PORT OF EVERETT: PIER 3 N BASELINE SURFACE SEDIMENT CHARACTERIZATION SAMPLING AND ANALYSIS PLAN

September 23, 2019

Prepared for:

Port of Everett

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Map 1. Sampling area within East Waterway
Map 2. Sediment sampling locations

Acronyms

AO	Agreed Order
ARI	Analytical Resources, Inc.
CPGPS	carrier-phase enhancement global positioning system
CSL	cleanup screening level
CV	coefficient of variation
DCAP	draft cleanup action plan
DMMP	Dredged Material Management Program
DNR	Department of Natural Resources
DQI	data quality indicator
dw	dry weight
Ecology	Washington State Department of Ecology
EDD	electronic data deliverable
EIM	Environmental Information Management
EPA	US Environmental Protection Agency
GPS	global positioning system
HDPE	high-density polyethylene
HPAH	high-molecular-weight polycyclic aromatic hydrocarbon
HpCDD	heptachlorodibenzo-*p*-dioxin
HpCDF	heptachlorodibenzofuran
HxCDD	hexachlorodibenzo-*p*-dioxin
HxCDF	hexachlorodibenzofuran
ID	identification
LCS	laboratory control sample
LDC	Laboratory Data Consultants, Inc.
LPAH	low-molecular-weight polycyclic aromatic hydrocarbon
MLLW	mean lower low water
MS	matrix spike

MSD	matrix spike duplicate
MTCA	Model Toxics Control Act
NAD83	North American Datum of 1983
OC	organic carbon
OCDD	octachlorodibenzo-*p*-dioxin
OCDF	octachlorodibenzofuran
PCB	polychlorinated biphenyl
PeCDD	pentachlorodibenzo-*p*-dioxin
PeCDF	pentachlorodibenzofuran
PLP	potentially liable party
Port	Port of Everett
PSEP	Puget Sound Estuary Program
QA/QC	quality assurance/quality control
RI/FS	remedial investigation/feasibility study
RL	reporting limit
RPD	relative percent difference
RSD	relative standard difference
RTK	real-time kinematic
SAP	sampling and analysis plan
SCO	sediment cleanup objective
SDG	sample delivery group
SGS Axys	SGS Axys Analytical Services Ltd.
SIM	selected ion monitoring
SM	Standard Method
SMS	Washington State Sediment Management Standards
SRM	standard reference material
SVOC	semivolatile organic compound
TBT	tributyltin
TCDD	tetrachlorodibenzo-*p*-dioxin

TCDF	tetrachlorodibenzofuran
TOC	total organic carbon
UCT-KED	Universal Cell Technology-kinetic energy discrimination
USACE	US Army Corps of Engineers
USCG	US Coast Guard
Windward	Windward Environmental LLC

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Contractor Signature Sheet

Sampling and Analysis Plan

Pier 3 N baseline sediment characterization

Port of Everett, Seattle, Washington

By signing below, I acknowledge that I have reviewed the Sampling and Analysis plan and agree to follow the methods and quality assurance procedures contained therein.

Date 09/17/19

Kathy Godtfredsen
Project Manager
Windward Environmental LLC

Date 09/17/19

Amara Vandervort
QA Manager
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Suzanne Replinger
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1 Introduction

The purpose of this sampling and analysis plan (SAP) is to document the procedures to be followed in characterizing surface sediment in an area north of Pier 3 within the East Waterway Site in Everett, Washington (Map 1) (hereinafter referred to as the Site). Sampling is targeted for the week of September 23, 2019.

This plan addresses project management responsibilities; sampling and analytical procedures; assessment and oversight; and data reduction, validation, and reporting. Field collection forms are provided in Appendix A. The field work will follow the health and safety procedures in the health and safety plan, which is provided as Appendix B.

1.1 SITE DESCRIPTION

The Washington State Department of Ecology (Ecology) entered into the first Agreed Order (AO), pursuant to the Model Toxics Control Act (MTCA), with Kimberly-Clark, the Port of Everett (Port), and the Department of Natural Resources (DNR) on February 16, 2016, to conduct a remedial investigation/feasibility study (RI/FS) and develop a draft cleanup action plan (DCAP) for the Site. A second AO between Ecology and the US Navy (another potentially liable party [PLP]), released for public review in April 2017, outlines US Navy cooperation and access for the completion of the RI/FS and DCAP.

The area to be sampled is north of Pier 3 within the East Waterway, just offshore of property that the Port leases. A new shipyard tenant is completing the permitting process for operations on-site, including a dry dock in the water. The dry dock will tie up to the upland site as well as Pier 3 (Figure 1). As part of the permitting process, the Port and the new tenant deemed it mutually beneficial to conduct a focused characterization of nearby sediment to provide baseline data for the tenant.

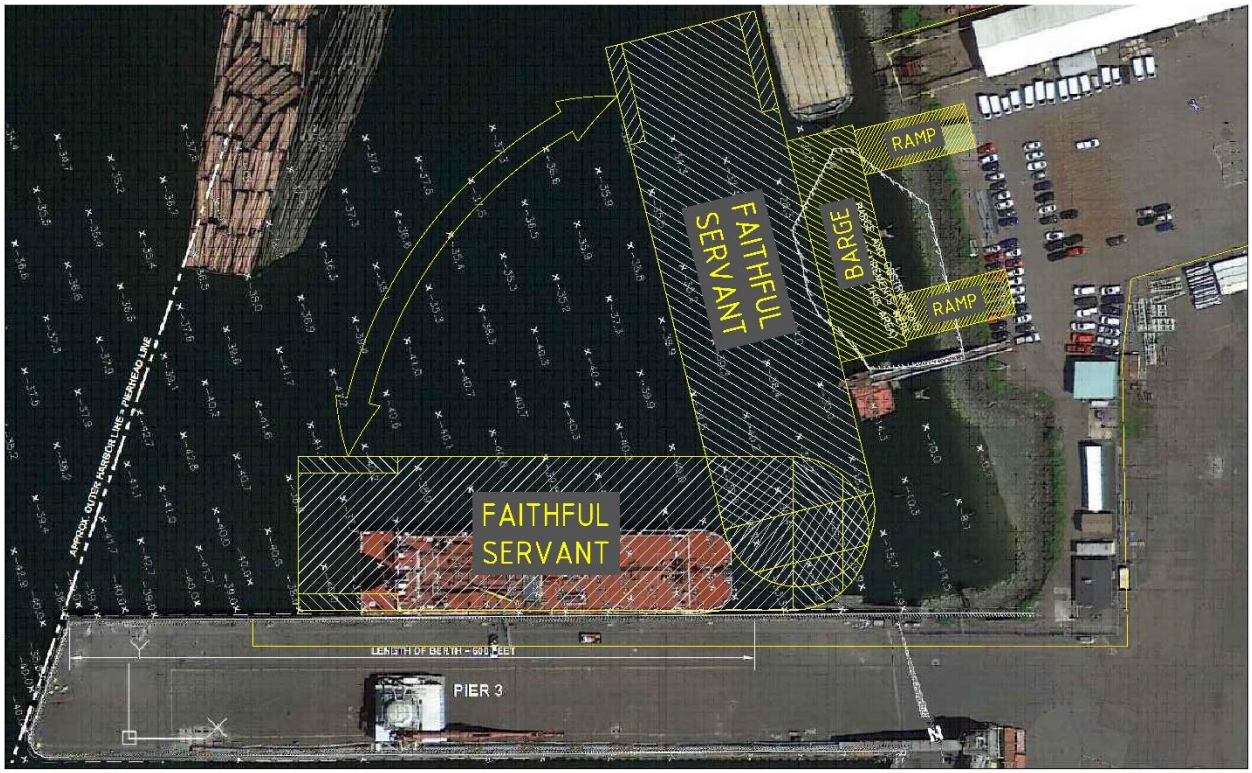

Figure 1. Locations where dry dock may be positioned

1.2 SEDIMENT SAMPLING OBJECTIVES

Surface sediment samples will be collected to obtain a baseline characterization of an area planned as the location of a shipyard tenant. The sampling will enable an assessment of existing surface sediment contamination (prior to the tenant's operations), as well as provide as a baseline from which to assess any future changes. Samples will be analyzed for chemicals with Washington State Sediment Management Standard (SMS) criteria and tributyltin (TBT), and a subset will be analyzed for dioxins/furans (a risk driver within the Site).

The results of the sampling will be shared with Ecology and the other PLPs in the form of a simple data report, and the data will be uploaded to Ecology's Environmental Information Management System (EIM) once they have been validated.

2 Project Team and Responsibilities

The overall project organization and individuals responsible for implementing the work elements presented in this SAP are described in this section.

Kathy Godtfredsen of Windward Environmental LLC (Windward) will be the project manager, responsible for implementing the sediment characterization plan. Suzanne Replinger of Windward will be the field coordinator, responsible for day-to-day technical and quality assurance/quality control (QA/QC) oversight. She will ensure that appropriate protocols for sample collection, preservation, and holding times are observed and will submit environmental samples to the designated laboratory for chemical and physical analyses.

Amara Vandervort of Windward will serve as QA/QC manager, responsible for providing oversight for both the field sampling and laboratory programs. She will also serve as the laboratory coordinator for chemical analyses, ensuring that samples are collected and documented appropriately, coordinating with the analytical laboratories, ensuring data quality, overseeing data validation, and supervising project QA coordination.

Independent third-party data review and validation will be performed by Laboratory Data Consultants, Inc. (LDC). SGS Axys Analytical Services Ltd. (SGS Axys) will perform analyses for dioxins/furans, and Analytical Resources, Inc. (ARI) will perform all other chemical and geotechnical analyses of the sediment samples.

The analytical testing laboratory will be responsible for the following:

- Perform the methods outlined in this plan, including those methods referenced for each analytical procedure.
- Follow documentation, custody, and sample logbook procedures.
- Implement QA/QC procedures required by the Puget Sound Estuary Program (PSEP; 1986, 1997a, b, c) and Dredged Material Management Program (DMMP) (USACE et al. 2018) guidelines.
- Meet all reporting requirements.
- Deliver electronic data files as specified in this SAP.
- Meet turnaround times for deliverables as described in this SAP.

Project personnel contact information is as follows:

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3 Study Design

To meet the objectives presented in Section 1.2, 14 surface sediment samples will be collected north of Pier 3 (Map 2). These samples, identified as samples EWW-19-SS01 through EWW-19-SS14, will be collected to characterize the baseline sediment concentrations in this area. Because the dry dock will pivot between the shoreline of the
leased property and Pier 3 (Figure 1), sampling locations have been arranged in a grid to cover this area. A sample will also be collected offshore of outfall PSO-5, where sediment contamination has been reported in earlier surveys.

All samples will be analyzed for chemicals with SMS criteria and TBT, and four of the samples will also be analyzed for PCB congeners and dioxins/furans (Map 2). These analytes were selected to reflect the MTCA listing of the Site, previous shipyard activities, and the risk driver status of dioxins/furans at the Site.

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4 Field Sampling and Processing

This section presents the sample collection, processing, and handling procedures that will be followed during the field program.

4.1 ANTICIPATED SCHEDULE

The surface sediment sampling will be conducted during the week of September 23, 2019. The sampling program will require one to two field days. Chemical analyses will be completed five weeks after the samples are submitted to the laboratory. Data validation will be complete three weeks after the preliminary data are submitted to the validator. Data will be posted to EIM within 30 days of validation.

4.2 STATION POSITIONING

On the day sampling begins, US Coast Guard (USCG) personnel will be contacted and advised that the sampling operations addressed in this SAP will be occurring within USCG's Vessel Traffic Service area. During sampling, VHF-FM channels 13 and 14 will be monitored.

Horizontal and vertical positioning will be determined using a carrier-phase enhancement global positioning system (CPGPS) receiver onboard the sampling vessel. The CPGPS will include a receiver unit that will receive radio broadcasts of CPGPS signals from a network of satellites and the Washington State Reference Network base stations. Real-time kinematic (RTK) positioning will be used to acquire corrections to enhance the precision of data derived from satellite-based positioning to produce centimeter-level accuracy (e.g., 10 cm for vertical and 20 cm for horizontal).

The water depth at each sampling location will be measured using a fathometer or lead line and converted to a mudline elevation (relative to mean lower low water [MLLW]) by subtracting the tidal elevation (from the CPGPS system's RTK water elevation measurement). Sampling location target coordinates are presented in Table 1.

Table 1. Target coordinates for sampling locations

Location ID	Easting (ft)[a]	Northing (ft)[a]	Analytes
EWW-19-SS01	1300936	360880	SMS and TBT
EWW-19-SS02	1300938	361123	SMS and TBT
EWW-19-SS03	1300967	361297	SMS and TBT
EWW-19-SS04	1300763	360880	SMS and TBT
EWW-19-SS05	1300796	361095	SMS, TBT, PCB congeners and dioxins/furans
EWW-19-SS06	1300828	361316	SMS and TBT

Location ID	Easting (ft)[a]	Northing (ft)[a]	Analytes
EWW-19-SS07	1300871	361538	SMS, TBT, PCB congeners and dioxins/furans
EWW-19-SS08	1300599	360933	SMS, TBT, PCB congeners and dioxins/furans
EWW-19-SS09	1300654	361126	SMS and TBT
EWW-19-SS10	1300689	361339	SMS and TBT
EWW-19-SS11	1300434	360989	SMS and TBT
EWW-19-SS12	1300494	361167	SMS and TBT
EWW-19-SS13	1300262	361057	SMS, TBT, PCB congeners and dioxins/furans
EWW-19-SS14	1300322	361218	SMS and TBT

[a] Washington North Zone, NAD83 geographic and state plane coordinates – US survey feet.

ID – identification
NAD83 – North American Datum of 1983
SMS – Washington State Sediment Management Standards
TBT - tributyltin

4.3 SURFACE SEDIMENT SAMPLING

Surface sediment collection and processing will follow standardized procedures for the Puget Sound area that have been developed by PSEP (1997b). Surface sediments will be collected from each location using a pneumatic power grab sampler from a sampling vessel. Samples from the 0- to 10-cm sediment interval will be collected to represent the biologically active zone.

The surface sediment samples will be collected as described in the following steps:

1. Using GPS, maneuver the sampling vessel to the approximate pre-identified sampling location.
2. Calculate the mudline elevation (relative to MLLW), as described in Section 4.2.
3. Open the grab sampler jaws to the deployment position.
4. Guide the sampler overboard until it is clear of the vessel.
5. Using GPS, position the sampling vessel such that the GPS receiver, mounted on the winch arm right over the grab sampler, is within 1 to 2 m of the intended sampling location.
6. Lower the sampler through the water column to the bottom at approximately 0.3 m/sec.
7. Record the GPS location of the boat when the sampler reaches bottom.
8. Record the water depth and time.
9. Retrieve the sampler, raising it at approximately 0.3 m/sec.

10. Guide the sampler aboard the vessel and place it on the work stand on the deck, using care to avoid jostling that might disturb the integrity of the sample.
11. Examine the sample using the following acceptance criteria:
    - The calculated mudline elevation is within 1 ft of the target mudline elevation (Table 1).
    - Sediment is not extruded from the upper face of the sampler.
    - Overlying water is present (indicating minimal leakage).
    - Sediment surface is relatively flat (indicating minimal disturbance or winnowing).
    - A penetration depth of at least 11 cm has been achieved.

If these sample acceptance criteria are not achieved, the sample will be rejected. If the location is obstructed or an acceptable grab sample cannot be obtained in three attempts, the target sampling location will be moved, remaining as close as possible to the original location.

After sample acceptance, the following observations will be noted on the Surface Sediment Collection Form (Form 1) or in the field logbook:

- GPS location
- Sample collection time
- Water depth (to the nearest 0.1 ft) as read by the boat's fathometer or lead line
- Tide elevation
- Gross characteristics of the surficial sediment, including texture, color, biological structures, odor, and presence of debris or oily sheen
- Gross characteristics of the vertical profile (i.e., changes in sediment characteristics and redox layer, if visible)
- Maximum penetration depth (nearest 0.5 cm)
- Comments relative to sample quality

Any deviations from the approved sampling plan will be noted on a Protocol Modification Form (Form 2).

4.4 SEDIMENT SAMPLE PROCESSING AND HANDLING PROCEDURES

This section describes the equipment decontamination procedures, sample containers, and processing procedures.

4.4.1 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 that come into direct contact with the sediment collected for analysis will be made of glass, stainless steel, or polycarbonate and will be cleaned prior to each day's use and between sampling. Decontamination of all items will follow PSEP protocols. The decontamination procedure is as follows:

1. Pre-wash and rinse with Site or tap water.
2. Scrub with solution of Site or tap water and phosphate-free detergent (e.g., Liquinox®).
3. Rinse with Site or tap water.
4. Rinse with distilled water.
5. Cover (no contact) all decontaminated items with aluminum foil.
6. Store in clean, closed container for next use.

4.4.2 Sample containers for analysis

The laboratory will provide certified, pre-cleaned containers for all samples.

4.4.3 Sample processing procedures

All working surfaces and instruments will be thoroughly cleaned, decontaminated, and covered with aluminum foil to minimize outside contamination between sampling events. Disposable gloves will be discarded after processing at each sampling location, and new gloves will be donned prior to handling decontaminated instruments or work surfaces.

Sample containers (i.e., jars and bottles) will be kept in the original packaging as received from the analytical laboratory (i.e., coolers and/or boxes) until they are used to collect the samples; a sample container will be removed from the original packaging only when a sample is to be collected and placed within. The container will immediately be labeled and placed in a sturdy, plastic cooler containing ice and/or frozen gel packs.

The steps for processing the samples are as follows:

1. Record a description of the grab sample on Form 1 for surface sediment, noting the following parameters as appropriate:
   - Water depth (to the nearest 0.1 ft) at sampling location
   - Penetration depth
   - Sediment color, density, consistency, and stratification

- Odor (e.g., hydrogen sulfide, petroleum)
- Vegetation
- Debris
- Biological activity (e.g., detritus, shells, tubes, bioturbation, live or dead organisms)
- Presence of oil sheen
- Any other distinguishing characteristics or features

2. Transfer material that will make up the sample for laboratory analysis into single clean stainless steel bowl and homogenize until textural and color homogeneity are achieved.
3. Using a clean stainless steel spoon, completely fill pre-labeled sample containers for all analyses.
4. Thoroughly check all sample containers for proper identification, analysis type, and lid tightness.
5. Pack each container carefully to prevent breakage and place all containers inside a cooler with ice or frozen gel packs for storage at the proper temperature (0 to 6°C for all samples), with a temperature blank in each cooler.
6. Return excess sediment to the sampling location.

4.5 SAMPLE TRANSPORT AND CHAIN-OF-CUSTODY PROCEDURES

Following sample processing, samples will be transferred to ARI's custody. Specific sample transport procedures are as follows:

1. Each cooler or container containing the sediment samples will be delivered to ARI, or to the Windward storage area for later delivery to ARI, within 24 hours.
2. Samples will be shipped from ARI to SGS Axys via FedEx. Custody seals will be affixed to sample coolers shipped to SGS Axys prior to shipping.
3. A sufficient amount of ice, double-bagged in sealed plastic bags, or frozen gel packs will be placed within the cooler. Chain-of-custody forms will be enclosed in a sealed plastic bag.

The persons transferring custody of the sediment samples will sign the chain-of-custody form upon transfer of sample possession to the analytical laboratory. The laboratory will record the condition of the samples upon receipt. Chain-of-custody procedures will be used internally by the laboratory to track sample handling and final disposition.

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5 Chemical/Conventional Analyses

Laboratory methods, QA/QC procedures, laboratory sample handling, and data quality indicators (DQIs) for the sediment samples collected for chemistry testing are described in this section.

5.1 METHODS AND SAMPLE HANDLING

All sediment samples will be analyzed for SMS chemicals and TBT, and 4 of the 14 samples will also be analyzed for dioxins/furans. Table 2 summarizes the parameters for analysis, analysis methods, and target reporting limits (RLs) for the collected sediment samples. All samples will be maintained according to the appropriate holding times and temperatures for each analysis, as presented in Table 3. All practical efforts will be made to meet Ecology PQL's as identified in the Sediment Cleanup User Manual II (SCUM II).

Table 2. SMS criteria, analysis methods, and target reporting limits

Parameter	Unit	SMS Criteria			Analysis Method	Target RL[b,c]
		SCO	CSL	LAET[a]		
Conventional Parameters						
TOC	%	nc	nc	na	Plumb (1981) combustion infrared	0.02
Grain size	%	nc	nc	na	PSEP 1986	0.1
Total solids	%	nc	nc	na	SM 2540 G-97	0.04
Metals				na		
Arsenic	mg/kg dw	57	93	na	EPA 6020A UCT-KED	0.2
Cadmium	mg/kg dw	5.1	6.7	na	EPA 6020A UCT-KED	0.1
Chromium	mg/kg dw	260	270	na	EPA 6020A	0.5
Copper	mg/kg dw	390	390	na	EPA 6020A UCT-KED	0.5
Lead	mg/kg dw	450	530	na	EPA 6020A	0.1
Mercury	mg/kg dw	0.41	0.59	na	EPA 7471B	0.025
Silver	mg/kg dw	6.1	6.1	na	EPA 6020A	0.2
Zinc	mg/kg dw	410	960	na	EPA 6020A UCT-KED	4
Organometals					na	
TBT (bulk sediment)	µg/kg dw	nc	nc	na	EPA 8270-SIM	3.9

Parameter	Unit	SMS Criteria			Analysis Method	Target RL[b,c]
		SCO	CSL	LAET[a]		
Organics						
Total LPAH	µg/kg dw	370 mg/kg OC	780 mg/kg OC	5,200	EPA 8270D (calculated)	20 (2 mg/kg OC)
Naphthalene	µg/kg dw	99 mg/kg OC	170 mg/kg OC	2,100	EPA 8270D	20 (2 mg/kg OC)
Acenaphthylene	µg/kg dw	66 mg/kg OC	66 mg/kg OC	1,300	EPA 8270D	20 (2 mg/kg OC)
Acenaphthene	µg/kg dw	16 mg/kg OC	57 mg/kg OC	500	EPA 8270D	20 (2 mg/kg OC)
Fluorene	µg/kg dw	23 mg/kg OC	79 mg/kg OC	540	EPA 8270D	20 (2 mg/kg OC)
Phenanthrene	µg/kg dw	100 mg/kg OC	480 mg/kg OC	1,500	EPA 8270D	20 (2 mg/kg OC)
Anthracene	µg/kg dw	220 mg/kg OC	1,200 mg/kg OC	960	EPA 8270D	20 (2 mg/kg OC)
2-Methylnaphthalene[c]	µg/kg dw	38 mg/kg OC	64 mg/kg OC	670	EPA 8270D	20 (2 mg/kg OC)
Total HPAHs	µg/kg dw	960 mg/kg OC	5,300 mg/kg OC	12,000	EPA 8270D (calculated)	20 (2 mg/kg OC)
Fluoranthene	µg/kg dw	160 mg/kg OC	1,200 mg/kg OC	1,700	EPA 8270D	20 (2 mg/kg OC)
Pyrene	µg/kg dw	1,000 mg/kg OC	1,400 mg/kg OC	2,600	EPA 8270D	20 (2 mg/kg OC)
Benzo(a)anthracene	µg/kg dw	110 mg/kg OC	270 mg/kg OC	1,300	EPA 8270D	20 (2 mg/kg OC)
Chrysene	µg/kg dw	110 mg/kg OC	460 mg/kg OC	1,400	EPA 8270D	20 (2 mg/kg OC)
Total benzofluoranthenes	µg/kg dw	230 mg/kg OC	450 mg/kg OC	3,200	EPA 8270D (calculated)	40 (4 mg/kg OC)
Benzo(a)pyrene	µg/kg dw	99 mg/kg OC	210 mg/kg OC	1,600	EPA 8270D	20 (2 mg/kg OC)
Indeno(1,2,3-cd)pyrene	µg/kg dw	34 mg/kg OC	88 mg/kg OC	600	EPA 8270D	20 (2 mg/kg OC)
Dibenz(a,h)anthracene	µg/kg dw	12 mg/kg OC	33 mg/kg OC	230	EPA 8270D	20 (2 mg/kg OC)
Benzo(g,h,i)perylene	µg/kg dw	31 mg/kg OC	78 mg/kg OC	670	EPA 8720D	20 (2 mg/kg OC)
Chlorinated Hydrocarbons						
1,2-Dichlorobenzene	µg/kg dw	2.3 mg/kg OC	2.3 mg/kg OC	35	EPA 8270D	20 (2 mg/kg OC)
1,2,4-Trichlorobenzene	µg/kg dw	0.81 mg/kg OC	1.8 mg/kg OC	31	EPA 8270D-SIM	5 (0.5 mg/kg OC)
1,4-Dichlorobenzene	µg/kg dw	3.1 mg/kg OC	9 mg/kg OC	110	EPA 8270D	20 (2 mg/kg OC)
Hexachlorobenzene	µg/kg dw	0.38 mg/kg OC	2.3 mg/kg OC	22	EPA 8070D-SIM	5 (0.5 mg/kg OC)
Phthalates						
Dimethyl phthalate	µg/kg dw	53 mg/kg OC	53 mg/kg OC	71	EPA 8270D	20 (2 mg/kg OC)
Diethyl phthalate	µg/kg dw	61 mg/kg OC	110 mg/kg OC	200	EPA 8270D	20 (2 mg/kg OC)
Di-n-butyl phthalate	µg/kg dw	220 mg/kg OC	1,700 mg/kg OC	1,400	EPA 8270D	20 (2 mg/kg OC)
Butyl benzyl phthalate	µg/kg dw	4.9 mg/kg OC	64 mg/kg OC	63	EPA 8270D	20 (2 mg/kg OC)
Bis(2-ethylhexyl) phthalate	µg/kg dw	47 mg/kg OC	78 mg/kg OC	1,300	EPA 8270D	20 (2 mg/kg OC)
Di-n-octyl phthalate	µg/kg dw	58 mg/kg OC	4,500 mg/kg OC	6,200	EPA 8270D	20 (2 mg/kg OC)

Parameter	Unit	SMS Criteria			Analysis Method	Target RL[b,c]
		SCO	CSL	LAET[a]		
Phenols						
Phenol	µg/kg dw	420	1,200	na	EPA 8270D	20
2-Methylphenol	µg/kg dw	63	63	na	EPA 8270D	20
4-Methylphenol	µg/kg dw	670	670	na	EPA 8270D	20
2,4-Dimethylphenol	µg/kg dw	29	29	na	EPA 8270D-SIM	25
Pentachlorophenol	µg/kg dw	360 mg/kg OC	690 mg/kg OC		EPA 8270D	100 (10 mg/kg OC)
Other SVOCs						
Benzyl alcohol	µg/kg dw	57	73	na	EPA 8270D	20
Benzoic acid	µg/kg dw	650	650	na	EPA 8270D	200
Dibenzofuran	µg/kg dw	15 mg/kg OC	58 mg/kg OC	540	EPA 8270D	20 (2 mg/kg OC)
Hexachlorobutadiene	µg/kg dw	3.9 mg/kg OC	6.2 mg/kg OC	11	EPA 8270D-SIM	20 (2 mg/kg OC)
n-Nitrosodiphenylamine	µg/kg dw	11 mg/kg OC	11 mg/kg OC	28	EPA 8270D	20 (2 mg/kg OC)
Total PCB Aroclors	**µg/kg dw**	**12 mg/kg OC**	**65 mg/kg OC**	**130**	**EPA 8082A**	**20 (2 mg/kg OC)**
PCB congeners	**ng/kg dw**	**12 mg/kg OC**	**65 mg/kg OC**	**130**	**EPA 1668c**	**2**
Dioxins/Furans	**ng/kg dw**	**nc**	**nc**	**nc**	**EPA 1613B**	**1-5**

[a] If sample TOC is outside the acceptable range for normalization (greater than 0.5% and less than 3.5%) then LAET will be used rather than the OC-normed SCO value.

[b] Actual RLs will vary based on the amount of sample analyzed, the analytical dilution, and the percent solids of the sample.

[c] Non-normalized RLs were converted to OC-normalized values using 1% TOC.

[d] 2-Methylnapthalene is not included in the sum of LPAHs.

CSL – cleanup screening level
dw – dry weight
EPA – US Environmental Protection Agency
HPAH – high-molecular-weight polycyclic aromatic hydrocarbon
LPAH – low-molecular-weight polycyclic aromatic hydrocarbon
nc – no criteria
OC – organic carbon
PCB – polychlorinated biphenyl
PSEP – Puget Sound Estuary Program
RL – reporting limit
SCO – sediment cleanup objective
SIM – selected ion monitoring
SM – Standard Method
SMS – Washington State Sediment Management Standards
SVOC – semivolatile organic compound
TBT – tributyltin
TOC – total organic carbon
UCT-KED – Universal Cell Technology-kinetic energy discrimination

Table 3. Guidelines for sediment sample handling and storage

Parameter	Holding Time	Preservative	Sample Size	Container Size and Type[a]
TOC	14 days	cool/0 to 6ºC	25 g	8-oz glass
	6 months	freeze, -18ºC		
Total metals	6 months; mercury sample must be frozen	cool/0 to 6ºC	5 g	
	2 years; 28 days for mercury	freeze, -18ºC		
SVOCs, PCBs and TBT	14 days until extraction	cool/0 to 6ºC	100 g	16-oz glass
	1 year until extraction	freeze, -18ºC		
	40 days after extraction	cool/0 to 6ºC, or freeze, -18ºC		
Dioxins/furans and PCB congeners	14 days until extraction	cool/0 to 6ºC	100 g	8-oz glass
	1 year until extraction	freeze, -18ºC		
Grain size	6 months	cool/0 to 6ºC (do not freeze)	100–200 g	16-oz HDPE

[a] All sample containers will have lids with Teflon® inserts.

HDPE – high-density polyethylene
PCB – polychlorinated biphenyl
SVOC – semivolatile organic compound
TBT – tributyltin
TOC – total organic carbon

5.2 QUALITY ASSURANCE/QUALITY CONTROL AND DATA QUALITY INDICATORS

The frequency of analysis for laboratory QA/QC samples is summarized in Table 4. Project-specific DQIs are summarized in Tables 5 and 6. When analyzing semivolatile organic compounds (SVOCs) and conventional parameters, initial calibrations will be required before any samples are analyzed, after each major disruption of equipment, and when ongoing calibration fails to meet acceptance criteria. Ongoing calibration verification will be required before and after every 10 samples or every 12 hours (depending on the test method).

Table 4. Laboratory QA/QC sample analysis summary

Analysis Type	Initial Calibration	Initial Calibration Verification (second source)	Continuing Calibration Verification	Laboratory Replicate[a]	MS[b]	MSD[b]	Method Blank	Surrogate Spike
TOC	prior to analysis	after initial calibration	1 per 10 samples	1 per batch or SDG[c]	1 per batch or SDG	na	1 per prep batch	na
Metals	prior to analysis and as needed[d]	after initial calibration	1 per 10 samples	1 per batch or SDG	1 per batch or SDG	na	1 per prep batch	na
TBT	prior to analysis and as needed[d]	after initial calibration	prior to each 12-hr analytical batch	na	1 per batch or SDG	1 per batch or SDG	1 per prep batch	every sample
Semivolatile organics	prior to analysis and as needed[d]	after initial calibration	prior to analytical batch, 1 per 10–20 samples, or every 12 hours	na	1 per batch or SDG	1 per batch or SDG	1 per prep batch	every sample
PCBs[e]	prior to analysis and as needed[d]	after initial calibration	prior to analytical batch, 1 per 10–20 samples, or every 12 hours	na	1 per batch or SDG	1 per batch or SDG	1 per prep batch	every sample
Dioxins/furans	prior to analysis and as needed[d]	after initial calibration	prior to analytical batch	1 per batch or SDG	na	na	1 per prep batch	every sample
PCB congeners	prior to analysis and as needed[d]	after initial calibration	prior to analytical batch	1 per batch or SDG	na	na	1 per prep batch	every sample

Note: A batch is a group of samples of the same matrix analyzed or prepared at the same time, not exceeding 20 samples.

[a] Laboratory replicate sample(s) will be analyzed only if sufficient sample volume is available. Non-project-specific results may also be available to satisfy this QA/QC requirement.

[b] Non-project-specific MS/MSD results may also be available to satisfy this QA/QC requirement.

[c] TOC analysis includes a triplicate per batch or SDG.

[d] Initial calibrations are valid until the ongoing continuing calibration no longer meets method specifications, when a new initial calibration is performed.

[e] Detects of PCBs will be 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. The primary column will be considered to be the column that results in the highest value with the least interference. Values should have RPDs less than 40%, or they will be P-flagged as estimated by ARI.

ARI – Analytical Resources, Inc.
MS – matrix spike
MSD – matrix spike duplicate
PCB – polychlorinated biphenyl
QA/QC – quality assurance/quality control
RPD – relative percent difference
SDG – sample delivery group
TBT – tributyltin
TOC – total organic carbon

Table 5. DQIs for chemical analyses

Parameter	Precision[a]	Accuracy[b]	Completeness
TOC	± 30% CV	75–125%	95%
Total metals	± 30% RPD	75–125%	95%
TBT	± 30% RPD	30–160%	95%
SVOCs	± 35% RPD	50–150%	95%
PCBs (Aroclors)	± 35% RPD	50–150%	95%
PCBs (congeners)	± 30% RPD	laboratory QC limits	95%
Dioxins/furans	± 30% RPD	laboratory QC limits	95%

[a] Values listed are performance-based limits provided by the laboratories.

[b] Values represent a range for all parameters.

CV – coefficient of variation
PCB – polychlorinated biphenyl
QC – quality control
RPD – relative percent difference
SVOC – semivolatile organic compound
TBT – tributyltin
TOC – total organic carbon

Table 6. QC acceptance criteria for dioxins/furans

Dioxin/Furan Compounds	Sediment RL (ng/kg dw)	Test Conc. ng/mL[a]	IPR[b]		OPR[c] (%)	I-CAL[d] (%)	CAL/VER[e] (%) (Coeff. of Variation)	Labelled Cmpd %Rec. in Sample	
			RSD (%)	Recovery				Warning Limit	Control Limit
Native Compound									
2,3,7,8-TCDD	1.0	10	28	83-129	70–130	20	78–129	-	-
2,3,7,8-TCDF	1.0	10	20	87–137	75–130	20	84–120	-	-
1,2,3,7,8-PeCDD	1.0	50	15	76–132	70–130	20	78–130	-	-
1,2,3,7,8-PeCDF	2.5	50	15	86–124	80–130	20	82–120	-	-
2,3,4,7,8-PeCDF	1.0	50	17	72–150	70–130	20	82–122	-	-
1,2,3,4,7,8-HxCDD	2.5	50	19	78–152	70–130	20	78–128	-	-
1,2,3,6,7,8-HxCDD	2.5	50	15	84–124	76–130	20	78–128	-	-
1,2,3,7,8,9-HxCDD	2.5	50	22	74–142	70–130	35	82–122	-	-
1,2,3,4,7,8-HxCDF	2.5	50	17	82–108	72–130	20	90–112	-	-
1,2,3,6,7,8-HxCDF	2.5	50	13	92–120	84–130	20	88–114	-	-
1,2,3,7,8,9-HxCDF	2.5	50	13	84–122	78–130	20	90–112	-	-
2,3,4,6,7,8-HxCDF	2.5	50	15	74–158	70–130	20	88–114	-	-
1,2,3,4,6,7,8-HpCDD	2.5	50	15	76–130	70–130	20	86–116	-	-
1,2,3,4,6,7,8-HpCDF	2.5	50	13	90–112	82–122	20	90–110	-	-
1,2,3,4,7,8,9-HpCDF	2.5	50	16	86–126	78–130	20	86–116	-	-
OCDD	5.0	100	19	86–126	78–130	20	79–126	-	-
OCDF	5.0	100	27	74–146	70–130	35	70–130	-	-
Labeled Compounds									
13C12-2,3,7,8-TCDD	-	100	37	28–134	25–130	35	82–121	40–120	25–130
13C12-2,3,7,8-TCDF	-	100	35	31–113	25–130	35	71–130	40–120	24–130
13C12-1,2,3,7,8-PeCDD	-	100	39	27–184	25–150	35	70–130	40–120	25–130

Dioxin/Furan Compounds	Sediment RL (ng/kg dw)	Test Conc. ng/mL[a]	IPR[b]		OPR[c] (%)	I-CAL[d] (%)	CAL/VER[e] (%) (Coeff. of Variation)	Labelled Cmpd %Rec. in Sample	
			RSD (%)	Recovery				Warning Limit	Control Limit
13C12-1,2,3,7,8-PeCDF	-	100	34	27–156	25–130	35	76–130	40–120	24–130
13C12-2,3,4,7,8-PeCDF	-	100	38	16–279	25–130	35	77–130	40–120	21–130
13C12-1,2,3,4,7,8-HxCDD	-	100	41	29–147	25–130	35	85–117	40–120	32–130
13C12-1,2,3,6,7,8-HxCDD	-	100	38	34–122	25–130	35	85–118	40–120	28–130
13C12-1,2,3,4,7,8-HxCDF	-	100	43	27–152	25–130	35	76–130	40–120	26–130
13C12-1,2,3,6,7,8-HxCDF	-	100	35	30–122	25–130	35	70–130	40–120	26–123
13C12-1,2,3,7,8,9-HxCDF	-	100	40	24–157	25–130	35	74–130	40–120	29–130
13C12-2,3,4,6,7,8-HxCDF	-	100	37	29–136	25–130	35	73–130	40–120	28–130
13C12-1,2,3,4,6,7,8-HpCDD	-	100	35	34–129	25–130	35	72–130	40–120	23–130
13C12-1,2,3,4,6,7,8-HpCDF	-	100	41	32–110	25–130	35	78–129	40–120	28–130
13C12-1,2,3,4,7,8,9-HpCDF	-	100	40	28–141	25–130	35	77–129	40–120	26–130
13C12-OCDD	-	200	48	20–138	25–130	35	70–130	25–120	17–130
Cleanup Standard									
37Cl4-2,3,7,8-TCDD	-	10	36	39–154	31–130	35	79–127	40–120	35–130

Table source: DMMP (2010)

[a] QC acceptance criteria for IPR, OPR, and samples based on a 20-µL extract final volume.

[b] IPR: Initial Precision and Recovery demonstration

[c] OPR: Ongoing Precision and Recovery test run with every batch of samples.

[d] I-CAL: Initial Calibration

[e] CAL/VER: Calibration Verification test run at least every 12 hours.

DMMP – Dredged Materials Management Program
dw – dry weight
HpCDD – heptachlorodibenzo-*p*-dioxin
HpCDF – heptachlorodibenzofuran
HxCDD – hexachlorodibenzo-*p*-dioxin
HxCDF – hexachlorodibenzofuran
OCDD – octachlorodibenzo-*p*-dioxin
OCDF – octachlorodibenzofuran
PeCDD – pentachlorodibenzo-*p*-dioxin
PeCDF – pentachlorodibenzofuran
QC – quality control
RL – reporting limit
RSD – relative standard difference
TCDD – tetrachlorodibenzo-p-dioxin
TCDF – tetrachlorodibenzofuran

Surrogates will be required (organics only) for every sample, including matrix spike (MS) samples and blanks. Matrix spikes (MS) and matrix spike duplicates (MSDs) will be required for SVOCs for every 20 samples received or at the request of the client. Matrix triplicates will be analyzed for conventional parameters (e.g., total organic carbon [TOC]).

All samples will be diluted and re-analyzed if target compounds are detected at levels that exceed their respective established calibration ranges. Re-analyses will be performed if surrogate or internal standard recoveries are outside control limits to demonstrate matrix effects. QC samples may be re-analyzed once if results are not within control limits, and if it cannot be determined that the sample matrix is the cause.

5.3 LABORATORY DATA REPORT

The laboratory will prepare a detailed report that documents all activities associated with the sample analyses. Included in this report will be:

- **Project Narrative:** A detailed description of the samples received, analyses performed, and corrective actions taken
- **Chain-of-Custody Documentation:** Chain-of-custody documentation must be available for all samples at all laboratories. The chain-of-custody will document basic sample identifiers such as client and project name, sample name, sample collection date and time, analyses requested, sampler's name or initials, and special instructions.
- **Data Summary Forms:** A tabular listing of concentrations and RLs for all target analytes. The data summary report forms or other supplemental forms will also list other pertinent information, such as amount of sample analyzed, dilution factors, sample processing dates, extract cleanups, and surrogate recoveries.
- **QA Summary:** Results of all QC analyses, specifically recovery and precision information. LCSs will be reported with each batch, when applicable, as listed in Table 4. Additional QC analyses will include laboratory replicates, MSs, and SRMs.
- **Instrument Calibration Forms and Raw Data:** Initial and continuing calibration summaries, instrument tuning data for mass spectroscopy analyses, laboratory bench sheets, quantitation reports, chromatograms, preparatory log book pages, and instrument log book pages

The laboratory will also provide deliverables in standard electronic data deliverable (EDD), format as specified by the project QA/QC coordinator.

5.4 DATA VALIDATION

LDC will conduct a summary data validation of all of the chemistry results, focusing on the results from the analysis of QA/QC samples specified in Tables 5 and 6.

6 Reporting

A final report documenting all activities associated with collecting, transporting, and chemically analyzing sediment samples will be prepared by Windward. Chemistry data will be provided in EIM format. The chemical laboratory reports will be included as appendices. The final report will include the following:

- Summary of all field activities, including a description of any deviations from the approved SAP and effects of deviations on testing results
- Positions of sediment sampling locations in state plane coordinates (North American Datum of 1983 [NAD83]) to the nearest foot, and in latitude and longitude in degrees and minutes to four decimal places
- Project map with target and actual sampling locations
- Appendices, including the laboratory chemistry data report, validation data report, and all field forms and chain-of-custody forms
- Data results, including copies of field data and laboratory analysis results. Associated QA/QC data and electronic copies of data will be available in a standard EDD format, upon request.

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7 References

DMMP. 2010. Revised supplemental information on polychlorinated dioxins and furans (PCDD/F) for use in preparing a quality assurance project plan (QAPP). Dredged Material Management Program (DMMP): Washington State Department of Natural Resources, Olympia, WA; US Army Corps of Engineers, Seattle District, Seattle, WA; US Environmental Protection Agency, Region 10, Seattle, WA; Washington State Department of Ecology, Seattle, WA.

Plumb R, Jr. 1981. Procedures for handling and chemical analysis of sediment and water samples. Waterways Experiment Station, US Army Corps of Engineers, Vicksburg, MS.

PSEP. 1986. Recommended protocols for measuring conventional sediment variables in Puget Sound. Prepared for the Puget Sound Estuary Program, US Environmental Protection Agency, Region 10. Tetra Tech, Seattle, WA.

PSEP. 1997a. Recommended guidelines for measuring organic compounds in Puget Sound water, sediment and tissue samples. Prepared for Puget Sound Estuary Program, US Environmental Protection Agency Region 10. King County (METRO) Environmental Laboratory, Seattle, WA.

PSEP. 1997b. Recommended guidelines for sampling marine sediment, water column, and tissue in Puget Sound. Prepared for the Puget Sound Estuary Program, US Environmental Protection Agency, Region 10. King County (METRO) Environmental Laboratory, Seattle, WA.

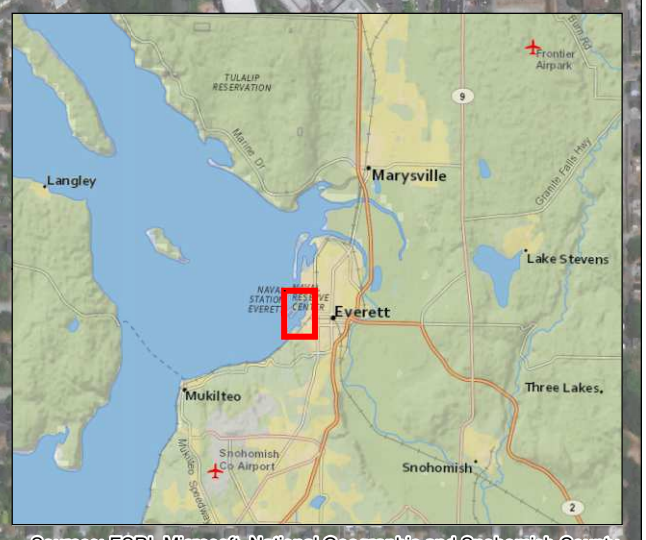
PSEP. 1997c. Recommended quality assurance and quality control guidelines for the collection of environmental data in Puget Sound. Prepared for Puget Sound Estuary Program, US Environmental Protection Agency Region 10. King County (METRO) Environmental Laboratory, Seattle, WA.

USACE, EPA, WDNR, Ecology. 2018. Dredged material evaluation and disposal procedures. User manual. Dredged Material Management Program: US Army Corps of Engineers, Seattle District, Seattle, WA; US Environmental Protection Agency, Region 10, Seattle, WA; Washington State Department of Natural Resources; and Washington State Department of Ecology, Olympia, WA.

Sampling Area

Pier 3

Port of Everett Marine Terminals



Sources: ESRI, Microsoft, National Geographic and Snohomish County
Imagery date: August 2011

WindWard environmental LLC

N

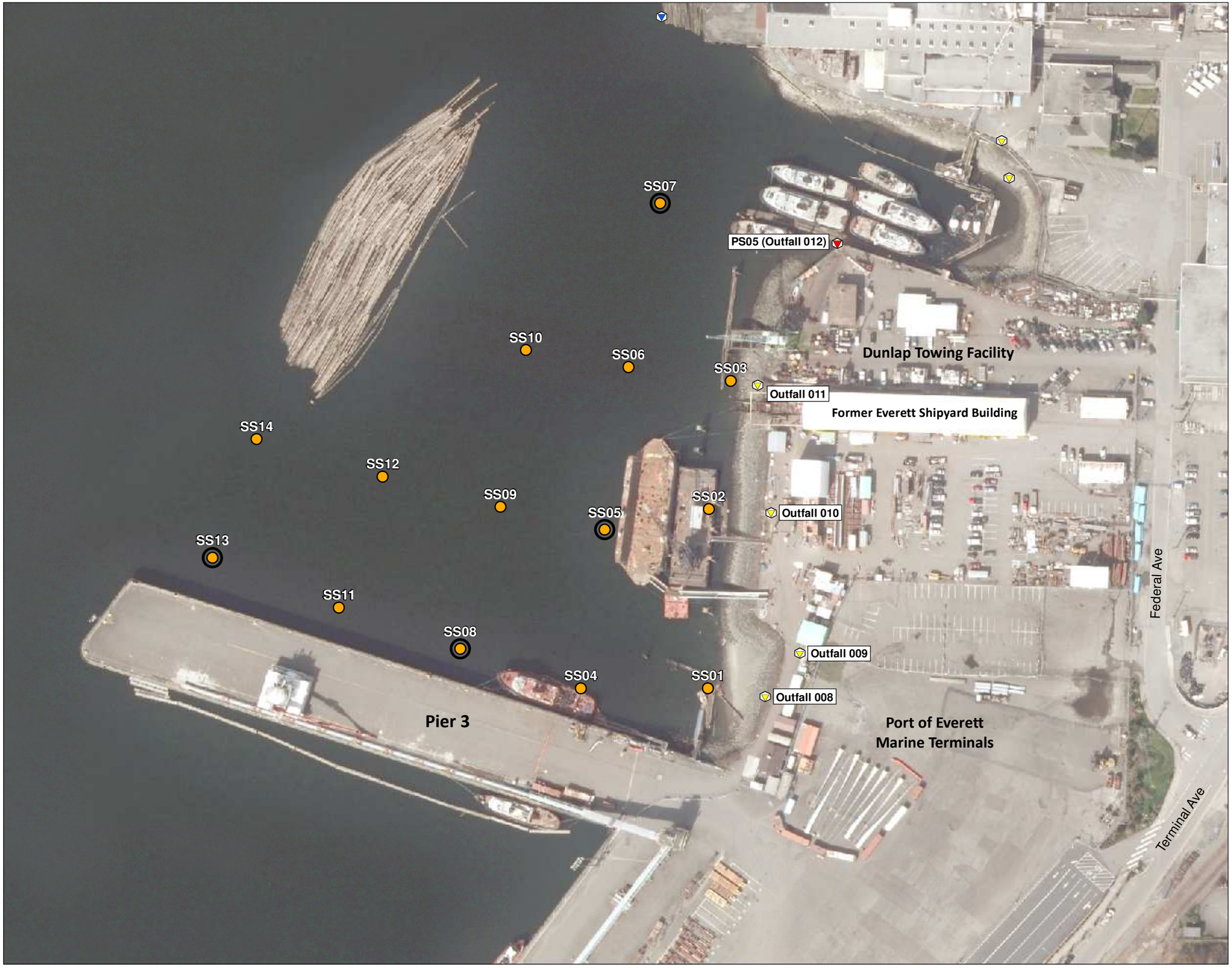
0 400 800 Feet

0 100 200 Meters

Map 1. Sampling area within the East Waterway

DRAFT

Prepared by craigh, 9/17/2019; W:\Projects\Port of Everett -Pier 3 NGIS\Maps and Analyses\SAP\7099 Site location.mxd



Proposed sampling stations

- SMS and TBT
- SMS, TBT, and dioxins/furans

Outfalls

- City CSO
- Historical industrial
- Storm drain

N

0 100 200 Feet

0 20 40 Meters

Map 2. Sediment sampling locations

DRAFT

Windward environmental LLC

Prepared by craigh, 9/17/2019, W:\Projects\Port of Everett_Pier 3 N\GIS\Maps and Analyses\SAP 7098 Proposed sampling locations.mxd

APPENDIX A. DATA COLLECTION FORMS

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FORM 1. SURFACE SEDIMENT COLLECTION FORM

SURFACE SEDIMENT COLLECTION FORM

Project Name: _____ **Project no.:** _____

Date: _____ **Weather:** _____

Sampling Method: _____ **Crew:** _____

GRAB DATA	**Location ID:**				
Latitude/Northing(Y):				**Longitude/Easting(X):**	
Grab time	**Water depth (ft)**	**Penetration depth (cm)**	**Acceptable grab (Y/N)**	**Benthic Community Subsample ID**	**Comments**
SAMPLE DATA	**Sample ID:**				
Pre-homogenization analyses (circle): VOC Sulfides Ammonia AVS/SEM TPH-P Other:					

Sediment type	**Sediment color**	**Sediment odor**		**Comments:**
cobble	brown surface	none	H_2S	
gravel	drab olive	slight	petroleum	
sand (F M C)	brown	moderate	other:	
silt	gray	strong		
clay	black			

GRAB DATA	**Location ID:**				
Latitude/Northing(Y):				**Longitude/Easting(X):**	
Grab time	**Water depth (ft)**	**Penetration depth (cm)**	**Acceptable grab (Y/N)**	**Benthic Community Subsample ID**	**Comments**
SAMPLE DATA	**Sample ID:**				
Pre-homogenization analyses (circle): VOC Sulfides Ammonia AVS/SEM TPH-P Other:					

Sediment type	**Sediment color**	**Sediment odor**		**Comments:**
cobble	brown surface	none	H_2S	
gravel	drab olive	slight	petroleum	
sand (F M C)	brown	moderate	other:	
silt	gray	strong		
clay	black			

FORM 2: PROTOCOL MODIFICATION FORM

Project Name and Number: _____

Material to be Sampled: _____

Measurement Parameter: _____

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Reason for Change in Field Procedure or Analysis Variation: _____

Variation from Field or Analytical Procedure: _____

Special Equipment, Materials or Personnel Required: _____

Initiator's Name: _____ Date: _____

Project Officer: _____ Date: _____

QA Officer: _____ Date: _____

PORT OF EVERETT PIER 3 N BASELINE SEDIMENT SAMPLING

APPENDIX B: HEALTH AND SAFETY PLAN

Prepared for:

Port of Everett
PO Box 538
Everett, WA 98206

September 18, 2019

Prepared by: Windward environmental LLC

200 West Mercer Street, Suite 401 ♦ Seattle, Washington ♦ 98119

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Health and Safety Plan

By their signature, the undersigned certify that this health and safety plan is approved and that it will be used to govern health and safety aspects of fieldwork described in the quality assurance project plan to which it is attached.

09/17/19

Kathy Godtfredsen — Date

Project Manager

09/17/19

Susan McGroddy — Date

Corporate Health and Safety Manager

09/17/19

Thai Do — Date

Field Coordinator/Health and Safety Officer

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Acronyms

AED	automated external defibrillator
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
FC	field coordinator
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	health and safety manager
HSO	health and safety officer
HSP	health and safety plan
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PEC	project emergency coordinator
PFD	personal flotation device
Port	Port of Everett
PPE	personal protective equipment
PM	project manager
QAPP	quality assurance project plan
TCDD	tetrachlorodibenzo-*p*-dioxin
USCG	US Coast Guard

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1 Introduction

This site-specific health and safety plan (HSP) describes safe working practices for conducting field activities at potentially hazardous sites and for handling potentially hazardous materials or waste products. This HSP covers elements as specified in 29CFR1910§120. The goal of the HSP is to establish procedures for safe working practices for all field personnel.

This HSP addresses all activities associated with collection and handling of surface sediment samples in an area north of Pier 3 within the East Waterway (hereinafter referred to as the Site). During Site work, this HSP will be implemented by the field coordinator (FC), who is also the designated site health and safety officer (HSO), in cooperation with the corporate health and safety manager (HSM) and the project manager (PM).

All personnel involved in fieldwork on this project are required to comply with this HSP. The content of this HSP reflects the types of activities that are anticipated to be performed, knowledge of the physical characteristics of the site, and consideration of preliminary chemical data from previous investigations at the site. The HSP may be revised based on new information and/or changed conditions during site activities. Revisions will be documented in the project records.

2 Site Description and Project Scope

2.1 SITE DESCRIPTION

The area to be sampled is north of Pier 3 within the East Waterway, just offshore of property that the Port of Everett (Port) leases. A new shipyard tenant is completing the permitting process for operations on-site, including a dry dock in the water. The dry dock will tie up to the upland site as well as Pier 3 (Figure 1). As part of the permitting process, the Port and the new tenant deemed it mutually beneficial to conduct a focused characterization of nearby sediment to provide baseline data for the tenant.

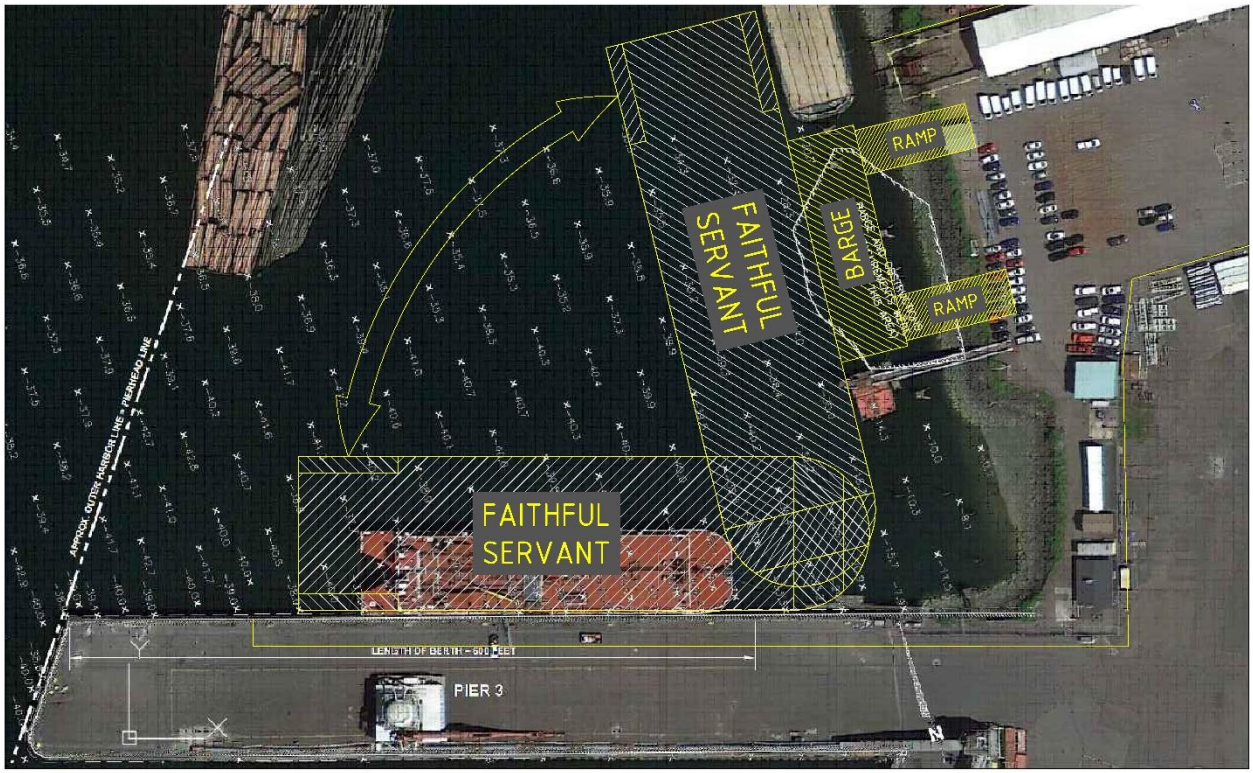

Figure 1. Locations where dry dock may be positioned

2.2 SCOPE AND DURATION OF WORK

Surface sediment grab samples will be collected using a pneumatic grab sampler, deployed from a research vessel. Additional details on the sampling design and sampling methods are provided in Sections 3 and 4 of the *Pier 3 N Baseline Surface Sediment Characterization Sampling and Analysis Plan*, respectively.

3 Health and Safety Personnel

Key health and safety personnel and their responsibilities are described below. These individuals are responsible for the implementation of this HSP.

Project Manager: The PM has overall responsibility for the successful outcome of the project. The PM will ensure that adequate resources and budget are provided for the health and safety staff to carry out their responsibilities during fieldwork. The PM, in consultation with the HSM, makes final decisions concerning the implementation of the HSP.

Field Coordinator/Health and Safety Officer: Because of the limited scope and duration of fieldwork, the FC and HSO will be the same individual. The FC/HSO will direct field sampling activities, coordinate the technical components of the field

program with health and safety components, and ensure that work is performed according to the QAPP. The FC/HSO will implement this HSP at the work location and will be responsible for all health and safety activities and the delegation of duties to a health and safety technician in the field, if appropriate. The FC/HSO also has stop-work authority, to be used if there is an imminent safety hazard or potentially dangerous situation. The FC/HSO or her designee shall be present during sampling and operations.

Corporate Health and Safety Manager: The HSM has overall responsibility for the preparation, approval, and revision of this HSP. The HSM will not necessarily be present during fieldwork but will be readily available, if required, for consultation regarding health and safety issues during fieldwork.

Field Crew: All field crew members must be familiar and comply with the information in this HSP. They also have the responsibility to report any potentially unsafe or hazardous conditions to the FC/HSO immediately.

4 Hazard Evaluation and Control Measures

This section discusses potential physical and chemical hazards that may be associated with the proposed project activities and presents control measures for addressing these hazards. The activity hazard analysis (Section 4.4) lists the potential hazards associated with each site activity and the recommended site control. Confined space entry will not be necessary for this project. Therefore, hazards associated with this activity are not discussed in this HSP.

4.1 PHYSICAL HAZARDS

For this project, it is anticipated that physical hazards present a greater risk of injury than do chemical hazards.

4.1.1 Slips, trips, and falls

As with all fieldwork sites, caution should be exercised to prevent slips on slick surfaces. In particular, sampling from a boat or other floating platform requires careful attention to minimize the risk of falling down or falling overboard. The same care should be used in rainy conditions or on the shoreline where there are slick rocks. Slips can be minimized through the use of boots with good treads, made of material that does not become overly slippery when wet.

Trips are always a hazard on the uneven deck of a boat, in cluttered work areas, or in the intertidal zone where uneven substrate is common. Personnel will keep work areas as free as possible from obstacles that could interfere with walking.

Falls can also be a hazard. Personnel can avoid falls by working as far from exposed edges as possible, erecting railings, and using fall protection when working on

elevated platforms. For this project, no work that would present a fall hazard is anticipated.

4.1.2 Sampling equipment

A pneumatic grab sampler will be deployed from the boat to collect sediment cores. Care will be taken to ensure that the sampler is safely guided over the railing and into the water. Before sampling activities begin, there will be a training session for all field personnel for the equipment that will be onboard the sampling vessel.

4.1.3 Falling overboard

Most of the sampling activities will be done from a boat. As with any work from a floating platform, there is a chance of falling overboard. Personal flotation devices (PFDs) will be worn by all personnel while working from the boat.

4.1.4 Manual lifting

Equipment and samples must be lifted and carried. Back strain can result if lifting is done improperly. During any manual handling tasks, personnel should lift with the load supported by their legs, not their backs. For heavy loads, an adequate number of people, or if possible, a mechanical lifting/handling device, will be used.

4.1.5 Heat stress, hypothermia, or frostbite

Sampling operations and conditions that might result in the occurrence of heat stress are not anticipated. The sampling will occur during the time of year when cold weather conditions may occur, making hypothermia or frostbite a concern. The FC/HSO will monitor all crew members for early symptoms of hypothermia (e.g., shivering, muscle incoordination, mild confusion). If such symptoms are observed, the FC/HSO will take immediate steps to reduce heat loss by providing extra layers of clothing or by temporarily moving the affected crew member to a warmer environment.

4.1.6 Weather

In general, field team members will be equipped for the normal range of weather conditions. The FC/HSO will be aware of current weather conditions and of the potential for those conditions to pose a hazard to the field crew. Some conditions that might force work stoppage are electrical storms, high winds, or high waves resulting from winds.

4.1.7 Sharp objects

Sampling operations might result in the exposure of field personnel to sharp objects on top of or buried within the sediment. If these objects are encountered, field personnel should not touch them. Also, field personnel should not dig in the sediment by hand.

4.2 VESSEL HAZARDS

Because of the high volumes of vessel traffic in and around the Site, precautions and safe boating practices will be implemented to ensure that the field boat does not interrupt vessel traffic. Additional potential vessel emergency hazards and responses are listed in Table 1.

Table 1. Potential vessel emergency hazards and responses

Potential Emergency or Hazard	Response
Fire or explosion	If manageable, personnel should attempt to put out a small fire with a fire extinguisher. Otherwise, personnel should call the USCG or 911 and evacuate the area (by rescue boat or swimming) and meet at a designated area. The FC/HSO will take roll call to make sure everyone evacuated safely. Emergency meeting places will be determined in the field during the daily safety briefing.
Medical emergency or injury	At least one person with current first aid and CPR training will be aboard the vessel at all times. This person will attempt to assess the nature and severity of the injury, immediately call 911, and perform CPR if necessary. Personnel should stop work and wait for medical personnel to arrive. Once the emergency has passed, the FC/HSO should fill out a site accident report.
Person overboard	All personnel aboard the sampling vessel will wear PFDs at all times. One person should keep an eye on the individual who fell overboard and shout the distance (boat lengths) and direction (o'clock) of the individual from the vessel. Personnel should stop work and use the vessel to retrieve the individual in the water.
Sinking vessel	Personnel should call the USCG immediately. If possible, personnel should wait for a rescue boat to arrive to evacuate vessel personnel. See fire or explosion (above) for emergency evacuation procedures. The FC/HSO will take a roll call to make sure everyone is present.
Lack of visibility	If navigation visibility or personal safety is compromised because of smoke, fog, or other unanticipated hazards, personnel should stop work immediately. The vessel operator and FC/HSO will assess the hazard and, if necessary, send out periodic horn blasts to mark vessel location to other vessels potentially in the area, move to a secure location (i.e., berth), and wait for the visibility to clear.
Loss of power	Personnel should stop work and call the USCG for assistance. Personnel should use oars to move the vessel towards the shoreline. Other vessel personnel should watch for potential collision hazards and notify the vessel operator if hazards exist. Personnel should secure the vessel to a berth, dock, or mooring as soon as possible.
Collision	Personnel should stop work and call the USCG for assistance. The FC/HSO and vessel operator will assess damage and potential hazards. If necessary, the vessel will be evacuated and secured until repairs can be made.

CPR – cardiopulmonary resuscitation
FC – field coordinator
HSO – health and safety officer
PFD – personal flotation device
USCG – US Coast Guard

4.3 CHEMICAL HAZARDS

Previous investigations have shown that some chemical substances are present at higher-than-background concentrations in the sampling area. For the purpose of discussing potential exposure to substances in sediments, the chemicals of concern are dioxins and furans.

4.3.1 Exposure routes

Potential routes of chemical exposure include inhalation, dermal contact, and ingestion. Exposure will be minimized by using safe work practices and by wearing the appropriate personal protective equipment (PPE). Further discussion of PPE requirements is presented in Section 7.

Inhalation — Inhalation is not expected to be an important route of exposure for this project.

Dermal exposure — Dermal exposure to hazardous substances associated with sediments, surface water, or equipment decontamination will be controlled through the use of PPE and adherence to detailed sampling and decontamination procedures.

Ingestion — Ingestion is not considered a major route of exposure for this project. Accidental ingestion of surface water is possible. However, careful handling of equipment and containers aboard the boat should prevent the occurrence of water splashing or spilling during sample collection and handling activities.

4.3.2 Chemical hazards

Dioxins/furans — Prolonged skin contact with dioxins/furans may cause acne-like symptoms known as chloracne. Other effects to the skin, such as red skin rashes, have been reported to occur in people following exposure to high concentrations of 2,3,7,8- tetrachlorodibenzo-*p*-dioxin (TCDD). Acute and chronic exposure can damage the liver, result in an increase in the risk of diabetes and abnormal glucose tolerance, and may increase the risk for reproductive and developmental effects. 2,3,7,8-TCDD is a possible human carcinogen, and a mixture of dioxins/furans with six chlorine atoms (four of the six chlorine atoms at the 2, 3, 7, and 8 positions) is a probable human carcinogen. Skin absorption may substantially contribute to the uptake of dioxins/furans. Large amounts of sediment would need to be ingested for any detrimental effects to occur. Momentary skin contact allows little, if any, opportunity for the passage of any of the compounds into the body. Field procedures require the immediate washing of sediments from exposed skin.

4.4 Activity Hazard Analysis

The activity hazard analysis summarizes the field activities to be performed during the project, outlines the hazards associated with each activity, and presents controls that can reduce or eliminate the risk of the hazard occurring. Table 2 presents the activity hazard analysis for sampling from a boat and scuba diving.

Table 2. Activity hazard analysis

Activity	Hazard	Control
Sampling from a boat	falling overboard	Use care in boarding and departing from vessel. Wear a PFD.
	skin contact with contaminated sediments or liquids	Wear modified Level D PPE.
	back strain	Use appropriate lifting techniques when transporting equipment and supplies to or from the boat or seek help.

PFD – personal flotation device
PPE – personal protective equipment

5 Work Zones and Shipboard Access Control

During sampling and sample handling activities, work zones will be established to identify where sample collection and processing are actively occurring. The intent of the zone is to limit the migration of sample material out of the zone and to restrict access to active work areas by defining work zone boundaries.

5.1 WORK ZONE

The work zone on the boat will encompass the area where sample collection and handling activities are performed. The work zone in the core processing area will include the immediate area surrounding the core samples and the jar labeling area. Only persons with appropriate training, PPE, and authorization from the FC/HSO will be allowed to enter the work zone while work is in progress.

5.2 DECONTAMINATION STATION

A decontamination station will be set up, and personnel will clean soiled boots or PPE prior to leaving the work zone. The station will have the buckets, brushes, soapy water, rinse water, or wipes necessary to clean boots, PPE, or other equipment leaving the work zones. Plastic bags will be provided for expendable and disposable materials. If the location does not allow for the establishment of a decontamination station, the FC/HSO will provide alternatives to prevent the spread of contamination.

Decontamination of the boat will also be completed at the end of each work day. Cockpit and crew areas will be rinsed down with site water to minimize the accumulation of sediment.

5.3 ACCESS CONTROL

Boat security and access control will be the responsibility of the FC/HSO and boat captain. Boat access will be granted only to essential project personnel and

authorized visitors. Any security or access control problems will be reported to the PM or appropriate authorities.

6 Safe Work Practices

Following common sense rules will minimize the risk of exposure or accident at the work site. The general safety rules listed below will be followed onsite:

- Do not climb over or under obstacles of questionable stability.
- Do not eat, drink, smoke, or perform other hand-to-mouth transfers in the work zone.
- Work only in well-lighted spaces.
- Never enter a confined space without the proper training, permits, and equipment.
- Make eye contact with equipment operators when moving within the range of their equipment.
- Be aware of the movements of shipboard equipment when not in the operator's range of vision.
- Get immediate first aid for all cuts, scratches, abrasions, or other minor injuries.
- Use the established sampling and decontamination procedures.
- Always use the buddy system.
- Be alert to your own and other workers' physical condition.
- Report all accidents, no matter how minor, to the FC/HSO.
- Do not do anything dangerous or unwise even if ordered by a supervisor.

7 Personal Protective Equipment and Safety Equipment

Appropriate PPE will be worn as protection against potential hazards. In addition, a PFD will be required for all personnel when working aboard the boat. Prior to donning PPE, personnel will inspect their PPE for any defects that might render the equipment ineffective.

Fieldwork will be conducted in Level D or modified Level D PPE, as discussed in Sections 7.1 and 7.2. Situations that would require PPE beyond modified Level D are not anticipated. Should the FC/HSO determine that PPE beyond modified Level D is necessary, the HSM will be notified and alternative PPE selected.

7.1 LEVEL D PERSONAL PROTECTIVE EQUIPMENT

Individuals performing general activities in which skin contact with contaminated materials is unlikely will wear Level D PPE. Level D PPE includes the following:

- Cotton overalls or lab coats
- Chemical-resistant steel-toed boots
- Chemical-resistant gloves
- Safety glasses

7.2 MODIFIED LEVEL D PERSONAL PROTECTIVE EQUIPMENT

Individuals performing activities in which skin contact with contaminated materials is possible but inhalation risks are not expected will be required to wear an impermeable outer suit. The type of outerwear will be chosen according to the types of chemical contaminants that might be encountered. Modified Level D PPE includes the following:

- Impermeable outer garb, such as rain gear or waders
- Chemical-resistant steel-toed boots
- Chemical-resistant outer gloves

7.3 SAFETY EQUIPMENT

In addition to the above-identified PPE, basic emergency and first aid equipment will also be provided. Equipment for the field team will include:

- A copy of this HSP
- First aid kit adequate for the number of personnel in the field crew
- Emergency eyewash

The FC/HSO will ensure that the safety equipment is available. Equipment will be checked daily to ensure its readiness for use.

8 Monitoring Procedures for Site Activities

A monitoring program that addresses the potential site hazards will be implemented. For this project, air, dust, and noise monitoring will not be necessary. The sampled media will be wet and will not pose a dust hazard, and equipment emitting high-amplitude (>85 dBA) sound will be not be used. Because sampling is occurring outdoors on a boat, air monitoring is not anticipated to be necessary.

For this project, the monitoring program will include all individuals monitoring themselves and their co-workers for signs of potential physical stress or illness. All personnel will be instructed to look for and inform each other of any deleterious

changes in their physical or mental conditions during the performance of all field activities. Examples of such changes are as follows:

- Headaches
- Dizziness
- Nausea
- Symptoms of heat stress
- Blurred vision
- Cramps
- Irritation of eyes, skin, or respiratory system
- Changes in complexion or skin color
- Changes in apparent motor coordination
- Increased frequency of minor mistakes
- Excessive salivation or changes in papillary response
- Changes in speech ability or speech pattern
- Shivering
- Blue lips or fingernails

If any of these conditions develop, work will be halted immediately and the affected person(s) evaluated. If further assistance is needed, personnel at the local hospital will be notified, and an ambulance will be summoned if the condition is thought to be serious. If the condition is the direct result of sample collection or handling activities, procedures will be modified to address the problem.

9 Decontamination

Decontamination is necessary to prevent the migration of contaminants from the work zone(s) into the surrounding environment and to minimize the risk of exposure of personnel to contaminated materials that might adhere to PPE. The following subsections discuss personnel and equipment decontamination. The following supplies will be available to perform decontamination activities:

- Wash buckets
- Rinse buckets
- Long-handled scrub brushes
- Clean water sprayers
- Paper towels

- Plastic garbage bags
- Alconox® or similar decontamination solution

9.1 MINIMIZATION OF CONTAMINATION

The first step in addressing contamination is to prevent or minimize exposure to existing contaminated materials and the spread of those materials. During field activities, the FC/HSO will enforce the following measures:

Personnel

- Do not walk through areas of obvious or known contamination.
- Do not handle, touch, or smell contaminated materials directly.
- Make sure PPE has no cuts or tears prior to use.
- Fasten all closures on outer clothing, covering with tape if necessary.
- Protect and cover any skin injuries.
- Stay upwind of airborne dusts and vapors.
- Do not eat, drink, chew tobacco, or smoke in the work zones.

Sampling equipment and boat

- Place clean equipment on a plastic sheet or aluminum foil to avoid direct contact with contaminated media.
- Keep contaminated equipment and tools separate from clean equipment and tools.
- Clean boots before entering the boat.

9.2 PERSONNEL DECONTAMINATION

The FC/HSO will ensure that all site personnel are familiar with personnel decontamination procedures. Personnel will perform decontamination procedures, as appropriate, before eating lunch, taking a break, or leaving the work location. Decontamination procedures for field personnel include:

1. Rinse off the outer suit if it is heavily soiled.
2. Wash and rinse outer gloves and boots with water.
3. Remove and inspect outer gloves and discard them if damaged.
4. Wash hands if taking a break.
5. Don necessary PPE before returning to work.
6. Dispose of soiled, disposable PPE before leaving for the day.

In addition to the decontamination procedures listed above, divers will:

1. Thoroughly rinse dive suit and gear after each dive.
2. Inspect gear for mud or stains and re-rinse or scrub with Alconox®, if necessary.
3. Discard any damaged or heavily soiled gear after the project, if necessary.
4. Launder dry suit underwear after the project.

9.3 SAMPLING EQUIPMENT DECONTAMINATION

Before use at each sampling location, the grab sampler will be rinsed in site water to dislodge and remove any sediment and decontaminated to ensure that it is cleared of all debris before use. Stainless steel spoons and bowls will also be decontaminated before each sample is collected.

9.4 VESSEL DECONTAMINATION

Most sampling will be conducted from a boat. Care will be taken to minimize the amount of sediment spilled on the vessel. The vessel deck will be hosed off regularly to remove sediment from the cockpit and crew areas to minimize slipping hazards and the transport of sediment on boots through work zones.

10 Disposal of Contaminated Materials

Contaminated materials that may be generated during field activities include PPE, decontamination fluids, and excess sample material. These contaminated materials will be disposed of as an integral part of the project.

10.1 PERSONAL PROTECTIVE EQUIPMENT

Gross surface contamination will be removed from PPE. All disposable sampling materials and PPE, such as disposable coveralls, gloves, and paper towels used in the sample processing, will be placed in heavyweight garbage bags. Filled garbage bags will be placed in a normal refuse container for disposal as solid waste.

10.2 EXCESS SAMPLE MATERIALS

At each sampling location, excess sediment collected will be returned to the collection location.

11 Training Requirements

Individuals who perform work at locations where potentially hazardous materials and conditions may be encountered must meet specific training requirements. It is not anticipated that hazardous concentrations of contaminants will be encountered in sampled material, so training will consist of site-specific instruction for all personnel

and the oversight of inexperienced personnel by an experienced person for one working day. The following subsections describe the training requirements for this fieldwork.

11.1 PROJECT-SPECIFIC TRAINING

In addition to Hazardous Waste Operations and Emergency Response (HAZWOPER) training, as described in Section 2.5 of the QAPP, field personnel will undergo training specifically for this project. All personnel must read this HSP and be familiar with its contents before beginning work. Personnel will acknowledge reading the HSP by signing the Field Team Health and Safety Plan Review Form (Attachment 1). The completed form will be kept in the project files.

The boat captain and FC/HSO or a designee will provide project-specific training prior to the first day of fieldwork and whenever new workers arrive. Field personnel will not be allowed to begin work until project-specific training has been completed and documented by the FC/HSO. Training will address the HSP and all health and safety issues and procedures pertinent to field operations. Training will include, but not be limited to, the following topics:

- Activities with the potential for chemical exposure
- Activities that pose physical hazards, and actions to control the hazard
- Ship access control and procedure
- Use and limitations of PPE
- Decontamination procedures
- Emergency procedures
- Use and hazards of sampling equipment
- Location of emergency equipment
- Vessel safety practices
- Emergency evacuation and emergency procedures

11.2 DAILY SAFETY BRIEFINGS

The FC/HSO or a designee and the boat captain will present safety briefings before the start of each day's activities. These safety briefings will outline the activities expected for the day, update work practices and hazards, address any specific concerns associated with the work location, and review emergency procedures and routes. The FC/HSO or designee will document safety briefings in the logbook.

11.3 FIRST AID AND CPR

At least one member of the field team must have first-aid and cardiopulmonary resuscitation (CPR) training. The first aid and CPR training should include

Automated External Defibrillator (AED) training. Documentation of which individuals possess first-aid and CPR training will be kept in the project health and safety files.

12 Medical Surveillance

A medical surveillance program conforming to the provisions of 29CFR1910§120(f) will not be necessary for field team members because the field team members do not meet any of the four criteria outlined in the regulations for the implementation of a medical surveillance program:

- Employees who are or may be exposed to hazardous substances or health hazards at or above permissible exposure levels for 30 days or more per year (1910.120(f)(2)(I)
- Employees who must wear a respirator for 30 days or more per year (1910.120(f)(2)(ii))
- Employees who are injured or become ill due to possible overexposures involving hazardous substances or health hazards from an emergency response or hazardous waste operation (1910.120(f)(2)(iii))
- Employees who are members of HAZMAT teams (1910.120(f)(2)(iv))

As described in Section 8, employees will monitor themselves and each other for any deleterious changes in their physical or mental condition during the performance of all field activities.

13 Reporting and Record Keeping

Each member of the field crew will sign the HSP review form (see Attachment 1). If necessary, accident/incident report forms and Occupational Safety and Health Administration (OSHA) Form 200s will be completed by the FC/HSO.

The FC/HSO or a designee will maintain a health and safety field logbook that records health-and-safety-related details of the project. Alternatively, entries may be made in the field logbook, in which case a separate health and safety field logbook will not be required. The logbook must be bound and the pages must be numbered consecutively. Entries will be made with indelible blue ink. At a minimum, each day's entries must include the following information:

- Project name or location
- Names of all personnel
- Weather conditions
- Type of fieldwork being performed

The individual maintaining the entries will initial and date the top or bottom of each completed page. Blank space at the bottom of an incompletely filled page will be lined out. Each day's entries will begin on the first blank page after the previous workday's entries.

14 Emergency Response Plan

As a result of the hazards and the conditions under which operations will be conducted, the potential exists for an emergency situation to occur. Emergencies may include personal injury, exposure to hazardous substances, fire, explosion, or release of toxic or non-toxic substances (i.e., spills). OSHA regulations require that an emergency response plan be available to guide actions in emergency situations.

Onshore organizations will be relied upon to provide response in emergency situations. The local fire department and ambulance service can provide timely response. Field personnel will be responsible for identifying emergency situations, providing first aid, if applicable, notifying the appropriate personnel or agency, and evacuating any hazardous area. Shipboard personnel will attempt to control only very minor hazards that could present an emergency situation, such as a small fire, and will otherwise rely on outside emergency response resources.

The following subsections identify the individual(s) who should be notified in case of emergency, provide a list of emergency telephone numbers, offer guidance for particular types of emergencies, and provide directions for getting from any sampling location to a hospital.

14.1 Pre-Emergency Preparation

Before the start of field activities, the FC/HSO will ensure that preparation has been made in anticipation of emergencies. This preparation includes the following:

- Meeting with equipment handlers concerning emergency procedures to be followed in the event of an injury
- Conducting a training session informing all field personnel of emergency procedures, locations of emergency equipment and their use, and proper evacuation procedures
- Conducting a training session (led by senior staff responsible for operating field equipment) to apprise field personnel of operating procedures and specific risks associated with field equipment
- Ensuring that field personnel are aware of the existence of the emergency response plan in the HSP and ensuring that a copy of the HSP accompanies the field team

14.2 PROJECT EMERGENCY COORDINATOR

The FC/HSO will serve as the project emergency coordinator (PEC) in the event of an emergency. She will designate a replacement for times when she is not available or is not serving as the PEC. The designation will be noted in the logbook. The PEC will be notified immediately when an emergency is recognized. The PEC will be responsible for evaluating the emergency situation, notifying the appropriate emergency response units, coordinating access with those units, and directing onboard interim actions before the arrival of emergency response units. The PEC will notify the HSM and the PM as soon as possible after initiating an emergency response action. The PM will have responsibility for notifying the client.

14.3 EMERGENCY RESPONSE CONTACTS

All personnel must know whom to notify in the event of an emergency situation, even though the FC/HSO has primary responsibility for notification. Table 3 lists the names and phone numbers for emergency response services and individuals.

Table 3. Emergency response contacts

Contact	Telephone Number
Emergency Numbers	
Ambulance	911
Police	911
Fire	911
Providence Regional Medical Center	425.261.2000
US Coast Guard Office Emergency General information	 206.286.5400 206.442.5295 UHF Channel 16
National Response Center	800.424.8802
US Environmental Protection Agency	908.321.6660
Washington State Department of Ecology Northwest Region Spill Response (24-hour emergency line)	206.649.7000
Project Management Emergency Contacts	
Susan McGroddy, Project Manager	206.812.5421
Mike Johns, Corporate Health and Safety Manager	206.812.5418
Thai Do, Field Coordinator/Health and Safety Officer	206.812.5407

14.4 RECOGNITION OF EMERGENCY SITUATIONS

Emergency situations will generally be recognizable through observation. An injury or illness will be considered an emergency if it requires treatment by a medical professional and cannot be treated with simple first-aid techniques.

14.5 DECONTAMINATION

In the case of evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. If an injured individual is also heavily contaminated and must be transported by emergency vehicle, the emergency response team will be informed of the type of contamination. To the extent possible, contaminated PPE will be removed but only if doing so does not exacerbate the injury. Plastic sheeting will be used to reduce the potential for spreading contamination to the inside of the emergency vehicle.

14.6 FIRE

Field personnel will attempt to control only small fires. If an explosion appears likely, personnel will follow evacuation procedures specified during the training session. If a fire cannot be controlled with the onboard fire extinguisher that is part of the required safety equipment, personnel will either withdraw from the vicinity of the fire or evacuate the site as specified during the training session.

14.7 PERSONAL INJURY

In the event of serious personal injury, including unconsciousness, possibility of broken bones, severe bleeding or blood loss, burns, shock, or trauma, the first responder will immediately do the following:

- Administer first aid, if qualified.
- If not qualified, seek out an individual who is qualified to administer first aid, if time and conditions permit.
- Notify the PEC of the incident, the name of the individual, the location, and the nature of the injury.

The PEC will immediately do the following:

- Notify the boat captain and FC/HSO, and the appropriate emergency response organization.
- Assist the injured individual.
- Follow the emergency procedures for retrieving or disposing of equipment and leave the site and proceed to the predetermined land-based emergency pick-up.
- Designate someone to accompany the injured individual to the hospital.
- If a life-threatening emergency occurs (i.e., injury in which death is imminent without immediate treatment), the FC/HSO or boat captain will call 911 and arrange to meet the emergency responder at the nearest accessible location or dock. For injuries or emergencies that are not life-threatening (e.g., broken

bones, minor lacerations), the PEC will follow the procedures outlined above and proceed to an alternative location if that would be more expedient.

- Notify the HSM and the PM.

If the PEC determines that emergency response is not necessary, he or she may direct someone to decontaminate and transport the individual by vehicle to the nearest hospital. Directions describing the route to the hospital are provided in Section 14.10.

If a worker leaves the site to seek medical attention, another worker should accompany them to the hospital. When in doubt about the severity of an injury or exposure, always seek medical attention as a conservative approach and notify the PEC.

The PEC will be responsible for completing all accident/incident field reports, OSHA Form 200s, and other required follow-up forms.

14.8 Overt Personal Exposure or Injury

If an overt exposure to toxic materials occurs, the first responder to the victim will initiate actions to address the situation. The following actions should be taken, depending on the type of exposure.

14.8.1 Skin contact

- Wash/rinse the affected area thoroughly with copious amounts of soap and water.
- If eye contact has occurred, rinse eyes for at least 15 minutes using the eyewash that is part of the onboard emergency equipment.
- After initial response actions have been taken, seek appropriate medical attention.

14.8.2 Inhalation

- Move victim to fresh air.
- Seek appropriate medical attention.

14.8.3 Ingestion

- Seek appropriate medical attention.

14.8.4 Puncture wound or laceration

- Seek appropriate medical attention.

14.9 SPILLS AND SPILL CONTAINMENT

No bulk chemicals or other materials subject to spillage are expected to be used during this project. Accordingly, no spill containment procedure is required for this project.

14.10 EMERGENCY ROUTE TO THE HOSPITAL

The name, address, and telephone number of the hospital that will be used to provide medical care is as follows:

Providence Regional Medical Center
1700 13th St.
Everett, WA
425.261.2000

Directions from the Site to Providence Regional Medical Center (Figure 1) are as follows:

- From 10th St, turn left onto W Marine Dr.
- Slight right to merge onto N Broadway.
- Turn right onto 13th St.
- Destination is on the left.

Figure 1. Directions to Providence Regional Medical Center from Port of Everett Site

Attachment 1. Field Team Health and Safety Plan Review

I have read a copy of the health and safety plan, which covers field activities that will be conducted to investigate potentially contaminated areas in the an area north of Pier 3 within the East Waterway in Everett, Washington. I understand the health and safety requirements of the project, which are detailed in this health and safety plan.

Signature	Date
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