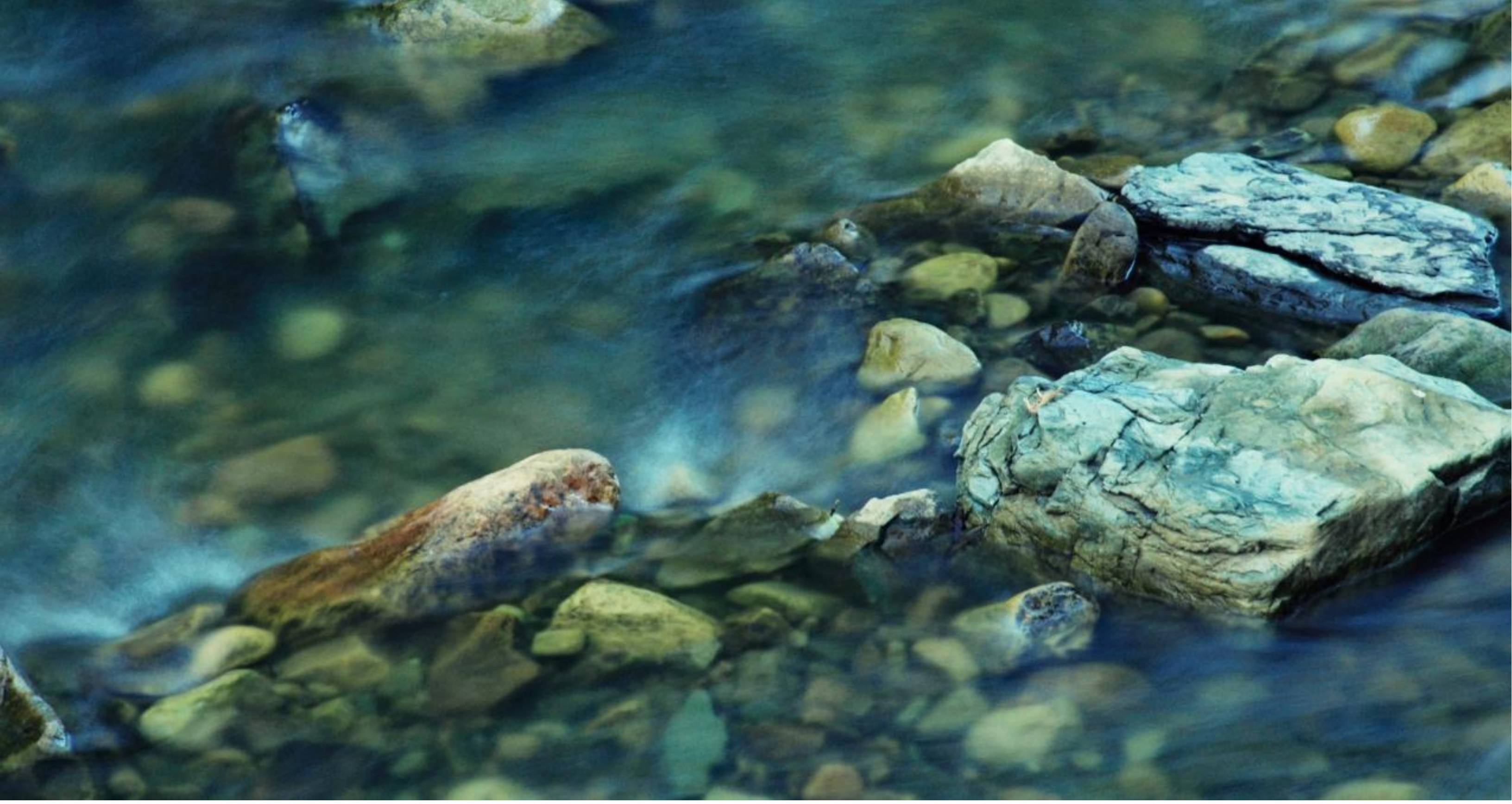

June 2020
Shelton Harbor Sediment Cleanup Unit
Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007)

Remedial Investigation/Feasibility Study Work Plan Addendum No. 1

Prepared for Simpson Timber Company, Manke Lumber Company, and the Washington State Department of Ecology

June 2020
Shelton Harbor Sediment Cleanup Unit
Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007)

Remedial Investigation/Feasibility Study Work Plan Addendum No. 1

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APPENDIX

ABBREVIATIONS

Ecology	Washington State Department of Ecology
OMMP	*Interim Action Operations, Maintenance, and Monitoring Plan*
PAH	polycyclic aromatic hydrocarbon
PDI	pre-design investigation
RI/FS	Remedial Investigation/Feasibility Study
RI/FS Work Plan	*Remedial Investigation/Feasibility Study Work Plan*
RI/FS Work Plan Addendum	*Remedial Investigation/Feasibility Study Work Plan Addendum No. 1*
SCO	sediment cleanup objective
SCU	Sediment Cleanup Unit
SMA	sediment management area
SQAPP Addendum No. 2	*Sampling and Quality Assurance Project Plan Addendum No. 2*
SWAC	surface-weighted average concentration

1 Remedial Investigation/Feasibility Study Work Plan

This *Remedial Investigation/Feasibility Study Work Plan Addendum No. 1* (RI/FS Work Plan Addendum) has been produced as an addendum to the 2017 Shelton Harbor *Remedial Investigation/Feasibility Study Work Plan* (RI/FS Work Plan; Anchor QEA 2017a) approved by the Washington State Department of Ecology (Ecology). This RI/FS Work Plan Addendum describes the rationale for additional sampling and analysis not included in the RI/FS Work Plan to support preparation of the Shelton Harbor Remedial Investigation/Feasibility Study (RI/FS). More detailed information on sampling locations, data collection procedures, and analytical methods is provided in the *Sampling and Quality Assurance Project Plan Addendum No. 2* (SQAPP Addendum No. 2; provided as Appendix A). The procedures detailed in SQAPP Addendum No. 2 apply to all site-related work, including this RI/FS Work Plan Addendum as well as the *Interim Action Operations, Maintenance, and Monitoring Plan* (OMMP; Appendix B).

1.1 Background

The RI/FS Work Plan (Anchor QEA 2017a) was developed in 2017 to describe RI/FS sampling and laboratory analysis; RI/FS development; and Interim Action analysis, design, and implementation for the Shelton Harbor Sediment Cleanup Unit (SCU), located within the Oakland Bay Site (Ecology Cleanup Site ID 13007). Following Ecology approval of the 2017 RI/FS Work Plan, the following work was performed in specific sediment management areas (SMAs) within the SCU (Figure 1):

- Four sampling events between 2017 and 2019:
  - Sediment characterization in accordance with the RI/FS Work Plan that included investigation elements throughout the SCU
  - Pre-design investigation (PDI) of SMAs 1 to 3 to inform Interim Actions
  - Further characterization of sediments in SMA-4 to inform the RI/FS
- Two Interim Action construction seasons between 2018 and 2019:
  - Capping of SMAs 1 to 3

This RI/FS Work Plan Addendum summarizes RI/FS and OMMP (Appendix B) data collection activities planned for summer 2020 throughout the SCU, focusing on the following SMAs:

- As outlined in the previous list, SMAs 1 to 3 were successfully capped by 2018 and 2019 Interim Actions. Post-construction OMMP (Appendix B) data collection within these areas will be performed to verify the protectiveness of the Interim Actions. As practicable, recent sediment that has accumulated on the surface of the caps will be sampled and analyzed to characterize concentrations in recently deposited sediments in order to verify that source control has been achieved in these areas.

- Existing RI/FS data have identified a localized area in SMA-4 with sediment toxicity attributable to wood debris degradation. Additional sampling and analysis will be performed to refine the areal and vertical extent of SMA-4 for the RI/FS.
- For the purpose of this RI/FS Work Plan Addendum, SMA-5 is defined as all areas outside SMAs 1 to 4 within the SCU. Additional sampling and analysis of SMA-5 will be performed to inform the RI/FS.
- Certain upland areas adjacent to the SCU will also be evaluated as part of this RI/FS Work Plan Addendum to further support source control evaluations in the RI/FS (Figure 1):
  - Clinker[1] deposit: The boundary of the clinker deposit will be refined.
  - Spit: The current status of shoreline stabilization along the southern boundary of this deposit will be documented.

In parallel with the cleanup work, the Squaxin Island Tribe and South Puget Sound Salmon Enhancement Group have been implementing the Oakland Bay Habitat Restoration Project within portions of the north harbor (Figure 1), resulting in the placement of sand and gravel within these areas to restore salt marsh and other habitat functions.

This document amends the RI/FS Work Plan tasks and schedule in consideration of the work completed to date.

1.2 Summary of Additional Data Collection

This RI/FS Work Plan Addendum describes subsequent RI/FS work for the SCU, which completes the RI/FS data collection tasks described in Agreed Order No. DE 14091 between Ecology and Simpson Timber Company, entered July 2017.

1.2.1 Additional RI/FS Sampling

Additional RI/FS sampling is needed to complete the RI/FS, as detailed in SQAPP Addendum No. 2 (Appendix A). Additional data collection will include the following:

- **Bathymetric Survey.** An updated bathymetric survey will be performed throughout the SCU to accomplish the following: 1) update bathymetric conditions within the SCU following Interim Action and restoration project modifications; and 2) characterize bathymetric conditions in SMA-4 to develop potential wood debris sediment remediation alternatives for this SMA.
- **Clinker Deposit Survey.** A deposit of clinker has been observed abutting Shelton Creek that was used as structural fill underlying the rail line. A visual survey (on foot) will be performed of the clinker deposit to further delineate the surface areal extent of this deposit, as set forth in the original RI/FS Work Plan.

[1] Clinker is a common term to describe burned or fused brick-like or slag-like fragments.

- **Spit Stability Survey.** The chemical quality of near-surface upland fill soils in the spit was characterized as part of separate habitat restoration actions (Anchor QEA 2017b). Fill materials extending to approximately 10 feet below ground surface were found to contain wood debris, dioxin/furan, and polycyclic aromatic hydrocarbon (PAH) concentrations exceeding background concentrations. A visual survey (on foot) will be performed to assess the existing condition of riprap materials that currently stabilize the southern boundary of this deposit to support RI/FS source control evaluations consistent with Ecology guidance (Ecology 2017).
- **Surface Sediment Characterization.** Surface sediment and porewater sampling will supplement existing data collected in the SCU to accomplish the following:
  - Update the calculated SCU-wide surface-weighted average concentrations (SWACs) to compare with regional background-based cleanup standards for dioxins/furans and carcinogenic PAHs:
    - For the RI/FS, SWACs will be calculated using methods specific to individual SMAs as appropriate. For SMAs 1 to 3 and the north harbor restoration areas (Figure 1), sediment composite samples comprised of equal aliquots collected from gridded points will be collected to characterize current surface sediment concentrations in these areas. A similar composite approach will be used for broad lower concentration areas of SMA-5. In moderate concentration areas adjacent to SMAs 1 to 3, surface sediment from individual stations will be sampled to characterize concentration distributions in these areas using a geospatial model (e.g., inverse-distance weighting or kriging, as appropriate). The combined composite and modeled results will be used to calculate SWACs in the RI/FS.
  - Refine the areal extent of wood debris in SMA-4.
  - Refine the areal extent of SMA-4, in consultation with Ecology, based on concentrations of wood debris in bulk sediment and free hydrogen sulfide in sediment porewater.
  - Identify any remaining areas of the SCU beyond SMAs 1 to 4 that may require remediation to meet cleanup standards.
- **Subsurface Sediment Sampling.** Within SMA-4, existing data will be augmented with two subsurface sediment cores to characterize the vertical extent of wood debris in this SMA and support remedial alternative development and evaluation (see Appendix A).

Note that concurrent data collection to verify the protectiveness of engineered caps placed in SMAs 1 to 3 is described in the OMMP (Appendix B).

1.3 Preliminary Schedule

Sampling is scheduled to take place in late June 2020. Data will be presented following laboratory analysis and validation in a data memorandum currently scheduled for September 2020. At that time, consistent with Agreed Order DE 14091, an RI/FS outline will also be presented to Ecology. The RI/FS and draft Cleanup Action Plan documents will follow according to the timeline in the Agreed Order.

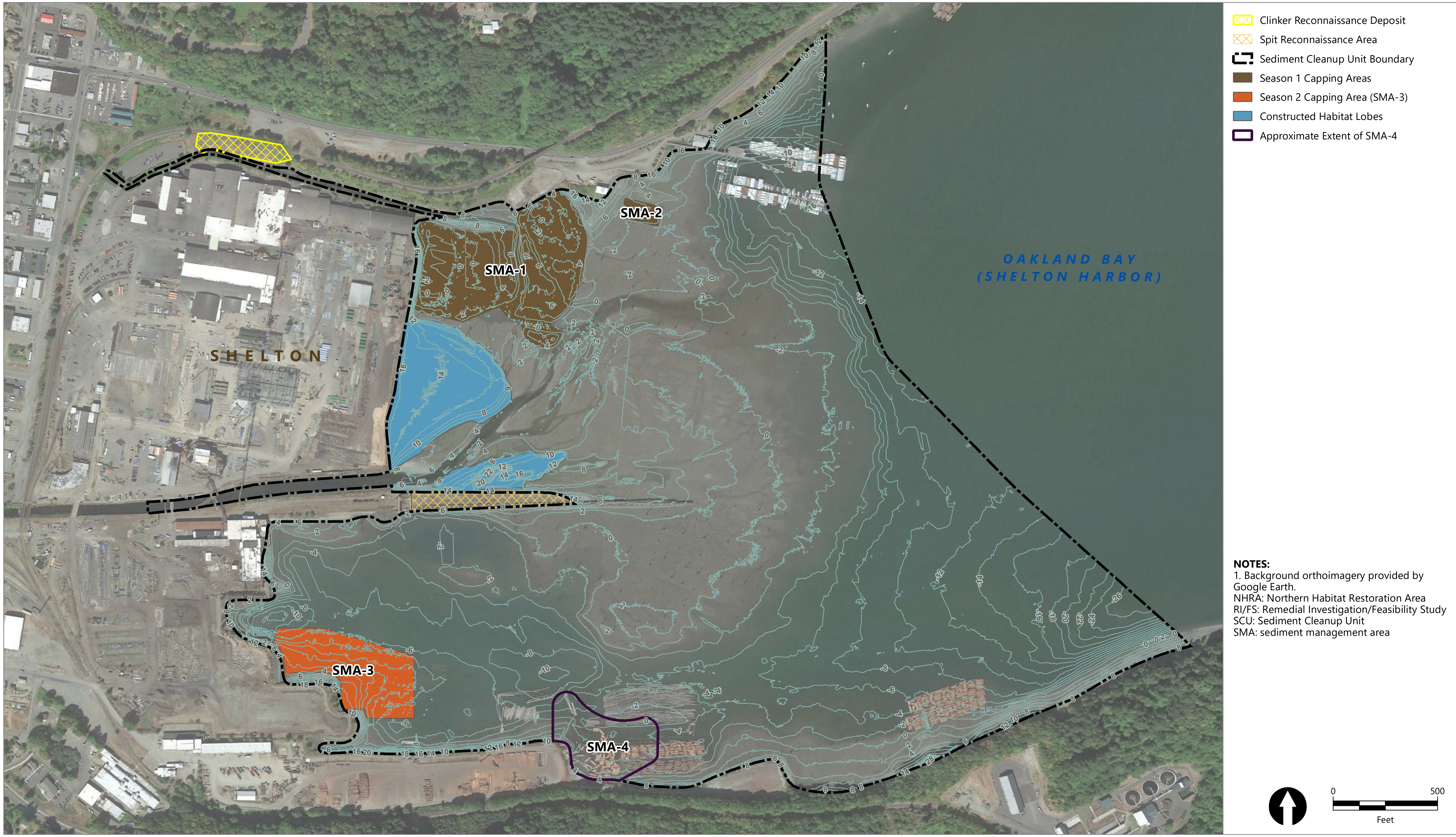
2 References

Anchor QEA (Anchor QEA, LLC), 2017a. *Remedial Investigation/Feasibility Study Work Plan*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). July 2017.

Anchor QEA, 2017b. *Soil Characterization Data Report: Oakland Bay Restoration Project.* Prepared for South Puget Sound Salmon Enhancement Group. August 2017.

Ecology (Washington State Department of Ecology), 2017. *Adaptation Strategies for Resilient Cleanup Remedies: A Guide for Cleanup Project Managers to Increase the Resilience of Toxic Cleanup Sites to the Impacts from Climate Change.* Prepared for Washington State Department of Ecology Toxics Cleanup Program. Publication No. 17-09-052. November 2017. Available at: https://fortress.wa.gov/ecy/publications/documents/1709052.pdf.

Figure



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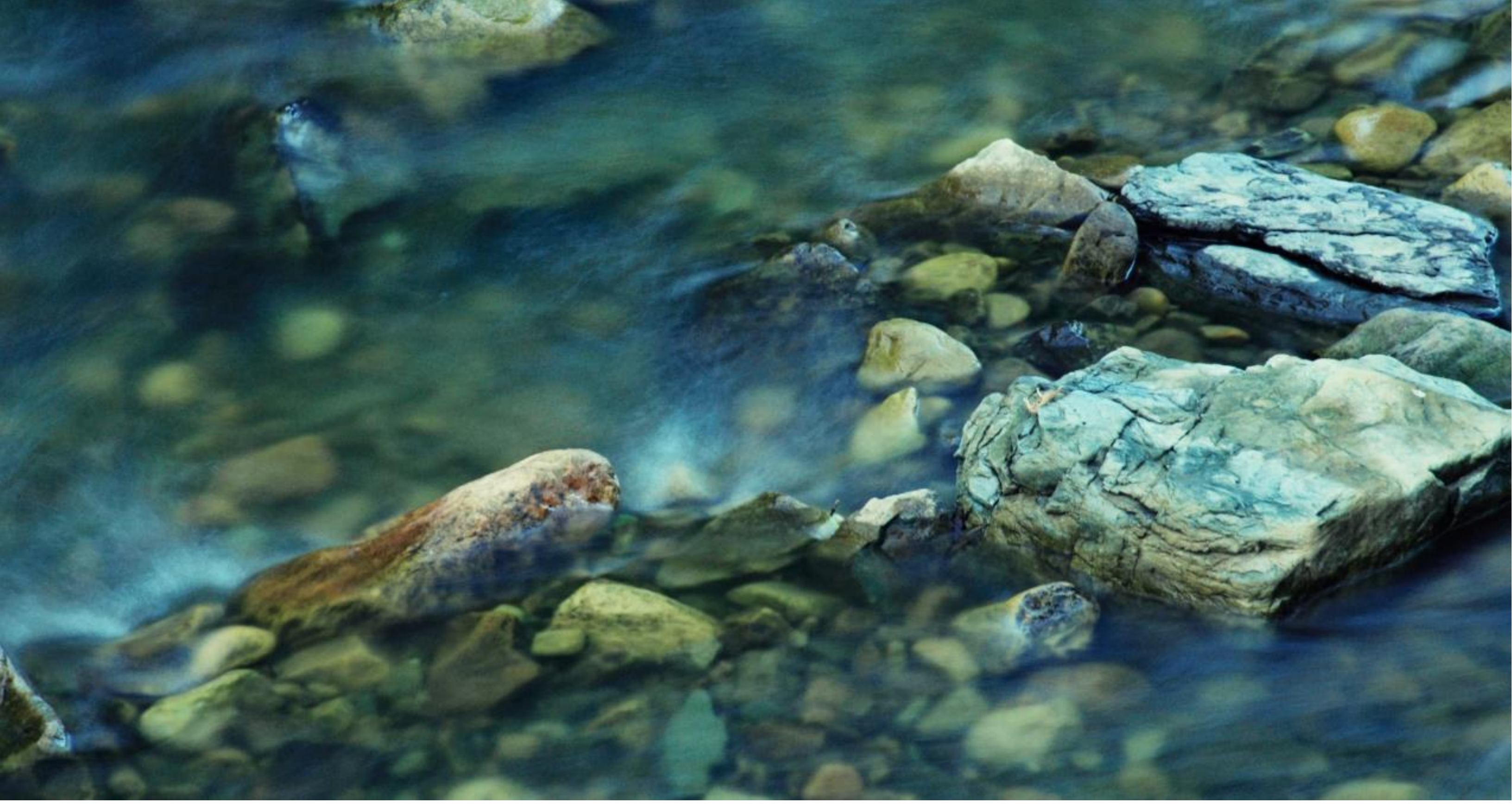
ANCHOR QEA

Figure 1
Shelton Harbor Sediment Management Areas
Remedial Investigation/Feasibility Study Work Plan Addendum No. 1
Oakland Bay and Shelton Harbor Sediments Cleanup Site

Appendix A
Sampling and Quality Assurance Project Plan Addendum No. 2



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ABBREVIATIONS

cm	centimeter
cPAH	carcinogenic polycyclic aromatic hydrocarbon
D/F	dioxin/furan
DGT	diffusive gradient thin film
Ecology	Washington State Department of Ecology
H_2S	hydrogen sulfide
NHRA	Northern Habitat Restoration Area
OMMP	*Interim Action Operations, Monitoring, and Maintenance Plan*
PAH	polycyclic aromatic hydrocarbon
PDI	pre-design investigation
QA/QC	quality assurance/quality control
RI/FS	Remedial Investigation/Feasibility Study
RI/FS Work Plan	*Remedial Investigation/Feasibility Study Work Plan*
RI/FS Work Plan Addendum	*Remedial Investigation/Feasibility Study Work Plan Addendum No. 1*
SCU	sediment cleanup unit
SMA	sediment management area
SQAPP	*Sampling and Quality Assurance Project Plan*
SQAPP Addendum	*Sampling and Quality Assurance Project Plan Addendum*
SQAPP Addendum No. 2	*Sampling and Quality Assurance Project Plan Addendum No. 2*
SWAC	surface-weighted average concentration
TVS	total volatile solids

1 Introduction

This *Sampling Quality Assurance and Project Plan Addendum No. 2* (SQAPP Addendum No. 2) is the second addendum to the *Sampling and Quality Assurance Project Plan* (SQAPP; Anchor QEA 2017a, Appendix A), supplementing the Shelton Harbor Sediment Cleanup Unit (SCU) *Remedial Investigation/Feasibility Study Work Plan* (RI/FS Work Plan; Anchor QEA 2017a) previously approved by the Washington State Department of Ecology (Ecology). This SQAPP Addendum No. 2 describes further sampling and analysis to be performed within the Shelton Harbor SCU to support development of the Remedial Investigation/Feasibility Study (RI/FS), including the following:

1. Bathymetric surveys
2. Spit and clinker[1] area visual surveys
3. Surface sediment grab sampling and chemical analyses
4. Subsurface sediment core sampling and geotechnical/chemical analyses

This SQAPP Addendum No. 2 also updates sampling and analytical methods that were not included in or have changed since the original SQAPP (Anchor QEA 2017a, Appendix A) and the *Sampling and Quality Assurance Project Plan Addendum* (SQAPP Addendum; Appendix A to the *Shelton Harbor Pre-Remedial Design Investigation Work Plan*; Anchor QEA 2018) were developed. The SQAPP methods apply to characterization required to inform the development of the RI/FS and the *Interim Action Operations, Monitoring, and Maintenance Plan* (OMMP; Appendix B to the *Remedial Action/Feasibility Study Work Plan Addendum No. 1* [RI/FS Work Plan Addendum]; Anchor QEA 2020).

[1] Clinker is a common term to describe burned or fused brick-like or slag-like fragments.

2 Data Generation and Acquisition

This section describes data to be acquired as documented in the RI/FS Work Plan Addendum (Anchor QEA 2020). Discrete target investigation locations are depicted in Figures A-1 through A-3. Target coordinates for the locations and required analysis are included in Table A-1. Analytical methods for the testing required under this program are included in Table A-2.

2.1 Bathymetric Survey

A bathymetric survey of the entire Shelton Harbor SCU will be conducted to support the RI/FS. The survey will be performed by a qualified subcontractor under the direction of Anchor QEA, LLC, and the survey data will be supplied following the survey. Relatively high-resolution survey methods (multibeam survey equipment on tight transects) will be used in previously capped areas within sediment management areas (SMAs) 1 to 3. Multibeam surveys on less dense survey transects will be performed in SMAs 4 and 5 to inform the RI/FS. The surveys will be conducted at higher tidal elevations to maximize the coverage area.

2.2 Visual Surveys

Visual surveys will be conducted to evaluate the clinker deposit and spit areas as depicted in Figure A-1.

2.2.1 Clinker Deposit Survey

The survey team will access the clinker area and walk horizontal transects along edges of the deposit adjacent to Shelton Creek to visually assess the extent of clinker in surface soils. Representative photographs of the clinker deposit will be taken. Transitions between the clinker deposit and native soil will be recorded, photographs will be taken, and the GPS point locations will be recorded. A minimum of nine transition point features around the edge of the clinker deposit will be recorded to characterize the general extent of the clinker deposit for the RI/FS.

In addition to defining the extents of the deposit, the survey will evaluate if any visually apparent surface drainage pathways in and around the clinker deposit are apparent. If apparent, GPS points, measurements, or notes will be collected for a wet season follow-up inspection to evaluate the potential for erosion or direct discharges. After completion of the survey, the GPS points will be plotted to define the extent of the clinker deposit, and any observed drainage features will be depicted in the RI/FS report.

2.2.2 Spit Stability Survey

As described in the *Soil Characterization Data Report* (Anchor QEA 2017b), spit fill materials extending to approximately 10 feet below ground surface were found to contain wood debris, dioxin/furan (D/F), and polycyclic aromatic hydrocarbon (PAH) concentrations exceeding background concentrations. The survey team will access the southern spit area to document shoreline conditions in this area, including the extent of riprap and other shoreline protection features, to assess the potential for erosion of spit fill materials. The team will document the presence of armor and photograph each bent beneath the trestle. The evaluation and representative photographs will be presented in the RI/FS report.

2.3 Surface Sediment Characterization Methods

This section describes methodologies to characterize surface sediments within the SCU. These data will be used to inform the RI/FS, including characterizing areas within the SCU with potential surface sediment benthic toxicity from chemicals of potential concern, including hydrogen sulfide (H_2S) and PAHs, as well as characterizing SCU-wide surface-weighted average concentrations (SWACs) for bioaccumulative D/F and carcinogenic PAH (cPAH) chemicals in accordance with the Sediment Management Standards (Ecology 2013). Concurrent data collection under the OMMP (RI/FS Work Plan Addendum, Appendix B; Anchor QEA 2020) will support SWAC calculations, verify source controls (by sampling depositional sediments), and verify cap effectiveness.

2.3.1 Low-tide Sediment Characterization

A low-tide sediment characterization will be conducted in the intertidal areas south of the spit and depicted in Figures A-1 and A-2. If any of these locations are inaccessible, sample acquisition will be conducted from a vessel, as described in the following sections.

2.3.1.1 Low Tide RI/FS Sampling Methods:

The testing for in situ H_2S, total volatile solids (TVS), D/Fs, and PAHs by sample location are provided in Table A-2. Low-tide hand-tool sampling methods were described in the SQAPP (Anchor QEA 2017a, Appendix A) and SQAPP Addendum (Anchor QEA 2018, Appendix A).

The low-tide reconnaissance area, as depicted in Figure A-1, will be accessed and navigated on foot. Sample locations will be selected to focus on areas with relatively greater amounts of surficial wood debris and/or *Beggiatoa* sp. As depicted in Figure A-1, five locations will be characterized for porewater H_2S using in situ diffusive gradient thin film (DGT) deployment and bulk sediment TVS testing as follows:

1. Determine representative sample locations.
2. Deploy a custom fabricated polycarbonate DGT spike with a flow-through cell where the bottom of the cell is approximately 10 centimeters (cm) below mudline and the top of the cell is covered by 2 to 3 cm of bedded sediment.
3. Allow the in situ DGT to equilibrate for 24 hours, retrieve, and process for laboratory characterization. Upon retrieval, field readings will be collected for pH, temperature, and salinity

and recorded on a field form or field notebook. Field parameters may be used to calculate the fraction of free H_2S sorbed to the DGT.

4. After the exposure duration is complete, remove the DGT from the deployment apparatus, rinse with distilled water, and place the DGT inside a labeled plastic bag. Retain the DGT on ice for analysis.
5. Following DGT retrieval, collect bulk sediment for laboratory TVS testing.

At two locations, SMA5-SG09 and SMA5-SG40, chemical testing is required. At SMA5-SG09, testing for D/Fs and PAHs will be conducted in addition to in situ DGT and TVS testing. At location SMA5-40, only PAH testing will be required. If any of these locations are inaccessible, sample acquisition will be conducted from a vessel, as described in the following sections.

2.3.1.2 Low-Tide OMMP Sampling Methods

Sampling will be conducted to characterize the cap, restoration cover, and potential overlying depositional sediments in the North and South Harbor, as depicted in Figure A-2. Bulk surface sediment will be collected and submitted for testing in accordance with parameters listed in Table A-1 and methods included in Table A-2. In situ porewater H_2S analysis will be conducted by DGT in accordance with the method presented in the SQAPP Addendum (Anchor QEA 2018, Appendix A).

The sampling and analysis program is as follows:

1. **SMA-1:** Field staff will navigate during low tide to each of the seven target locations (Table A-1; Figure A-2). At each location, the depth of depositional sediments will be determined. If depositional sediment depth is greater than 1 cm, a subsample of the depositional sediments will be collected and retained for integration into a depositional sediment composite. At each subsample location, an additional 0- to 10-cm bulk sediment sample will be collected and retained for integration into the composite. At each composite subsample location, an archive sample will be retained for future testing, if necessary. The samples will be submitted in accordance with Table A-1.
2. **SMA-2:** Field staff will navigate during low tide to each of the two target locations (Table A-1; Figure A-2). The SMA-2 Interim Action Area composite sample will be collected, processed, and submitted for bulk sediment testing in accordance with Table A-1. At each composite subsample location, an archive sample will be retained for future testing, if necessary.
3. **SMA-3:** Field staff will navigate during low tide to each of the five target locations (Table A-1; Figure A-2). At each location, the depth of depositional sediments will be determined. If depositional sediment depth is greater than 1 cm, a subsample of the depositional sediments will be collected and retained for integration into a depositional sediment composite. At each subsample location, an additional 0- to 10-cm bulk sediment sample will be collected and retained for integration into the post-construction five-point composite. At each composite subsample

location, an archive sample will be retained for future testing, if necessary. The samples will be submitted in accordance with Table A-1.

4. **Northern Habitat Restoration Area (NHRA):** Field staff will navigate during low tide to each of the five target locations (Table A-2; Figure A-2). A 0- to 10-cm bulk sediment sample will be collected and retained for integration into the post-construction five-point composite. The samples will be submitted for testing in accordance with Table A-1.

2.3.2 Vessel-Based Surface Sediment Characterization

Where sampling cannot be accomplished by hand at low tide and in subtidal areas, sampling will be conducted from a vessel. This section describes surface sediment sampling required by the RI/FS Work Plan Addendum (Anchor QEA 2020). Sampling under this program may be conducted by Van Veen sampler deployed from a vessel. A subset of locations will undergo ex situ testing for porewater H_2S using a DGT apparatus, which is described in the SQAPP Addendum (Anchor QEA 2018, Appendix A).

2.3.2.1 Discrete Sediment Grab Collection

Surface sediment will be collected by Van Veen sampler according to the procedures included in the SQAPP (Anchor QEA 2017a, Appendix A). Following acceptance of the grab, the sample will be retained by removing material from the desired grab depth (0 to 10 cm) into a clean stainless-steel pot or bowl. To avoid cross-contamination, only sediment that has not come into contact with the sides or bottom of the grab should be removed. The result of discrete testing for D/Fs and PAHs will be used to inform the development of an SCU-wide SWAC.

2.3.2.2 Composite Sediment Grab Collection

Composite surface sediment samples will be collected by Van Veen sampler according to the procedures included in the SQAPP (Anchor QEA 2017a, Appendix A).

SMA-5 is defined as the area within the SCU that is not included in the Interim Action Areas (SMA-1, SMA-2, and SMA-3) or SMA-4. The following three separate composite samples will be collected from SMA-5 as follows:

1. A five-point composite will be collected from the following sample locations shown in Figure A-1: RIFS-SMA5-SG13, RIFS-SMA5-SG14, RIFS-SMA5-SG15, RIFS-SMA5-SG17, and RIFS-SMA5-SG18.
2. A 10-point composite will be collected from the following grid sample locations shown in Figure A-1: RIFS-SMA5-SG19 through RIFS-SMA5-SG23, RIFS-SMA5-SG25, RIFS-SMA5-SG26, RIFS-SMA5-SG27, RIFS-SMA5-SG31, and RIFS-SMA5-SG32.

3. A seven-point composite will be collected from the following grid sample locations shown in Figure A-1: RIFS-SMA5-SG24, RIFS-SMA5-SG28, RIFS-SMA5-SG29, RIFS-SMA5-SG30, RIFS-SMA5-SG33, RIFS-SMA5-SG34, and RIFS-SMA5-SG35.

The 0- to 10-cm mass will be retained from each individual composite component until all components have been collected. Some composite locations also require discrete porewater sulfide characterization. Samples will be processed according to the following sequence:

1. Conduct the ex situ DGT processing procedure as follows:
    a. Immediately after accepting the grab, collect approximately 0.5 gallon of sediment from the 0- to 10-cm interval and place it directly into a plastic bag.
    b. Immediately place the DGT piston into the bag containing the sediment.
    c. Squeeze all head space from the bag, seal it, place it into a Mylar bag[2] with oxygen-scavenging packets, and ensure the DGT piston is completely covered and placed into a cooler with ice.
    d. Agitate the bag every 3 hours from 7:00 a.m. to 10:00 p.m. to refresh the DGT surface over the 24-hour exposure duration.
    e. After the exposure duration is complete, remove the DGT from the bag, rinse with distilled water, and place the DGT in foil and inside a labeled plastic bag.
    f. Record the temperature of the sediment, the pH, and the salinity on the field form.
    g. Transport the bags to Anchor QEA's Portland, Oregon, Environmental Geochemistry Laboratory for analysis.
2. In Interim Action cap areas, assess if the presence of depositional sediments is sufficient for subsampling. If present, remove material from half a portion of the grab to fill two laboratory-provided, pre-cleaned 8- or 16-ounce jars. One jar will be retained for compositing, and one will be retained for archiving in accordance with Table A-1.
3. Remove the material from the desired grab depth (0 to 10 cm) and place into two laboratory-provided, pre-cleaned 8- or 16-ounce jars. One jar will be retained for compositing, and one will be retained for archiving in accordance with Table A-1. To avoid cross-contamination, only sediment that has not come into contact with the sides or bottom of the grab should be removed.
4. All subsamples within a composite must be sampled into a jar of the same volume (i.e., 8 or 16 ounces) and will be stored in a cooler while other composite targets are acquired prior to homogenization.
5. After collecting sample material from all of the composite components, the composite sample will be processed as described in Section 2.3.3.1, using equal volumes from the subsamples.

[2] The Mylar bags do not transmit light; the samples will be placed into an iced cooler.

2.3.3 Surface Sediment Grab Processing

All samples will be processed in accordance with the following procedures. All working surfaces and instruments will be thoroughly cleaned, decontaminated, and prepared to minimize cross-contamination between sampling stations. Disposable gloves will be discarded after processing each station and replaced prior to handling decontaminated instruments or work surfaces.

The steps for processing a discrete sample are as follows:

1. Photograph the unhomogenized sample.
2. Where applicable (in accordance with Table A-1) conduct DGT sampling as detailed in Section 2.3.2.2.
3. Homogenize with a decontaminated stainless-steel paddle and drill.
4. Photograph the homogenized sample.
5. Using a clean stainless-steel spoon, completely fill pre-labeled sample containers as specified in Table A-3.
6. Immediately after filling the sample container with sediment, place the screw cap on the sample container and tighten.
7. Thoroughly check all sample containers for proper identification, analysis type, and lid tightness.
8. Pack each container carefully to prevent breakage and place inside a cooler with ice for storage at the proper temperature (4°C ± 2°C for all samples).
9. In accordance with the SQAPP (Anchor QEA 2017a, Appendix A), a homogenization duplicate (from a single homogenate) will be collected once for every 20 samples.

2.3.3.1 Composite Homogenization Methods

The steps for processing a composite surface sediment sample are as follows:

1. Select a subsample and remove one of the two jars (determination as to which jar volume to use for composite or archive will be made in the field based on the number of subsamples and analysis required). Open the container, remove all sample material from the jar, and place into a clean stainless-steel pot or bowl that will hold the composite sample. The additional jar that remains unsampled will be retained and submitted as an archive sample in accordance with Table A-1 for future testing, if required.
2. Select a second subsample, remove one of the two jars (which should be the same volume as the jar used for the first subsample), and place the sample material into the composite sample stainless-steel pot or bowl. The additional jar that remains unsampled will be retained and submitted as an archive sample in accordance with Table A-1 for future testing, if required.
3. Continue this process until all composite subsamples have been added to the composite sample stainless-steel pot or bowl.
4. Photograph the unhomogenized sample.
5. Homogenize with a decontaminated stainless-steel paddle and drill.

6. Photograph the homogenized sample.
7. Using a clean stainless-steel spoon, completely fill pre-labeled sample containers as specified in Table A-3.
8. Immediately after filling the sample container with sediment, place the screw cap on the sample container and tighten.
9. Thoroughly check all sample containers for proper identification, analysis type, and lid tightness.
10. Pack each container carefully to prevent breakage and place inside a cooler with ice for storage at the proper temperature (4°C ± 2°C for all samples).
11. In accordance with the SQAPP (Anchor QEA 2017a, Appendix A), a homogenization duplicate (from a single homogenate) will be collected once for every 20 samples.

Samples will be submitted for testing as presented in Table A-2.

2.4 Subsurface Sediment Collection

The thickness of wood debris in SMA-4 has been characterized at one location on the eastern edge of SMA-4 (Station SPI-22A; Figure A-3). Subsurface borings will be advanced at two locations within the central area of SMA-4 to refine the depth of subsurface wood debris accumulations in this area. All borings will be conducted using MudMole or equivalent coring methods. Subsurface borings are shown in Figure A-3.

2.4.1 Core Collection Procedures

The borings will start at the mudline with a 3-inch-inside-diameter core sampler. The core barrel will be advanced into the mudline, thereby forcing the sediment into the inside of the sampler. The core barrel sampler will be driven to the depth goal or until refusal is encountered, at which point the core barrel sampler will then be withdrawn from the subsurface. The liner will be cut lengthwise to expose the sample for visual classification of wood debris and collection of laboratory samples. The depth goal for the subsurface exploration is 1 to 2 feet below native contact or a maximum core length of approximately 20 feet below mudline.

2.4.2 Core Processing Procedures

Core sample processing will occur on a barge or at an upland processing facility. For each core sample, the percent of recovery will be noted, and lithology will be interpreted in accordance with ASTM International D2488 and noted on field logs. Pictures will be taken of the recovered sediment prior to subsampling.

Each core sample will be visually inspected for wood debris content, and the bottom of the wood debris layer will be observed and indicated on the field logs. After the core has been logged, archive samples will be collected at 2-foot intervals throughout the wood debris layer. A sediment sample will be collected from the z-layer (the 1-foot interval below the observed wood debris layer) and analyzed for TVS and D/F. Additional samples will be collected from each 1-foot layer below the z-layer sample and archived. Additional cores may be collected to assess geotechnical properties of the underlying sediments.

2.5 Horizontal Positioning and Vertical Control

Refer to the SQAPP (Anchor QEA 2017a, Appendix A) for horizontal positioning of the sample vessel and vertical control of the sample. Target coordinates for each sampling location are included in Table A-1. As-collected coordinates will be recorded at each station.

2.6 Sample Containers for Analysis

The contract laboratory will provide certified, pre-cleaned, U.S. Environmental Protection Agency-approved containers for all chemistry and geotechnical samples. Sediment for ex situ DGT testing will be placed in commercially available food-grade polyethylene bags and sealed airtight. Table A-3 lists container size, holding times, and preservation for the categories of analytes. At a minimum, each sample container will be labeled with the following information:

1. Project name and number
2. Sample identifier
3. Date and time of sample collection
4. Initials of field personnel responsible for sample collection
5. Analyses required
6. Preservative type (if applicable)

2.7 Sample Identification

2.7.1 Discrete Samples

Each discrete sample will be assigned a unique alphanumeric identifier using the following format:

1. The first four characters identify the type of investigation (e.g., RIFS or OMMP).
2. The next three characters identify the sediment management location (e.g., SMA1, SMA2, SMA3, SMA4, SMA5, or NHRA).
3. The next characters identify the collection method and location, as follows:
    a. SG for surface sediment grab
    b. SC for sediment core
    c. DGT for DGT test locations
    d. A two-digit location ID following the method ID (e.g., 01, 02, 03, and so on)
4. For sediment cores, a field will be included to identify the depth interval in feet (e.g., the top 4 feet of the core would be identified as 000040).

5. The last characters will identify the sampling date (YYMMDD).

Sample "RIFS-SMA5-SG04-200415" represents an RI/FS sediment grab collected inside of SMA-5 at location 04 on April 15, 2020.

Sample "RIFS-SMA4-SC01-000020-200418" represents an RI/FS sediment core collected inside of SMA-4 at location 01 from 0 to 2 feet below mudline on April 18, 2020.

Field duplicate samples will be identified by adding 100 to the location ID. Duplicate sample "RIFS-SMA5-SG103-200419" is the field duplicate of sample "RIFS-SMA5-SG03-200419."

2.7.2 Composite Samples

Each composite sample will be assigned a unique alphanumeric identifier using the following format:

1. The first four characters identify the type of investigation (e.g., RIFS or OMMP).
2. The next three characters identify the sediment management location (e.g., SMA1, SMA2, SMA3, SMA4, SMA5, or NHRA).
3. The next two characters identify the collection method (e.g., SG for sediment grab)
4. The next characters identify the type of composite and the number of subsamples in that composite, as follows:
    a. COMP for a surface sediment composite (e.g., a two-point composite of surface sediment would be identified as COMP02)
    b. DCOMP for a depositional material composite (e.g., a five-point composite of depositional sediment would be identified as DCOMP05)
5. The last characters will identify the sampling date (YYMMDD).

Sample "RIFS-SMA5-SG-COMP10-200622" represents an RI/FS composite sample of 10 surface sediment grabs collected inside of SMA-5 on June 22, 2020.

Sample "OMMP-SMA1-SG-DCOMP5-200626" represents an OMMP composite sample of five depositional sediment grabs collected inside of SMA-1 on June 26, 2020.

Field duplicate samples will be identified by adding 100 to the location ID. Duplicate sample "RIFS-SMA5-SG-COMP107-200624" is the field duplicate of sample "RIFS-SMA5-SG-COMP07-200624."

2.8 Waste Management

As described in Attachment A-1, sediments with visible evidence of chemical contamination (e.g., oily droplets, sheen, paint chips, or sandblast grit) will not be returned to the water. Instead, they will be retained onboard the vessel for appropriate disposal on shore. Sediment without visible evidence of chemical contamination will be washed overboard at the collection site prior to moving to the next sampling station.

All disposable sampling materials and personnel protective equipment used in sample processing, such as disposable coveralls, gloves, and paper towels, will be placed in heavy-duty garbage bags or other appropriate containers.

Sediment remaining after core processing and sampling will be collected in appropriately sized drums and consolidated. The drums will be located in a secure area and labeled appropriately. After core processing is completed, a composite sample will be collected and analyzed to obtain representative data for sediment disposal profiling.

3 Field and Laboratory Quality Assurance and Quality Control

This section describes the quality assurance/quality control (QA/QC) procedures specific to the RI/FS Work Plan Addendum No. 1 (Anchor QEA 2020). For QA/QC procedures not listed, refer to the SQAPP (Anchor QEA 2017a, Appendix A).

3.1 Field Quality Assurance and Quality Control

3.1.1 Field Duplicates

Field homogenization duplicates will be collected and tested in accordance with the SQAPP (Anchor QEA 2017a, Appendix A) at a frequency of 1 per 20 samples (DGT and laboratory bulk sediment tests). A discrete sample and an SMA-5 composite sample will be selected for duplicate testing. No data will be qualified based solely on field duplicate precision.

3.1.2 Equipment Blanks

A rinse blank will be collected from the sediment processing equipment used to prepare the sample in accordance with the procedures in the SQAPP (Anchor QEA 2017a, Appendix A).

3.2 Analytical Laboratory Quality Assurance and Quality Control

An updated laboratory QA/QC analysis summary is provided in Table A-4, and laboratory data quality objectives are detailed in Table A-5. Chemical testing laboratories will conduct all analysis except for DGT H_2S, which will be conducted in Anchor QEA's Environmental Geochemistry Laboratory in Portland, Oregon, consistent with work previously conducted.

4 Documentation, Recordkeeping, and Reporting Requirements

All documentation will be produced and retained in accordance with the SQAPP requirements (Anchor QEA 2017a, Appendix A). These data will be prepared in a data summary report including work conducted, plan deviations, data quality assessment, and results. In addition, these results will be loaded to Ecology's Environmental Information Management system. The interpretation of results will be presented in the RI/FS report.

5 Data Validation and Usability

Refer to the SQAPP for data validation and usability procedures (Anchor QEA 2017a, Appendix A). When data undergo validation, their use may be qualified. All results, including those qualified in validation, will be presented and interpreted, as applicable, in the RI/FS report.

6 References

Anchor QEA (Anchor QEA, LLC), 2017a. *Remedial Investigation/Feasibility Study Work Plan*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company and the Washington State Department of Ecology. July 2017.

Anchor QEA, 2017b. *Soil Characterization Data Report.* Oakland Bay Restoration Project. Prepared for South Puget Sound Salmon Enhancement Group. August 2017.

Anchor QEA, 2018. *Shelton Harbor Pre-Remedial Design Investigation Work Plan.* Oakland Bay and Shelton Harbor Sediments Cleanup Site. Prepared for Washington State Department of Ecology. April 2018.

Anchor QEA, 2020. *Remedial Investigation/Feasibility Study Work Plan Addendum No. 1*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company, Manke Lumber Company, and the Washington State Department of Ecology. June 2020.

Ecology (Washington State Department of Ecology), 2013. *Sediment Management Standards.* Chapter 173-204 WAC. Prepared for Washington State Department of Ecology Toxics Cleanup Program. Publication No. 13-09-055. September 2013. Available at: https://fortress.wa.gov/ecy/publications/publications/1309055.pdf.

Tables

Table A-1
Target RI/FS and OMMP Locations

Location ID	Latitude	Longitude	Elevation (ft MLLW)	Composite Component (0–10 cm)	Depositional Composite Component (0–2 cm)	Dioxin/Furan	PAH	Copper	Tributyltin	Total Organic Carbon	Porewater H_2S	Total Volatile Solids	Wood Debris Coring	Archive
SMA-1 Composite Sample														
OMMP-SMA1-SG01	47.211776	-123.089485	4.47	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG02	47.212377	-123.089514	6.00	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG03	47.213185	-123.089419	0.60	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG04	47.212830	-123.091168	1.00	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG05	47.212226	-123.091273	0.30	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG06	47.212864	-123.089828	8.06	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG07	47.212648	-123.090239	6.19	X	X	--	--	--	--	--	X	--	--	X
OMMP-SMA1-SG-COMP-07*	--	--	--	--	--	X	X	--	--	X	--	--	--	--
OMMP-SMA1-SG-DCOMP-XX**	--	--	--	--	--	X	X	--	--	X	--	--	--	--
SMA-2 Composite Sample														
OMMP-SMA2-SG01	47.213455	-123.087815	4.11	X	--	--	--	--	--	--	--	--	--	X
OMMP-SMA2-SG02	47.213402	-123.087483	2.89	X	--	--	--	--	--	--	--	--	--	X
OMMP-SMA2-SG-COMP-02*	--	--	--	--	--	X	X	X	X	X	--	--	--	
SMA-3 Composite Sample														
OMMP-SMA3-SG01	47.207408	-123.093668	0.73	X	X	--	--	--	--	--	--	--	--	X
OMMP-SMA3-SG02	47.207123	-123.092768	4.49	X	X	--	--	--	--	--	--	--	--	X
OMMP-SMA3-SG03	47.206850	-123.091983	-4.45	X	X	--	--	--	--	--	--	--	--	X
OMMP-SMA3-SG04	47.207532	-123.092718	-3.11	X	X	--	--	--	--	--	--	--	--	X
OMMP-SMA3-SG05	47.207686	-123.093900	-4.74	X	X	--	--	--	--	--	--	--	--	X
OMMP-SMA3-SG-COMP-05*	--	--	--	--	--	X	X	--	--	X	--	--	--	--
OMMP-SMA3-SG-DCOMP-XX**	--	--	--	--	--	X	X	--	--	X	--	--	--	--
SMA-4 Discrete Samples														
RIFS-SMA4-SG01	47.206723	-123.090253	-4.88	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG02	47.207227	-123.090086	-6.23	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG03	47.207323	-123.089044	-10.59	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG04	47.206329	-123.086420	-4.37	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG05	47.206900	-123.085355	-3.31	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG06	47.207240	-123.085295	-4.67	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SG07	47.206544	-123.084734	0.19	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA4-SC01	47.206459	-123.088236	-2.50	--	--	X	--	--	--	--	--	X	X	X
RIFS-SMA4-SC02	47.206442	-123.087272	-3.48	--	--	X	--	--	--	--	--	X	X	X
SMA-5 Discrete Samples														
RIFS-SMA5-SG01	47.207961	-123.094977	-7.61	--	--	X	X	--	--	--	X	X	--	X
RIFS-SMA5-SG02	47.208701	-123.094029	-7.12	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG03	47.208005	-123.093295	-6.03	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG04	47.208876	-123.092383	-4.24	--	--	X	X	--	--	--	--	--	--	X
RIFS-SMA5-SG05	47.207556	-123.091457	-5.74	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG06	47.206423	-123.091697	-2.79	--	--	X	X	--	--	--	--	--	--	X
RIFS-SMA5-SG07	47.208641	-123.090546	-1.53	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG08	47.207413	-123.089492	-9.33	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG09	47.209358	-123.088774	0.58	--	--	X	X	--	--	--	X	X	--	X
RIFS-SMA5-SG10	47.208042	-123.088034	1.77	--	--	X	X	--	--	--	--	--	--	X
RIFS-SMA5-SG11	47.206542	-123.087299	-3.70	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG12	47.213300	-123.088457	6.94	--	--	X	X	--	--	--	--	--	--	X
RIFS-SMA5-SG16	47.213612	-123.086523	-0.79	--	--	X	--	--	--	--	--	--	--	X
RIFS-SMA5-SG36	47.209199	-123.091348	-2.16	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA5-SG37	47.209254	-123.089942	0.84	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA5-SG38	47.209103	-123.093387	0.91	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA5-SG39	47.209148	-123.092235	-2.00	--	--	--	--	--	--	--	X	X	--	X
RIFS-SMA5-SG40	47.209422	-123.087546	2.00	--	--	--	X	--	--	--	--	--	--	X

Table A-1
Target RI/FS and OMMP Locations

Location ID	Latitude	Longitude	Elevation (ft MLLW)	Composite Component (0–10 cm)	Depositional Composite Component (0–2 cm)	Dioxin/Furan	PAH	Copper	Tributyltin	Total Organic Carbon	Porewater H_2S	Total Volatile Solids	Wood Debris Coring	Archive
SMA-5 5-Point Composite Sample														
RIFS-SMA5-SG13	47.212471	-123.088417	1.71	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG14	47.212858	-123.087157	0.36	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG15	47.212197	-123.086222	-2.30	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG17	47.214424	-123.085771	-1.77	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG18	47.212929	-123.085537	-8.44	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG-COMP-05*	--	--	--	--	--	X	X	--	--	--	--	--	--	--
SMA-5 10-Point Composite Sample														
RIFS-SMA5-SG19	47.212242	-123.084211	-2.73	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG20	47.210917	-123.082134	-10.83	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG21	47.210872	-123.084145	-1.52	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG22	47.210827	-123.086156	1.30	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG23	47.210782	-123.088166	4.50	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG25	47.209502	-123.084079	-2.20	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG26	47.209547	-123.082069	-9.53	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG27	47.209592	-123.080058	-13.76	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG31	47.208222	-123.079992	-15.40	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG32	47.208266	-123.077982	-24.69	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG-COMP-10*	--	--	--	--	--	X	X	--	--	--	--	--	--	--
SMA-5 7-Point Composite Sample														
RIFS-SMA5-SG24	47.209457	-123.086090	1.80	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG28	47.208087	-123.086024	-1.36	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG29	47.208132	-123.084013	-5.75	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG30	47.208177	-123.082003	-10.38	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG33	47.206717	-123.085958	-3.98	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG34	47.206762	-123.083947	-2.37	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG35	47.206807	-123.081937	0.16	X	--	--	--	--	--	--	--	--	--	X
RIFS-SMA5-SG-COMP-07*	--	--	--	--	--	X	X	--	--	--	--	--	--	--
NHRA Composite Sample														
NHRA-SMA5-SG01	47.211544	-123.091674	14.54	X	--	--	--	--	--	--	--	--	--	X
NHRA-SMA5-SG02	47.210549	-123.091911	13.69	X	--	--	--	--	--	--	--	--	--	X
NHRA-SMA5-SG03	47.211357	-123.090902	11.17	X	--	--	--	--	--	--	--	--	--	X
NHRA-SMA5-SG04	47.210897	-123.090955	12.62	X	--	--	--	--	--	--	--	--	--	X
NHRA-SMA5-SG05	47.209945	-123.090205	14.21	X	--	--	--	--	--	--	--	--	--	X
NHRA-SMA5-SG-COMP-05*	--	--	--	--	--	X	X	--	--	--	--	--	--	--

Notes:

* The sample is a composite and does not have defined coordinates or elevation.

** The number of subsamples will be defined in the field and reflected in the sample ID as described in Section 2.7.2 of the SQAPP (Anchor QEA 2017, Appendix A). The sample is a composite and does not have defined coordinates or elevation.

--: not applicable
cm: centimeter
ft: feet
H_2S: hydrogen sulfide
MLLW: mean lower low water
NHRA: Northern Habitat Restoration Area
OMMP: *Interim Action Operations, Monitoring, and Maintenance Plan*
PAH: polycyclic aromatic hydrocarbon
RI/FS: Remedial Investigation/Feasibility Study
SMA: sediment management area
SQAPP: *Sampling and Quality Assurance Project Plan*
X: location to be submitted for testing

Table A-2

Parameters for Analysis, Methods, and Target Quantitation Limits

Parameter	Method	Target Reporting Limit
Conventionals (%)		
Total organic carbon	EPA 9060M	0.10
Total solids	EPA 160.3	0.10
Total volatile solids	ASTM D2974	0.10
Geotechnical parameters (%)		
Moisture content	ASTM D2216	0.10
Atterberg Limits	ASTM D4318	0.10
Bulk density	ASTM D2937	0.10
One-dimensional consolidation	ASTM D2435	N/A
Unconsolidated, undrained triaxial shear strength	ASTM D2850	N/A
Vane shear testing	ASTM D2573	N/A
Grain size	ASTM D422	0.10
Organotins (µg/kg)		
Di-n-butyltin	GC/MS	1.0
n-Butyltin	GC/MS	1.0
Tetra-n-butyltin	GC/MS	1.0
Tri-n-butyltin	GC/MS	1.0
Metals (mg/kg)		
Copper	EPA 6020A	1.0
Dioxins/furans (ng/kg)		
Dioxins		
2,3,7,8-TCDD	EPA 1613B	0.5
1,2,3,7,8-PeCDD	EPA 1613B	2.5
1,2,3,4,7,8-HxCDD	EPA 1613B	2.5
1,2,3,6,7,8-HxCDD	EPA 1613B	2.5
1,2,3,7,8,9-HxCDD	EPA 1613B	2.5
1,2,3,4,6,7,8-HpCDD	EPA 1613B	2.5
OCDD	EPA 1613B	5.00
Furans		
2,3,7,8-TCDF	EPA 1613B	0.5
1,2,3,7,8-PeCDF	EPA 1613B	2.5
2,3,4,7,8,-PeCDF	EPA 1613B	2.5
1,2,3,4,7,8-HxCDF	EPA 1613B	2.5
1,2,3,6,7,8-HxCDF	EPA 1613B	2.5
1,2,3,7,8,9-HxCDF	EPA 1613B	2.5
2,3,4,6,7,8-HxCDF	EPA 1613B	2.5
1,2,3,4,6,7,8-HpCDF	EPA 1613B	2.5
1,2,3,4,7,8,9-HpCDF	EPA 1613B	2.5
OCDF	EPA 1613B	5
Polycyclic aromatic hydrocarbons (µg/kg)		
2-Methylnaphthalene	EPA 8270D SIM	0.5
Acenaphthene	EPA 8270D SIM	0.5
Acenaphthylene	EPA 8270D SIM	0.5
Anthracene	EPA 8270D SIM	0.5
Benzo(a)anthracene	EPA 8270D SIM	0.5
Benzo(a)pyrene	EPA 8270D SIM	0.5
Benzo(b)fluoranthene	EPA 8270D SIM	0.5

Table A-2
Parameters for Analysis, Methods, and Target Quantitation Limits

Parameter	Method	Target Reporting Limit
Benzo(e)pyrene	EPA 8270D SIM	0.5
Benzo(g,h,i)perylene	EPA 8270D SIM	0.5
Benzo(k)fluoranthene	EPA 8270D SIM	0.5
Chrysene	EPA 8270D SIM	0.5
Dibenzo(a,h)anthracene	EPA 8270D SIM	0.5
Fluoranthene	EPA 8270D SIM	0.5
Fluorene	EPA 8270D SIM	0.5
Indeno(1,2,3-c,d)pyrene	EPA 8270D SIM	0.5
Naphthalene	EPA 8270D SIM	0.5
Perylene	EPA 8270D SIM	0.5
Phenanthrene	EPA 8270D SIM	0.5
Pyrene	EPA 8270D SIM	0.5
Porewater Conventionals (mg/L)		
DGT Sulfide	Densitometry	0.01

Notes:
µg/kg: micrograms per kilogram
ASTM: ASTM International
DGT: diffusive gradient thin film
EPA: U.S. Environmental Protection Agency
GC/MS: gas-chromatography and mass spectrometry
mg/kg: milligrams per kilogram
mg/L: milligrams per liter
N/A: not applicable
ng/kg: nanograms per kilogram
SIM: selected ion monitoring

Table A-3
Guidelines for Sample Handling and Storage

Parameter	Sample Size	Container Size and Type[1]	Holding Time	Preservative
Moisture content	150 g	16-oz jar or 1-quart zip-top bag	None	None
Atterberg limits			None	None
Bulk density	3 to 5 feet	Shelby tube	None	None
One-dimensional consolidation			None	None
Unconsolidated, undrained triaxial shear strength			None	None
Grain size	150 g	16-oz HDPE	None	None
Total solids	50 g	8-oz glass	None	Cool/4°C
Total organic carbon	50 g	From TS container	28 days	Cool/4°C
			6 months	Freeze -18°C
Total volatile solids/loss on ignition	100 g	8-oz glass	14 days	Cool/4°C
			6 months	Freeze -18°C
Organotins	150 g	8-oz glass	14 days until extraction	Cool/4°C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4°C
Dioxins/furans	150 g	8-oz amber glass	None	Cool/4°C
Polycyclic aromatic hydrocarbons	150 g	8-oz glass	14 days until extraction	Cool/4°C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4°C
Ex situ DGT	0.5 gallon	Large plastic bag	7 days	Cool/4°C
In situ DGT	None	--	7 days	Cool/4°C

Notes:
1. All sample containers will have lids with Teflon inserts.
DGT: diffusive gradient thin film
g: gram
HDPE: high-density polyethylene
oz: ounce
TS: total solids

Table A-4
Laboratory Quality Assurance/Quality Control Analysis Summary

Analysis Type	Initial Calibration	Ongoing Calibration	Replicates	Matrix Spikes	LCS/Blank Spike	Matrix Spike Duplicates	Method Blanks	Surrogate Spikes
Total solids	Daily or each batch[1]	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Total organic carbon	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	N/A	Each batch	N/A
Organotins	As needed[2]	Every 12 hours	N/A	1 per 20 samples	1 per 20 samples	1 per 20 samples	Each batch	Each sample
Dioxins/furans	As needed[2]	Every 12 hours	1 per 20 samples	N/A[3]	1 per 20 samples	N/A[3]	Each batch	Each sample
Polycyclic aromatic hydrocarbons	As needed[2]	Every 12 hours	N/A	1 per 20 samples	1 per 20 samples	1 per 20 samples	Each batch	Each sample
DGT sulfide	Daily or each batch	1 per 10 samples	N/A	N/A	N/A	N/A	Each batch	N/A

Notes:

1. Calibration and certification of drying ovens and weighing scales are conducted biannually.
2. Initial calibrations are considered valid until the ongoing continuing calibration no longer meets method specifications. At that point, a new initial calibration is performed.
3. Isotope dilution required by the method.

DGT: diffusive gradient thin film

LCS: laboratory control sample

N/A: not applicable

Table A-5
Data Quality Objectives

Parameter	Precision (Percentage)	Accuracy[1] (Percentage)	Completeness (Percentage)
Total organic carbon	± 30 RPD	75 to 125 R	95
Total solids	± 20 RPD	N/A	95
Organotins	± 35 RPD	50 to 150 R	95
PAHs	± 35 RPD	51 to 150 R	96
Dioxins/furans	± 35 RPD	52 to 150 R	97

Notes:
1. Laboratory control sample and matrix spike/matrix spike duplicate percent recovery.
N/A: not applicable
PAH: polycyclic aromatic hydrocarbon
R: recovery
RPD: relative percent difference

Figures

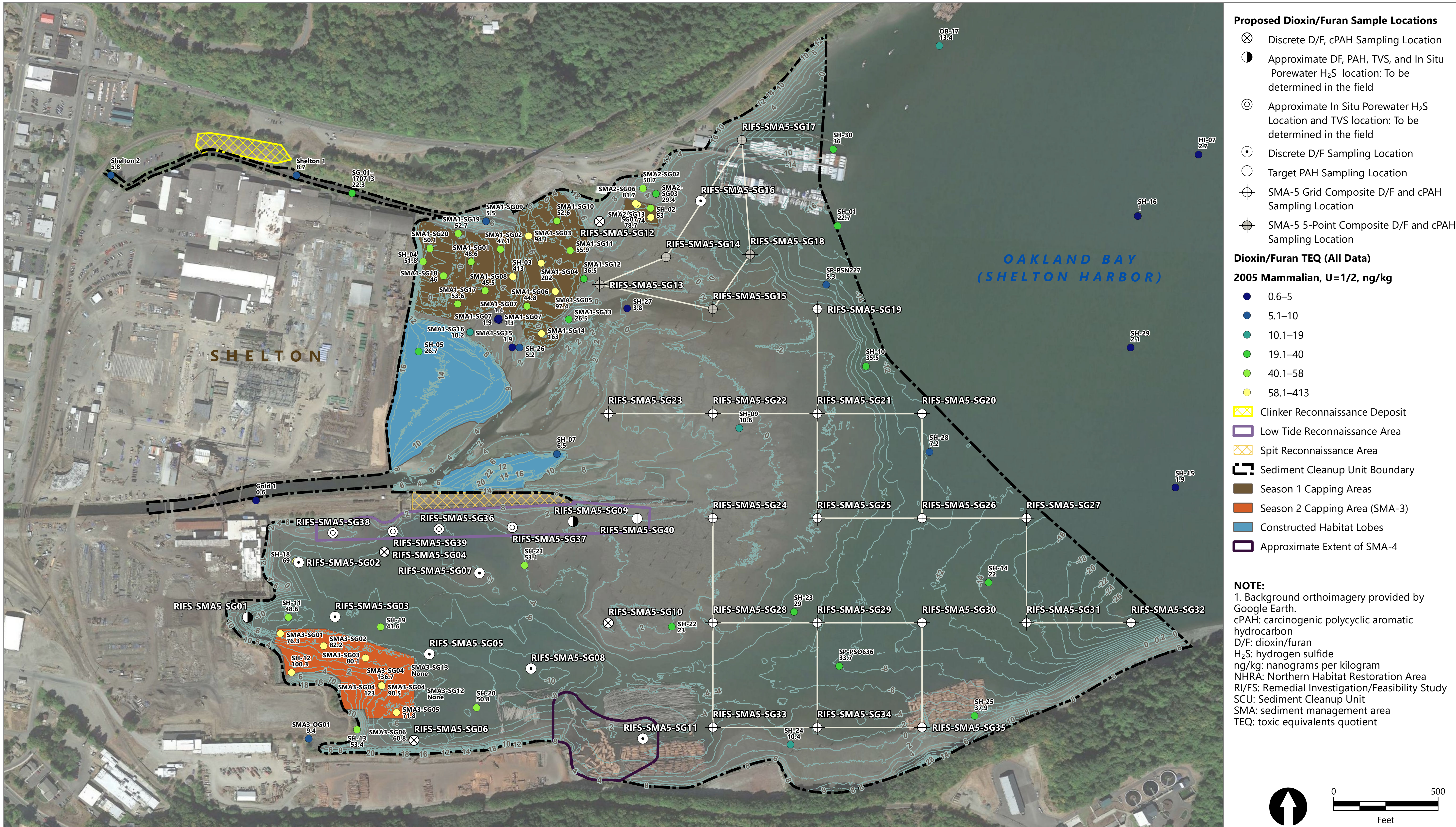

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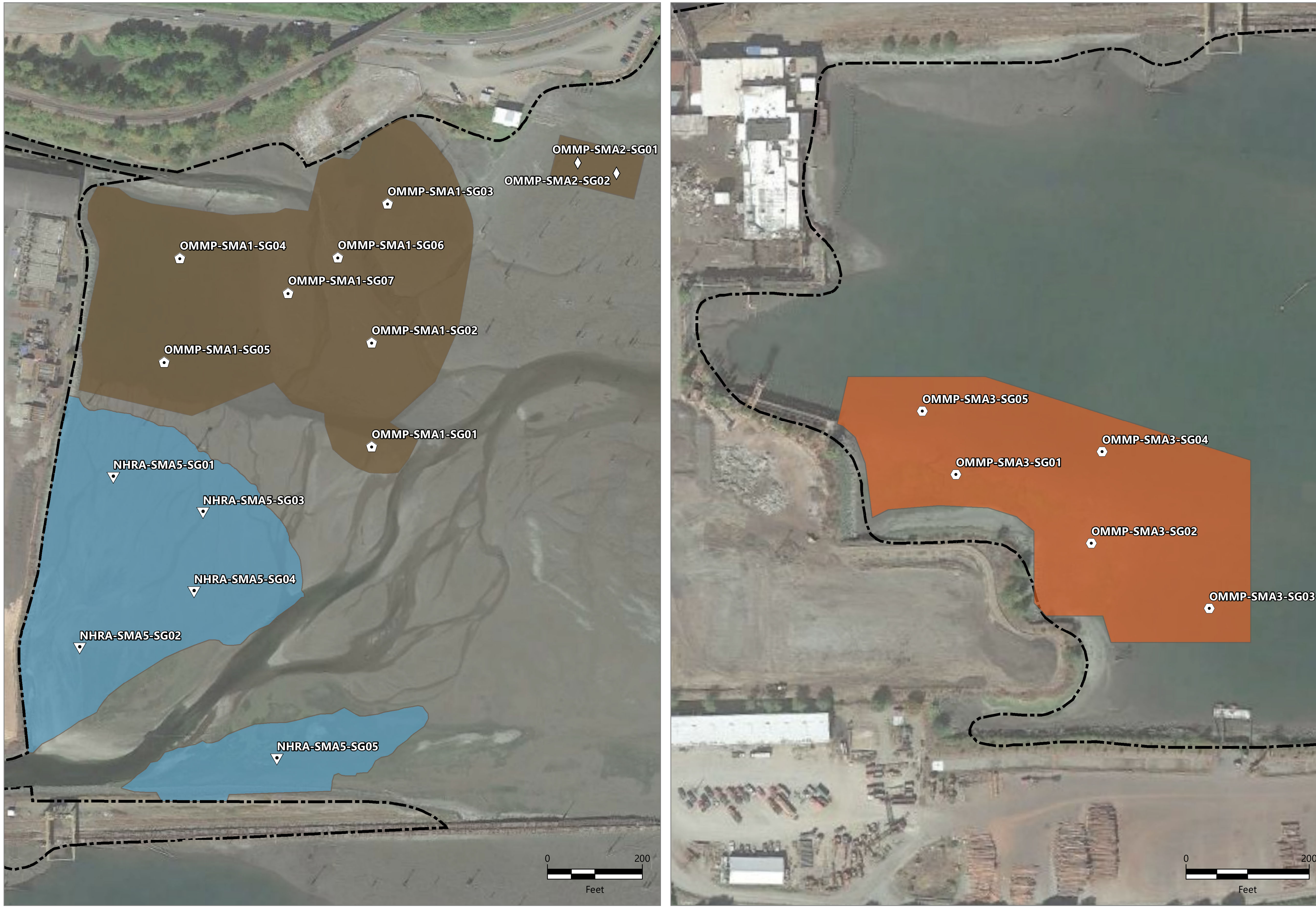
Figure A-1
2020 Shelton Harbor SCU Sediment Sampling Target Locations
Sampling and Quality Assurance Project Plan Addendum No. 2
Oakland Bay and Shelton Harbor Sediments Cleanup Site



Proposed Dioxin/Furan Sample Locations

- D/F and cPAH Composite Sample and Individual Porewater H_2S Samples: If depositional sediment present >1-cm sub sampling will be conducted (e.g., 0-2 and 0-10 cm sample intervals).
- D/F and cPAH Composite Sample: If depositional sediment present >1-cm sub sampling will be conducted (e.g., 0-2 and 0-10 cm sample intervals).
- D/F and cPAH Composite Test: 0-10 cm Sample Depth
- D/F, TBT, cPAH and Cu Composite Test: 0-10 cm Sample Depth
- Clinker Deposit
- Sediment Cleanup Unit Boundary
- Season 1 Capping Areas
- Season 2 Capping Area (SMA-3)
- Constructed Habitat Lobes

NOTES:

1. Background orthoimagery provided by Google Earth.

cm: centimeter
cPAH: carcinogenic polycyclic aromatic hydrocarbon
Cu: copper
D/F: dioxin/furan
H_2S: hydrogen sulfide
NHRA: Northern Habitat Restoration Area
OMMP: Operations, Maintenance, and Monitoring Plan
SMA: sediment management area
TBT: tributyltin

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Figure A-2
Shelton Harbor Interim Action Cap Monitoring Target Locations
Sampling and Quality Assurance Project Plan Addendum No. 2
Oakland Bay and Shelton Harbor Sediments Cleanup Site

Pass SCO Biological Criteria

Pass CSL/Fails SCO Biological Criteria

Fails CSL Biological Criteria

Sample Locations and Porewater H_2S Concentration and TVS Result Where Available

Sediment Core Location

Sediment Profile Imaging Location

Beggiatoa Present During RI/FS or PDIA

Approximate Extent of SMA-4

Proposed Sampling

Discrete TVS and Porewater H_2S Sampling Location

Core Sample Location

NOTES:
CSL: cleanup screening level
H_2S: hydrogen sulfide
mg/L: milligrams per liter
PDIA: Pre-Design Investigation Addendum
RI/FS: Remedial Investigation/Feasibility Study
SCO: sediment cleanup objective
SMA: sediment management area
TVS: total volatile solids

0 200
Feet

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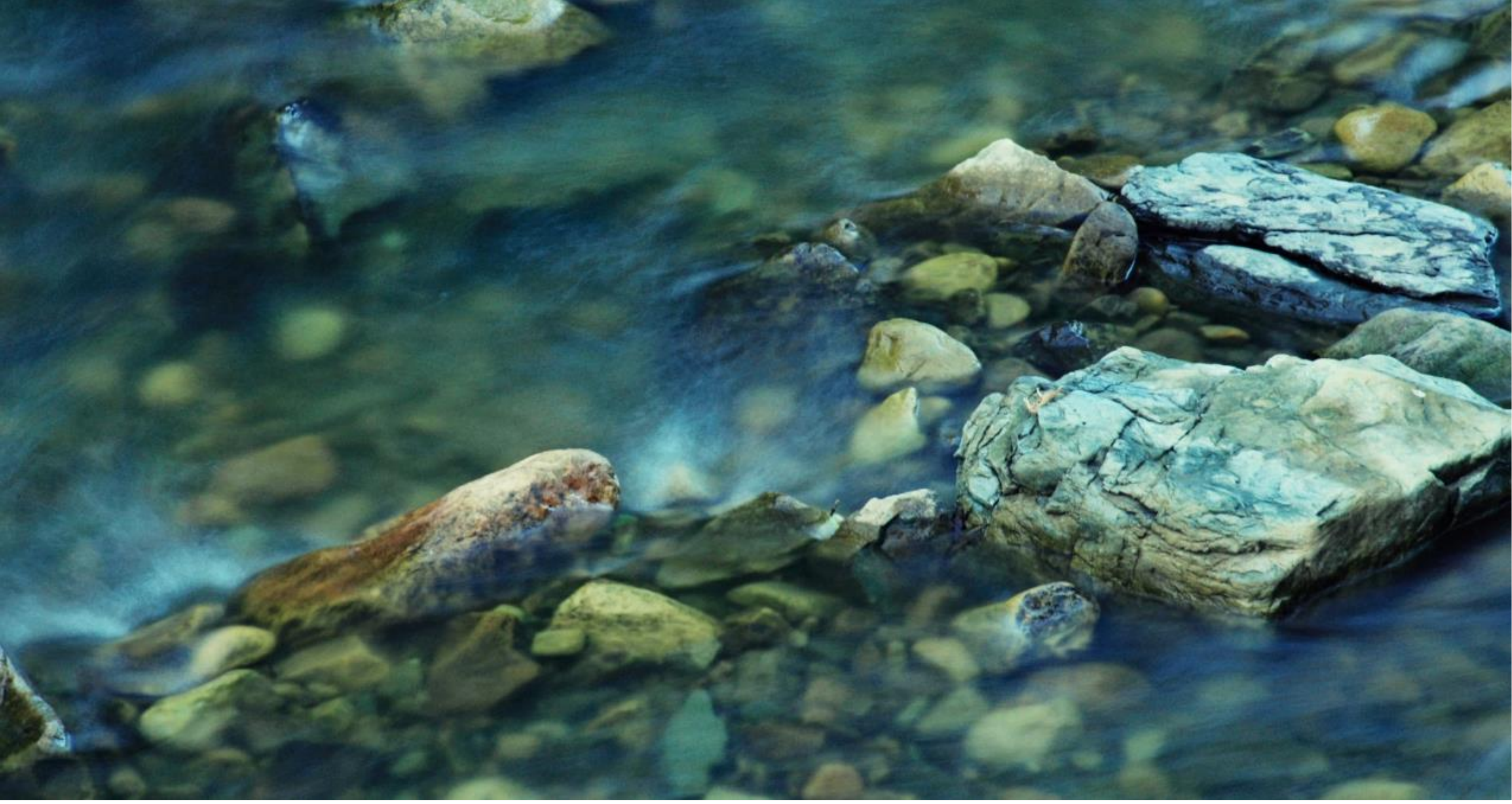
Figure A-3
2020 SMA-4 Surface and Subsurface Sediment Sampling Target Locations
Sampling and Quality Assurance Project Plan Addendum No. 2
Oakland Bay and Shelton Harbor Sediments Cleanup Site

Attachment A-1
Substantive Requirements of Washington Department of Fish and Wildlife Hydraulic Project Approval for Sediment Sampling Activities – Shelton Harbor

Substantive Requirements of Washington Department of Fish and Wildlife
Hydraulic Project Approval
For Sediment Sampling Activities
Shelton Harbor

- Conduct borings in a manner to minimize turbidity and discharge of silt to the water column.
- Minimize disturbance of sediment while collecting cores, surface samples or using other equipment such as sediment profile imaging cameras.
- Take precautions to minimize sediment disturbance from prop wash and anchoring.
- Do not ground the boat or bring vehicles onto sediments.
- Sediments with visible evidence of chemical contamination (e.g., oily droplets, sheen, paint chips, sandblast grit) should not be returned to the water. Instead they should be retained on board the vessel for appropriate disposal onshore.
- Sediment sampling equipment shall be well-maintained and in good repair to prevent the loss of lubricants or other deleterious materials from entering the water.
- FISH KILL/ WATER QUALITY PROBLEM NOTIFICATION: If a fish kill occurs or fish are observed in distress at the job site, immediately stop all activities causing harm. Immediately notify the Washington Department of Fish and Wildlife of the problem by calling Area Habitat Biologist Allison Cook 360-480-3510 or emailing hpaapplications@dfw.wa.gov. If the likely cause of the fish kill or fish distress is related to water quality, also notify the Washington Military Department Emergency Management Division at 1-800-258-5990. Activities related to the fish kill or fish distress must not resume until the Washington Department of Fish and Wildlife gives approval.

Appendix B
Interim Action Operations, Maintenance, and Monitoring Plan



June 2020
Shelton Harbor Sediment Cleanup Unit
Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007)

Interim Action Operations, Maintenance, and Monitoring Plan

Prepared for Simpson Timber Company and the Washington State Department of Ecology

June 2020
Shelton Harbor Sediment Cleanup Unit
Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007)

Interim Action Operations, Maintenance, and Monitoring Plan

Prepared for
Simpson Timber Company
1305 5th Avenue, Suite 2700
Seattle, Washington 98101

Washington State Department of Ecology
Toxics Cleanup Program, Southwest Region
PO Box 47775
Olympia, Washington 98504-7775

Prepared by
Anchor QEA, LLC
1201 3rd Avenue, Suite 2600
Seattle, Washington 98101

Project Number: 110008-01.03
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FIGURE

ABBREVIATIONS

AO	Agreed Order
BODR	*Shelton Harbor Interim Action Basis of Design Report*
BODR Addendum	*Shelton Harbor Interim Action Basis of Design Report Addendum No. 1*
CoC	chemical of concern
Ecology	Washington State Department of Ecology
IAP	*Shelton Harbor Interim Action Plan*
MTCA	Model Toxics Control Act
OMMP	*Interim Action Operations, Maintenance, and Monitoring Plan*
PAH	polycyclic aromatic hydrocarbon
QC	quality control
RI/FS Work Plan Addendum	*Remedial Action/Feasibility Study Work Plan Addendum No. 1*
SCU	sediment cleanup unit
Simpson	Simpson Timber Company
SMA	sediment management area
SMS	sediment management standard
SQAPP Addendum No. 2	*Sampling and Quality Assurance Project Plan Addendum No. 2*
SWAC	surface-weighted average concentration
USACE	U.S. Army Corps of Engineers
WAC	Washington Administrative Code

1 Introduction

This *Interim Action Operations, Maintenance, and Monitoring Plan* (OMMP) describes long-term monitoring and adaptive management of engineered caps in the Shelton Harbor sediment cleanup unit (SCU) to ensure their long-term integrity and protectiveness. This OMMP builds on the *Shelton Harbor Interim Action Basis of Design Report* (BODR; Anchor QEA 2018a) and *Shelton Harbor Interim Action Basis of Design Report Addendum No. 1* (BODR Addendum; Anchor QEA 2019a), which describe the approach and criteria for the engineering design of Interim Actions at the SCU, as set forth in the *Shelton Harbor Interim Action Plan* (IAP; Anchor QEA 2018b), and in accordance with the requirements of the Agreed Order (AO) No. DE 14091 between the Washington State Department of Ecology (Ecology) and Simpson Timber Company (Simpson), entered in July 2017. The actions described in this OMMP will be performed by Simpson under Ecology oversight, consistent with AO requirements.

Implementation of this OMMP will be performed consistent with the requirements of the Model Toxics Control Act (MTCA), Chapter 70.105D in the Revised Code of Washington, as administered by Ecology under the MTCA Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC). Implementation of this OMMP will also comply with the Sediment Management Standards (SMS), WAC Chapter 173-204.

1.1 Purpose and Scope of the OMMP

As described in the BODR and BODR Addendum (Anchor QEA 2018a, 2019a), engineered caps have been placed over approximately 12 acres of the SCU. Engineered cap placement was conducted over two construction seasons, beginning in October 2018 and ending in September 2019. The extent of engineered caps successfully placed in sediment management areas (SMAs) within the SCU is shown in Figure B-1. Long-term monitoring of engineered caps in SMA-1, SMA-2, and SMA-3 will be performed to ensure their long-term integrity and protectiveness.

As described in more detail in Section 3, the long-term monitoring of engineered caps will primarily include physical survey methods (e.g., bathymetry) to monitor the integrity, surface elevation, and thickness of the caps, beginning in Year 1 following completion of construction. Post-construction cap monitoring will begin in 2020, continuing in Year 3 (2022) and Year 5 (2025), and then approximately every 5 years thereafter through 2035, as described in more detail herein. Focused follow-on chemical or biological monitoring may be performed in targeted cap areas identified by the physical surveys to further evaluate the protectiveness of the caps. Cap repairs will be performed as needed based on the results of the monitoring. The need for and scope/schedule of long-term cap monitoring and maintenance beyond 2035 will be developed as a collaborative effort between Simpson and Ecology based on the results of monitoring through 2035. Additional monitoring events may be triggered by specific storm or seismic events (e.g., a wind event with a recurrence interval of 20 years or more or a seismic event of a magnitude greater than 5.5).

Long-term performance and confirmation monitoring activities will inform Ecology’s 5-year reviews of the effectiveness of remedial actions within the SCU, consistent with MTCA and SMS requirements. Sampling events will be scheduled to facilitate Ecology's 5-year reviews, beginning in approximately 2025.

Subsequent sections of this OMMP describe post-construction environmental monitoring activities that will be performed within the SCU, including the details of post-construction monitoring and maintenance of capped areas to ensure the cap remains physically stable and chemically protective over time, as well as long-term surface sediment monitoring to verify that cleanup actions accelerate natural recovery processes. The overall objective of this OMMP is to confirm that remedial actions within the SCU achieve the performance standards specified in the IAP.

1.2 Organization of the OMMP

The remainder of this OMMP is organized as follows:

- Section 2 – Project Roles and Responsibilities
- Section 3 – Cap Monitoring and Potential Corrective Actions
- Section 4 – Reporting
- Section 5 – References

The *Sampling and Quality Assurance Project Plan Addendum No. 2* (SQAPP Addendum No. 2; Appendix A to the *Remedial Action/Feasibility Study Work Plan Addendum No. 1* [RI/FS Work Plan Addendum]; Anchor QEA 2020) specifies the procedures to ensure that sample collection, handling, and analysis as part of the OMMP will result in data of sufficient quality to evaluate the effectiveness of remedial actions within the SCU.

2 Project Roles and Responsibilities

2.1 Washington State Department of Ecology

Ecology is the regulatory authority and responsible agency for overseeing and authorizing remedial actions within the SCU. In this capacity, Ecology will review information described in this OMMP to ensure that the monitoring is conducted in a manner consistent with the stated objectives of the OMMP. Joyce Mercuri is the Ecology site manager, who will exercise project oversight for Ecology and coordinate with Simpson. Ecology will make final decisions to resolve unforeseen problems, which may change the project components or the manner in which the OMMP is undertaken.

2.2 Simpson Timber Company

The operation, maintenance, and monitoring work on this project will be managed by Simpson and executed by Simpson or by a designated representative. The project coordinator for Simpson is Greg Brunkhorst of Anchor QEA, LLC, who will be responsible for implementation of the OMMP, including required monitoring, sampling, testing, and reporting. Included within this responsibility will be the monitoring or quality control (QC) activities to ensure that activities described in this OMMP are conducted in accordance with the requirements described herein. These activities may also be assigned to other designees with the requisite expertise and experience.

3 Cap Monitoring and Potential Corrective Actions

Long-term cap monitoring will encompass two broad categories:

- Physical integrity performance monitoring (Section 3.1)
- Sediment quality confirmation monitoring (Section 3.2)

Physical integrity monitoring will be performed using a high-resolution hydrographic survey (i.e., multibeam bathymetric survey) conducted at the start of each OMMP monitoring event. The bathymetric survey data will be used to evaluate post-construction changes in cap thicknesses by comparing measured surface elevations of the cap with the final post-construction surveys presented in the Northern Shelton Harbor Interim Action: Water Quality Monitoring and Cap Construction Status (Season 1; Anchor QEA 2019b) and Shelton Harbor Interim Action: Season 2 Water Quality and Cap Thickness Monitoring Construction Completion (Anchor QEA 2019c) memoranda.[1] Based on a comparison of the survey results, cap areas of relatively greater erosion or settlement will be targeted as locations to conduct follow-on sediment quality monitoring, as needed. Visual inspections of the caps at low tide will also be conducted to further detail the physical integrity of the caps and locate potential follow-on sediment core sampling locations, as necessary.

Surface sediment quality monitoring will be conducted at designated sampling stations shown in Figure B-1. Additional surface sediment sampling stations may be selected following completion and interpretation of the hydrographic survey or follow-on sediment core sampling, as described in the following sections.

3.1 Physical Integrity Performance Monitoring

Bathymetric survey methods will be similar between the post-construction and each OMMP survey to allow detailed comparisons. Changes in bathymetry will be evaluated to identify areas of net settlement, erosion, or deposition relative to post-construction conditions. A potential cap area of concern for potential settlement or erosion will be identified when the apparent total cap thickness relative to as-built conditions is less than the minimum specification defined in the BODR and BODR Addendum (Anchor QEA 2018a, 2019a), depending on the specific cap area. A potential cap area of concern may trigger visual inspection of the cap surface (Section 3.1.2) or sediment sampling in that area to more accurately characterize (through coring or probing) the in-place cap layer thicknesses (Section 3.1.3).

[1] Baseline and OMMP event survey data will be maintained on Anchor QEA's redundant file server. A GIS map package file of the survey data can be made available upon request.

3.1.1 Bathymetric Survey Methods

Bathymetric surveying was used during construction to verify that the placed thicknesses of the engineered caps meet the requirements described in the BODR and BODR Addendum (Anchor QEA 2018a, 2019a). Multibeam bathymetric surveys will be performed as part of OMMP monitoring to identify changes in mudline elevations. Multibeam surveys will be conducted by a licensed surveyor and will meet or exceed the accuracy standards for a U.S. Army Corps of Engineers (USACE) navigation and dredging support survey as referenced in the USACE hydrographic survey manual, April 2004 revision (USACE 2004).

3.1.2 Visual Inspection Methods

Visual inspection will be performed to evaluate the integrity of caps if the bathymetry survey indicates areas of relatively greater erosion or settlement. Cap inspections may be performed at low tide for intertidal caps and by a diver for subtidal caps to further detail the physical integrity of the armored areas and toe of the armored slope. Inspections will include documentation of each of the following:

- Description of the cap surface conditions and subsurface probing
- Indications of settlement, seepage, or other unanticipated conditions
- Sediment core locations (these may also be identified as necessary to more accurately characterize the in-place layer thickness)

3.1.3 Sediment Coring Methods

Sediment cores may be performed at locations identified in the bathymetric surveys or inspections where possible cap settlement or erosion of cap thicknesses are below the BODR-defined cap design criteria (Anchor QEA 2018a). If necessary, cores will be advanced to a minimum depth of approximately 1 foot below the minimum required cap thickness. The cores will be visually inspected to determine the thicknesses of the cap material.

If the coring verifies the cap thickness specification in that area (e.g., reductions in cap surface elevations are primarily attributable to subgrade settlement), no further cap monitoring in that area will be required during that event. Conversely, if the coring reveals that cap thickness specifications in that area have not been maintained, additional contingency evaluations—including surface sediment chemical analyses or cap maintenance or repair—may be performed as appropriate, subject to Ecology approval (Section 3.3).

Detailed procedures for field sampling, location control, sample handling, and decontamination are provided in the SQAPP Addendum No. 2 (RI/FS Work Plan Addendum, Appendix A; Anchor QEA 2020). Detailed field and laboratory quality assurance and QC criteria, including method specifications, detection limits, accuracy, and precision requirements, are provided in the *Sampling* *and Quality Assurance Project Plan* (Appendix A to the *Remedial Investigation/Feasibility Study Work Plan* [Anchor QEA 2017]).

3.2 Confirmation Monitoring at Cap Locations

As discussed in the previous sections, surface sediment (0- to 10-centimeter) quality monitoring will be conducted within each Interim Action area. One seven-point composite will be analyzed from SMA-1 with two discrete in situ tests or porewater hydrogen sulfide; one five-point composite from SMA-3; and one two-point composite will be analyzed within SMA-2, as depicted in Figure B-1. In SMA-1 and SMA-3, surface sediments composite samples will be tested for dioxins/furans and polycyclic aromatic hydrocarbons (PAHs). SMA-2 will also be tested for bulk sediment copper and tributyltin. In addition, if sufficient thickness (greater than 1 centimeter) is present, a depositional material sample will be collected from the surface of the SMA-1 and SMA-3 cap areas to characterize current depositional concentrations of chemicals of concern (CoCs; including dioxins/furans and PAHs). All sediment samples collected as part of the OMMP will be collected and analyzed in accordance with the SQAPP Addendum No. 2 (RI/FS Work Plan Addendum, Appendix A; Anchor QEA 2020).

Additional targeted surface sediment sampling may be performed following completion and interpretation of the bathymetric surveys and/or follow-on core sampling (Section 3.1). The decision on whether to collect and analyze additional surface grab samples or sediment core samples in these areas, along with the specific CoC analyses, will be made by Ecology in consultation with Simpson based on field observations.

If the CoC analyses confirm that cleanup standards are being maintained, then no further cap monitoring or repair in that area will be required during that event. Conversely, if the CoC analyses reveal that cleanup standards may be exceeded, further focused monitoring or cap maintenance or repair will be performed as appropriate (Section 3.3), subject to Ecology approval.

3.2.1 Sediment Sampling and Analysis Methods

Sediment sampling and analysis methods are presented in the SQAPP Addendum No. 2 (RI/FS Work Plan Addendum, Appendix A; Anchor QEA 2020).

3.3 Corrective Actions

In the event that physical cap monitoring reveals that maintenance is required, Simpson and Ecology will consult to determine appropriate technical deliverables and scope of maintenance action. In the event that monitoring indicates that remedial action performance standards may not be achieved across the appropriate point of compliance (i.e., as a surface-weighted average concentration [SWAC] across the entire SCU for dioxins/furans), Simpson will submit recommendations for further monitoring or corrective actions to Ecology for review. CoC monitoring data collected across the SCU (see the RI/FS Work Plan Addendum; Anchor QEA 2020) will be used to calculate the SWAC.

If physical or chemical monitoring data reveal that cap performance standards are not being achieved, a response plan will be developed describing additional response actions to be taken to ensure cap protectiveness. In conjunction with Ecology, Simpson will evaluate the extent and significance of the exceedance. The need for additional response actions will take into consideration all monitoring results relative to an overall assessment of the successful performance of the remedial action. Through these discussions, an appropriate course of action will be developed and implemented, as necessary. The specific problem causing the need for a contingency will dictate which additional response actions may be most appropriate.

Possible additional response actions may include, but are not limited to, those listed for the following scenarios:

- Erosion of cap material
  - Perform additional monitoring to further assess erosion and to determine the extent, cause, and potential solution to the verified erosion.
  - Perform additional sediment quality sampling within those erosion areas where there may be a potential for underlying material to be exposed.
  - Discuss operations that might contribute to erosion and modifications to these operations that may be required to maintain remedy effectiveness.
  - Place additional material with less erosion potential to supplement caps.
- Sediment cleanup standard exceedance
  - Conduct confirmation biological sediment toxicity testing to confirm or refute the occurrence of adverse ecological impacts.
  - Conduct a source control evaluation in coordination with Ecology (as necessary).
  - Place additional capping material.

4 Reporting

Subsequent to each OMMP monitoring event described in the previous sections, Simpson will submit a detailed report to Ecology outlining the actions taken and the results, which will include survey maps and chemical analysis data. A recommendation for modifications to the scope of future monitoring efforts (e.g., reduction in the frequency of cap monitoring) or corrective actions will be described in detail if warranted.

5 References

Anchor QEA (Anchor QEA, LLC), 2017. *Remedial Investigation/Feasibility Study Work Plan*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company and the Washington State Department of Ecology. July 2017.

Anchor QEA, 2018a. *Shelton Harbor Interim Action Basis of Design Report*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company. September 2018.

Anchor QEA, 2018b. *Shelton Harbor Interim Action Plan*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company and the Washington State Department of Ecology. January 2018.

Anchor QEA, 2019a. *Shelton Harbor Interim Action Basis of Design Report Addendum No 1*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company. May 2019.

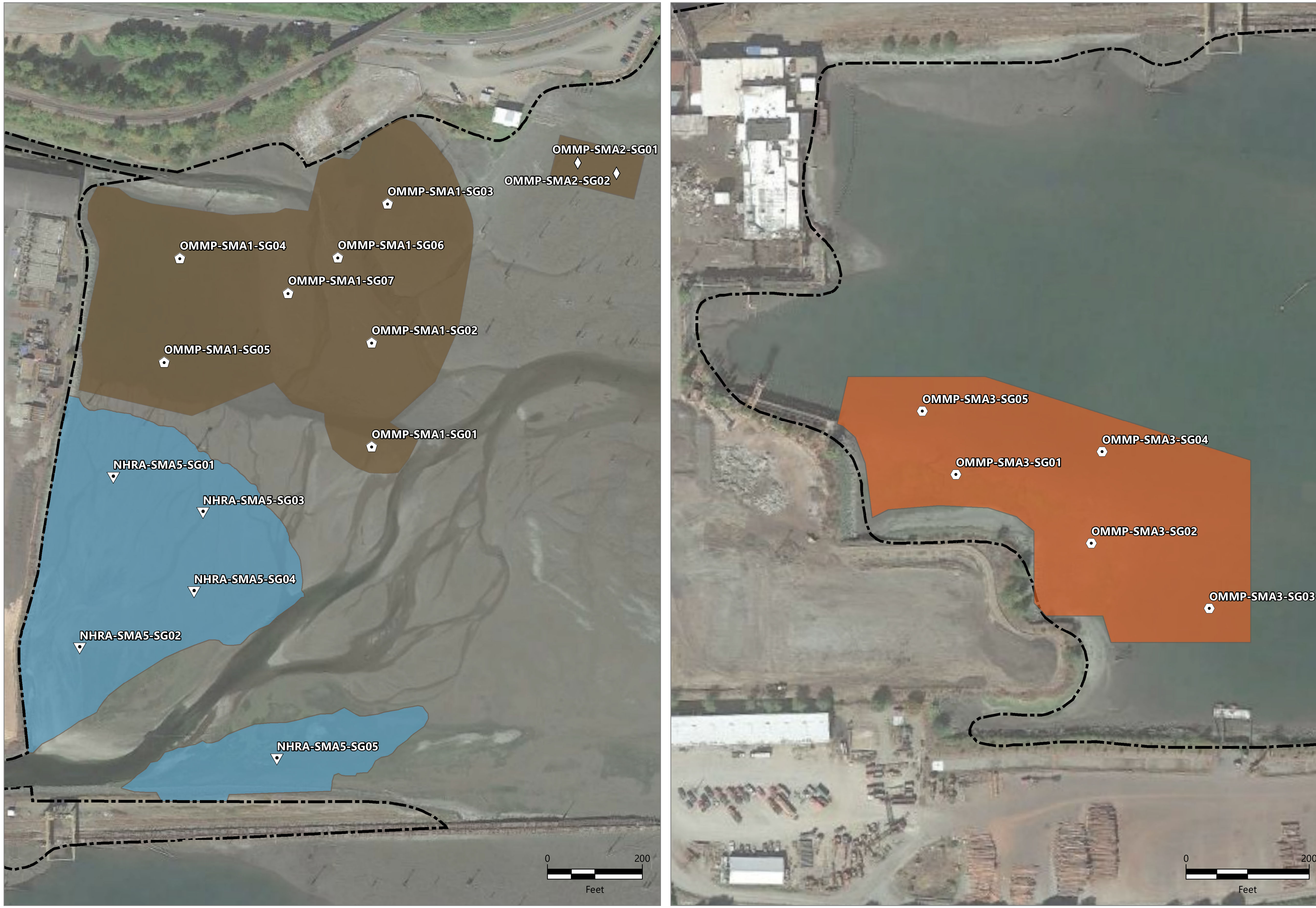
Anchor QEA, 2019b. Memorandum to: Joyce Mercuri, Washington State Department of Ecology. Regarding: Northern Shelton Harbor Interim Action: Water Quality Monitoring and Cap Construction Status. March 11, 2019.

Anchor QEA, 2019c. Memorandum to: Joyce Mercuri, Washington State Department of Ecology. Regarding: Shelton Harbor Interim Action: Season 2 Water Quality and Cap Thickness Monitoring. November 13, 2019.

Anchor QEA, 2020. *Remedial Investigation/Feasibility Study Work Plan Addendum No. 1*. Shelton Harbor Sediment Cleanup Unit, Oakland Bay and Shelton Harbor Sediments Cleanup Site (Cleanup Site ID 13007). Prepared for Simpson Timber Company, Manke Lumber Company, and the Washington State Department of Ecology. June 2020.

USACE (U.S. Army Corps of Engineers), 2004. *Engineering and Design: Hydrographic Surveying*. EM 1110-2-1003. April 2004.

Figure



Proposed Dioxin/Furan Sample Locations

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NOTES:
1. Background orthoimagery provided by Google Earth.
cm: centimeter
cPAH: carcinogenic polycyclic aromatic hydrocarbon
Cu: copper
D/F: dioxin/furan
H_2S: hydrogen sulfide
NHRA: Northern Habitat Restoration Area
OMMP: Operations, Maintenance, and Monitoring Plan
SMA: sediment management area
TBT: tributyltin

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Figure B-1
Shelton Harbor Interim Action Cap Monitoring Target Locations
Interim Action Operations, Maintenance, and Monitoring Plan
Oakland Bay and Shelton Harbor Sediments Cleanup Site