA cleanup requirements, including but not limited to: complying with cleanup standards, utilizing permanent solutions to the maximum extent practicable, and including adequate monitoring to ensure the effectiveness of the cleanup action.

Cleanup Action Plan: A document that selects the cleanup action and specifies cleanup standards and other requirements for a particular site. The cleanup action plan, which follows the remedial investigation/feasibility study report, is subject to a public comment period. After completion of a comment period on the cleanup action plan, Ecology finalizes the cleanup action plan.

Cleanup Level: The concentration (or amount) of a hazardous substance in soil, water, air, or sediment that protects human health and the environment under specified exposure conditions. Cleanup levels are part of a uniform standard established in state regulations, such as MTCA.

Cleanup Process: The process for identifying, investigating, and cleaning up hazardous waste sites.

Contaminant: Any hazardous substance that does not occur naturally or occurs at greater than natural background levels.

Feasibility Study: Provides identification and analysis of site cleanup alternatives and is usually completed within a year. Evaluates sufficient site information to enable the selection of a cleanup action. The entire Remedial Investigation/Feasibility Study (RI/FS) process takes about two years and is followed by the cleanup action plan.

Hazardous Site List: A list of ranked sites that require further remedial action. These sites are published in the Site Register.

Interim Action: Any remedial action that partially addresses the cleanup of a site. It is an action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility; an action that corrects a problem that may become substantially worse or cost substantially more to address if the action is delayed; an action needed to provide for completion of a site hazard assessment, state remedial investigation/feasibility study, or design of a cleanup action.

Model Toxics Control Act: Refers to Chapter 70.105D RCW. Voters approved it in November 1988. The implementing regulation is found in Chapter 173-340 WAC.

Public Notice: At a minimum, adequate notice mailed to all persons who have made a timely request of Ecology and to persons residing in the potentially affected vicinity of the proposed action; mailed to appropriate news media; published in the local (city or county) newspaper of largest circulation; and the opportunity for interested persons to comment.

Public Participation Plan: A plan prepared under the authority of WAC 173-340-600 to encourage coordinated and effective public involvement tailored to the public's needs at a particular site.

Release: Any intentional or unintentional entry of any hazardous substance into the environment, including, but not limited to, the abandonment or disposal of containers of hazardous substances.

Remedial Action: Any action or expenditure consistent with MTCA to identify, eliminate, or minimize any threat posed by hazardous substances to human health or the environment, including any investigative and monitoring activities of any release or threatened release of a hazardous substance, and any health assessments or health effects studies conducted in order to determine the risk or potential risk to human health.

Remedial Investigation: Any remedial action that provides information on the extent and magnitude of contamination at a site. This usually takes 12 to 18 months and is followed by the feasibility study. The purpose of the Remedial Investigation/Feasibility Study is to collect and develop sufficient site information to enable the selection of a cleanup action.

APPENDIX F

14TH STREET BULKHEAD REPLACEMENT CHARACTERIZATION REPORT

Everett Marina PSDDA Sediment Characterization Report

14th Street Bulkhead Replacement
Everett, Washington

Prepared by:

The RETEC Group, Inc.
1011 S.W. Klickitat Way, Suite #207
Seattle, Washington 98134

RETEC Project Number: PORE1-18490-400

Prepared for:

Port of Everett
P.O. Box 538
Everett, Washington 98206

February 24, 2005

Everett Marina PSDDA Sediment Characterization Report

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February 24, 2005

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List of Acronyms

AET	Apparent Effects Threshold
ARI	Analytical Resources, Inc.
ASTM	American Society for Testing and Materials
BT	bioaccumulation trigger
COC	chemical of concern
DAIS	Dredged Analysis Information System
DGPS	Differential Global Positioning System
DMMP	Dredged Material Management Program
DMMU	Dredged Material Management Units
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
MDL	method detection limit
ML	maximum level
MLLW	mean lower low water
MS/MSD	matrix spike/matrix spike duplicate
PCB	polychlorinated biphenyl
Port	Port of Everett
PSDDA	Puget Sound Dredged Disposal Analysis
PSEP	Puget Sound Estuary Protocol
QA/QC	quality assurance/quality control
SAP	Sampling and Analysis Plan
SL	screening level
SMARM	Sediment Management Annual Review Meeting
SMS	Sediment Management Standards
SQS	Sediment Quality Standards
SVOC	semivolatile organic compound
TBT	tributyl tin
TDL	target detection limit
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers

1 Introduction

1.1 Project Description

This Sediment Characterization Report provides the results of sampling and analysis of sediments along the 14th Street bulkhead at the Everett Marina in Everett, Washington. The investigation was conducted in accordance with the Puget Sound Dredged Disposal Analysis (PSDDA) Program and the approved Sediment Characterization Sampling and Analysis Plan, 14th Street Bulkhead Replacement (SAP) (RETEC, 2004). The site location is provided in Figure 1-1. The testing was performed in support of maintenance dredging to be performed in conjunction with a bulkhead replacement project along the north side of Everett Marina (14th Street).

One dredged material management unit (DMMU) was evaluated on January 4, 2005. This report summarizes the characterization performed on the DMMU identified in Figure 1-2 and Table 1-1. The total dredged volume of sediment of the DMMU is approximately 4,000 cubic yards (cyds), including a one-foot overdredge allowance. This volume was previously estimated to be 3,800 cyds in the SAP but is closer to 4,000 cyds following additional volume calculations.

1.2 Sediment Description

PSDDA guidance identifies all marinas as areas of moderate concern for sediment contamination. In areas of moderate concern, no more than 16,000 cy of sediment may be represented by a single DMMU for surface sediment (less than 4-foot cut depth). One field sample may represent each 4,000 cy of surface sediment. One test sample was collected from composites of three cores for the entire DMMU due to its long, narrow shape. Sediment consists of silt and sand in the marina and mudline elevations of sediments in the dredge prism range from approximately 0 to -9 feet MLLW.

1.3 Sampling and Analysis Objectives

The sampling and analysis objectives are stated in the SAP (RETEC, 2004) and are also listed below. The primary objective of the characterization is to collect the necessary chemical, physical, and biological testing data to evaluate the suitability of open-water disposal for dredged sediments that will be dredged as part of the proposed project. This report characterizes the sediment to be dredged and outlines the procedures used to accomplish these objectives.

The sediment characterization program objectives and constraints are summarized below:

- To characterize sediments for dredging in conformance with PSDDA requirements to enable the PSDDA agencies to designate approved disposal option(s);

- To collect, handle, and analyze representative sediment core samples that characterize the full dredging prism in accordance with protocols, timing, and QA/QC requirements outlined in the PSDDA Evaluation Procedures Technical Appendix (June 1988), the updated procedures documented in Chapter 5 and Appendix A of the PSDDA Phase II Management Plan Report (September, 1989), modifications made through the PSDDA and Sediment Management Annual Review Meeting (SMARM) process, and procedures presented in PSEP Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound.

- Sediment cores will be composited and analyzed in a timely manner to meet the remediation schedule and PSDDA requirements for sample holding times, including those related to possible biological analysis, if needed.

- Chemical and biological testing results will be compared to chemical guidelines or biological performance criteria presented in the Evaluation Procedures Technical Appendix – Phase I (PSDDA, 1988), the PSDDA Management Plan Report – Phase II (PSDDA, 1989), as well as any revisions to guidelines or performance criteria that have been incorporated as part of the SMARM process.

2 Investigation Methods

This section describes the methods by which the PSDDA sampling at the marina was performed. A total of three cores was collected from the DMMU on January 4, 2005. These sampling locations are shown on Figure 1-2 and on Table 2-1. Samples were composited on January 5, 2005 and delivered to the laboratory for analysis.

2.1 Sampling and Location Methods

Sampling was performed from gangways (ramps) passing over the maintenance dredging area. Sediment coring was performed using push-coring with 3-inch contaminant-free cellulose acetyl butyrate (CAB) liner tubes. Sampling was conducted from the ramps at the deepest expected dredge cut, which measured approximately 26 feet from the bulkhead. Precise measurements of sampling locations were made from the bulkhead and utility poles located on RETEC base maps. The measurements made with the measuring tape are more accurate than the error associated with a GPS. The coordinates of sampling stations were reported in Washington State Plane North (NAD83) and converted to World Geodetic System of 1984 (WGS 84). These coordinates are found in Table 2-1.

2.2 Sediment Coring Procedures

Sediment core samples were collected at three locations along the 14th Street bulkhead (Figure 1-2). Sampling was performed using a 3-inch contaminant-free CAB liner tube. A continuous sediment sample is retained within the tubing with the aid of a metal core catcher. There is no core liner. A completely new core tube was used for each sample. The core catcher was decontaminated between uses and reused for each core.

As mentioned in Section 2.1, coring was performed from ramps joining floating moorages to the bulkhead along 14th Street. Deployment from the ramp was thought to better maintain the core tube in a vertical position while pushing than if a flat-bottomed boat were used. Care was taken to prevent disturbance of the sediment surface prior to coring.

A 16-foot steel pole was attached to the core tube with a fitted joiner that allowed pushing and pulling of the entire assembly. The length of penetration was recorded by measurements made along the steel pole. The height of the sediment column inside the core was measured after retrieval. The percent recovery was estimated from the penetration depth and recovered length measurements and recorded on field log sheets. The recovery estimate is used to accurately determine the true sample depth. Individual core recovery information is used to determine the *in-situ* depth from which the sediments within a given analytical sample were collected. For the coring, 10-foot lengths of core tube were used and driven until refusal was encountered.

Criteria established in the SAP (RETEC, 2004) for cores included the following:

- Overlying water is present and the surface is intact
- The core tube appears intact without obstruction or blocking
- Recovery is greater than 75 percent of drive length.

Core tubes and the surface sediment interval were intact in all cores, and overlying water was present. No obstruction or blocking was present in the cores. Two cores did not meet the 75 percent recovery criteria: EC-2 (71 percent) and EC-3 (71 percent). Additional discussion of core recovery is included in Section 4.2. Core logs are included in Appendix A.

After the cores were recovered, they were sectioned in the field using a hacksaw into approximate sections of 4 feet for ease of transportation. As each section was cut, observations of the visible end of the sediment cores were recorded on the field core log sheet. Sections were capped with aluminum foil, a plastic end cap, and taped securely. Cores were labeled with the core location, core section, and the top of core on each section using a permanent marker.

The following field observations were recorded in the field core log for each of the cut sample ends:

- Sample location, time, and water depth
- Core tube penetration depth
- Sample recovery
- Physical sediment description-sediment particle size
- Sediment type, density/consistency, color
- Odor
- Visual stratification lenses
- Debris (wood, paint chips, etc.) or vegetation
- Biological activity (e.g., shells, tubes, presence of organisms)
- Presence of sheen or staining
- Other distinguishing characteristics or features.

2.3 Core Process Sample Handling

The core tube sections were transported on ice to RETEC offices in Seattle. At the laboratory, sample-coring tubes were push extruded onto a processing table lined with aluminum foil on top of plastic. Aluminum foil lining the table was replaced with each core. To prevent additional compaction during extrusion, the core tube migrated along the extruded sediment rather than the core tube remaining stationary while the sediment migrated out. During core sample logging and sub-sampling, a detailed record was kept regarding the

sediment stratigraphy within the sample on coring process logs. For each core section, the following information was recorded on core processing logs:

- Physical soil description – sediment particle size
- Sediment type, density/consistency, color
- Odor
- Visual stratification and lenses
- Debris (wood, paint chips, etc.) or vegetation
- Biological activity (e.g., shells, tubes, presence of organisms)
- Presence of sheen or staining
- Other distinguishing characteristics or features.

In-situ depths from 0 to 3 feet and 3 to 4 feet were sampled from EC-1. *In-situ* sample intervals of 0 to 2.6 feet and 2.6 to 3.5 feet were collected from EC-2 and from 0 to 2.5 feet and 2.5 to 3.5 feet in EC-3. The bottom of the core of each of these locations corresponds to the deepest dredge cut collected at -10 feet MLLW. The S1 and S2 layers of each core were combined with the same *in-situ* intervals of the other cores. The compositing scheme was identified in the PSDDA SAP (RETEC, 2004) and may be seen in Tables 1-1 and 2-2.

To reduce cross-contamination due to smear, the smeared sediments found along the sidewalls of the core tube were removed prior to compositing. Only sediment that is not touching the sidewalls or ends was collected for chemical analysis. Samples were composited under the direction of an experienced RETEC geologist per the compositing plan and in accordance with USACE guidelines. For sediment composite samples, equal volumes of sediment were removed from each core section comprising a composite.

Immediately upon extrusion of cores, a subsample volume was collected from EC-1 for volatiles and sulfide analysis without mixing by randomly selecting a sample that has not had contact with the core lining from one core representing each composite. Volatile and sulfide samples were collected from the S-1 intervals and volatile samples were collected from the S-2 intervals. Table 2-2 indicates the stations from which volatile and sulfide subsamples were collected. For sulfides, 5 ml of 2N zinc acetate was added to each sample using a pipette creating a thin film across the top of sediment in the jar. Separate containers were completely filled with sample sediment for volatiles. No headspace was allowed to remain in either container.

Sediments representing each composite sample were placed in a decontaminated stainless steel bowl and mixed using decontaminated stainless steel mixing spoons until homogenous in color and texture.

All sample handling, sub-sampling, judgment of sample acceptability, gear and utensil decontamination, compositing, storage, and chain-of-custody procedures were conducted in accordance with PSEP (1996a). All utensils and mixing containers used during sample preparation were decontaminated according to PSEP (1996a) protocols prior to use.

Sediment samples collected for chemical and physical analyses were placed in iced coolers and delivered to Analytical Resources, Inc. (ARI), of Seattle, Washington. All samples delivered to ARI were properly packed in coolers and maintained at 4°C. Original chain-of-custody forms and analysis request forms accompanied the samples to the laboratory. Extra samples, including z-samples (S2 samples), from each composite sample were archived at -18°C at ARI for possible future analysis.

2.4 QA/QC Samples

Additional matrix spike/matrix spike duplicate (MS/MSD) samples were collected for laboratory QA purposes. Samples were collected from one station with sufficient sediment volume for analysis of volatiles, SVOCs, PCBs/pesticides, and metals.

2.5 Sample Transport and Chain of Custody Procedures

Containerized sediment samples were transported to the laboratories after compositing was completed according to the guidance contained in the SAP (RETEC, 2004). Specific sample shipping procedures were as follows:

- Individual sample containers were packed to prevent breakage and transported in a sealed ice chest or other suitable container. Glass jars were separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.

- Coolers were packed with ice packs or crushed ice (sealed in plastic bags) to keep the samples at 4 °C ± 2 ºC.

- Cooler trip blanks were included with volatile samples at a frequency of one per cooler.

- Each cooler or container containing the sediment samples for chemical analysis was delivered to the laboratory within 24 hours of being sealed.

- The shipping containers were clearly labeled with sufficient information (name of project, time and date container was sealed,

person sealing the container, and consultant's office name and address) to enable positive identification.

- A sealed envelope containing chain of custody forms was enclosed in a plastic bag and taped to the inside lid of the cooler.

- Samples were not shipped and coolers were not out of the custody of the samplers at any time. Therefore, custody seals were not required.

Upon transfer of sample possession to the analytical laboratory, the custody form was signed by the persons transferring custody of the sample container. Custody forms were used internally in the lab to track sample handling and final disposition.

3 Chemical and Physical Testing

This section provides an overview of the chemical and physical testing results. Samples were analyzed in accordance with PSDDA guidelines by an Ecology-accredited laboratory using accredited methods. Table 3-1 presents the results of grain size analysis, and Table 3-2 presents chemical testing results.

3.1 Sediment Grain Size Results

Grain size was tested in the upper interval (S-1 samples) of PSDDA cores. These samples were composed of a single composite sampled from the surface layer (approximately 0 to 3 feet *in-situ* depth) from three cores. Grain size results are presented in Table 3-1. The S-1 interval consisted of slightly clayey sandy silt with traces of gravel.

3.2 Chemistry Testing Results

Chemical analysis was conducted on sample EC-1A-S1 for the list of constituents contained in Table 4-1 of the SAP (RETEC, 2004). Testing was not performed on the Z-sample EC-1A-S2 due to no screening level exceedances of chemicals in EC-1A-S1. Chemical testing results are contained in Table 3-2.

Laboratory testing procedures were conducted in accordance with the procedures specified in the PSDDA Evaluation Procedures Technical Appendix, June 1988; the PSDDA Phase II Management Plan Report, September 1989; and with the PSEP Recommended Protocols. Testing was conducted in accordance with the procedures identified in the SAP (RETEC, 2004). An aliquot (8-oz) of each sediment sample has been archived and preserved at –18 °C for additional analysis, if necessary.

3.2.1 PCB / Pesticide Distribution

PCBs

PCB concentrations are presented in mg/kg dry weight (dw) and normalized to organic carbon as ppm total organic carbon (TOC) in Table 3-2. Aroclor 1254 was detected above detection limits (2.2 ppm TOC). No other PCBs were detected above detection limits. The detected concentration of PCBs in is below the TOC normalized SMS Sediment Quality Standards (SQS) and the dry weight Screening Level (SL) criteria. All detection limits were below the PSDDA SL, and all carbon normalized detection limits were below the SQS total PCB criteria.

Pesticides

No pesticides were detected in EC-1A-S1. All detection limits were below all PSDDA criteria.

3.2.2 Metals

No metals included in PSDDA testing exceeded the SL in sample EC-1A-S1. All detection limits were below PSDDA and SMS criteria.

3.2.3 Volatile Organics

No volatile organics were detected in sample EC-1A-S1. All detection limits were below PSDDA criteria.

3.2.4 Semivolatile Organics

EPA Method 8270 semivolatile organics that were tested include PAHs, phthalates, phenols, and other miscellaneous extractables. No exceedances of semivolatiles above the SL criteria were measured in sample EC-1A-S1. All other semi-volatile organic compounds, including phthalates, phenols, and miscellaneous extractables were below PSDDA and SMS criteria for all samples.

3.2.5 Conventional Parameters

Conventional parameters analyzed in EC-1A-S1 included total solids, total organic carbon, total sulfides, and ammonia. Total solids content was 62.3 percent, and total volatile solids content was 5.3 percent. Total organic carbon content was 1.8 percent, and ammonia was 19.8 mg/kg. Total sulfides was measured at 580 mg/kg, however, this concentration is likely biased low due to low matrix spike percent recoveries. The data validation report contained in Appendix B explains that this concentration should be flagged as an estimate due to the low recovery. All conventional parameters are typical of Puget Sound sediment.

3.3 QA/QC

3.3.1 Validation

Data were validated against QA1, QA2, and project criteria for inclusion into the sediment characterization reports. Any qualifiers added to the data as part of data validation are included in Table 3-2. The data validation report is included as Appendix B. Hardcopy QA2 data will be submitted to the Sediment Management Unit at Ecology. A copy of the transmittal letter will be provided to the DMMO.

4 Quality Assurance Summary

Included below are a summary of deviations from the SAP and the expected effect of these deviations on the testing results. Other than these deviations, all sampling and analysis was performed according to procedures outlined in the SAP (RETEC, 2004).

4.1 Location

All cores were collected within 50 feet of the targeted location. Core EC-2 was 47 feet from its intended location because the core was collected from the elevated ramp connecting the floating moorages to the bulkhead. This method was determined to be more effective at keeping the core tube vertical than using a boat for push coring. The other two cores were collected from the ramps and were within 22 feet of the target locations.

The final locations coring were confirmed by measuring the distance from the collection location to the bulkhead and other landmarks contained on previously surveyed basemaps. This method is thought to be more accurate than using a GPS with an associated ±3 meter error.

4.2 Core Recovery

Criteria for sediment core acceptability are listed in the SAP (RETEC, 2004). These criteria include an intact surface sediment interval with overlying water present, no obstruction or blocking in the cores, and 75 percent recovery. All cores met these criteria with the exception of two cores. As shown on the core logs in Appendix A, core EC-1 met the 75 percent recovery criteria, but only 71 percent was recovered from cores EC-2 and EC-3. Each of these cores contained intact surface sediment intervals with overlying water present, and no obstruction or blocking was present. Each core was pushed until refusal, which was likely due to frictional resistance rather than changes in substrate. The poor recovery is not due to sediment loss from the bottom of the tube as the core catchers were plugged and retaining sediment. Coring in sediment containing high fines (58 percent) is likely the reason for slightly lower than targeted recoveries.

In each of these instances, the low recoveries are not expected to adversely affect the sampling and testing results. Each core was pushed into the sand or silty sand layers that are expected to represent the bottom of the maintenance dredging depth. Sampled intervals were adjusted to in-situ depths and are consistent with the targeted depths.

5 Conclusion

Collection and evaluation of the sediment data was completed using the Sediment Characterization SAP for the 14th Street Bulkhead Replacement Project prepared in accordance with PSDDA guidelines (RETEC, 2004). Deviations from the SAP are summarized in Section 4. These deviations do not substantially affect the testing results.

One DMMU was evaluated for suitability of unconfined, open-water disposal. Results of analytical testing indicate that DMMU-1A does not contain chemicals detected at levels greater than any of the PSDDA criteria (Table 3-2). This unit also does not contain chemical concentrations above any SMS criteria. Because no PSDDA criteria were exceeded, biological testing was not conducted. Therefore, DMMU 1A is suitable for unconfined, open-water disposal.

Chemical testing was not conducted on the Z-sample from the sediment interval of three to four feet *in-situ* for sample EC-1-S2. Testing was not required to characterize the post-dredge sediment surface because the surface unit is suitable for unconfined, open-water disposal and therefore complies with the anti-degradation policy in the SMS rule (WAC 173-204-120).

6 References

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Tables

Table 1-1 Everett Marina Maintenance Dredging Coring Plan

DMMU	Dredge Prism		Sediment Core ID	Compositing Scheme	
	Approximate Dredge Volume [1] (cy)	Approximate Dredge Surface Area (sq. yd)		Surface Sediment Composite ID (0 to 3 ft in-situ)	z-sample ID (3 to 4 ft in-situ)
1A	4,000	3,622	EC-1	EC-1A-S1	EC-1A-S2
			EC-2		
			EC-3		

[1] This volume was previously estimated to be 3,800 cy in the SAP but is closer to 4,000 cy following additional volume calculations.

Table 2-1 Everett Marina Push Core Locations Collected January 4, 2005

DMMU	Sediment Core ID	Target Locations [1]		Actual Locations [2]				Mudline Elevations, ft [4]	Approx. Distance from Target, ft
		Longitude [1]	Latitude [1]	Longitude [1]	Latitude [1]	Easting [3]	Northing [3]		
1A	EC-1	122.22174570	47.99918375	122.22182745	47.99918550	1300499	367539	-7.1	20
	EC-2	122.21970242	47.99915912	122.21989451	47.99916228	1300972	367522	-7.0	47
	EC-3	122.21736087	47.99913258	122.21727095	47.99913092	1301614	367499	-7.1	22

Notes:

[1] World Geodetic System of 1984

[2] Actual locations determined from ramp locations using CADD

[3] North American Datum of 1983, Washington State Plane North

[4] Mudline elevations estimated using tides calculated with tide and current software (WXTide32 version 2.7, http://wxtide32.com) for Everett.

Table 2-2 Summary of PSDDA Vibracore Sediment Sample Intervals and Analytical Testing

Core ID	Sample ID	Uncorrected Sample Interval	In-Situ Sample Interval	Analyses					
				Pesticides/ PCBs	Metals	SVOCs	VOCs	Conventionals	Grain Size
DMMU-1A									
EC-1 *	EC-1A-S1	0.0 to 2.3 feet	0.0 to 3.0 feet	X	X	X	X	X	X
EC-2		0.0 to 1.9 feet	0.0 to 2.6 feet						
EC-3		0.0 to 1.8 feet	0.0 to 2.5 feet						
EC-1 †	EC-1A-S2	2.3 to 3.0 feet	3.0 to 4.0 feet	Archived					
EC-2		1.9 to 2.5 feet	2.6 to 3.5 feet						
EC-3		1.8 to 2.5 feet	2.5 to 3.5 feet						

NOTE:

X - Sediment was collected and analyzed for the indicated analysis at this location.

* = Sulfide and volatile sampling conducted from these cores in the S1 interval

† = Volatile sampling conducted from these cores in the S2 interval

Table 3-1 Grain Size Data

Sample ID	Gravel	Sand						Silt					Clay			
		V. Coarse	Coarse	Med	Fine	Very Fine	Total	Coarse	Med	Fine	Very Fine	Total	8 to 9	9 to 10	<10	Total
EC-1A-S1	**2.4**	1.3	1.6	2.4	8.6	25.3	**39.2**	23.3	12.8	7.6	4.0	**47.7**	3.2	2.0	5.4	**10.6**
TRIP 1	**0.0**	0.8	3.9	2.9	2.0	8.0	**17.6**	16.6	19.6	15.9	10.8	**62.9**	6.4	3.7	9.3	**19.4**
TRIP 2	**0.2**	0.3	2.5	4.7	3.0	8.8	**19.3**	13.6	21.3	16.6	9.5	**61.0**	7.0	3.0	9.4	**19.4**
TRIP 3	**0.0**	0.1	1.2	5.8	3.2	8.5	**18.8**	14.2	21.5	16.3	10.0	**62.0**	7.1	3.7	8.5	**19.3**

Table 3-2 Summary of PSDDA Investigation Chemical Concentrations

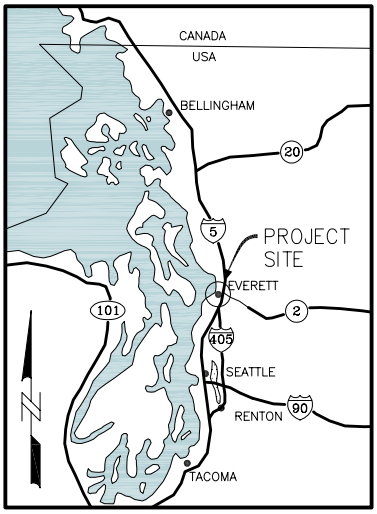
Parameter	SMS Criteria		PSDDA Criteria			EC-1A-S1		
	SQS	MCUL	SL	BT	ML			
Conventionals								
Total Solids (%)	nv	nv	nv	nv	nv	**62.3**		
Total Volatile Solids(%)	nv	nv	nv	nv	nv	**5.3**		
Total Organic Carbon (%)	nv	nv	nv	nv	nv	**1.8**		
Ammonia (mg/kg)	nv	nv	nv	nv	nv	**19.8**		
Total Sulfides (mg/kg)	nv	nv	nv	nv	nv	**580**		**J-**
Metals	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		
Antimony	nv	nv	150	nv	200	<8		U
Arsenic	57	93	57	507.1	700	**11**		
Cadmium	5.1	6.7	5.1	11.3	14	**0.3**		
Chromium	260	270	nv	267	nv	**40.5**		
Copper	390	390	390	1,027	1,300	**52.4**		
Lead	450	530	450	975	1,200	**16**		
Mercury	0.41	0.59	0.41	1.5	2.3	**0.11**		
Nickel	nv	nv	140	370	370	**44**		
Silver	6.1	6.1	6.1	6.1	8.4	<0.5		U
Zinc	410	960	410	2,783	3,800	**75.8**		
LPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
Naphthalene	99	170	2.1	nv	2.4	**0.055**	**3.1**	
Acenaphthylene	66	66	0.56	nv	1.3	<0.020	<1.1	U
Acenaphthene	16	57	0.5	nv	2	**0.140**	**7.8**	
Fluorene	23	79	0.54	nv	3.6	**0.110**	**6.1**	
Phenanthrene	100	480	1.5	nv	21	**0.360**	**20.0**	
Anthracene	220	1200	0.96	nv	13	**0.110**	**6.1**	
2-Methylnaphthalene	38	64	0.67	nv	1.9	<0.020	<1.1	U
Total LPAH	370	780	5.2	nv	29	**0.775**	**43.1**	
HPAH	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
Fluoranthene	160	1200	1.7	4.6	30	**0.850**	**47.2**	
Pyrene	1000	1400	2.6	11.98	16	**0.970**	**53.9**	
Benzo(a)anthracene	110	270	1.3	nv	5.1	**0.430**	**23.9**	
Chrysene	110	460	1.4	nv	21	**1.000**	**55.6**	
Benzofluoranthenes	230	450	3.2	nv	9.9	**0.760**	**42.2**	
Benzo(a)pyrene	99	210	1.6	nv	3.6	**0.230**	**12.8**	
Indeno(1,2,3-cd)pyrene	34	88	0.6	nv	4.4	**0.120**	**6.7**	
Dibenzo(a,h)anthracene	12	33	0.23	nv	1.9	**0.053**	**2.9**	
Benzo(g,h,i)perylene	31	78	0.67	nv	3.2	**0.120**	**6.7**	
Total HPAH	960	5300	12	nv	69	**4.533**	**251.9**	
Chlorinated Hydrocarbons	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
1,3-Dichlorobenzene	nv	nv	0.17	nv	nv	<0.001	<0.06	U
1,4-Dichlorobenzene	3.1	9	0.11	nv	0.12	<0.001	<0.06	U
1,2-Dichlorobenzene	2.3	2.3	0.035	nv	0.11	<0.001	<0.06	U
1,2,4-Trichlorobenzene	0.81	1.8	0.031	nv	0.064	<0.007	<0.39	U
Hexachlorobenzene	0.38	2.3	0.022	0.168	0.23	<0.020	<1.1	U
Phthalates	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
Dimethyl phthalate	53	53	1.4	nv	nv	<0.020	<1.1	U
Diethyl phthalate	61	110	1.2	nv	nv	<0.020	<1.1	U
Di-n-butyl phthalate	220	1700	5.1	nv	nv	<0.020	<1.1	U
Butyl benzyl phthalate	4.9	64	0.97	nv	nv	<0.020	<1.1	U
Bis(2-ethylhexyl)phthalate	47	78	8.3	nv	nv	**0.150**	**8.3**	U
Di-n-octyl phthalate	58	4500	6.2	nv	nv	**0.026**	**1.4**	U
Phenols	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		
Phenol	0.42	1	0.42	nv	1.2	0.083		UB
2-Methylphenol	0.063	0.063	0.063	nv	0.077	<0.020		U
4-Methylphenol	0.67	0.67	0.67	nv	3.6	**0.022**		
2,4-Dimethylphenol	0.029	0.029	0.029	nv	0.21	<0.020		U
Pentachlorophenol	0.36	0.69	0.4	0.504	0.69	<0.099		U
Miscellaneous Extractables	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		
Benzyl alcohol	0.057	0.073	0.057	nv	0.87	<0.020		U
Benzoic acid	0.65	0.65	0.65	nv	0.76	**0.220**		U
Miscellaneous Extractables	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
Dibenzofuran	15	58	0.54	nv	1.7	**0.026**	**1.4**	
Hexachloroethane	nv	nv	1.4	nv	14	<0.020	<1.1	U
Hexachlorobutadiene	3.9	6.2	0.029	nv	0.27	<0.020	<1.1	U
N-Nitrosodiphenylamine	11	11	0.028	nv	0.13	<0.020	<1.1	U
Volatile Organics	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*		
Trichloroethene	nv	nv	0.16	nv	1.6	<0.001		U
Tetrachlorethene	nv	nv	0.057	nv	0.21	<0.001		U
Ethylbenzene	nv	nv	0.01	nv	0.05	<0.001		U
Total xylenes	nv	nv	0.04	nv	0.16	<0.003		U
Pesticides	*(ppm TOC)*	*(ppm TOC)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(ppm TOC)*	
DDT	nv	nv	0.0069	0.05	0.069	<0.006	<0.3	U
Aldrin	nv	nv	0.01	nv	nv	<0.001	<0.06	U
alpha-chlordane	nv	nv	0.01	0.037	nv	<0.001	<0.06	U
dieldrin	nv	nv	0.01	nv	nv	<0.002	<0.11	U
heptachlor	nv	nv	0.01	nv	nv	<0.001	<0.06	U
alpha-BHC	nv	nv	nv	10 *	nv	<0.001	<0.06	U
gamma-BHC (Lindane)	nv	nv	0.01	nv	nv	<0.001	<0.06	U
Aroclor 1016	nv	nv	nv	nv	nv	<0.020	<1.1	U
Aroclor 1242	nv	nv	nv	nv	nv	<0.020	<1.1	U
Aroclor 1248	nv	nv	nv	nv	nv	<0.020	<1.1	U
Aroclor 1254	nv	nv	nv	nv	nv	**0.040**	**2.20**	
Aroclor 1260	nv	nv	nv	nv	nv	<0.020	<1.1	Y
Aroclor 1221	nv	nv	nv	nv	nv	<0.039	<2.2	U
Aroclor 1232	nv	nv	nv	nv	nv	<0.020	<1.1	U
Total PCBs **	12	65	0.13	38*	3.1	**0.040**	**2.20**	U

Notes:
Bold values at or above laboratory detection limit
Underlined values exceed the SQS value in SMS or the SL value of PSDDA
Data has been validated according to QA-2 protocols.

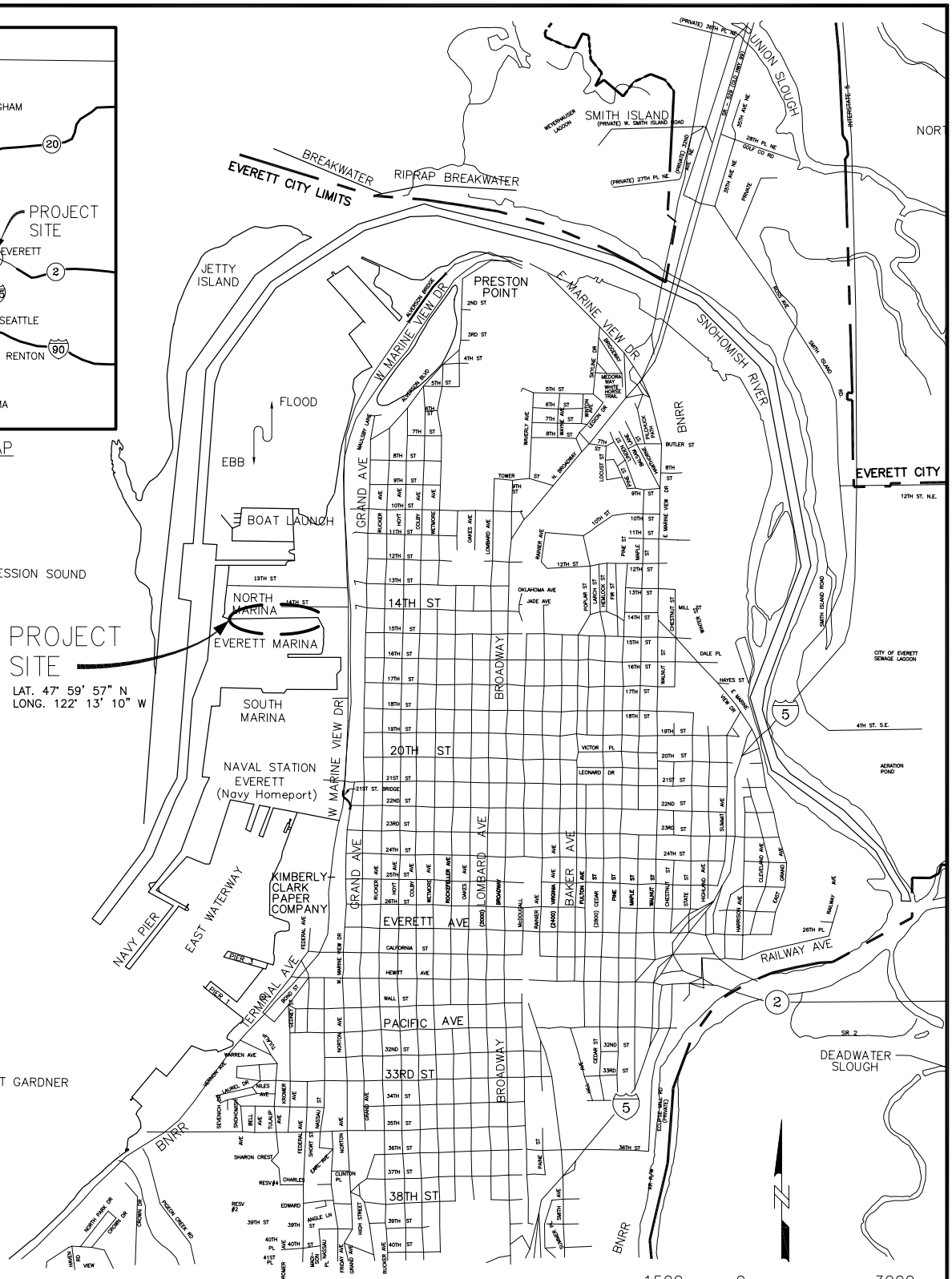
* This value is normalized to total organic carbon, and is expressed in mg/kg (TOC normalized).
** Total PCBs are calculated by summing detected concentrations of Aroclors.
nv - No value currently established under PSDDA.

U = Undetected
B = Possible/probable blank contamination due to detection in the blank
J- = Estimated concentration, biased low
Y = Reporting limit raised due to interference

Figures



LOCATION MAP
NOT TO SCALE



VICINITY MAP

1500 0 3000
SCALE IN FEET

SITE ADDRESS

NAME: PORT OF EVERETT MARINA
ADDRESS: 1720 W. MARINE VIEW DRIVE
EVERETT, WA 98206
PHONE: 206-259-3164

(SECTION 18, TOWNSHIP 29 NORTH, RANGE 5 EAST, W.M. IN THE CITY OF EVERETT, SNOHOMISH COUNTY, WASHINGTON)

RETEC

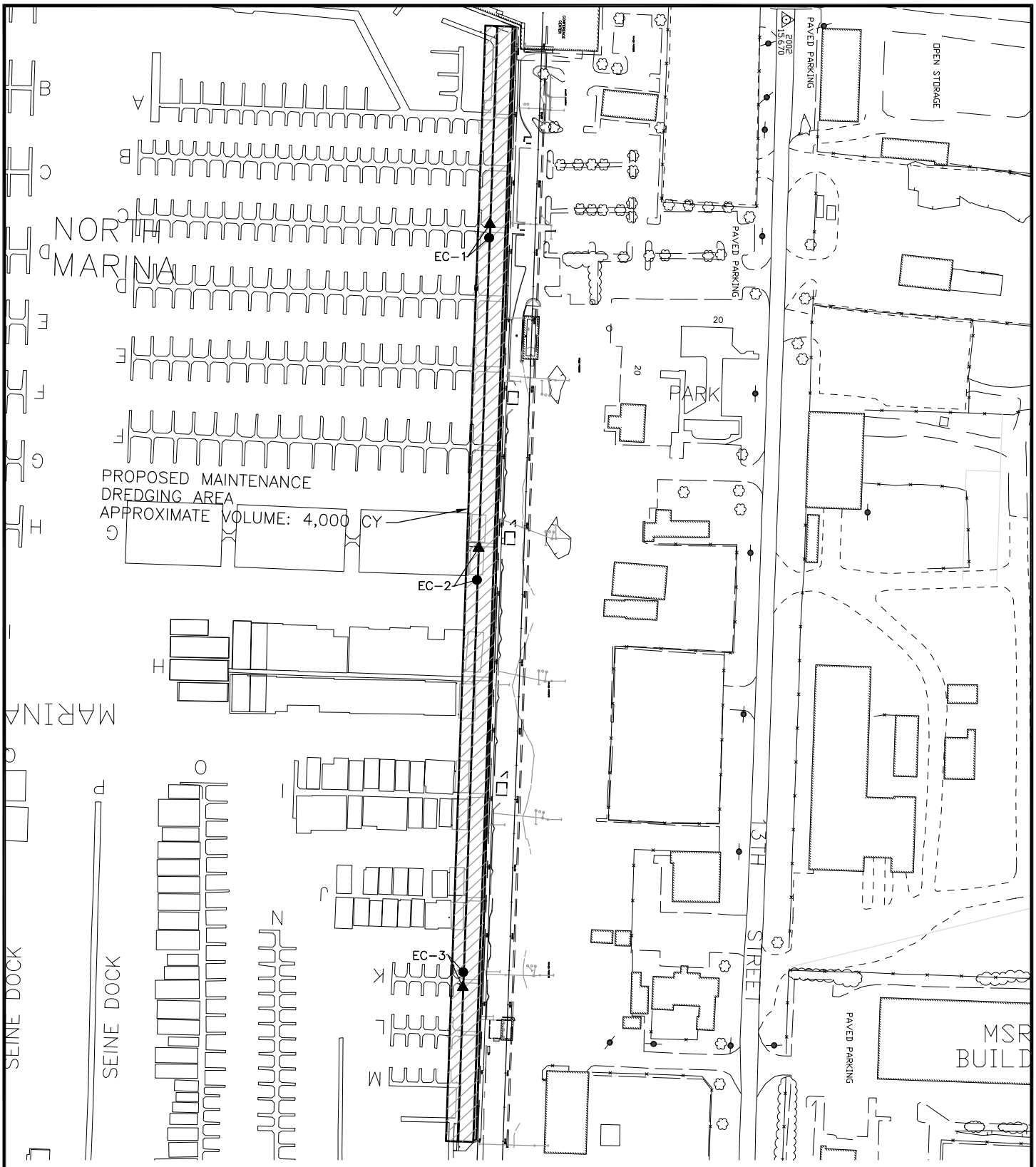
PORT OF EVERETT
14th STREET MAINTENANCE DREDGING
PORE1-18490-100

SITE LOCATION MAP

DATE: 10/25/04 | DRWN: A.S./SEA

FIGURE 1-1

File: H:\18490\18490S001.dwg Layout: ANSI_AVI-CP User: astenberg Plotted: Feb 10, 2005 - 3:48pm Xref's:



EXISTING CONDITIONS PLAN

LEGEND

- MAINTENANCE DREDGING AREA
- TARGET PSDDA SAMPLING LOCATIONS
- ACTUAL PSDDA SAMPLING LOCATIONS

100 0 200

SCALE IN FEET

RETEC

PORT OF EVERETT 14th STREET MAINTENANCE DREDGING PORE1-18490-100	**CORING LOCATIONS IN DMMU-1A AT EVERETT MARINA**
DATE: 02/02/05 | DRWN: A.S./SEA	**FIGURE 1-2**

File: H:\18490\18490S005.dwg Layout: FIGURE 1-2 User: astenberg Plotted: Feb 10, 2005 - 3:46pm Xref's:

Appendix A

PSDDA Core Sampling Logs

Sediment Core Log

Core: EC-1

Sheet 1 of 1

Project: **Everett Marina**	Water Body Type: **Marine**	Tube Length: **10'**
Project #: **PORE1-18490-200**	SW Elevation (ft)/Tide: **+2.9 ft**	Penetration Depth: **4.0'**
Client: **Port of Everett**	Water Depth (ft): **10**	Sample Quality: **Good**
Collection Date: **01/04/05**	Mudline Elevation (ft): **-7.1**	Recovery in ft (%): **3.0' (75)**
Contractor: **RETEC**	N./LAT: E./LONG:	Process Date: **01/05/05**
Vessel: **None**	Horiz. Datum: Vert. Datum:	Process Method: **Push Extrusion**
Operator: **None**	Method/Tube ID: **3" OD Push Core**	Logged By: **D. Berlin**

Depth (ft) Below Mudline	Recovered Interval	Sample #	Analysis	Headspace PID	Sediment Description (Classification Scheme: USCS; Recalculated depth interval in feet)	Comments	Calc. In situ Depths (ft) & Graphic Log	Mudline Elevation (ft)
0	S1	S1	S2-, VOC		MH: (0-0.5') wet, soft, greenish gray slightly sandy (m-f grains) SILT w/ trace gravel to 1/2" thick and mussel shells. Strong H2S odor, grading sandier with depth.			
1					SM: (0.5-1.8') moist, firm, dark gray SILTY SAND (f-m grains) w/ moderate shell frags. Trace wood frags (1/2") and strong H2S odor, grading to slightly silty sand with depth.			-8
2					SP: (1.8-2.25') moist, firm, dark gray slightly silty SAND (f-m grains). Moderate H2S odor, grading to drier slightly silty sand with depth.			-9
	S2	S2	S2-, VOC		SP: (2.25-3.0') moist, firm, dark gray slightly silty SAND (f-m grains) w/ moderate shell frags to 1" diameter. Moderate H2S odor.			-10
3								

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2839

Remarks: **Core catcher is plugged**

Calculated Recovery

Sample Length/Penetration Length:

3.0' / 4.0' = 75 %

Sediment Core Log

Core: EC-2

Project: **Everett Marina**	Water Body Type: **Marine**	Tube Length: **10'**
Project #: **PORE1-18490-200**	SW Elevation (ft)/Tide: **+6.5 ft**	Penetration Depth: **3.5'**
Client: **Port of Everett**	Water Depth (ft): **13.5**	Sample Quality: **Good**
Collection Date: **01/04/05**	Mudline Elevation (ft): **-7.0**	Recovery in ft (%): **2.5' (71)**
Contractor: **RETEC**	N./LAT: E./LONG:	Process Date: **01/05/05**
Vessel: **None**	Horiz. Datum: Vert. Datum:	Process Method: **Push Extrusion**
Operator: **None**	Method/Tube ID: **3" OD Push Core**	Logged By: **D. Berlin**

Depth (ft) Below Mudline	Recovered Interval	Sample #	Analysis	Headspace PID	Sediment Description (Classification Scheme: USCS; Recalculated depth interval in feet)	Comments	Calc. In situ Depths (ft) & Graphic Log	Mudline Elevation (ft)
0	S1				SM: (0-1.1') wet, soft, brownish gray SILTY SAND (m-f grains) w/ trace leaves on surface and trace shell frags @ 0.7'. Strong H2S odor.			-7
1					SP: (1.1-2.5') wet, firm dark gray slightly silty SAND (f-m grains) w/ moderate rope fibers and trace shell frags. Moderate H2S odor, grading to moderate shell frags to BOC.			-8
2	S2							-9

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2839

Remarks: **Core catcher is plugged**

Penetration until refusal @ 3.5'

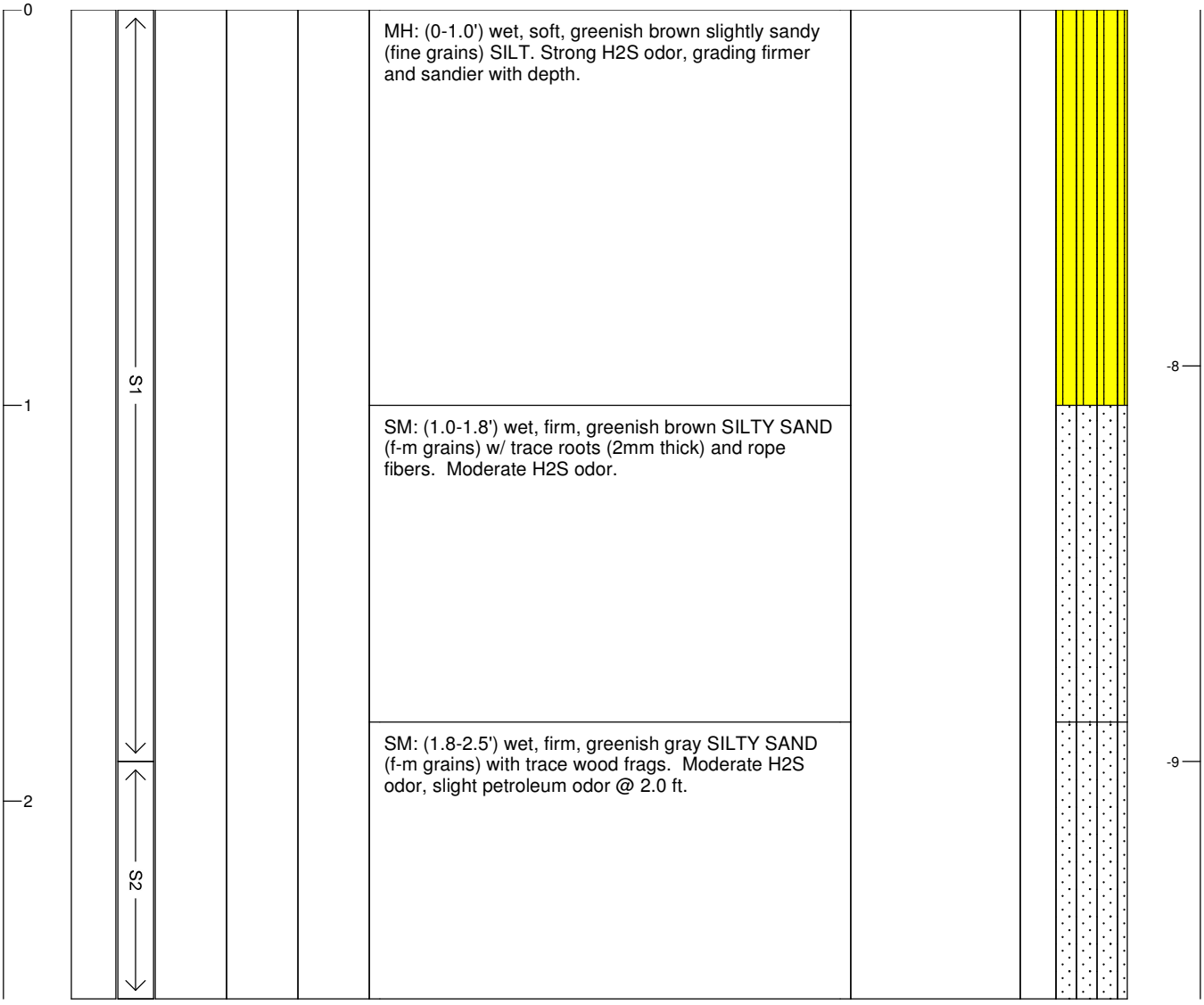
Calculated Recovery
Sample Length/Penetration Length:
2.5' / **3.5'** = **71** %

Sediment Core Log

Core: EC-3

Project: **Everett Marina**	Water Body Type: **Marine**	Tube Length: **10'**
Project #: **PORE1-18490-200**	SW Elevation (ft)/Tide: **+9.4 ft**	Penetration Depth: **3.5'**
Client: **Port of Everett**	Water Depth (ft): **16.5**	Sample Quality: **Good**
Collection Date: **01/04/05**	Mudline Elevation (ft): **-7.1**	Recovery in ft (%): **2.5' (71)**
Contractor: **RETEC**	N./LAT: E./LONG:	Process Date: **01/05/05**
Vessel: **None**	Horiz. Datum: Vert. Datum:	Process Method: **Push Extrusion**
Operator: **None**	Method/Tube ID: **3" OD Push Core**	Logged By: **D. Berlin**

Depth (ft) Below Mudline	Recovered Interval	Sample #	Analysis	Headspace PID	Sediment Description (Classification Scheme: USCS; Recalculated depth interval in feet)	Comments	Calc. In situ Depths (ft) & Graphic Log	Mudline Elevation (ft)
0	S1				MH: (0-1.0') wet, soft, greenish brown slightly sandy (fine grains) SILT. Strong H2S odor, grading firmer and sandier with depth.			-8
1					SM: (1.0-1.8') wet, firm, greenish brown SILTY SAND (f-m grains) w/ trace roots (2mm thick) and rope fibers. Moderate H2S odor.			
2	S2				SM: (1.8-2.5') wet, firm, greenish gray SILTY SAND (f-m grains) with trace wood frags. Moderate H2S odor, slight petroleum odor @ 2.0 ft.			-9



The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2839

Remarks: **Core catcher is plugged**

Penetration until refusal @ 3.5'

Calculated Recovery
Sample Length/Penetration Length:
2.5' / **3.5'** = **71** %

Appendix B

Data Validation Report

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

November 22, 2004

Operations Division/Technical Support Branch
Dredged Material Management Office

Daniel Berlin
RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, Washington 98134-1162

Re: Port of Everett – 14th Street Sediment
Testing Sampling and Analysis Plan

Dear Mr. Berlin:

This letter responds to the sampling and analysis plan (SAP) submitted to the Dredged Material Management Program (DMMP) for review on November 12, 2004. Based on our review of the SAP, we approve the SAP, subject to making the following changes.

Specific Comments:

1. Page 3-1, 6th bullet. Please note that the maximum surface depth interval for a DMMP characterization is 0-4 feet and not 0-3 feet as denoted. The sediments noted for testing fall within the surface sediment designation at 0-3 feet for the proposed project characterization/dredging.

2. Page 3-2, both bullets denoted. Change Surface Sediments to 0-4 feet; and Subsurface Sediments to > 4 feet.

3. Page 3-3, section 3.3.1, first bullet. The DMMP/PSDDA site disposal of dredged material at nondispersive disposal sites in Puget Sound are generally restricted to clamshell dredged material. The disposal of hydraulically dredged material at a nondispersive PSDDA disposal site is generally not allowed due to the high water content of the slurry in the hopper barge, and concerns about the ensuing spread of the material on the bottom outside the boundary of the disposal site. The DMMP agencies have only allowed a limited disposal of hydraulically dredged material at the Rosario Strait dispersive site.

4. Page 5-2, 1st bullet. Potential selection of DMMP appropriate amphipod species for the acute 10-day mortality test, should also include *Eohaustorius estuarius.*

5. Page 5-4, second paragraph, first sentence. Change sentence as follows: "For the amphipod test… 30 mg/L total ammonia for *A. abdita* or *R. abronius*, and **60 mg/L for *Eohaustorius estuarius* (*E. estuarius*)** testing".

6. Please fill out the sampling and analysis cost data sheet provided (Attachment 1) and submit it with your sediment characterization report to the Dredged Material Management Office.

Please call me (206-764-3768) if you have any questions about our SAP review comments.

Sincerely,

David R. Kendall, Ph.D.
Chief, Dredged Material Management Office

Enclosures
Copies Furnished:

Peter Leon, DNR
John Malek, EPA
Tom Gries, Ecology
Cinde Donoghue, Ecology
Randel Perry, Corps Regulatory Branch
DMMO file

PROJECT SAMPLING AND TESTING COST SUMMARY: (Required fields shaded)		
Project Name:		
Total Project Volume Tested: (cubic yards)		
SAMPLING COSTS: (includes: bathymetric survey, SAP development, sample positioning, project sediment sampling costs, reference/control sediment sampling costs)		**$**
CHEMICAL TESTING COSTS: (PSDDA or Grays Harbor-Willapa Bay DMMP chemicals of concern)		
Number of DMMU analyzed:		
Conventionals: (unit cost)		**$**
Metals: (unit cost)		**$**
Organics: (unit cost)		**$**
Special Chemicals: (unit cost) (if any, specify which chemicals, e.g., TBT, Dioxin)		**$**
Total Chemical Testing Costs: (includes cumulative chemical testing costs, chemistry report, QA/QC report including QA2 data)		**$**
BIOLOGICAL TESTING COSTS:		
Number of DMMU analyzed:		
Amphipod: (specify species and unit cost)		**$**
Sediment Larval: (specify species and unit cost)		**$**
Neanthes Growth: (unit cost)		**$**
Bioaccumulation test: (2 species) (specify species, total cost)	*Macoma nasuta*	**$**
	Nephtys caecoides	**$**
Reference sample collection (location)		**$**
Total Biological Testing Costs: (includes total bioassay testing cost, QA/QC costs, and bioaccumulation costs if any)		**$**
MISCELLANEOUS COSTS: (includes any costs not covered such as administrative overhead, final report Cost)		**$**
GRAND TOTAL COSTS: (summary of sampling + testing costs + miscellaneous costs)		**$**

APPENDIX G

2006 SEPA CHECKLIST

ENVIRONMENTAL CHECKLIST

Purpose of Checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply". Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply". In additional, complete the Supplemental Sheet for Nonproject actions (part D).

For nonproject actions, the references in the checklist to the words "project", "applicant", and "property or site" should be read as "proposal", "proposer", and "affected geographic area", respectively.

A. Background

1. Name of proposed project, if applicable:

Jeld-Wen Waterfront Redevelopment Comprehensive Plan Map Change, Planned Development Overlay Rezone and Shoreline Designation Change.

2. Name of applicant:

Applicant and Owner
Jeld-Wen, Inc, and Eagle Crest

Co-Applicant and Owner
Port of Everett

3. Address and phone number of applicant and contact person:

Jeld-Wen, Inc
P.O. Box 1329
Klamath Falls, OR 97601

Contact Person: Stuart Woolley
Executive V.P.
541.923.0807

Port of Everett
P.O. Box 538
Everett, WA 98206

Contact Person: John Mohr
Executive Director
425.259.3164

Local Contact: Randy Blair
W & H Pacific
3350 Monte Villa Parkway
Bothell, WA 98021
425.951.4815

4. Date checklist prepared: ***June 26, 2006***

5. Agency requesting checklist:

CITY OF EVERETT

6. Proposed timing or schedule (including phasing, if applicable):

Considering that this is a non-project action following approval of the requested land use, zoning and shoreline designation and approval of the submitted Redevelopment Concept the applicant will subsequently prepare more detailed site investigations, technical and environmental evaluations, design guidelines and site plans to be submitted with a more specific development application. This subsequent development application will **also be subject to SEPA review.**

Regarding phasing, the project will be developed in multiple phases. The timing of development at this time is unknown.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, as described in item 6.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- ***Project Level SEPA environmental review.***
- ***Environmental evaluation of existing buildings***
- ***Environmental and geotechnical explanation of soils.***
- ***Stormwater Management Plan***
- ***Project Level evaluation regarding Compliance with the Federal Endangered Species Act.***
- ***Technical and environmental analysis associated with the Marina***

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Not aware of any.

10. List any government approvals or permits that will be needed for your proposal, if known.

City of Everett

- ***Comprehensive Plan Amendment and Zoning Change***
- ***Shoreline Master Program Amendments***
- ***Official Site Plan Approval to comply with Planned Development Zoning Overlay requirements***
- ***Shoreline Substantial Development Permit***
- ***Binding Site Plan***
- ***Grading Permit***
- ***Demolition Permits for existing structures***
- ***Building Permits***
- ***Utility Extensions***
- ***Right-of-Way Use Permits***
- ***Sign Permits***

State of Washington

- *401 Water Quality Certification Nationwide Permits*
- *Approval to Allow Temporary Exceedance of Water Quality Standards*
- *Hydraulic Project Approval*
- *Individual Stormwater Discharge Permit*

Federal

- *Army Corps of Engineers Nationwide Permit 3 – Bulkhead Maintenance and Repair**
- *Army Corps of Engineers Section 404 Permit – Work in Navigable Waters – In –water marina and new boat haul-out**
- *Army Corps of Engineers Section 10 Permit – New Dredging*
- *Endangered Species Act (ESA) Compliance – Biological Evaluation/Biological Assessments (BE/BA)*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

This proposal is to change the City of Everett Comprehensive Plan Map of the Jeld-Wen and Port of Everett properties from Maritime Services with shoreline designations of Maritime Interim Aquatic Conservancy and Aquatic to the designation of waterfront commercial with a Shoreline Urban Multi-Use overlay. The zoning of the properties would be changed from Maritime Services (M-S) and Heavy Manufacturing (M-2) to Waterfront Commercial with a Planned Development Overlay. Following approval of these initial land use, zoning and shoreline re-designations, more detailed environmental and technical evaluations will be performed, a detailed site plan prepared and design guidelines. These documents will subsequently be submitted to the City for site plan approval. Following the site plan approval more detailed design and construction documents will be submitted to the City and other applicable agencies to obtain permits for construction.

Regarding site area, the gross acres of the Jeld-Wen property is 52.63 acres, of which approximately 36 acres is uplands. The gross acres of the Port Property is 41.32 acres, of which approximately 17 acres is uplands.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known, if a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The proposal is located in Section 7, T29N, R5E. Two of the street addresses associated with the properties are 200 West Marine View Drive and 200 West Marine View Drive, Everett, WA 98201. A vicinity map and color aerial photo are attached (Attachment "A"). A copy of the development concept is included in Attachment "B".

B. Environmental Elements

1. Earth

a. General description of the site (circle one): (Flat,) rolling, hilly, steep slopes, mountainous, other _____ .

b. What is the steepest slope on the site (approximate percent slope)?

With the exception of rip rap and retainment at the shoreland edges the properties predominately have a 1%- 3% slope.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

According to the Snohomish County Soil Conservation Service soil survey, the properties soils are classified as "Urban Land". This is predominately due to the historic filling of this area in the early 1900's. Based on the previous use of the Jeld-Wen property for manufacturing purposes, the property appears suitable for urban development.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

There has been no past history or evidence of unstable soils on the site. With the future development plan application a geotechnical evaluation will be performed to provide technical data on the design criteria for structures, foundations, pavement, retaining walls, utility bedding and pier/piles, and shoreline protection, etc.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Due to the relatively flat nature of the properties, upland site grading will be less than many other properties in the City. The dredging to expand the waterfront and accommodate the marina and upland site development grading will be addressed with subsequent development applications at the time of permit application with the City and other applicable agencies.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

As is the case with all earthwork, erosions could occur on the site if soils were left exposed during heavy or lengthy rain storms. Measures used to manage erosions will be described in the future project level environmental review.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 95% of the Jeld-Wen uplands is currently paved or covered with "impervious structures. The Port of Everett property currently has little impervious surface, however the existing zoning on the Port property would permit up to 90% or more imperious surface.

The proposal will likely reduce the impervious service by 10% or more due to the provision of both public and private open space features.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The measures to reduce or control erosion will be addressed with the future redevelopment projects level review.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.'

No emissions will occur as a result of this land use zoning and shoreline re-designation request. Subsequent applications will address this item.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Not aware of any.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

None proposed at this time due to the action requested. Following approval of the land use, zoning and shoreline designation more detailed evaluation will be performed and this item will be addressed in a subsequent SEPA review.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. The Snohomish River Navigation Channel, adjacent shorelands and the Maulsby Wetlands which is located east of the West Marine View Drive.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, the proposal and associated Development Concept proposes a Marina (public and private), pedestrian access (public and private) and expanded water access (dredging) which is both public and private. This is illustrated on the Development Concept contained in Attachment "B".

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill materials.

The amount of fill or dredge material is not known at this time. The areas projected for fill and dredge activities associated with the Marina uses are shown on Attachment "B".

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No. Domestic and fire protection water service is provided by the City.

5) Does the proposal lie with a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No. Sanitary Sewer Service is provided by the City.

b. Ground

1) Will ground water be withdrawn, or will water be discharge to ground water? Give general description, purpose, and approximate quantities, if known.

No. Existing domestic and fire protection lines will serve the project from the City of Everett water system

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste materials will be discharged from the project.

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The principal source of runoff on the property will be rainwater and snowmelt from impervious surfaces such as roof tops, parking areas and other paved areas.

There will also be the potential for runoff of petrochemicals from parking areas and boat storage. The project level environmental review will include a stormwater management plan addressing the best management practices to be utilized to minimize the influence of stormwater runoff from entering the ground or surface waters. Stormwater will be detained and discharged to the Port Gardner Channel.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Yes, however on the Jeld-Wen property which is over 90% impervious it will be less since the majority of this site has an outdated stormwater system. With the exception of the western 6 acres, this site has no stormwater detention or

water quality treatment facilities. The Port property which is undeveloped has less storm water runoff in its current state. The project level environmental review as previously discussed in item C.1 will include a stormwater management plan addressing the best management practices to be utilized.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

The project level environmental review will include a stormwater management plan which will describe the best management practice and measures that will be used to reduce or control surface, ground and runoff water. In addition, future construction will be performed in accordance with applicable City, State and Federal permit conditions and standards.

4. Plants

a. Check or circle types of vegetation found on the site:
_X_ deciduous tree: alder, maple, aspen, other
_X_ evergreen tree: fir, cedar, pine, other
_X_ shrubs
_X_ grass
___ pasture
___ crop or grain
___ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
_X_ water plants: water lily, eelgrass, milfoil, other various aquatic plants (TBD)
___ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

There are very few trees on either the Jeld-Wen or Port properties. The exception is the approximately 2 acre uplands at the south end of the Jeld-Wen property. Approximately 25% or more of the trees are proposed to be retained on this 2 acre parcel. The Port property is predominately wild grasses and invasive shrub species. All of this vegetation is proposed to be removed with future construction.

c. List threatened or endangered species known to be on or near the site.

No aware of any.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Redevelopment of the site will include multiple landscape treatments which will include native and ornamental plant species of trees, shrubs and ground covers.

These include the potential 2 acres waterfront park at the south end of the Jeld-Wen property, the proposed linear park at West Marine View Drive, the public and private trail network along the shoreline and other open space features.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: ~~hawk~~, ~~heron~~, eagle, songbirds, ~~other:~~ bald eagles, gulls, kingfishers, turns and sea ducks will likely be found on or in the vicinity of the project site
mammals: deer, bear, elks, beaver, ~~other:~~ Harbor seals, sea lions and ~~others~~ otters utilize the waters near the site
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

Chinook Salmon, bull trout, and bald eagles are likely near the site. To our knowledge there are no known bald eagle nests on the site. The project level environmental review will include a plant and animal evaluation and assessment.

c. Is the site part of a migration route? If so, explain.

Yes. Migrating adult and juvenile salmonid species use the Snohomish River channel as a migration route. The project level environmental review will include an evaluation and assessment regarding any potential impact and applicable mitigation measures.

d. Proposed measure to preserve or enhance wildlife, if any:

The project level environmental review will include an evaluation and assessment of various methods to preserve or enhance wildlife as an element of redeveloping the site.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Future redevelopment will require electrical power and natural gas for heating, lighting, appliance, space and water heating and other typical urban energy requirements.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Future site development will be designed to conform to applicable state and local energy code criteria.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal. If so, describe.

The potential for environmental health hazards on the Jeld-Wen site will be less than the previous door manufacturing uses on the site. Specific aspects of the environmental health hazards will be addressed in the subsequent project level environmental review.

1) Describe special emergency services that might be required.

With the exception of the marina uses, standard police, fire, and medical emergency services will be required in the event of accident, fire, environmental spill or unusual emergency event on the property. Police, fire, and emergency medical services will be provided by the City of Everett. The City of Everett has mutual aid agreements with adjacent jurisdictions.

2) Proposed measures to reduce or control environmental health hazards, if any:

Redevelopment of the Jeld-Wen site will result in replacing the old structures, buildings and inadequate infrastructure which was not designed and constructed to current environmental health standards. Future development will be subject to current environmental health standards. The project level review will address any needed special measures.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Predominately the noise is related to vehicular traffic along West Marine View Drive and the railroad on the east side of this roadway.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Typical short term construction noise associated with demolition of existing structures and new construction activity associated with the proposed uses. Future demolition and construction activities will occur within the established hours and days of the week permitted by the City. Long term noise will be typical of other residential, marina, and commercial uses.

3) Proposed measures to reduce or control noise impacts, if any:

Construction activity will be limited to the City permitted construction hours and others which maybe required as conditions associated with State or Federal permits.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The Jeld-Wen site is currently used by Rinker to transport gravel which has been barged to the property. The previous door manufacturing facility on the remainder of the site is no longer in operation. The Port property is undeveloped. The properties immediately adjacent to the site are undeveloped. More specifically,; 1) North – undeveloped, 2) South – mudflats/tidelands, 3) West – water channel and 4) West Marine View Drive, Railroad and Maulsby Wetland

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

The Jeld-Wen property contains numerous structures and buildings associated with the previous door manufacturing facility. There is also a barge dock at the west end of the site. In addition a new gravel processing building exists on the portion of site leased to Rinker. No structures exist on the Port Property.

d. Will any structures be demolished? If so, what?

It is anticipated that most all of the existing structures will be demolished. The project level environmental review will provide a description of all structures which will be demolished.

e. What is the current zoning classification of the site?

M-S Maritime Services and M-2 Heavy Manufacturing.

f. What is the current comprehensive plan designation of the site?

Maritime Services with a shoreline overlay of Urban Maritime Interim, Aquatic, and Aquatic Conservancy.

g. If applicable, what is the current shoreline master program designation of the site?

The Everett Shoreline Master Program designates the adjacent shoreline as Urban Maritime Interim, Aquatic and Aquatic Conservancy.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

None of the uplands portions of the site are classified as environmentally sensitive. The City notes in the Shoreline Plan that the Maulsby Mudflats is subject to special area planning to be conducted by the City and multiple property owners.

i. Approximately how many people would reside or work in the completed project?

Unknown at this time. The project level environmental review will provide information on the projected number of people who will work and or reside at the site.

j. Approximately how many people would the completed project displace?

No people currently reside on the property. The existing Rinker gravel operation will need to relocate. The number of on-site Rinker employees and truck drivers varies based on the economy and construction activity.

k. Proposed measures to avoid or reduce displacement impacts, if any:

The time period necessary to obtain permits for redevelopment of the property should be sufficient for Rinker to relocate its operation.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The proposed redevelopment will require the requested Comprehensive plan amendment, rezone and Shoreline Designation change to waterfront commercial with planned development overlay and an urban multi-use shoreline designation.

The proposal also includes a pedestrian trail and open space network consistent with the adopted Shoreline Public Access Plan (2003).

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

At this stage a specific development proposal has not been prepared. This is a non-project action initially requesting a change in the land use and zoning designations.

A copy of an initial development concept is enclosed (Attachment "B"). The residential uses will likely contain waterfront live/work units, low-rise, mid-rise and residential tower flats. Residential units will predominantly be for middle to *upper income.*

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not applicable. No residential units exist on the property.

c. Proposed measures to reduce or control housing impacts, if any:

During the future project level environmental review, the project will include a set of design guidelines for buildings, public and private open spaces, the Marina, waterfront, and a linear park along West Marine View Drive. At this time a historic Maritime Everett Waterfront theme is proposed.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest height of any proposed structure is projected to be approximately eighty (80) feet. These are labeled residential tower flats on the Conceptual Plan (Attachment "B"). Exterior building materials would likely include wood, glass, metal, masonry block, and other contemporary finishes. As previously discussed in this checklist a set of architectural design guidelines will be prepared with the future development application. These guidelines will be established as binding conditions, covenants, and restrictions (CC & R's) for all development on the property. More detailed information on the varied building heights site plan and building materials will be provided during the project level environmental review.

b. What views in the immediate vicinity would be altered or obstructed?

Views in the immediate vicinity along West Marine View Drive will be altered. The alterations associated with both the Jeld-Wen and Port Property include the open space linear Park along the roadway. Regarding the Jeld-Wen property, the new buildings will be set back further from West Marine View Drive. The residences on the bluff east of the site along Alverson Blvd. are setback approximately 700 feet from the Jeld-Wen frontage along West Marine View Drive and setback 600-700 feet from the Port property. Some views from the residences on the bluff will likely be altered, however no ones total view will be *obstructed. Prior to the public hearings on this proposal the applicant intends to prepare and submit cross-sections and graphic simulations which illustrate the development and the potential view alterations. Also, more detailed information on this element will be proved during the project level environmental review.*

c. Proposed measure to reduce or control aesthetic impacts, if any:

As discussed in item 10.b. the linear park, water feature, setback of buildings from West Marine View Drive and provision of architectural design guidelines and CC & R's will reduce the aesthetic impacts. In addition the building height variation will assist for the residential element. It is also proposed that the building heights will be highest at the center of the Jeld-Wen site and tapering down in height toward the edges of the site. In addition, it is anticipated there will be a tapering down in height toward the water to reduce the alteration of views from the residences on the bluff.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Redevelopment and new development will produce exterior and interior lighting, automobile headlights, street and parking lighting, grounds lighting and business sign lighting. Information on sources of light and glare will be provided during the project level environmental review.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The future redevelopment will change the type and location of lighting on the Jeld-Wen site and provide new lighting sources on the Port site. It is not anticipated that these sources will produce a safety hazard. These sources will alter the current condition along West Marine View Drive and from the residences on the bluff. Further review of these factors will be addressed in the project level environmental review.

c. What existing off-site sources of light or glare may affect your proposal?

Not aware of any which may affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

The need for any special provisions to reduce or control light and glare will be identified during the project level environmental review and site plan review process.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

North View Park is located along West Marine View Drive approximately 900 linear feet south of the Jeld-Wen property. There is also a public park on the bluff along Alverson Blvd. The City's Legion Golf Course is located within approximately one mile northeast of the property.

b. Would the proposed project displace any existing recreation uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The future redevelopment will improve active and informal recreation. These improvements include the potential 2 acre public waterfront park, linear park along West Marine View Drive, increased public shoreline access on the Port property with view points and increased shoreline access to the residents on the Jeld-Wen property. These improvements are consistent with the City of Everett Shoreline Public Access Plan.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

Not aware of any.

c. Proposed measures to reduce or control impacts, if any:

Not applicable.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

West Marine View Drive provides primary access to the Jeld-Wen and Port Property.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The site is not currently serviced by public transit. It appears Everett Transit may have at one time served the Jeld-Wen site when the manufacturing facility was in operation. This opinion is based on the fact that a Transit Shelter exists along the frontage with West Marine View Drive. Currently Everett Transits closest bus stop is approximately one mile south of the site. With future development it is anticipated enough potential ridership would warrant Everett Transit extending transit service to the site.

c. How many parking spaces would the completed project have? How many would the project eliminate?

With the future development proposal once a specific site plan is prepared and the mix of uses determined a projection of the number of parking spaces will be able to be identified. The existing parking spaces for the previous Jeld-Wen manufacturing facility will be redeveloped and replaced.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

New vehicular and pedestrian circulation improvements will be required for redevelopment. It is anticipated the vehicular circulation (streets/drives) will be private and maintained by a Property Owners Association (POA) and or a Home Owners Association (HOA). The specific location of these facilities will be shown on the future site plan. The site plan will be subject to City approval.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project concept includes both a private and public marina with boat slips intended to with improvements and dredging use the adjacent water channel.

These water uses are at this time projected to be primarily for recreational boat purposes. If the market warrants there is the possibility of tour boats, charter boats, and passenger boats. Further review of these factors will be addressed during the project level environmental review.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Redevelopment of the site will increase vehicular trips per day. At this time the number, type and peak hour are not known. The project level environmental review will include a traffic analysis in accordance with the City traffic analysis criteria.

g. Proposed measures to reduce or control transportation impacts, if any:

The future project level environmental review will include measures to reduce or control transportation impacts. At a minimum those measures will include complying with the City Traffic Mitigation requirements.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

Yes. There will be an increased demand for public services over the current use of the property. These increases will predominantly relate to police and fire protection. It is not anticipated that the residential uses will attract a significant number of families or single parents with school age children. The project level environmental review will provide more information on the increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any:

The removal of the vacant existing buildings will remove a potential fire hazard. With redevelopment the provision of a comprehensive vehicular circulation network, along with updated fire protection devices and new structures built to code will reduce the impact on fire and police protection. The need for any special measures to reduce or control impacts on public services will be addressed as a part of the project level environmental review.

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse, service, telephone service, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Extensions and some upgrades of the utilities noted in item 16.a. will be required to serve the future redevelopment of the property. The specifics regarding extensions and upgrades will be provided as a part of the project level environmental review.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Randy Blair - W Hilaji

Date Submitted: June 30, 2009

D. Supplemental sheet for nonproject actions

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Redevelopment of the site for commercial, recreation and residential oriented mixed-use under the proposed comprehensive plan map change and rezone could potentially result in some increased discharge to water, emissions to air, and production of noise. The previously completed sections of this Environmental Checklist provide additional information regarding the potential for increased emissions, releases and discharges in each of these categories. However, it should also be noted that incremental redevelopment and use of the site that

would otherwise occur under its current comprehensive plan designation and zoning would potentially create equal or greater levels of these same types of discharges, emissions and releases. This is because the current comprehensive plan and zoning allow and promote use of the site for a wide range of more industrial and heavy manufacturing oriented uses. These uses typically produce proportionally more water, air, noise and toxic or hazardous emissions and substances than do the mix of uses allowed under the requested plan and zone change.

Proposed measures to avoid or reduce such increases are:

(1) Full compliance of the proposed mixed-use oriented site redevelopment with all applicable City of Everett Comprehensive plan provisions and related development regulations as they would be emended by the requested map change and PDO rezone; (2) Removal of nearly all the site's older structures and large industrial uses and replacement with lower polluting uses and structures that fully comply with the most current building, fire/safety and environmental codes; and (3) Implementation of any needed special emission/discharge reduction controls or requirements as part of the project level, site plan approval and environmental review process.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The proposal is not anticipated to have more adverse affects on plants, animals, fish or marine life than would the types of uses and intensity of development allowed under the current comprehensive plan designation and zoning. This is because the portions of the proposed site redevelopment described in the proposed concept for redevelopment now being evaluated that are most likely to have any significant affect on plants, animals, fish or marine life are already allowed by the current comprehensive plan and zoning. The one exception is the portion of the shoreline currently designated Aquatic Conservancy. The procedure to evaluate and change the shoreline use on the portions designated Urban Maritime Interim are similar for the existing and proposed land use designation and zoning.

Proposed measures to protect or conserve plants, animals, fish or marine life are:

(1) Removal of older existing structures and redevelopment with new stormwater management facilities will reduce impacts on aquatic plants, fish, and marine life; and (2) Implementation of any special measures determined to be needed to protect or conserve plants animals, fish or marine life near the site as part of the project level, site plan approval and environmental review process.

3. How would the proposal be likely to deplete energy or natural resources?

Master planned, mixed – use redevelopment of the site as would be allowed by the proposed comprehensive plan map change and PDO rezone is likely to result in the consumption of additional energy or natural resources. However it should also be noted that incremental redevelopment and intensified use of the site what would otherwise occur under its current comprehensive plan designation and zoning is likely to eventually consume equal or greater amounts of energy or other natural resources. This is because the current comprehensive plan and zoning allow and promote use of the site for a wide range of more industrial and heavy manufacturing oriented uses. These uses typically require substantial amounts of energy and other natural resources for their manufacturing and fabrication processes.

Proposed measures to protect or conserve energy and natural resources are:

(1) Redevelopment related replacement of the site's older structures with new buildings and improvements that comply with all of the most current building and energy conservation codes; and (2) Use of a pedestrian oriented, master planned redevelopment typically requires less energy per square foot of building space and will promote greater use of future public transit and reduce the number of peak hour auto trips to and from the site.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Refer to response in item 2. The proposal is not anticipated to have any substantial greater impact than the uses which are permitted under the current land use and zoning designations.

Proposed measures to protect such resources or to avoid or reduce impacts are:

(1) Removal of older existing structures, and redevelopment with new stormwater management facilities will reduce impacts on aquatic plants, fish and marine life; and (2) Implementation of any special mitigation measures identified during the project level, site plan approval and environmental review process as being needed to protect or conserve environmentally sensitive areas, fish resources or other government protected areas near the site.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The Jeld-Wen Corporation and the Port of Everett are requesting that the City of Everett approve an amendment to the Everett Comprehensive Plan Map and associated Zone Map affecting their respective properties.

The proposal is to change the comprehensive plan designation for the subject property from Maritime Service to Waterfront Commercial. The zone district would be changed from Maritime Services (M-S) and Heavy Manufacturing (M-2) to Waterfront Commercial with a Planned Development Overlay Zone allowing for a mix of residential, recreation and commercial uses. The future development application would include project specific design guidelines. This proposal would require the Shoreline Master Program be amended for the site from Urban Maritime Interim, Aquatic and Aquatic Conservancy to Urban Multi-Use. The purpose of the above map amendments is to allow for the redevelopment of this urban shoreline site for optimum land uses while restoring and improving some of the aquatic/biological functions associated within and near the site.

As shown on the conceptual diagram (Attachment 'B") the project will include a mix of residential and recreational uses with local commercial uses to support them. The residential uses will mainly be located on the Jeld-Wen portion of the site with recreational uses (public/private marina and public walk/bike ways), commercial and some residential uses on the Port portion of the site. The Jeld-Wen portion of the site would include residential low rise, mid rise and tower flats as illustrated in the Everett Comprehensive Plan. The dwelling units would be connected by a loop road and pedestrian trails. A private marina will be provided at the northwest end of this portion of the site. The structures will be oriented to allow for optimal view opportunities from the dwelling units to the water with building heights being highest at the center of the site and tapering down in height toward the northeast and southwest and toward the northwest end of the site. The tapering of height toward the north end of the site will also mitigate obstruction of views of Puget Sound from existing dwellings east of the site, on top of the bluff. The majority of the vehicular parking will be provided underneath the various housing structures to provide appropriate spacing between the buildings to include pedestrian friendly plazas and landscaping, thus enhancing the livability of that part of the site. The 2 acre wooded area at the southern end of the Jeld-Wen site will include a trail spur from the west Marine View Drive Trail to the western end of the site where a public viewpoint will be provided. This wooded area also provides the potential for another public waterfront park. In addition, a lineal park with water frontage is proposed along West Marine View Drive. Pedestrian access to the more public and commercial Port property would be provided by way of two bridges spanning an enhanced water body between the two ownerships. These proposed public access provisions exceed those recommended in the City of Everett Shoreline Public Access Plan.

Two vehicular access points from west Marine View Drive would be provided to the site.

A public walkway, vista lookouts, plazas for outdoor public events and the marina with public restroom facilities will be oriented to the north shore of the Port property These outdoor recreation opportunities will attract the general public to a village-like esplanade where necessary local commercial goods and services will be provided to support those activities, as well as provide for incidental needs of the development residents. This recreation and commercial hub of the development will help to create a waterfront public esplanade where local residents and the general public converge to create a lively, village-square atmosphere.

One road running through the center of the Port site provides access to dwelling units and commercial facilities with a turnaround at its northern end. Low-rise residential and waterfront live-work townhomes will also be located at the Port property. The low-rise multiple-family structures are located at the entry of the site and the live-work townhome units are west of the main road. Mixed use residential and ground floor commercial buildings are provided east of the main road and will be oriented toward the river mouth and the proposed marina to the north. The marina front commercial services and the live-work units will be readily accessible from pedestrian walkways and the main street, thus having ample exposure to pedestrian and vehicular traffic.

The marina will provide a mix of private and public boat slips for the residents of the Jeld-Wen/ Port neighborhood and the public. A parking lot for the general public will be located at the northeast corner of the site, just off of West Marine View Drive. This parking area will not only serve those who may be renting a boat slip at the marina, but also anyone interested in renting a small boat or walking along the waterfront commercial esplanade at the northern boundary of the site. One road running through the center of the Port site would provide access to dwelling units and commercial facilities with a turn-around at its northern end. Specific land uses planned along the northern boundary of the site will be commercial and residential mixed use with public restroom and natural/cultural interpretive facilities to support boat owners and those using the public pedestrian walkways.

Three public vista locations will be provided along the trail running along the north boundary of the site adjoining the public/private marina. Commercial uses at the ground floor of the mixed use buildings facing the marina could have retail and commercial service uses such as restaurant/sandwich shop, grocery sales, boat/bike rental service and fitness club. Commercial uses in the work-home units could include professional offices (i.e. lawyer, architect, accountant, real estate sales, caterer) as well as artists and craftsman.

In addition to the aforementioned a detailed explanation of how the requested plan map change area rezone will assist in implementing Comprehensive Plan policies is contained in the Narrative Statement portion of the "Comprehensive Plan Change and Rezone Application" for this proposal.

Proposed measures to avoid or reduce shoreline and land use impacts are:

(1) To obtain the requested comprehensive plan amendment and PDO rezone to ensure that redevelopment will be fully consistent with these changes and related development regulations; (2) Use of the City's discretionary site plan approval process to create a high quality, site redevelopment plan. (3) Provide improved public pedestrian access, (4) Provide linear park along West Marine View Drive (5) Provide potential 2 acres public waterfront park and (6) implement applicable elements of the City Shoreline Public Access Plan.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Redevelopment of the site for masterplanned, residential, recreation and commercial purposes will produce an increase in daily vehicular trips. This form of mixed-use development will also produce an increased demand for most types of public services (with the exception of schools because the type of residential units being proposed are not expected to attract a significant number of single parents or families with children) and it is anticipated utilities will need to be extended and potentially upgraded.

Proposed measures to reduce or respond to such demand(s) are:

(1) The proposed form of compact, pedestrian oriented, mixed-use site redevelopment will significantly reduce both the capital expense and ongoing operational costs of satisfying its demands for additional transportation, public services and urban utilities compared to the same amount of development carried out in a more conventional manner on either this site or on scattered sites throughout the City, (2) Compact, pedestrian oriented development of the site will also provide the opportunity to create a neighborhood with opportunities to live, work, obtain convenience services and recreate on-site. (3) Redevelopment of the site will also result in removal of the older, non-conforming buildings and replacement with new buildings and improvements that will comply with the most recent building, fire and other safety codes. The site will also be provided with a fully looped water system with adequate fire flow and new fire hydrants; and (4) the proposed site redevelopment will comply with all standard City transportation, public services and utility system impact mitigation requirements as well as any special requirements imposed as part of the site plan approval and project level environmental review process.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The future site plan and development applications will be required to demonstrate that it is capable of complying with applicable local, state, or federal laws and requirements for the protection of the environment before it can proceed to the final approval and construction permits. A more detailed project level environmental review will be conducted with a specific development application. The final design and construction documents will be modified as necessary to avoid conflicts with applicable environmental protection requirements as a result of this more detailed environmental review effort and site plan review process.

ATTACHMENT 1

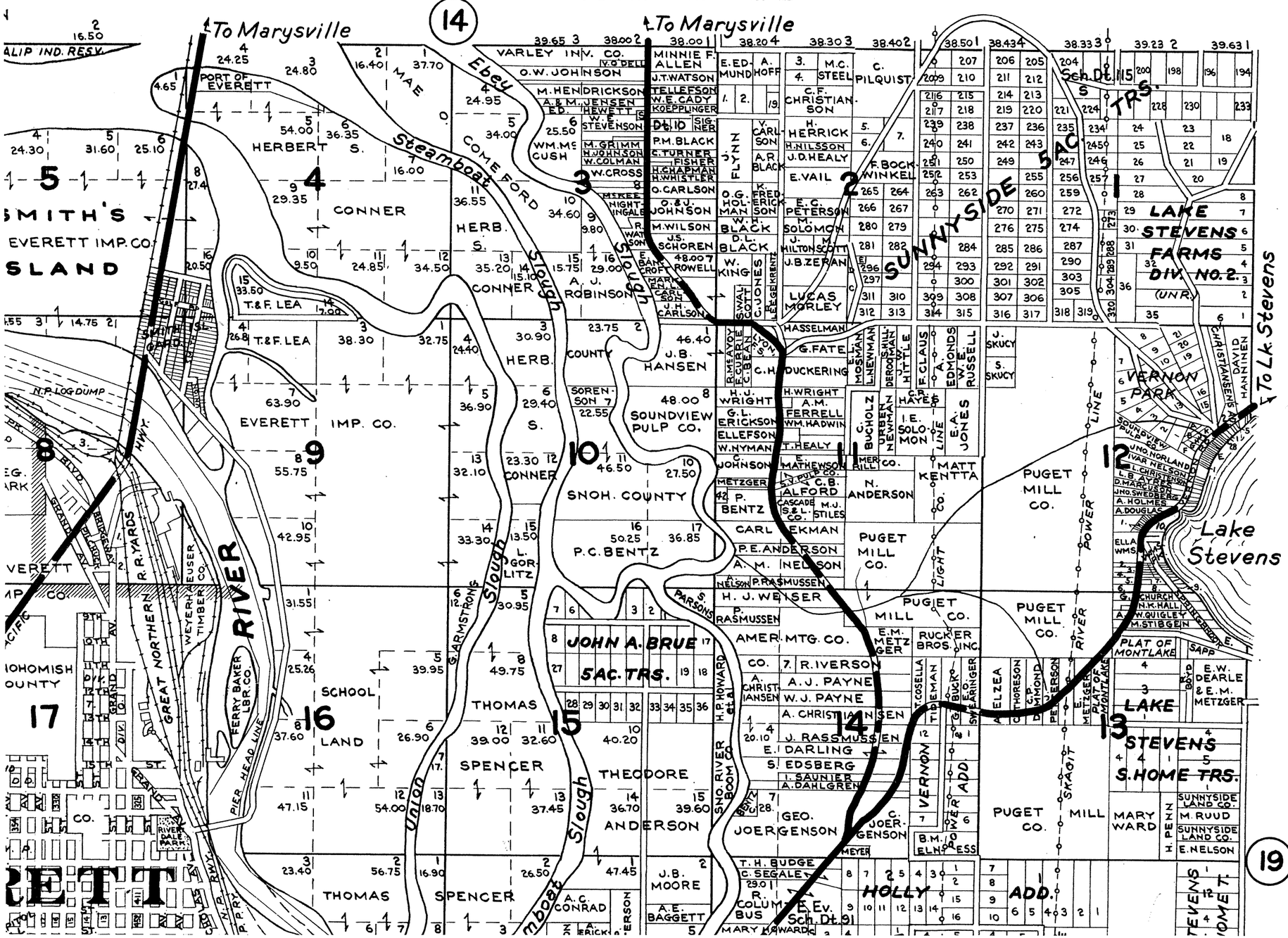
SANBORN MAPS

1936

TOWNSHIP 29N., RANGE 5E. W. M.

SNOHOMISH COUNTY, WASHINGTON

SCALE 2 IN. - 1 MILE



SHORELAND OWNERSHIPS

1-SULTAN RWY.& TIMBER CO.
2-IRVING DOUGHERTY MILL
3-PARKER LBR.& MILL COMPANY
4-SOUND CASKET MFG. COMPANY
5-NATIONAL POLE CO.
6-K.K.TIMBER CO.
7-EVERBEST SHINGLE CO.
8-CLOUGH SHINGLE CO.
9-NORTHWESTERN MFG. CO.
10-CARLSON BROS. CO.
11-EVERBEST SHINGLE CO.
12-ROBINSON MFG. CO.
13-PUGET SOUND PULP & TBR CO.
14-ASSOC. OIL CO.
15-AMER. PACKING CO.
16-NOR. PAC R.R.
17-WEYERHAEUSER TIMBER CO. MILL "A"
18-FISHERMANS PACKING CO.
19-EVERETT DOCK & WHSE. CO.
20-PIER NO. 1.
21-STANDARD OIL DOCK

SMALL TRACTS

SEC. 2.
1-2-M. BRITTON
3-C. CARLSON et al
4-H. OVERSON
5-C.C. CARLSON
6-A.E. CARLSON
7-M.P. CARLSON
19-S. SEIBERT

SEC. 8.
1-AMER. SMELTING & REFINING CO.
2-WEYER. TBR. CO.
3-WEYER. TBR. & MILL COMPANY

SEC. 11
42-SOUNDVIEW PULP CO.

SEC. 12
1-S.E. BARGREEN
2-E. STRICKLAND
3-M. WRIGHT
4-T. McINTYRE
5-C.N. MIMS
6-A.E. GILBERT
7-J. PURDY
8-A.E. GILBERT
9-A. HALL
10-J. TITCOMB

SEC. 14
7-S. EDSBERG

SEC. 21.
8-SUMNER IRON WORKS
9-THE MYCHEL CO.

SEC 23.
9-ERIC JOSEPHSON
10-A. ABRAHAMSON
11-J. DUCKERING
20-D. J. DUCKERING

SEC. 24
12-ZORA M. MORRIS
13-FRANK GILLESPIE
14-F.L. GILLESPIE

SEC. 25
15-W.T. ROBERTS

SEC 26
21-R.&J. MARQUIE

SEC. 28
22-U.S. FIDELITY & GUARANTEE CO.

SEC. 30
16-T. GOLDSBY
17-S.J. NERDRUM
24-I.B. VESTAL et al
200-B. TASTAD
201-P. RINGDAL
202-203-204-"
205-E. TJELSNES
206-L. SNYDER
207-MARY KINSEY
208-F.L. WHITTAKER
209-J.A. GARDNER
210-" " "
211-F.E. HENKE
212-LAURA MOORE
213-C.H. GAITHER
214-F.E. HENKE
215-RUTH SATHER
216-F.L. WHITTAKER
217-J.C. RAYMOND
218-C.A. DUEHN
219-W.H. VAUGN
220-A.H. WARREN
221-J. WICKLUND
222-S.O. " "
223-SCH. DT. 115
224-225-B.D. MORTON
226-O. GRINDE
227-228-C.J. WENHOLM
229-S. PEVNY
230-J. RUSSELL
231-232-G. TURCOTT
233-H. P. ZENDEN
234-E.C. JOHNSON
235-A.H. RICHARDSON
236-A.H. WARREN
237-WM. HADWIN
238-J.D. HARMES
239-LOAN & SECUR. CO.
240-B. GRONDAHL
241-A. PERSON
242-B.A. PARKER
243-W.E. CLARK
244-E. CUSHING
245-246-ANNA JOHNSON
247-A.P. ANDERSON
248-HILDA SMITH
249-H. KALLICOTT
250-E.A. MACKLIN
251-G.H. BROWN
252-E.L. ALEITH
253-S.R. SHERWOOD
E. 330' of 254-A GABRIELSON
254 exc. E. 330'-S.A. AMSDAL

SEC. 12
255-W.K. McFARLANE
256-W.O. WICKSTROM Blk. 3
257-CITY OF SEATTLE
258-L. ANDERSON
259-FRANK GREEN
260-W.K. McFARLANE
261-G. LARSEN
262-T.F. DAHLBECK
263-C. FINDLEY
264-L.A. FOSKER
265-G.M. TURNER
266-AUG. & ANNE FALQUIST
267-L.A. FOSKER
268-H. NEWMAN
269-S. BLOOMQUIST
270-R. ANDERSON
271-MAUDE HARVEY
272-FRANK GREEN
273-E. GREEN
274-W.E. CLARK
N. 50' of 275-C.S. MOORE
275 exc. N. 50'-P. LEFFLER
276-W.R. REDDOCK
277-T. KALLICOT
278-U. KALLICOT
279-H. ANDERSON
280-AUG. FALQUIST
281-J.G. ANDERSON
282-U.R. PUCKETT
283-K. KALLICOT
284-H.H. BERGBY
285-C.M. TASTAD
286-P. LEFFLER
287-S. AUSTBY
288-B. SHARPLESS

VERNON PARK

SEC. 12.
1-C.C. GILMAN
2-N. MOON et al
3-E. METZGER
4-5-A. MINCH
6-H.T. COLLINS
7-B. JOHNSON
8-LOAN & SEC. CO. et al
9-E. METZGER et al
10-exc. S. 125'-M. KNUDSON
S. 125' of 10-J.A. WHILLANS
11-C. THORESON
12-less N. 139'-JAS. FLYNN
N. 139' of 12-A.E. LINDBLAD
13-WM. MALLARD
14-E. MILLER
15-WM. MALLARD
16-M. HURLEY
17. E. LOWER
18-19-C. THORESON
20-J.T. KING
21-O. JOHNSON
A-T.P. HEALY
B-SOUNDVIEW PULP CO.
C-E. MILLER
TRACT E
1-2-R.L. WARNOCK
3-4-5-C. GILMAN
6 to 9-C. LANGLAND
10-11-F. PINK
12-C. THEURER
13-B. CARTER
14-15-A. MINCH
16-17-J. HUTTER
18-19-N. MOON et al
20-L. PARKS
21-22-A. NILSSON
23 to 28-E. MILLER
F-R.L. WARNOCK
G-E.F. PARDEE
N. ½ of H-B. CARTER
S. ½ of H-CORA THEURER
J-K-JOS. HUTTER

LAKE STEVENS SUMMER HOME TRACTS

SEC 5. 13-24

Blk. 3
1-A. GARNER
2-E. THORNTON
3-4-INTERURBAN REALTY CO.

Blk. 4-
1-INTERURBAN REALTY CO.
2-3-M.P. PHILLIPS
4-E.M. METZGER

Blk 5.
E. ½ of E. ¾ of 1+2-C. FAIRCHILD
W. ½ of E. ¾ of 1+2-V. SELLIN
W. ¼ of 1+2-E. ARMACK
W. ¼ of 3-E. ARMACK
E. ¾ of 3-D. THORN
W. ¼ of 4-E. ARMACK
E. ¾ of 4-L. EIDSVICK

Blk. 12
1-SUNNYSIDE LD. CO.
2-J. SWANSON
3-C. BERGSTROM
4-W. BLACK EST.

Blk. 17.
1-E.M. METZGER
2-H. " "
3-R. MUNGER
4-E.C. METZGER

VERNON ADD.

SEC. 14
1-2-4 toll:

1936

FOR SALE BY

CHAS. F. METSKER, CIVIL ENGINEER
514 S. W. OAK STREET, PORTLAND, OREGON
930½ PACIFIC AVE., TACOMA, WASHINGTON
1120 THIRD AVE., SEATTLE, WASHINGTON

TOWNSHIP 2
SNOHOMISH

EVERETT

Certified Sanborn® Map Report

Sanborn® Library search results
Certification # 1085-4C6B-87C2

JELD-WEN Nord Door
300 West Marine View Drive
Everett, WA 98201

Inquiry Number 1971200.1s

July 06, 2007

EDR® Environmental Data Resources Inc

The Standard in Environmental Risk Information

440 Wheelers Farms Rd
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Telephone: 1-800-352-0050
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Certified Sanborn® Map Report

7/06/07

Site Name:
JELD-WEN Nord Door
300 West Marine View Drive
Everett, WA 98201

Client Name:
SLR International Corp
1800 Blankenship Road
West Linn, OR 97068-0000

EDR Inquiry # 1971200.1s

Contact: Emily Goodwin

EDR® Environmental Data Resources Inc

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Certified Sanborn Results:

Site Name: JELD-WEN Nord Door
Address: 300 West Marine View Drive
City, State, Zip: Everett, WA 98201
Cross Street:
P.O. # 008.0228.00026
Project: JELD-WEN Nord D
Certification # 1085-4C6B-87C2

Sanborn® Library search results
Certification # 1085-4C6B-87C2

Maps Identified - Number of maps indicated within "( )"

1968 (2)
1957 (2)

Total Maps: 4

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- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

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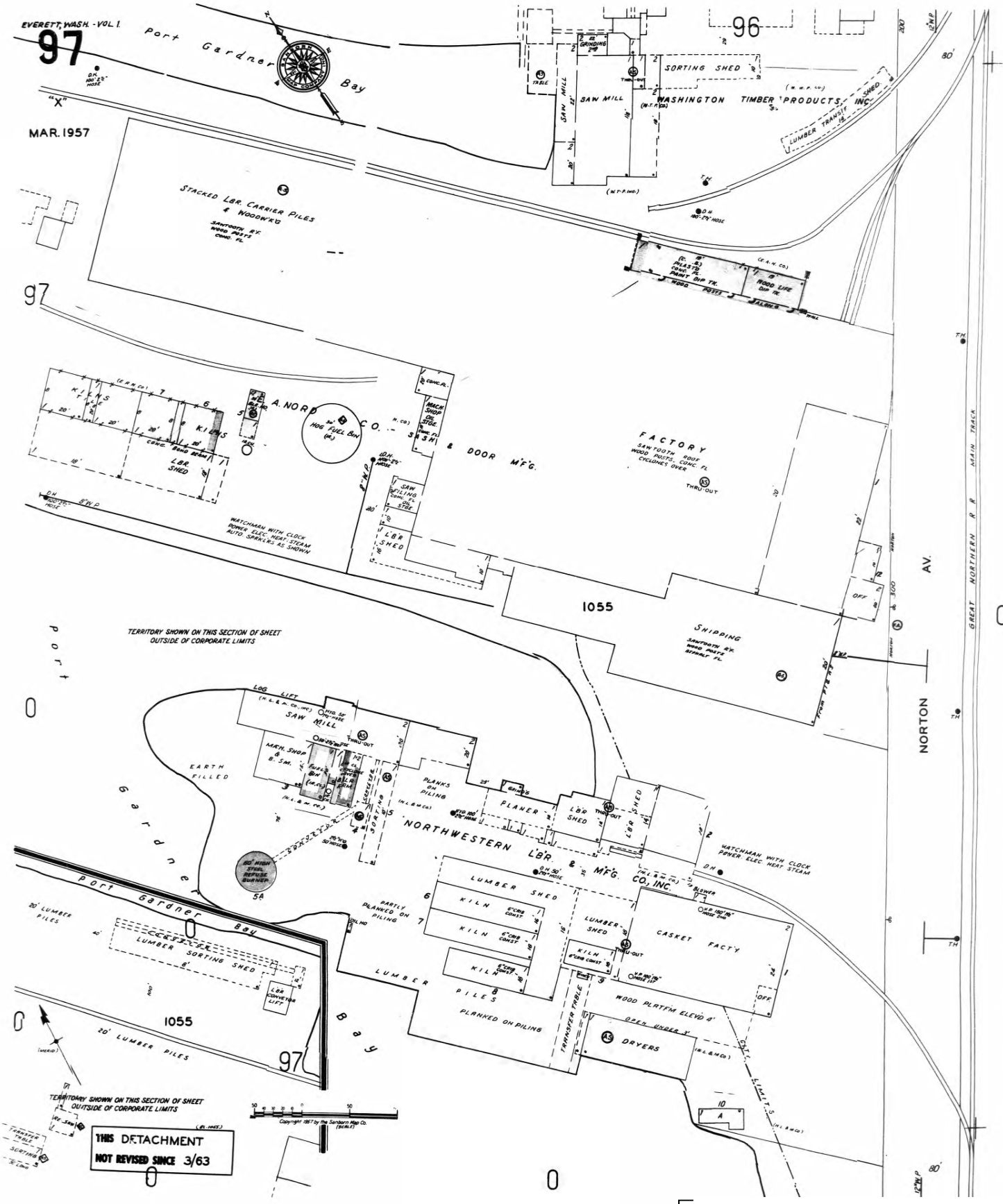

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Certification # 1085-4C6B-87C2

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EDR Inquiry: 1971200.1s
Client: SLR International Corp

Site Name: JELD-WEN Nord Door
Address: 300 West Marine View Drive

City, ST, ZIP: Everett WA 98201
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Research Associate: SES
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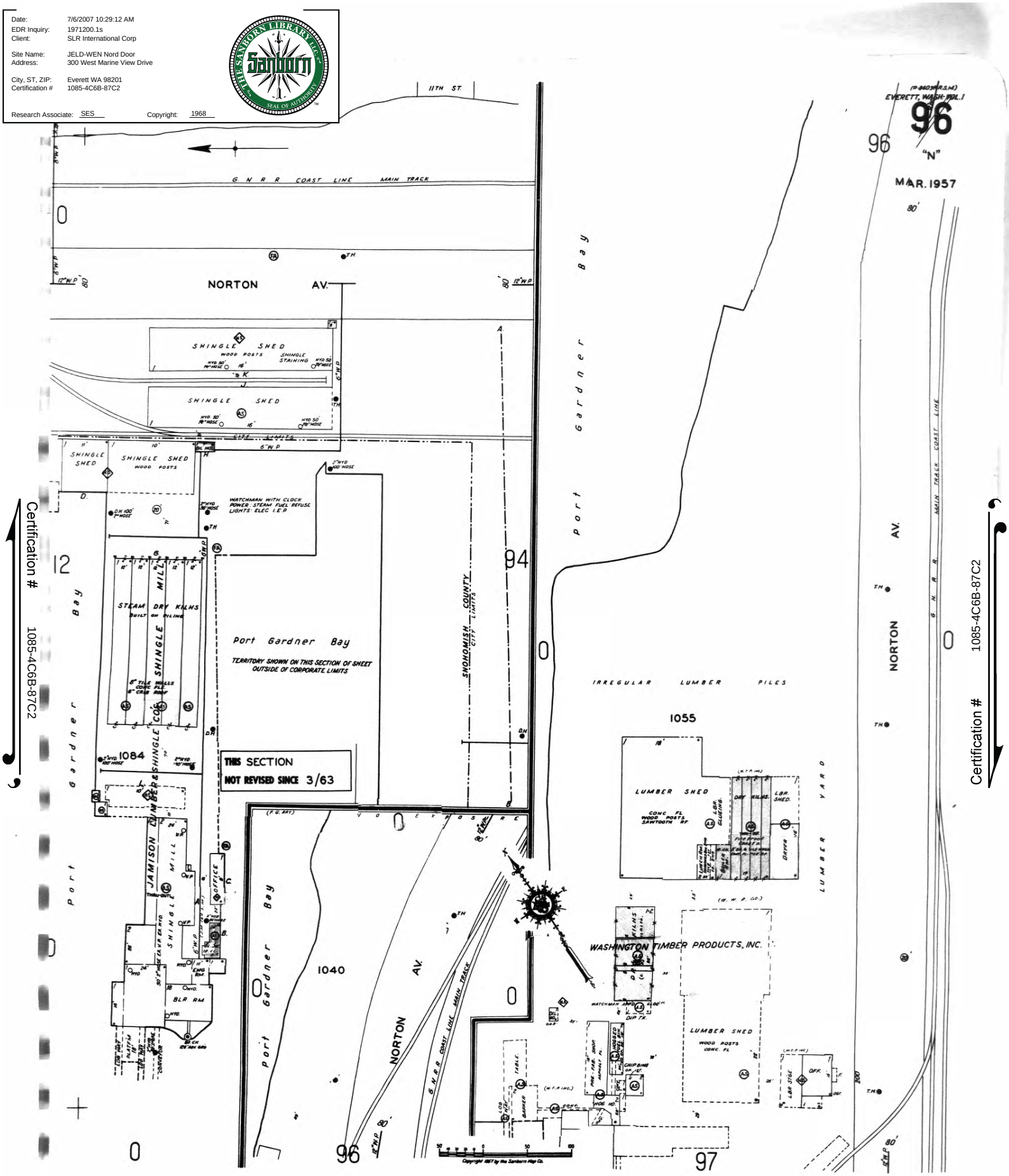

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Certification # 1085-4C6B-87C2

Date: 7/6/2007 10:29:12 AM
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Client: SLR International Corp

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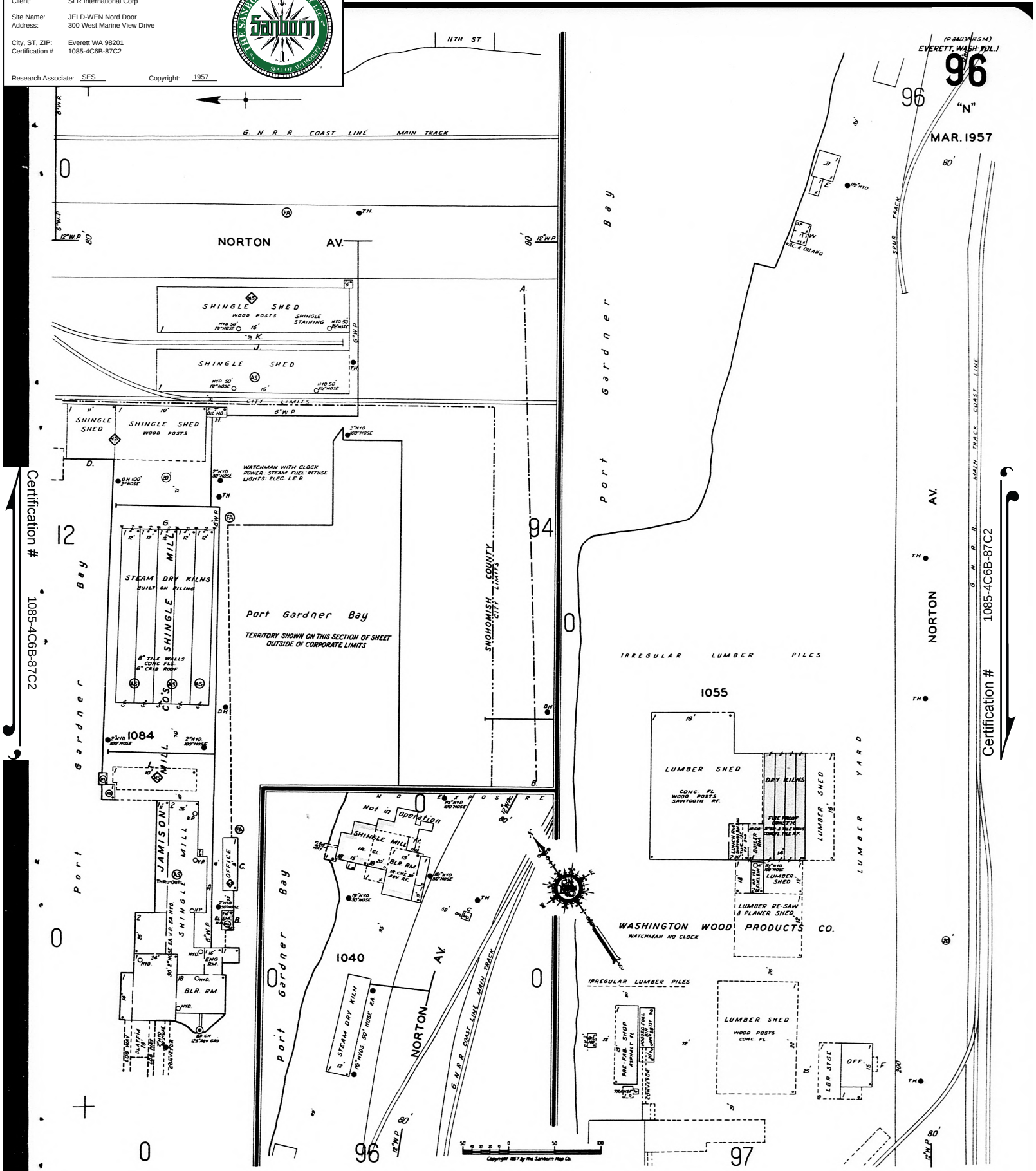
Address: 300 West Marine View Drive

City, ST, ZIP: Everett WA 98201
Certification # 1085-4C6B-87C2

Research Associate: SES Copyright: 1957



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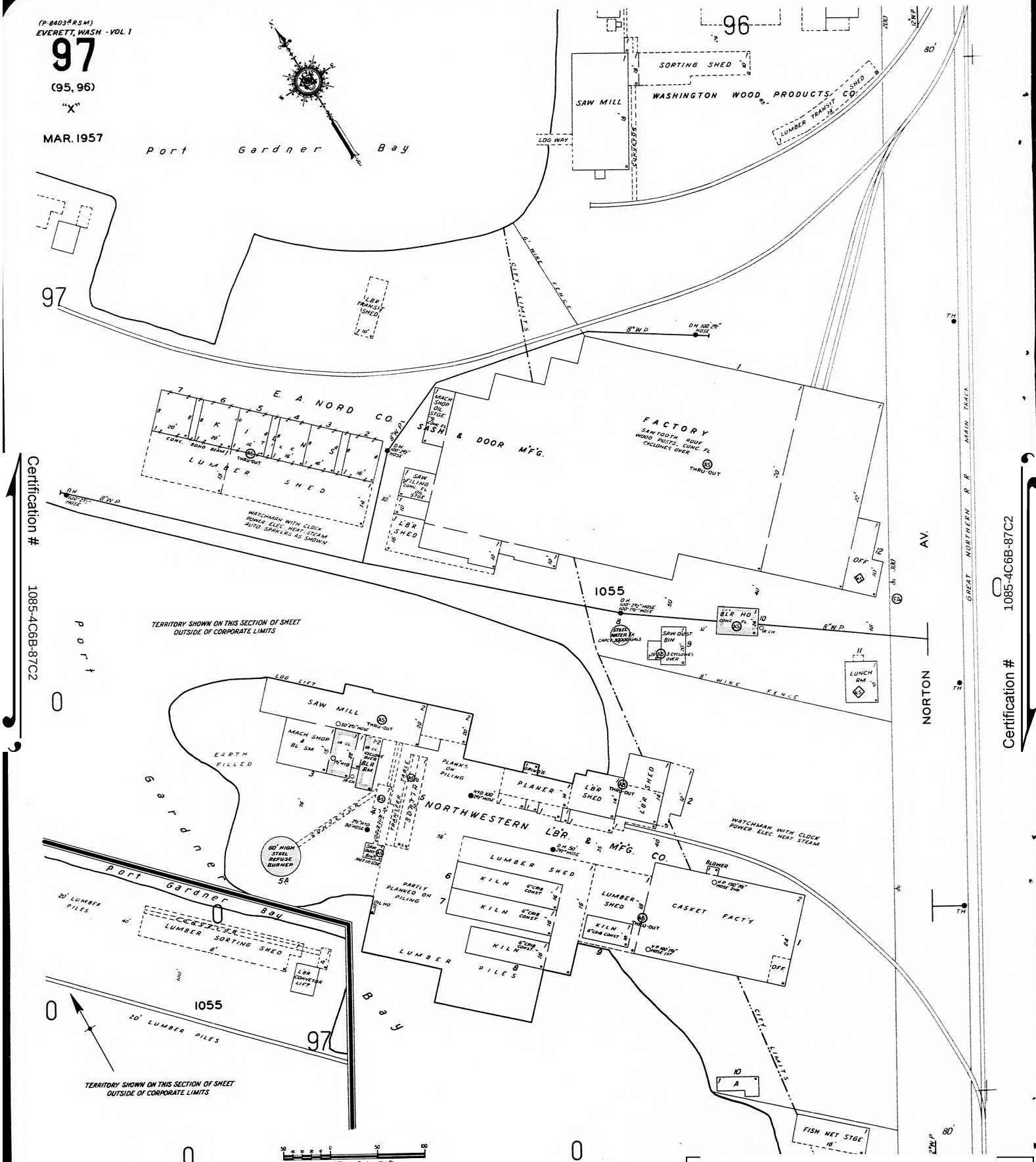
(P-8403ARSM)
EVERETT, WASH. - VOL. 1
97
(95, 96)
"X"
MAR. 1957



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EDR Inquiry:	1971200.1s
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Address:	300 West Marine View Drive
City, ST, ZIP:	Everett WA 98201
Certification #	1085-4C6B-87C2
Research Associate:	SES
Copyright:	1957

ATTACHMENT 2

SOIL AND GROUNDWATER PCL CALCULATIONS

Table 1
Groundwater Preliminary Cleanup Levels
SVOCs and PAHs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Calculated Groundwater Preliminary Cleanup Level (PCL) [A] (µg/L)	Reference [B]	Laboratory Practical Quantitation Limit (PQL) [C] (µg/L)	Selected PCLs [D]
	Semivolatile Organic Compounds (SVOCs) [E]				
208-96-8	**acenaphthylene**	NA	NA	10	10
98-86-2	**acetophenone**	800	Groundwater Method B	1	800
1912-24-9	**atrazine**	0.4	Groundwater Method B	1	1
100-52-7	**benzaldehyde**	800	Groundwater Method B	10	800
92-52-4	**biphenyl; 1,1'-**	400	Groundwater Method B	1	400
111-44-4	**bis(2-chloroethyl)ether**	0.3	Surface Water ARAR	1	1
111-91-1	**bis(2-chloroethoxy) methane**	NA	NA	1	1
39638-32-9	**bis(2-chloroisopropyl) ether**	1,400	Surface Water ARAR	1	1,400
108-60-1	**bis(2-chloro-1-methylethyl)ether**	37	Surface Water Method B	1	37
117-81-7	**bis(2-ethylhexyl) phthalate**	1.2	Surface Water ARAR	1	1.2
101-55-3	**p-Bromodiphenyl ether**	NA	NA	1	1
85-68-7	**butylbenzylphthalate**	1,300	Surface Water Method B	1	1,300
105-60-2	**caprolactam**	8,000	Groundwater Method B	10	8,000
86-74-8	**carbazole**	4.4	Groundwater Method B	1	4.4
59-50-7	**chloro-3-methylphenol;4-**	NA	NA	1	1
106-47-8	**chloroaniline;4-**	32	Groundwater Method B	1	32
95-57-8	**chlorophenol;2-**	97	Surface Water Method B	1	97
91-58-7	**chloronaphthalene;2-**	1,000	Surface Water ARAR	1	1,000
7005-72-3	**chlorophenyl-phenyl ether;4-**	NA	NA	1	1
132-64-9	**dibenzofuran**	32	Groundwater Method B	1	32
91-94-1	**dichlorobenzidine;3,3-**	0.021	Surface Water ARAR	1	1
120-83-2	**dichlorophenol;2,4-**	77	Surface Water ARAR	1	77
84-66-2	**diethyl phthalate**	17,000	Surface Water ARAR	1	17,000
131-11-3	**dimethyl phthalate**	72,000	Surface Water Method B	1	72,000
105-67-9	**dimethylphenol;2,4-**	380	Surface Water ARAR	10	380
84-74-2	**di-n-butylphthalate**	2,000	Surface Water ARAR	1	2,000
117-84-0	**di-n-octylphthalate**	320	Groundwater Method B	1	320
534-52-1	**dinitro-2-methylphenol: 4,6-**	NA	NA	10	10
51-28-5	**dinitrophenol;2,4-**	69	Surface Water ARAR	10	69
121-14-2	**dinitrotoluene;2,4-**	0.11	Surface Water ARAR	10	10
606-20-2	**dinitrotoluene;2,6-**	16	Groundwater Method B	10	16
118-74-1	**hexachlorobenzene**	0.00028	Surface Water ARAR	1	1
87-68-3	**hexachlorobutadiene**	0.44	Surface Water ARAR	1	1
77-47-4	**hexachlorocyclopentadiene**	40	Surface Water ARAR	10	40
67-72-1	**hexachloroethane**	1.4	Surface Water ARAR	1	1.4
78-59-1	**isophorone**	8.4	Surface Water ARAR	1	8.4
91-57-6	**methylnaphthalene; 2**	32	Groundwater Method B	1	32
95-48-7	**methylphenol;2-**	400	Groundwater Method B	10	400
108-39-4	**methylphenol; 3-**	400	Groundwater Method B	10	400
106-44-5	**methylphenol;4-**	40	Groundwater Method B	10	40
88-74-4	**nitroaniline;2-**	NA	NA	10	10
99-09-2	**nitroaniline;3-**	NA	NA	10	10
100-01-6	**nitroaniline;4-**	NA	NA	1	1
98-95-3	**nitrobenzene**	17	Surface Water ARAR	1	17
88-75-5	**nitrophenol;2-**	NA	NA	10	10
100-02-7	**nitrophenol;4-**	NA	NA	10	10
86-30-6	**nitrosodiphenylamine; N-**	3.3	Surface Water ARAR	1	3.3
621-64-7	**nitroso-di-n-propylamine;N-**	0.005	Surface Water ARAR	1	1
87-86-5	**pentachlorophenol**	0.27	Surface Water ARAR	10	10
108-95-2	**phenol**	21,000	Surface Water ARAR	10	21,000
95-94-3	**tetrachlorobenzene;1,2,4,5-**	0.97	Surface Water ARAR	1	1
58-90-2	**tetrachlorophenol;2,3,4,6-**	480	Groundwater Method B	10	480
95-95-4	**trichlorophenol;2,4,5-**	1,800	Surface Water ARAR	1	1,800
88-06-2	**trichlorophenol;2,4,6-**	1.4	Surface Water ARAR	1	1.4
	Carcinogenic Polycyclic Aromatic Compounds (cPAHs) [F]				
56-55-3	**benzo[a]anthracene**	0.0028	Surface Water ARAR	0.05	0.05
50-32-8	**benzo[a]pyrene**	0.0028	Surface Water ARAR	0.05	0.05
205-99-2	**benzo[b]fluoranthene**	0.0028	Surface Water ARAR	0.05	0.05
207-08-9	**benzo[k]fluoranthene**	0.0028	Surface Water ARAR	0.05	0.05
218-01-9	**chrysene**	0.0028	Surface Water ARAR	0.05	0.05
53-70-3	**dibenzo[a,h]anthracene**	0.0028	Surface Water ARAR	0.05	0.05
193-39-5	**indeno[1,2,3-cd]pyrene**	0.0028	Surface Water ARAR	0.05	0.05
	Non-Carcinogenic PAHs (PAHs) [F]				
83-32-9	**acenaphthene**	640	Surface Water Method B	0.1	640
120-12-7	**anthracene**	8,300	Surface Water ARAR	0.1	8,300
191-24-2	**benzo[ghi]perylene [G]**	830	Surface Water ARAR	0.1	830
206-44-0	**fluoranthene**	90	Surface Water Method B	0.1	90
86-73-7	**fluorene**	1,100	Surface Water ARAR	0.1	1,100
91-20-3	**naphthalene**	4,900	Surface Water Method B	0.1	4,900
85-01-8	**phenanthrene [H]**	640	Surface Water Method B	0.1	640
129-00-0	**pyrene**	830	Surface Water ARAR	0.1	830

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

A - Groundwater PCLs selected per Ecology recommended hierarchy as outlined below.

B - References source of groundwater cleanup levels selected using hierarchy provided below.

C - PQL from Environmental Sciences Corp environmental laboratory.

D - Selected PCL defined as calculated PCL, with the exception of analytes where PQL > calculated PCL. In these instances, the PQL will be selected as th PCL.

E - SVOCs per EPA Method 8270C.

F - cPAHs and PAHs will be analyzed per 8270 SIM (low level).

G - Toxicity information is not available for benzo(ghi)perylene. Pyrene has been used as surrogate.

H - Toxicity information is not available for phenanthrene. Anthracene has been used as surrogate.

NA - Value not available.

Hierarchy for Selection of PCLs

The groundwater cleanup levels were selected using the following hierarchy:

1) Choose the most stringent value among all the Surface Water ARARs and Surface Water Method B values per WAC-173-340-730.

2) If there is no Surface Water cleanup value available in the Cleanup Levels and Risk Calculation (CLARC) table, then choose the Groundwater Method A value (Table 720-1).

3) If there is no Groundwater Method A cleanup value, then choose the Groundwater Method B (ingestion) value from the CLARC table.

4) If there is no Groundwater Method B cleanup value, then choose the most stringent Groundwater ARAR value available in CLARC.

Table 2
Soil Preliminary Cleanup Levels
SVOCs and PAHs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Preliminary Cleanup Levels (PCL) (mg/kg)				Laboratory Practical Quantitation Limit (PQL) [E] (mg/kg)	Selected PCLs [F]	Parameters from CLARC Summary Table [G]							
		Soil Cleanup Based on Protection of Surface Water [A]	Soil Method A [B]	Soil Method B Direct Contact [C]	Terrestrial Ecological Receptors [D]			Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)
	Semivolatile Organic Compounds (SVOCs) [H]														
208-96-8	**acenaphthylene**	NA	Not Researched	Not Researched	--	0.33	0.33	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched
98-86-2	**acetophenone**	NA	Researched-No Data	8,000	--	0.33	8,000	Not Researched	Not Researched	Researched-No Data	2	0.000005	Not Researched	Researched-No Data	0.1
1912-24-9	**atrazine**	NA	Researched-No Data	4.5	--	0.33	4.5	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	Not Researched	0.22	0.035
100-52-7	**benzaldehyde**	NA	Researched-No Data	8,000	--	0.33	8,000	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	0.1
92-52-4	**biphenyl;1,1'-**	NA	Researched-No Data	4,000	--	0.33	4,000	Not Researched	Not Researched	Researched-No Data	2	0.05	Not Researched	Researched-No Data	0.05
111-44-4	**bis(2-chloroethyl)ether**	0.0017	Researched-No Data	0.91	--	0.33	0.33	17,000	0.00074	1.2	2	No Data	76	1.1	Researched-No Data
111-91-1	**bis(2-chloroethoxyl) methane**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
39638-32-9	**bis(2-chloroisopropyl) ether**	NA	Researched-No Data	3,200	--	0.33	3,200	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	0.05
108-60-1	**bis(2-chloro-1-methylethyl)ether**	NA	Researched-No Data	14	--	0.33	14	Not Researched	Not Researched	0.035	2	Researched-No Data	Not Researched	0.07	Researched-No Data
117-81-7	**bis(2-ethylhexyl) phthalate**	2.64	Researched-No Data	71	--	0.33	2.64	0.34	0.0000042	Researched-No Data	1	Researched-No Data	110,000	0.014	0.02
101-55-3	**p-Bromodiphenyl ether**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
85-68-7	**butylbenzylphthalate**	369	Researched-No Data	16,000	--	0.33	369	2.7	0.000052	Researched-No Data	1	0.2	14,000	Researched-No Data	0.2
105-60-2	**caprolactam**	NA	Researched-No Data	40,000	--	0.33	40,000	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	Not Researched	Researched-No Data	0.5
86-74-8	**carbazole**	0.32	Researched-No Data	50	--	0.33	0.33	7.5	0.00000063	NA	1	No Data	3,400	0.02	Researched-No Data
59-50-7	**chloro-3-methylphenol;4-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
106-47-8	**chloroaniline;4-**	0.17	Researched-No Data	320	--	0.33	0.33	5,300	0.000014	Researched-No Data	2	0.004	66	Researched-No Data	0.004
95-57-8	**chlorophenol;2-**	1.15	Researched-No Data	400	--	0.33	1.15	22,000	0.016	Researched-No Data	2	Researched-No Data	390	Researched-No Data	0.005
91-58-7	**chloronaphthalene;2-**	NA	Researched-No Data	6,400	--	0.33	6,400	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	0.08
7005-72-3	**chlorophenyl-phenyl ether; 4-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
132-64-9	**dibenzofuran**	NA	Researched-No Data	160	--	0.33	160	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	Not Researched	Researched-No Data	0.002
91-94-1	**dichlorobenzidine;3,3-**	0.0004	Researched-No Data	2.2	--	0.33	0.33	3.1	0.00000016	Researched-No Data	1	Researched-No Data	720	0.45	Researched-No Data
120-83-2	**dichlorophenol;2,4-**	0.54	Researched-No Data	240	--	0.33	0.54	4,500	0.00013	Researched-No Data	2	Researched-No Data	150	Researched-No Data	0.003
84-66-2	**diethyl phthalate**	95.9	Researched-No Data	64,000	--	0.33	95.9	1,100	0.000019	Researched-No Data	1	Researched-No Data	82	Researched-No Data	0.8
131-11-3	**dimethyl phthalate**	NA	Researched-No Data	80,000	--	0.33	80,000	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	Not Researched	Researched-No Data	1
105-67-9	**dimethylphenol;2,4-**	3.12	Researched-No Data	1,600	--	0.33	3.12	7,900	0.000082	Researched-No Data	2	Researched-No Data	210	Researched-No Data	0.02
84-74-2	**di-n-butyl phthalate**	72	Researched-No Data	8,000	200	0.33	72	11	0.000000039	Researched-No Data	1	Researched-No Data	1,600	Researched-No Data	0.1
117-84-0	**di-n-octylphthalate**	531,201	Researched-No Data	1,600	--	0.33	1,600	0.02	0.0027	Researched-No Data	1	Researched-No Data	83,000,000	Researched-No Data	0.02
534-52-1	**dinitro-2-methylphenol;4,6-**	NA	Researched-No Data	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
51-28-5	**dinitrophenol;2,4-**	0.28	Researched-No Data	160	--	0.33	0.33	2,800	0.000018	Researched-No Data	1	Researched-No Data	0.01	Researched-No Data	0.002
121-14-2	**dinitrotoluene;2,4-**	0.0007	Researched-No Data	160	--	0.33	0.33	270	0.0000038	Researched-No Data	1	0.002	96	Not Researched	0.002
606-20-2	**dinitrotoluene;2,6-**	0.09	Researched-No Data	80	--	0.33	0.33	180	0.000031	Researched-No Data	1	0.001	69	Not Researched	0.001
118-74-1	**hexachlorobenzene**	0.0004	Researched-No Data	0.63	--	0.33	0.33	6.2	0.054	1.6	1	Researched-No Data	80,000	1.6	0.0008
87-68-3	**hexachlorobutadiene**	0.48	Researched-No Data	13	--	0.33	0.48	3.2	0.33	0.077	2	Researched-No Data	54,000	0.078	0.0002
77-47-4	**hexachlorocyclopentadiene**	160.2	Researched-No Data	480	--	0.33	160.2	1.8	1.1	Researched-No Data	2	0.000057	200,000	Researched-No Data	0.006
67-72-1	**hexachloroethane**	0.06	Researched-No Data	71	--	0.33	0.33	50	0.16	0.014	2	Researched-No Data	1,800	0.014	0.001
78-59-1	**isophorone**	0.04	Researched-No Data	1,100	--	0.33	0.33	12,000	0.00027	Researched-No Data	2	Researched-No Data	47	0.00095	0.2
91-57-6	**methylnaphthalene;2-**	NA	Not Researched	320	--	0.33	320	Not Researched	Not Researched	Not Researched	2	Not Researched	Not Researched	Not Researched	0.004
95-48-7	**methylphenol;2-**	2.33	Researched-No Data	4,000	--	0.33	2.33	26,000	0.000049	Researched-No Data	2	Researched-No Data	91	Researched-No Data	0.05
108-39-4	**methylphenol; 3-**	NA	Researched-No Data	4,000	--	0.33	4,000	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	0.05
106-44-5	**methylphenol;4-**	NA	Researched-No Data	400	--	0.33	400	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	0.005
88-74-4	**nitronaniline;2-**	NA	Researched-No Data	Not Researched	--	0.33	0.33	Not Researched	Not Researched	Researched-No Data	1	0.000057	Not Researched	Researched-No Data	Researched-No Data
99-09-2	**nitronaniline;3-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
100-01-6	**nitronaniline;4-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
98-95-3	**nitrobenzene**	0.11	Researched-No Data	40	--	0.33	0.33	2,900	0.00098	Researched-No Data	2	0.00017	120	Researched-No Data	0.0005
88-75-5	**nitrophenol;2-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
100-02-7	**nitrophenol;4-**	NA	NA	NA	--	0.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
86-30-6	**nitrosodiphenylamine;N-**	0.10	Researched-No Data	200	--	0.33	0.33	35	0.00021	Researched-No Data	Researched-No	Researched-No Data	1,300	0.0049	Researched-No Data
621-64-7	**nitroso-di-n-propylamine;N-**	0.00002	Researched-No Data	0.14	--	0.33	0.33	9,900	0.000092	Researched-No Data	Researched-No	Researched-No Data	24	7	Researched-No Data
87-86-5	**pentachlorophenol**	0.004	Researched-No Data	8.3	11	0.33	0.33	2,000	0.000001	Researched-No Data	1	Researched-No Data	590	0.12	0.03
108-95-2	**phenol**	96.2	Researched-No Data	48,000	--	0.33	96.2	83,000	0.000016	Researched-No Data	2	Researched-No Data	29	Researched-No Data	0.6
95-94-3	**tetrachlorobenzene;1,2,4,5-**	NA	Researched-No Data	24	--	0.33	24	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	Not Researched	Researched-No Data	0.0003
58-90-2	**tetrachlorophenol;2,3,4,6-**	NA	Researched-No Data	2,400	--	0.05	2,400	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	280	Researched-No Data	0.03
95-95-4	**trichlorophenol;2,4,5-**	64.8	Researched-No Data	8,000	--	0.33	64.8	1,200	0.00018	Researched-No Data	2	Researched-No Data	1,600	Researched-No Data	0.1
88-06-2	**trichlorophenol;2,4,6-**	0.02	Researched-No Data	91	--	0.33	0.33	800	0.00032	0.011	2	Researched-No Data	380	0.011	Researched-No Data
	Carcinogenic Polycyclic Aromatic Compounds (cPAHs) [I]														
56-55-3	**benzo[a]anthracene**	0.020	Researched-No Data	0.140	--	0.006	0.020 [J]	0.0094	0.00014	Researched-No Data	1	Researched-No Data	360,000	7.3	Researched-No Data
50-32-8	**benzo[a]pyrene**	0.054	0.100	0.140	30	0.006	0.054 [J]	0.0016	0.000046	6.1	1	Researched-No Data	970,000	7.3	Researched-No Data
205-99-2	**benzo[b]fluoranthene**	0.067	Researched-No Data	0.140	--	0.006	0.067 [J]	0.0015	0.0046	Researched-No Data	1	Researched-No Data	1,200,000	7.3	Researched-No Data
207-08-9	**benzo[k]fluoranthene**	0.067	Researched-No Data	0.140	--	0.006	0.067 [J]	0.0008	0.000034	Researched-No Data	1	Researched-No Data	1,200,000	7.3	Researched-No Data
218-01-9	**chrysene**	0.022	Researched-No Data	0.140	--	0.006	0.022 [J]	0.0016	0.0039	Researched-No Data	1	Researched-No Data	400,000	7.3	Researched-No Data
53-70-3	**dibenzo[a,h]anthracene**	0.101	Researched-No Data	0.140	--	0.006	0.101 [J]	0.0025	0.0000006	Researched-No Data	1	Researched-No Data	1,800,000	7.3	Researched-No Data
193-39-5	**indeno[1,2,3-cd]pyrene**	0.196	Researched-No Data	0.140	--	0.006	0.140 [J]	0.000022	0.000066	Researched-No Data	1	Researched-No Data	3,500,000	7.3	Researched-No Data
	Non-Carcinogenic Polycyclic Aromatic Compounds (PAHs) [I]														
83-32-9	**acenaphthene**	65.3	Researched-No Data	4,800	NA	0.006	65.3	4.2	0.0064	Researched-No Data	1	Not Researched	4,900	Researched-No Data	0.06
120-12-7	**anthracene**	3,851	Researched-No Data	24,000	--	0.006	3,851	0.043	0.0027	Researched-No Data	1	Researched-No Data	23,000	Researched-No Data	0.3
191-24-2	**benzo[ghi]perylene [K]**	1,132	Not Researched	Not Researched	--	0.33	1,132	0.14	0.00045	Researched-No Data	1	Researched-No Data	68,000	Researched-No Data	0.03
206-44-0	**fluoranthene**	88.6	Researched-No Data	3,200	--	0.006	88.6	0.21	0.00066	Researched-No Data	1	Researched-No Data	49,000	Researched-No Data	0.04
86-73-7	**fluorene**	173.8	Researched-No Data	3,200	--	0.006	173.8	2	0.0026	Researched-No Data	1	Researched-No Data	7,700	Researched-No Data	0.04
91-20-3	**naphthalene**	137.4	5.0	1,600	--	0.33	5.0	31	0.02	Researched-No Data	2	0.00086	1,200	Researched-No Data	0.02
85-01-8	**phenanthrene [L]**	65.3	Not Researched	Not Researched	--	0.33	65.3	4.2	0.0064	Researched-No Data	1	Not Researched	4,900	Researched-No Data	0.06
129-00-0	**pyrene**	1,132	Researched-No Data	2,400	--	0.006	1,132	0.14	0.00045	Researched-No Data	1	Researched-No Data	68,000	Researched-No Data	0.03

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

"Researched-No Data" means research has been conducted and no data exists in the Cleanup Levels and Risk Calculation (CLARC) database for this parameter.

"Not Researched" means research has not been conducted and no value exists in the CLARC database for this parameter.

A - PCLs calculated from calculated using Ecology's three phase partitioning model as described in WAC 173-340-747 to generate soil concentrations which are protective of surface water.

B - Soil Method A values for unrestricted land use from CLARC summary tables.

C - Soil Method B Direct Contact values for unrestricted land use from CLARC summary tables.

D - Terrestrial Ecological Evaluation Values from Ecology Toxics Cleanup Program Table 749-2: Priority contaminants of ecological concern for sites that qualify for the simplified terrestrial ecological evaluation.

E - PQL from Environmental Sciences Corp environmental laboratory.

F - Selected PCL = most restrictive PCL for Soil Cleanup, with the exception of analytes where PQL > calculated PCL or no calculated PCL is given. In these instances, the PQL will be selected as the PCL; if no PCL is available for Soil Cleanup Based on Protection of Surface Water, the Soil Method A or Soil Method B value (if no Method A value is given) is selected.

G - Parameters from CLARC Summary Tables used for Worksheet for Calculating Soil Cleanup Levels for Unrestricted and Industrial Land Use.

H - SVOCs per EPA Method 8270C.

I - cPAHs and PAHs per EPA Method 8270 SIM SS.

J - Presented PCLs to assist in evaluating laboratory PQLs. Cleanup levels and remediation levels will be established for mixtures of cPAHs following the procedures in MTCA 173-340-708(8)(e).

K - Toxicity information is not available for benzo(ghi)perylene. Pyrene has been used as surrogate.

L - Toxicity information is not available for phenanthrene. Anthracene has been used as surrogate.

NA - Value not available.

Calculations - SVOCs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Chemical	Soil Preliminary Cleanup Levels Based on Protection of Surface Water (mg/kg)	Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)	Selected Surface Water CUL from Table 1 (ug/L)	Calculated Non-Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Calculated Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Gastrointestinal Absorption Conversion Factor (GI)	Dermal Absorption Fraction (ABS)
	SVOCs														
208-96-8	acenaphthylene		No Research	No Research	No Data	No Data	No Data	No Research	No Data	No Data	10			0.5	0.1
98-86-2	acetophenone		No Research	No Research	No Data	2	5.00E-06	No Research	No Data	0.1	800	5,556		0.5	0.1
1912-24-9	atrazine		No Research	No Research	No Data	1	No Data	No Research	0.22	0.035	1	1,944	1.52	0.5	0.1
100-52-7	benzaldehyde		No Research	No Research	No Data	2	No Data	No Research	No Data	0.1	800	5,556		0.5	0.1
92-52-4	biphenyl;1,1'-		No Research	No Research	No Data	2	0.05	No Research	No Data	0.05	400	2,778		0.5	0.1
111-44-4	bis(2-chloroethyl)ether	0.0017	17,000	0.00074	1.2	2	No Data	76	1.1	No Data	0.3		0.81	0.5	0.1
111-91-1	bis(2-chloroethoxyl)methane		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	1			0.5	0.1
39638-32-9	bis(2-chloroisopropyl) ether		Not Researched	Not Researched	No Data	2	No Data	No Research	No Data	0.04	1,400	2,222		0.5	0.1
108-60-1	bis(2-chloro-1-methylethyl)ether		No Research	No Research	0.035	2	No Data	No Research	0.07	No Data	37		0.06	0.5	0.1
117-81-7	bis(2-ethylhexyl) phthalate	2.64	0.34	0.0000042	No Data	1	No Data	110,000	0.014	0.02	1.2	1,111	1.85	0.5	0.1
101-55-3	p-Bromodiphenyl ether		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	1			0.5	0.1
85-68-7	butylbenzylphthalate	369	2.7	0.00005	No Data	1	0.2	14,000	No Data	0.2	1,300	11,111		0.5	0.1
105-60-2	caprolactam		No Research	No Research	No Research	1	No Data	No Research	No Research	0.5	8,000	27,778		0.5	0.1
86-74-8	carbazole	0.32	7.5	0.00000063	No Research	1	No Data	3,400	0.02	No Data	4.4		0.51	0.5	0.1
59-50-7	chloro-3-methylphenol;4-		No Research	No Research	No Research	No Research	No Data	No Research	No Research	No Research	1			0.5	0.1
106-47-8	chloroaniline;4-	0.17	5,300	0.000014	No Data	2	0.004	66	No Data	0.004	32	222		0.5	0.1
95-57-8	chlorophenol;2-	1.15	22,000	0.016	No Research	2	No Data	390	No Data	0.005	97	278		0.5	0.1
91-58-7	chloronaphthalene;2-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	1,000			0.5	0.1
7005-72-3	chlorophenyl-phenyl ether;4-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	2			0.5	0.1
132-64-9	dibenzofuran		No Research	No Research	No Research	1	No Data	No Research	No Data	2.00E-03	32	111		0.5	0.1
91-94-1	dichlorobenzidine;3,3'-	0.0004	3.1	0.00000016	No Research	1	No Data	720	0.45	No Data	0.021		2.18	0.5	0.1
120-83-2	dichlorophenol;2,4-	0.54	4,500	0.00013	No Research	2	No Data	150	No Data	0.003	77	167		0.5	0.1
84-66-2	diethyl phthalate	95.9	1,100	0.000019	No Research	1	No Data	82	No Data	0.8	17,000	44,444		0.5	0.1
131-11-3	Dimethyl phthalate		No Research	No Research	No Research	1	No Data	No Research	No Data	1	72,000	55,556		0.5	0.1
105-67-9	dimethylphenol; 2,4-	3.12	7,900	0.000082	No Data	2	No Data	210	No Data	0.02	380	1,111		0.5	0.1
84-74-2	di-n-butyl phthalate	72	11	0.000000039	No Data	1	No Data	1,600	No Data	0.1	2,000	5,556		0.5	0.1
117-84-0	di-n-octylphthalate	531,201	0.02	0.0027	No Data	1	No Data	83,000,000	No Data	0.02	320	1,111		0.5	0.1
534-52-1	dinitro-2-methylphenol;4,6		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	10			0.5	0.1
51-28-5	dinitrophenol;2,4-	0.28	2,800	0.000018	No Research	1	No Data	0.01	No Data	0.002	69	111		0.5	0.1
121-14-2	dinitrotoluene;2,4-	0.0007	270	0.0000038	No Research	1	0.002	96	No Research	0.002	0.11	111		0.5	0.1
606-20-2	dinitrotoluene;2,6-	0.09	180	0.000031	No Research	1	0.001	69	No Research	0.001	16	56		0.5	0.1
118-74-1	hexachlorobenzene	0.0004	6.2	0.054	No Research	1	No Data	80,000	1.6	0.0008	0.00028	44	0.62	0.5	0.1
87-68-3	hexachlorobutadiene	0.48	3.2	0.33	No Research	2	No Data	54,000	0.078	0.0002	0.44	11	3.68	0.5	0.1
77-47-4	hexachlorocyclopentadiene	160.2	1.8	1.1	No Research	2	0.000057	200,000	No Data	0.006	40	333		0.5	0.1
67-72-1	hexachloroethane	0.06	50	0.16	No Research	2	No Data	1,800	0.014	0.001	1.4	56	1.59	0.5	0.1
78-59-1	isophorone	0.04	12,000	0.00027	No Research	2	No Data	47	0.00095	0.2	8.4	11,111	0.27	0.5	0.1
91-57-6	2-methylnapthalene		No Research	No Research	No Research	2	No Data	No Research	No Data	0.004	32	222		0.5	0.1
95-48-7	2-methylphenol (o-cresol)	2.33	26,000	0.000049	No Research	2	No Data	91	No Data	0.05	400	2,778		0.5	0.1
108-39-4	3-methylphenol		Not Researched	Not Researched	No Data	2	No Data	Not Researched	No Data	0.05	400	2,778		0.5	0.1
106-44-5	4-methylphenol (p-cresol)		No Research	No Research	No Research	2	No Data	No Research	No Data	0.005	40	278		0.5	0.1
88-74-4	nitroaniline;2-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	10			0.5	0.1
99-09-2	nitroaniline;3-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	10			0.5	0.1
100-01-6	nitroaniline;4-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	1			0.5	0.1
98-95-3	nitrobenzene	0.11	2,900	0.00098	No Research	2	0.00017	120	No Data	0.0005	17	28		0.5	0.1
88-75-5	nitrophenol; 2-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	10			0.5	0.1
100-02-7	nitrophenol; 4-		No Research	No Research	No Research	No Research	No Research	No Research	No Research	No Research	10			0.5	0.1
86-30-6	n-Nitrosodiphenylamine	0.10	35	0.00021	No Research	No Data	No Data	1,300	0.0049	No Data	3.3		0.69	0.5	0.1
621-64-7	nitroso-di-n-propylamine;N-	0.000022	9,900	0.000092	No Research	No Data	No Data	24	7	No Data	0.005		0.14	0.5	0.1
87-86-5	pentachlorophenol	0.004	2,000	0.000001	No Research	1	No Data	590	0.12	0.03	0.27	1,667	4.19	0.5	0.1
108-95-2	phenol	96.2	83,000	0.000016	No Research	2	No Data	29	No Data	0.6	21,000	33,333		0.5	0.1
95-94-3	tetrachlorobenzene; 1,2,4,5-		No Research	No Research	No Data	1	No Data	No Research	No Data	0.0003	1	17		0.5	0.1
58-90-2	tetrachlorophenol; 2,3,4,6-		No Research	No Research	No Data	1	No Data	280	No Data	0.03	480	1,667		0.5	0.1
95-95-4	trichlorophenol;2,4,5-		1,200	0.00018	No Data	2	No Data	1,600	No Data	0.1	1,800	5,556		0.5	0.1
88-06-2	trichlorophenol;2,4,6-	0.016	800	0.00032	No Research	2	No Data	380	0.011	No Data	1.4		1.59	0.5	0.1
	Carcinogenic Polycyclic Aromatic Compounds (cPAHs)														
56-55-3	benzo[a]anthracene	0.020	0.0094	0.00014	No Data	1	No Data	360,000	7.3	No Data	0.0028		0.14	0.5	0.1
50-32-8	benzo[a]pyrene	0.054	0.0016	0.000046	6.1	1	No Data	970,000	7.3	No Data	0.0028		0.14	0.5	0.1
205-99-2	benzo[b]fluoranthene	0.067	0.0015	0.0046	No Data	1	No Data	1,200,000	7.3	No Data	0.0028		0.14	0.5	0.1
207-08-9	benzo[k]fluoranthene	0.067	0.0008	0.000034	No Data	1	No Data	1,200,000	7.3	No Data	0.0028		0.14	0.5	0.1
218-01-9	chrysene	0.022	0.0016	0.0039	No Research	1	No Data	400,000	7.3	No Data	0.0028		0.14	0.5	0.1
53-70-3	dibenzo[a,h]anthracene	0.10	0.0025	0.0000006	No Research	1	No Data	1,800,000	7.3	No Data	0.0028		0.14	0.5	0.1
193-39-5	indeno[1,2,3-cd]pyrene	0.20	0.000022	0.000066	No Research	1	No Data	3,500,000	7.3	No Data	0.0028		0.14	0.5	0.1
	Non-Carcinogenic PAHs														
83-32-9	acenaphthene	65	4.2	0.0064	No Data	1	No Research	4,900	No Data	0.06	640	3,333		0.5	0.1
120-12-7	anthracene	3,851	0.043	0.0027	No Data	1		23,000	No Data	0.3	8,300	16,667		0.5	0.1
191-24-2	benzo[g,h,i]perlyene	1,132.12	0.14	0.00045	No Research	1	No Data	68,000	No Data	0.03	830	1,667		0.5	0.1
206-44-0	fluoranthene	88.56	0.21	0.00066	No Research	1	No Data	49,000	No Data	0.04	90	2,222		0.5	0.1
86-73-7	fluorene	173.80	2	0.0026	No Research	1	No Data	7,700	No Data	0.04	1,100	2,222		0.5	0.1
91-20-3	naphthalene	137.37	31	0.02	No Research	2	0.00086	1,200	No Data	0.02	4,900	1,111		0.5	0.1
85-01-8	phenanthrene	3,851	0.043	0.0027	No Data	1		23,000	No Data	0.3	8,300	16,667		0.5	0.1
129-00-0	pyrene	1,132.12	0.14	0.00045	No Research	1	No Data	68,000	No Data	0.03	830	1,667		0.5	0.1

Table 3
Groundwater Preliminary Cleanup Levels
VOCs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Calculated Groundwater Preliminary Cleanup Level (PCL) [A] (µg/L)	Reference [B]	Laboratory Practical Quantitation Limit (PQL) [C] (µg/L)	Selected PCLs [D]
	Volatile Organic Compounds (VOCs) [E]				
67-64-1	**acetone**	800	Groundwater Method B	25	800
71-43-2	**benzene**	1.2	Surface Water ARAR	0.5	1.2
74-97-5	**bromochloromethane**	NA	NA	0.5	0.5
75-27-4	**bromodichloromethane**	0.27	Surface Water ARAR	0.5	0.5
75-25-2	**bromoform**	4.3	Surface Water ARAR	0.5	4.3
74-83-9	**bromomethane**	47	Surface Water ARAR	0.89	47
78-93-3	**butanone;2- (MEK)**	4,800	Groundwater Method B	2.5	4,800
75-15-0	**carbon disulfide**	800	Groundwater Method B	0.5	800
56-23-5	**carbon tetrachloride**	0.23	Surface Water ARAR	0.5	0.5
108-90-7	**chlorobenzene**	130	Surface Water ARAR	0.5	130
75-00-3	**chloroethane**	15	Groundwater Method B	0.5	15
67-66-3	**chloroform**	5.7	Surface Water ARAR	0.5	5.7
74-87-3	**chloromethane**	130	Surface Water Method B	0.5	130
110-82-7	**cyclohexane**	NA	NA	1	1
96-12-8	**dibromo-3-chloropropane;1,2-**	0.031	Groundwater Method B	1	1
124-48-1	**dibromochloromethane**	0.4	Surface Water ARAR	0.5	0.5
106-93-4	**1,2-Dibromoethane**	0.01	Groundwater Method A	0.5	0.5
95-50-1	**1,2-Dichlorobenzene**	420	Surface Water ARAR	0.5	420
541-73-1	**1,3-Dichlorobenzene**	320	Surface Water ARAR	0.5	320
106-46-7	**1,4-Dichlorobenzene**	4.9	Surface Water Method B	0.5	4.9
75-71-8	**dichlorodifluoromethane**	1,600	Groundwater Method B	0.5	1,600
75-34-3	**dichloroethane;1,1-**	800	Groundwater Method B	0.5	800
107-06-2	**dichloroethane;1,2-**	0.38	Surface Water ARAR	0.5	0.5
75-35-4	**dichloroethylene;1,1-**	0.057	Surface Water ARAR	0.5	1
156-59-2	**dichloroethylene;1,2-,cis**	80	Groundwater Method B	0.5	80
156-60-5	**dichloroethylene;1,2-,trans**	10,000	Surface Water ARAR	0.5	10,000
78-87-5	**dichloropropane;1,2-**	0.5	Surface Water ARAR	0.5	0.5
542-75-6	**dichloropropene;1,3-**	0.34	Surface Water ARAR	0.5	0.5
123-91-1	**dioxane;1,4-**	4	Groundwater Method B	100	100
100-41-4	**ethylbenzene**	530	Surface Water ARAR	0.5	530
591-78-6	**hexanone-2**	NA	NA	2.5	2.5
98-82-8	**isopropylbenzene**	800	Groundwater Method B	0.5	800
79-20-9	**methyl acetate**	8,000	Groundwater Method B	20	8,000
108-10-1	**4-methyl-2-pentanone (MIK)**	640	Groundwater Method B	2.5	640
1634-04-4	**methyl tert-butyl ether**	20	Groundwater Method A	0.5	20
75-09-2	**methylene chloride**	4.6	Surface Water ARAR	2.5	4.6
108-87-2	**methylcyclohexane**	NA	NA	1	1
100-42-5	**styrene**	1.5	Groundwater Method B	0.5	1.5
79-34-5	**tetrachloroethane;1,1,2,2-**	0.17	Surface Water ARAR	0.5	0.5
127-18-4	**tetrachloroethylene**	0.39	Surface Water Method B	0.5	0.5
108-88-3	**toluene**	1,300	Surface Water ARAR	0.5	1,300
76-13-1	**trichloro-1,2,2-trifluoroethane;1,1,2-**	240,000	Ground Water Method B	0.5	240,000
87-61-6	**1,2,3-trichlorobenzene**	NA	NA	0.5	0.5
120-82-1	**1,2,4-Trichlorobenzene**	35	Surface Water ARAR	0.5	35
71-55-6	**1,1,1-Trichloroethane**	420,000	Surface Water Method B	0.5	420,000
79-00-5	**1,1,2-Trichloroethane**	0.59	Surface Water ARAR	1	1
79-01-6	**trichloroethylene**	1.5	Surface Water Method B	1	1.5
75-69-4	**trichlorofluoromethane**	2,400	Groundwater Method B	0.5	2,400
75-01-4	**vinyl chloride**	0.025	Surface Water ARAR	0.2	0.2
1330-20-7	**xylenes (total)**	1,000	Groundwater Method A	1.5	1,000

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

A - PCLs selected per Ecology recommended hierarchy as outlined below.

B - References source of groundwater cleanup levels selected using hierarchy provided below.

C - PQL from Environmental Sciences Corp environmental laboratory.

D - Selected PCL defined as calculated PCL, with the exception of analytes where PQL > calculated PCL. In these instances, the PQL will be selected as the PCL.

E - VOCs per EPA Method 8260.

Hierarchy for Selection of PCLs

The groundwater cleanup levels were selected using the following hierarchy:

1) Choose the most stringent value among all the Surface Water ARARs and Surface Water Method B values per WAC-173-340-730.

2) If there is no Surface Water cleanup value available in the Cleanup Levels and Risk Calculation (CLARC) table, then choose the Groundwater Method A value (Table 720-1).

3) If there is no Groundwater Method A cleanup value, then choose the Groundwater Method B (ingestion) value from the CLARC table.

4) If there is no Groundwater Method B cleanup value, then choose the most stringent Groundwater ARAR value available in CLARC.

Table 4
Soil Preliminary Cleanup Levels
VOCs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Preliminary Cleanup Levels (PCL) (mg/kg)				Laboratory Practical Quantitation Limit (PQL) [E] (mg/kg)	Selected PCLs [F]	Parameters from CLARC Summary Table [G]							
		Soil Cleanup Based on Protection of Surface Water [A]	Soil Method A [B]	Soil Method B Direct Contact [C]	Terrestrial Ecological Receptors [D]			Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)
	Volatile Organic Compounds (VOCs) [H]														
67-64-1	**acetone**	3.21	Researched - No Data	8,000	--	0.05	3.21	1,000,000	0.0016	Researched-No Data	2	Researched-No Data	0.58	Researched-No Data	0.1
71-43-2	**benzene**	0.0068	0.03	18	--	0.001	0.0068	1,800	0.23	0.027	2	0.0086	62	0.055	0.004
74-97-5	**bromochloromethane**	NA	Researched - No Data	NA	--	0.001	0.001	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched
75-27-4	**bromodichloromethane**	0.0014	Researched - No Data	16	--	0.001	0.0014	6,700	0.066	Researched-No Data	2	Researched-No Data	55	0.062	0.02
75-25-2	**bromoform**	0.029	Researched - No Data	130	--	0.001	0.029	3,100	0.022	0.0039	2	Researched-No Data	130	0.0079	0.02
74-83-9	**bromomethane**	0.218	Researched - No Data	110	--	0.005	0.218	15,000	0.26	Researched-No Data	2	0.0014	9	Researched-No Data	0.0014
78-93-3	**butanone;2- (MEK)**	NA	Researched - No Data	48,000	--	0.1	48,000	Not Researched	Not Researched	Researched-No Data	2	0.29	Not Researched	Researched-No Data	0.6
75-15-0	**carbon disulfide**	5.6	Researched - No Data	8,000	--	0.001	5.6	1,200	1.2	Researched-No Data	2	0.2	46	Researched-No Data	0.1
56-23-5	**carbon tetrachloride**	0.0021	Researched - No Data	7.7	--	0.001	0.002	790	1.3	0.053	2	Researched-No Data	150	0.13	0.0007
108-90-7	**chlorobenzene**	1.126	Researched - No Data	1,600	--	0.001	1.126	470	0.15	Researched-No Data	2	0.005	220	Researched-No Data	0.02
75-00-3	**chloroethane**	NA	Researched - No Data	350	--	0.005	350	Not Researched	Not Researched	0.0029	2	2.9	Not Researched	0.029	0.4
67-66-3	**chloroform**	0.03	Researched - No Data	160	--	0.005	0.03	7,900	0.15	0.081	2	Researched-No Data	53	0.0061	0.01
74-87-3	**chloromethane**	NA	Researched - No Data	77	--	0.001	77	Not Researched	Not Researched	0.0063	2	Researched-No Data	6	0.013	Researched-No Data
110-82-7	**cyclohexane**	NA	Not Researched	NA	--	0.001	0.001	Not Researched	Not Researched	Not Researched	Not Researched	1.7	Not Researched	Not Researched	1.7
124-48-1	**dibromochloromethane**	0.002	Researched - No Data	12	--	0.001	0.002	2,600	0.032	Researched-No Data	2	Researched-No Data	63	0.084	0.02
96-12-8	**dibromo-3-chloropropane;1,2-**	NA	Researched - No Data	0.71	--	0.005	0.71	Not Researched	Not Researched	0.0024	2	0.000057	Not Researched	1.4	Researched-No Data
106-93-4	**1,2-Dibromoethane**	NA	0.005	0.012	--	0.001	0.005	Not Researched	Not Researched	0.77	2	0.0001	66	855	Researched-No Data
95-50-1	**1,2-Dichlorobenzene**	4.93	Researched - No Data	7,200	--	0.001	4.93	160	0.078	Researched-No Data	2	0.04	380	Researched-No Data	0.09
541-73-1	**1,3-Dichlorobenzene**	NA	Not Researched	NA	--	0.001	0.001	Not Researched	Not Researched	Not Researched	2	Not Researched	Not Researched	Not Researched	Not Researched
106-46-7	**1,4-Dichlorobenzene**	0.081	Researched - No Data	42	--	0.001	0.081	74	0.1	Researched-No Data	2	0.23	620	0.024	Researched-No Data
75-71-8	**dichlorodifluoromethane**	NA	Researched - No Data	16,000	--	0.001	16,000	Not Researched	Not Researched	Researched-No Data	2	0.05	Not Researched	Researched-No Data	0.2
75-34-3	**dichloroethane;1,1-**	4.37	Researched - No Data	8,000	--	0.001	4.37	5,100	0.23	Not Researched	2	0.1	53	Not Researched	0.1
107-06-2	**dichloroethane;1,2-**	0.002	Researched - No Data	11	--	0.001	0.002	8,500	0.04	0.091	2	0.0014	38	0.091	0.02
75-35-4	**dichloroethylene;1,1-**	0.00041	Researched - No Data	4,000	--	0.001	0.001	2,300	1.1	Researched-No Data	2	0.057	65	Researched-No Data	0.05
156-59-2	**dichloroethylene;1,2-,cis**	0.40	Researched - No Data	800	--	0.001	0.40	3,500	0.17	Researched-No Data	2	Researched-No Data	36	Researched-No Data	0.01
156-60-5	**dichloroethylene;1,2-,trans**	54	Researched - No Data	1,600	--	0.001	54	6,300	0.39	Researched-No Data	2	0.02	38	Researched-No Data	0.02
78-87-5	**dichloropropane;1,2-**	0.0026	Researched - No Data	15	--	0.001	0.0026	2,800	0.12	Researched-No Data	2	0.0011	47	0.068	Researched-No Data
541-75-6	**dichloropropene;1,3-**	0.003	Researched - No Data	5.6	--	0.001	0.003	2,800	0.73	0.014	2	0.0057	27	0.18	0.03
123-91-1	**dioxane;1,4-**	NA	Researched - No Data	91	--	0.10	91	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	0.011	Researched-No Data
100-41-4	**ethylbenzene**	4.53	6	8,000	--	0.001	4.53	170	0.32	Researched-No Data	2	0.29	200	Researched-No Data	0.1
591-78-6	**hexanone-2**	NA	NA	NA	--	0.01	0.01	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched
98-82-8	**isopropylbenzene**	NA	Researched - No Data	8,000	--	0.001	8,000	Not Researched	Not Researched	Researched-No Data	2	0.11	Not Researched	Researched-No Data	0.1
79-20-9	**methyl acetate**	NA	Researched - No Data	80,000	--	0.02	80,000	Not Researched	Not Researched	Researched-No Data	2	Researched-No Data	Not Researched	Researched-No Data	1
108-10-1	**4-methyl-2-pentanone**	NA	Researched - No Data	6,400	--	0.01	6,400	Not Researched	Not Researched	Researched-No Data	2	0.02	Not Researched	Researched-No Data	0.08
1634-04-4	**methyl tert-butyl ether**	0.085	0.1	560	--	0.001	0.085	50,000	0.018	Researched-No Data	2	0.86	11	0.0018	0.86
75-09-2	**methylene chloride**	0.087	0.02	130	--	0.005	0.02	13,000	0.09	0.0016	2	0.86	10	0.0075	0.06
108-87-2	**methylcyclohexane**	NA	Researched - No Data	NA	--	0.001	0.001	Not Researched	Not Researched	Researched-No Data	2	0.86	Not Researched	Researched-No Data	Researched-No Data
100-42-5	**styrene**	0.034	Researched - No Data	33	--	0.001	0.034	310	0.11	0.002	2	0.29	910	0.03	0.2
79-34-5	**tetrachloroethane;1,1,2,2-**	0.001	Researched - No Data	5	--	0.001	0.001	3,000	0.014	0.2	2	Researched-No Data	79	0.2	Researched-No Data
127-18-4	**tetrachloroethylene**	0.004	0.050	1.9	--	0.001	0.004	200	0.75	0.021	2	Researched-No Data	270	0.54	0.01
108-88-3	**toluene**	9.45	7	6,400	--	0.005	7	530	0.27	Researched-No Data	2	1.4	140	Researched-No Data	0.08
76-13-1	**1,1,2-trichloro-1,2,2-trifluoroethane**	NA	Researched - No Data	2,400,000	--	0.001	2,400,000	Not Researched	Not Researched	Researched-No Data	2	8.6	Not Researched	Researched-No Data	30
87-61-6	**1,2,3-trichlorobenzene**	NA	NA	NA	--	0.001	0.001	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched	Not Researched
120-82-1	**1,2,4-Trichlorobenzene**	1.33	Researched - No Data	800	--	0.001	1.33	300	0.058	Researched-No Data	2	0.057	1,700	Researched-No Data	0.01
71-55-6	**1,1,1-Trichloroethane**	3,373	2	72,000	--	0.001	2	1,300	0.71	Researched-No Data	2	3	140	Researched-No Data	0.9
79-00-5	**1,1,2-Trichloroethane**	0.0033	Researched - No Data	18	--	0.001	0.0033	4,400	0.037	0.056	2	Researched-No Data	75	0.057	0.004
79-01-6	**trichloroethylene**	0.01	0.030	2.5	--	0.001	0.01	1,100	0.42	0.4	2	0.01	94	0.4	0.0003
75-69-4	**trichlorofluoromethane**	NA	Researched - No Data	24,000	--	0.005	24,000	Not Researched	Not Researched	Researched-No Data	2	0.2	Not Researched	Researched-No Data	0.3
75-01-4	**vinyl chloride**	0.00016	Researched - No Data	0.67	--	0.001	0.001	2,800	1.1	0.031	2	0.029	19	1.5	0.003
1330-20-7	**xylenes**	9.09	9	16,000	--	0.003	9	170	0.28	Researched-No Data	2	0.029	230	Researched-No Data	0.2

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

"Researched-No Data" means research has been conducted and no data exists in the database for this parameter.

"Not Researched" means research has not been conducted and no value exists in the database for this parameter.

A - PCLs calculated from calculated using Ecology's three phase partitioning model as described in WAC 173-340-747 to generate soil concentrations which are protective of surface water.

B - Soil Method A values for unrestricted land use from CLARC summary tables.

C - Soil Method B Direct Contact values for unrestricted land use from CLARC summary tables.

D - Terrestrial Ecological Evaluation Values from Ecology Toxics Cleanup Program Table 749-2: Priority contaminants of ecological concern for sites that qualify for the simplified terrestrial ecological evaluation.

E - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory.

F - Selected PCL = Most restrictive PCL for Soil Cleanup, with the exception of analytes where PQL > calculated PCL or no calculated PCL is given. In these instances, the PQL will be selected as the PCL; if no PCL is available for Soil Cleanup Based on Protection of Surface Water, the Soil Method A or Method B value (if no Method A value) is selected.

G - Parameters from CLARC Summary Tables used for Worksheet for Calculating Soil Cleanup Levels for Unrestricted and Industrial Land Use.

H - VOCs per EPA Method 8260.

NA - Value Not Available.

Calculations - VOCs
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Chemical	Soil Preliminary Cleanup Levels Based on Protection of Surface Water (mg/kg)	Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)	Selected Surface Water CUL from Table 3 (ug/L)	Calculated Non-Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Calculated Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Gastrointestinal Absorption Conversion Factor (GI)	Dermal Absorption Fraction (ABS)
	VOCS														
67-64-1	acetone	3.21	1,000,000	0.0016	No Data	2	No Data	0.58	No Data	0.1	800	7,390		0.8	0.03
71-43-2	benzene	0.0068	1,800	0.23	0.027	2	0.0086	62	0.055	0.004	1.2	296	16.80	0.8	0.03
74-97-5	bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
75-27-4	bromodichloromethane	0.0014	6,700	0.066	No Data	2	No Data	55	0.062	0.02	0.27	1,478	14.90	0.8	0.03
75-25-2	bromoform	0.029	3,100	0.022	0.0039	2	No Data	130	0.0079	0.02	4.3	1,478	116.94	0.8	0.03
74-83-9	bromomethane	0.22	15,000	0.26	No Data	2	0.0014	9	No Data	0.0014	47	103		0.8	0.03
78-93-3	butanone;2-		No Research	No Research	No Data	2	0.29	No Research	No Data	0.6	4,800	44,342		0.8	0.03
75-15-0	carbon disulfide	5.6	1,200	1.2	No Data	2	0.2	46	No Data	0.1	800	7,390		0.8	0.03
56-23-5	carbon tetrachloride	0.002	790	1.3	0.053	2	No Data	150	0.13	0.0007	0.23	52	7.11	0.8	0.03
108-90-7	chlorobenzene	1.13	470	0.15	No Data	2	0.005	220	No Data	0.02	130	1,478		0.8	0.03
75-00-3	chloroethane		No Research	No Research	0.0029	2	2.9	No Research	0.029	0.4	15	29,561	31.85	0.8	0.03
67-66-3	chloroform	0.030	7,900	0.15	0.081	2	No Data	53	0.0061	0.01	5.7	739	151.44	0.8	0.03
74-87-3	chloromethane		No Research	No Research	0.0063	2	No Data	6	0.013	No Data	130		71.06	0.8	0.03
110-82-7	cyclohexane		No Research	No Research	No Research	2	1.7	No Research	No Research	1.7		125,635		0.8	0.03
124-48-1	dibromochloromethane	0.0021	2,600	0.032	No Data	2	No Data	63	0.084	0.02	0.4	1,478	11.00	0.8	0.03
96-12-8	dibromo-3-chloropropane;1,2-		No Research	No Research	0.0024	2	0.000057	No Research	1.4	No Data	0.031		0.66	0.8	0.03
106-93-4	1,2-Dibromoethane		NA	NA	0.77	2	0.0001	66	85	NA	NA		0.01	0.8	0.03
95-50-1	1,2-Dichlorobenzene	4.93	160	0.078	No Data	2	0.04	380	No Data	0.09	420	6,651		0.8	0.03
541-73-1	1,3-Dichlorobenzene		No Research	No Research	No Research	2	No Research	No Research	No Research	No Research	320			0.8	0.03
106-46-7	1,4-Dichlorobenzene	0.081	74	0.1	No Data	2	0.23	620	0.024	No Data	4.9		38.49	0.8	0.03
75-71-8	dichlorodifluoromethane		No Research	No Research	No Data	2	0.05	No Research	No Data	0.2	1,600	14,781		0.8	0.03
75-34-3	dichloroethane;1,1-	4.37	5,100	0.23	No Research	2	0.1	53	No Research	0.1	800	7,390		0.8	0.03
107-06-2	dichloroethane;1,2-	0.0024	8,500	0.04	0.091	2	0.0014	38	0.091	0.02	0.5	1,478	10.15	0.8	0.03
75-35-4	dichloroethylene;1,1-	0.00041	2,300	1.1	No Research	2	0.057	65	No Data	0.05	0.057	3,695		0.8	0.03
156-59-2	dichloroethylene;1,2-,cis	0.40	3,500	0.17	No Data	2	No Data	36	No Data	0.01	80	739		0.8	0.03
156-60-5	dichloroethylene;1,2-,trans	54	6,300	0.39	No Data	2	0.02	38	No Data	0.02	10,000	1,478		0.8	0.03
78-87-5	dichloropropane;1,2-	0.0026	2,800	0.12	No Data	2	0.0011	47	0.068	No Data	0.5		13.59	0.8	0.03
542-75-6	dichloropropene;1,3-	0.003	2,800	0.73	0.014	2	0.0057	27	0.18	0.03	0.5	2,217	5.13	0.8	0.03
123-91-1	dioxane; 1,4-		No Research	No Research	No Data	2	No Data	No Research	0.011	No Data	100		83.98	0.8	0.03
100-41-4	ethylbenzene	4.53	170	0.32	No Data	2	0.29	200	No Data	0.1	530	7,390		0.8	0.03
591-78-6	hexanone; 2-		No Research	No Research	No Data	NA	No Data	No Research	No Data	No Data	2.5			0.8	0.03
98-82-8	isopropylbenzene		No Research	No Research	No Data	2	0.11	No Research	No Data	0.1	800	7,390		0.8	0.03
79-20-9	methyl acetate		No Research	No Research	No Data	2	No Data	No Research	No Data	1	8,000	73,903		0.8	0.03
108-10-1	4-methyl-2-pentanone		No Research	No Research	No Data	2	0.02	No Research	No Data	0.08	640	5,912		0.8	0.03
1634-04-4	methyl tert-butyl ether	0.085	50,000	0.018	No Data	2	0.86	11	0.0018	0.86	20	63,557	513.22	0.8	0.03
75-09-2	methylene chloride	0.087	13,000	0.09	0.0016	2	0.86	10	0.0075	0.06	20	4,434	123.17	0.8	0.03
108-87-2	methylcyclohexane		No Research	No Research	No Data	2	0.86	No Research	No Data	No Data	1			0.8	0.03
100-42-5	styrene	0.034	310	0.11	0.002	2	0.29	910	0.03	0.2	1.5	14,781	30.79	0.8	0.03
79-34-5	tetrachloroethane;1,1,1,2-		No Research	No Research	0.026	2	No Data	No Research	0.026	0.03	1.7	2,217	35.53	0.8	0.03
127-18-4	tetrachloroethylene	0.0042	200	0.75	0.021	2	No Data	270	0.54	0.01	0.39	739	1.71	0.8	0.03
108-88-3	toluene	9.45	530	0.27	No Data	2	1.4	140	No Data	0.08	1,300	5,912		0.8	0.03
76-13-1	trichloro-1,2,2-trifluoroethane;1,1,2-		No Research	No Research	No Data	2	8.6	No Research	No Data	30	240,000	2,217,090		0.8	0.03
87-61-6	trichlorobenzene; 1,2,3-		No Research	No Research	No Data	2	No Data	No Research	No Data	No Data	0.5			0.8	0.03
120-82-1	trichlorobenzene; 1,2,4-	1.33	300	0.058	No Data	2	0.057	1,700	No Data	0.01	35	739		0.8	0.03
71-55-6	trichloroethane; 1,1,1-	3,373	1,300	0.71	No Data	2	3	140	No Data	0.9	420,000	66,513		0.8	0.03
79-00-5	trichloroethane; 1,1,2-	0.0033	4,400	0.037	0.056	2	No Data	75	0.057	0.004	0.59	296	16.21	0.8	0.03
79-01-6	trichloroethylene	0.010	1,100	0.42	0.4	2	0.01	94	0.4	0.0003	1.5	22	2.31	0.8	0.03
75-69-4	trichlorofluoromethane		No Research	No Research	No Data	2	0.2	No Research	No Data	0.3	2,400	22,171		0.8	0.03
96-18-4	trichloropropane;1,2,3-		No Research	No Research	No Data	2	No Data	No Research	7	0.006	0.0063	443	0.13	0.8	0.03
75-01-4	vinyl chloride	0.00016	2,800	1.1	0.031	2	0.029	19	1.5	0.003	0.025	222	0.62	0.8	0.03
1330-20-7	xylenes	9.09	170	0.28	No Data	2	0.029	230	No Data	0.2	1,000	14,781		0.8	0.03

Table 5
Groundwater Preliminary Cleanup Levels
Metals, PCBs, Dioxin/Furan, TPH
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Calculated Groundwater Preliminary Cleanup Level (PCL) [A] (µg/L)	Reference [B]	Laboratory Practical Quantitation Limit (PQL) [C] (µg/L)	Selected PCLs [D]
	Metals [E]				
7440-36-0	**Antimony**	5.6	Surface Water ARAR	1	5.6
7440-38-2	**Arsenic**	0.018	Surface Water ARAR	1	1
7440-41-7	**Beryllium**	270	Surface Water Method B	1	270
7440-43-9	**Cadmium in Water**	0.25	Surface Water ARAR	1	1
18540-29-9	**Chromium [F]**	10	Groundwater Method A	1	10
7440-50-8	**Copper**	2.4	Surface Water ARAR	1	2.4
7439-92-1	**Lead**	0.54	Surface Water ARAR	1	1
7440-02-0	**Nickel [G]**	8.2	Surface Water ARAR	1	8.2
7782-49-2	**Selenium**	5	Surface Water ARAR	1	5
7440-22-4	**Silver**	0.32	Surface Water ARAR	0.5	0.5
7440-28-0	**Thallium [H]**	0.24	Surface Water ARAR	1	1
7440-66-6	**Zinc**	32	Surface Water ARAR	10	32
7439-97-6	**Mercury**	0.012	Surface Water ARAR	0.2	0.2
	Polychlorinated Biphenyls [I] (PCBs)				
1336-36-3	**Total PCBs**	0.000064	Surface Water Method B	0.01	0.01
	Total Dioxin / Furan [J]				
1746-01-6	**2,3,7,8 TCDD [K]**	0.000000005	Surface Water ARAR	0.00000001	0.00000001
	Total Petroleum Hydrocarbons [L] (TPH)				
N/A	TPH-Gx	1,000/800 [M]	Groundwater Method A	100	1,000/800 [M]
N/A	TPH-Dx	500	Groundwater Method A	100	500

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

A - PCLs selected per Ecology recommended hierarchy as outlined below.

B - References source of groundwater cleanup levels selected using hierarchy provided below.

C - PQL from Environmental Sciences Corp environmental laboratory.

D - Selected PCL defined as calculated PCL, with the exception of analytes where PQL > calculated PCL. In these instances, the PQL will be selected as the PCL.

E - Metals per EPA Method 6020; Mercury per EPA Method 7470A.

F - Chromium VI.

G - Nickel, soluble salts.

H - Thallium soluble salts.

I - PCBs per EPA Method 8082.

J - Dioxin/Furan by EPA Method 1613.

K - Per Ecology Comment 45(d) to the Draft Final Work Plan, 2,3,7,8 TCDD has been used for total Dioxin/Furan.

L - Hydrocarbon per NW-TPH-Gx and NW-TPH-Dx methodologies.

M - Gasoline Range Organics 1,000µg/L with no detectable benzene in groundwater; 800 µg/L if benzene present in groundwater.

NA - Value not available.

Hierarchy for Selection of PCLs

The groundwater cleanup levels were selected using the following hierarchy:

1) Choose the most stringent value among all the Surface Water ARARs and Surface Water Method B values per WAC-173-340-730.

2) If there is no Surface Water cleanup value available in the Cleanup Levels and Risk Calculation (CLARC) table, then choose the Groundwater Method A value (Table 720-1).

3) If there is no Groundwater Method A cleanup value, then choose the Groundwater Method B (ingestion) value from the CLARC table.

4) If there is no Groundwater Method B cleanup value, then choose the most stringent Groundwater ARAR value available in CLARC.

Table 6
Soil Preliminary Cleanup Levels
Metals, PCBs, Dioxin/Furan, and TPH
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Analyte	Preliminary Cleanup Levels (PCL) (mg/kg)				Laboratory Practical Quantitation Limit (PQL) [E] (mg/kg)	Selected PCLs [F]	Parameters from CLARC Summary Table [G]							
		Soil Cleanup Based on Protection of Surface Water [A]	Soil Method A [B]	Soil Method B Direct Contact [C]	Terrestrial Ecological Receptors [D]			Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Kd (Distribution Coefficient for Metals) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)
	Metals [H]														
7440-36-0	**Antimony**	5.1	Researched - No Data	32	--	1	5.1	Not Researched	0	Researched-No Data	1	Researched-No Data	45	Researched-No Data	0.0004
7440-38-2	**Arsenic**	0.0105	20	0.67	20	1	1	Not Researched	0	15	1	15	29	1.5	0.0003
7440-41-7	**Beryllium**	4,267	Researched - No Data	160	25	0.1	25	Not Researched	0	8.4	1	0.0000057	790	Researched-No Data	0.002
7440-43-9	**Cadmium**	5.7	2	80	25	0.25	2	Not Researched	0	0.042	1	Researched-No Data	6.7	Researched-No Data	0.001
18540-29-9	**Chromium [I]**	3.84	19	240	42	0.5	3.84	Not Researched	0	Researched-No Data	1	0.0000023	19	Researched-No Data	0.003
7440-50-8	**Copper**	1.07	Researched - No Data	3,000	100	1	1.07	Not Researched	0	Researched-No Data	1	Researched-No Data	22	Researched-No Data	0.037
7439-92-1	**Lead**	108	250	Not Researched	220	0.25	108	Not Researched	0	Researched-No Data	1	Researched-No Data	10,000	Researched-No Data	Researched-No Data
7440-02-0	**Nickel [J]**	10.69	Researched - No Data	1,600	100	1	10.69	Not Researched	0	0.84	Not Researched	Researched-No Data	65	Researched-No Data	0.02
7782-49-2	**Selenium**	0.52	Researched - No Data	400	0.8	1	1	Not Researched	0	Researched-No Data	1	Researched-No Data	5	Researched-No Data	0.005
7440-22-4	**Silver**	0.054	Researched - No Data	400	--	0.5	0.5	Not Researched	0	Researched-No Data	1	Researched-No Data	8.3	Researched-No Data	0.005
7440-28-0	**Thallium [K]**	0.342	Researched - No Data	5.6	--	1	1	Not Researched	0	Researched-No Data	1	Researched-No Data	71	Researched-No Data	0.00007
7440-66-6	**Zinc**	39.8	Researched - No Data	24,000	270	1.5	39.8	Not Researched	0	Researched-No Data	1	Researched-No Data	62	Researched-No Data	0.3
7439-97-6	**Mercury**	0.013	2	24	0.7	0.02	0.02	Not Researched	0.47	Researched-No Data	1	0.000086	52	Researched-No Data	0.0003

CAS #	Analyte	Preliminary Cleanup Levels (PCL) (mg/kg)				Laboratory PQL [E] (mg/kg)	Selected PCLs [F]	Parameters from CLARC Summary Table [G]							
		Soil Cleanup Based on Protection of Surface Water [A]	Soil Method A [B]	Soil Method B Direct Contact [C]	Terrestrial Ecological Receptors [D]			Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)
	Polychlorinated Biphenyls [L] (PCBs)														
1336-36-3	**Total PCBs**	NA	1	0.50	--	0.0005	0.50	Not Researched	Not Researched	Researched-No Data	1	Researched-No Data	110,000	Researched-No Data	0.00007
	Total Dioxin / Furan														
1746-01-6	**2,3,7,8 TCDD [M]**	NA	NA	0.000011	--	0.000011	0.000011	Not Researched	Not Researched	150,000	1	Researched-No Data	Not Researched	150,000	Researched-No Data

Analyte	Preliminary Cleanup Levels (PCLs) (mg/kg)		Laboratory PQL (mg/kg)	Selected PCLs [E]
	Method A [B]	Terrestrial Ecological Receptors [D]		
TPH-Gx [N]	100/30 [O]	200	0.1	100/30
TPH-Dx [N]	2,000	460	4	460

Notes:

Shading denotes PCL value where the calculated PCL is less than the laboratory PQL or where no calculated PCL is available.

"Researched-No Data" means research has been conducted and no data exists in the database for this parameter.

"Not Researched" means research has not been conducted and no value exists in the database for this parameter.

A - PCLs calculated from calculated using Ecology's three phase partitioning model as described in WAC 173-340-747 to generate soil concentrations which are protective of surface water.

B - Soil Method A values for unrestricted land use from CLARC summary tables.

C - Soil Method B Direct Contact values for unrestricted land use from CLARC summary tables.

D - Terrestrial Ecological Evaluation Values from Ecology Toxics Cleanup Program Table 749-2: Priority contaminants of ecological concern for sites that qualify for the simplified terrestrial ecological evaluation.

E - Practical Quantitation Limit (PQL) from Environmental Sciences Corp environmental laboratory.

F - Selected PCL defined as most restrictive PCL for Soil Cleanup, with the exception of analytes where PQL > calculated PCL or no calculated PCL is given. In these instances, the PQL will be selected as the PCL; if no PCL is available for Soil Cleanup.

G - Parameters from CLARC Summary Tables used for Worksheet for Calculating Soil Cleanup Levels for Unrestricted and Industrial Land Use.

H - Priority Pollutant Metals per EPA Method 6010B.

I - Chromium VI.

J - Nickel, Soluble Salts.

K - Thallium, Soluble Salts.

L - PCBs per EPA Method 8082.

M - Per Ecology Comment 45(d) to the Draft Final Work Plan, 2,3,7,8 TCDD has been used for total Dioxin/Furan.

N - Hydrocarbon per NW-TPH-Gx and NW-TPH-Dx methodologies.

O - 100 mg/kg for gasoline mixtures without benzene and the total of ethylbenzene, toluene and xylene are less than 1% of the gasoline mixture, 30 mg/kg for all other gasoline mixtures.

NA - Value not available.

Calculations - Metals, PCBs, and Dioxin/Furan
Bay Wood Products Site, Port of Everett
Everett, WA

CAS #	Chemical	Soil Preliminary Cleanup Levels Based on Protection of Surface Water (mg/kg)	Aqueous Solubility (S) (mg/L)	Henrys Law Constant (unitless) (Hcc) (unitless)	Inhalation Cancer Potency Factor (CPFi) (kg-day/mg)	Inhalation Correction Factor (INH) (unitless)	Inhalation Reference Dose (RfDi) (mg/kg-day)	Koc (Soil Organic Carbon-Water Partitioning Coefficient) (L/kg)	Distribution Coefficient for Metals(Kd) Soil Organic Carbon-Water Partitioning Coefficient (Koc) for PCBs and Dioxin/Furan L(kg)	Oral Cancer Potency Factor (CPFo) (kg-day/mg)	Oral Reference Dose (RfDo) (mg/kg-day)	Selected Surface Water CUL from Table 5 (ug/L)	Non-Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Carcinogenic Direct Contact Soil Cleanup Level (mg/kg)	Gastrointestinal Absorption Conversion Factor (GI)	Dermal Absorption Fraction (ABS)
	Metals															
7440-36-0	Antimony	5.1	No Research	0	No Data	1	No Data	NA	45	No Data	0.0004	5.6	29		0.2	0.01
7440-38-2	Arsenic	0.0105	No Research	0	15	1	15	NA	29	1.5	0.0003	0.018	22	1	0.2	0.01
7440-41-7	Beryllium	4,267	No Research	0	8.4	1	0.0000057	NA	790	No Data	0.002	270	144		0.2	0.01
7440-43-9	Cadmium	5.7	No Research	0	6.3	1	No Data	NA	6.7	No Data	0.001	41	72		0.2	0.01
18540-29-9	Chromium VI	3.84	No Research	0	0.042	1	0.0000023	NA	19	No Data	0.003	10	NA		0.2	0.01
7440-50-8	Copper	1.07	No Research	0	No Data	1	No Data	NA	22	No Data	0.037	2.4	2,667		0.2	0.01
7439-92-1	Lead	108	No Research	0	No Data	1	No Data	NA	10,000	No Data	No Data	0.54	NA		0.2	0.01
7440-02-0	Nickel, soluble salts	10.69	No Research	0	No Data	1	No Data	NA	65	No Data	0.02	8.2	NA		0.2	0.01
7782-49-2	Selenium	0.52	No Research	0	No Data	1	No Data	NA	5	No Data	0.005	5	360		0.2	0.01
7440-22-4	Silver	0.054	No Research	0	No Data	1	No Data	NA	8.3	No Data	0.005	0.32	360		0.2	0.01
7440-28-0	Thallium, soluble	0.342	No Research	0	No Data	1	No Data	NA	71	No Data	0.00007	0.24	5		0.2	0.01
7440-66-6	Zinc	39.8	No Research	0	No Data	1	No Data	NA	62	No Data	0.3	32	21,622		0.2	0.01
7439-97-6	Mercury	0.013	No Research	0.47	No Data	1	0.000086	NA	52	No Data	0.0003	0.012	22		0.2	0.01
	PCBs															
	total PCBs		0.7	No Research	2	1	No Data	310,000	NA	2	No Data	0.01		NA	0.5	0.1
	Total Dioxin / Furan															
1746-01-6	2,3,7,8 TCDD		No Research	No Research	150,000	1	No Data	No Research	NA	150,000	No Data	0.00000001		0.00001	0.8	0.3