April 2022
Whatcom Waterway Cleanup in Phase 1 Site Areas

Year 5 Compliance Monitoring Report

Prepared for Port of Bellingham

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Prepared for
Port of Bellingham
1801 Roeder Avenue
Bellingham, Washington 98225

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

Project Number: 190007-01.01
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ABBREVIATIONS

µg/L	microgram per liter
AFDW	ash-free dry weight
BST	Bellingham Shipping Terminal
cm	centimeter
CSL	cleanup screening level
D/F	dioxins/furans
DO	dissolved oxygen
Ecology	Washington State Department of Ecology
GP West	Georgia-Pacific West, Inc.
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligram per liter
MNR	monitored natural recovery
MTCA	Model Toxics Control Act
ng/kg	nanogram per kilogram
PAH	polycyclic aromatic hydrocarbon
Port	Port of Bellingham
Project	Whatcom Waterway Cleanup in Phase 1 Site Areas
RAU	remedial action unit
Report	Whatcom Waterway Year 5 Compliance Monitoring Report
RPD	relative percent difference
SCO	sediment cleanup objective
Site	Whatcom Waterway Site
SQAPP	Sampling and Quality Assurance Project Plan
SWAC	surface-weighted average concentration
TEQ	toxic equivalency quotient

GLOSSARY

Whatcom Waterway Site (Site)	The overall Model Toxics Control Act (MTCA) cleanup site addressed by the Whatcom Waterway Consent Decree. This area includes both Whatcom Waterway and adjacent aquatic lands impacted by historical mercury discharges from the former Georgia-Pacific chlor-alkali plant wastewater discharges. The Site includes both Phase 1 and Phase 2 cleanup areas and additional areas being addressed by monitored natural recovery.
Whatcom Waterway	The physical waterway extending from Roeder Avenue to deep water. Whatcom Waterway includes both the Inner Waterway and Outer Waterway areas.
Inner Waterway	The inner portion of Whatcom Waterway, extending from Roeder Avenue to the beginning of the Federal Navigation Channel at Waterway Station 29+00. The Inner Waterway includes Site Units 2 and 3 of the Whatcom Waterway Site.
Outer Waterway	The outer portion of Whatcom Waterway, extending from Station 29+00 into deep water. The Outer Waterway includes Site Units 1A, 1B, and 1C of the Whatcom Waterway Site. The Federal Navigation Channel that was updated in 2007 is located within the Outer Waterway.
Federal Navigation Channel	The Whatcom Waterway federal navigation project as currently authorized in existing Water Resources Development Act legislation. The authorized project includes a 30-foot-deep navigation channel (plus applicable over-dredge allowances) extending from Station 29+00 of Whatcom Waterway into deep water. The Federal Navigation Channel is maintained by coordinated actions of the U.S. Army Corps of Engineers and the Port of Bellingham as the local sponsor.
Central Waterfront Site	The MTCA site located on certain properties between Whatcom Waterway and I&J Waterway. Design of the cleanup action is in progress under a MTCA agreed order.
GP West Site	The MTCA site located on upland property on the south side of Whatcom Waterway. The Georgia-Pacific West, Inc. (GP West) Site is divided into two remedial action units (RAUs), the Pulp and Tissue Mill RAU and the Chlor-Alkali RAU. The RAUs are in different stages of the cleanup process under MTCA.

Log Pond	Site Unit 4 of the Whatcom Waterway Site. The Log Pond is located between Whatcom Waterway and the GP West Site. The Log Pond was capped in 2001 as part of an Interim Action. Additional capping was completed as part of the Whatcom Waterway Phase 1 cleanup work.
Chlor-Alkali Remedial Action Unit	The Chlor-Alkali RAU comprises the western portion of the GP West Site adjacent to the Log Pond and Cornwall Avenue. Design of the cleanup action is in progress under a MTCA agreed order.
Pulp and Tissue Mill Remedial Action Unit	The Pulp and Tissue Mill RAU comprises the eastern portion of the GP West Site adjacent to Whatcom Waterway and Roeder Avenue. The final cleanup of this RAU was completed in 2016 under a MTCA consent decree.
Whatcom Waterway Cleanup in Phase 1 Site Areas (Project)	The construction and monitoring activities completed to implement the final cleanup of Phase 1 Areas of the Whatcom Waterway Site.
Phase 1 Site Areas	Whatcom Waterway Site Units 3B, 2A, and 4, and portions of Units 1C and 2C. Cleanup of these units has been completed.
Phase 2 Site Areas	Whatcom Waterway Site Units 1A, 1B, 2B, and 8, and portions of Units 1C, 2C, 5B, 6B, and 6C. These areas will be cleaned up as part of a future phase of construction, consistent with the requirements of the First Amendment to the Whatcom Waterway Consent Decree.
Monitored Natural Recovery Areas (MNR Areas)	Whatcom Waterway Site Units 3A, 5A, 5C, 6A, 7, and 9, and portions of Units 5B, 6B, and 6C. Clean sediment is naturally accumulating in these areas, and they are subject to long-term compliance monitoring requirements.
Central Waterfront Shoreline	The upland properties located between Whatcom Waterway and I&J Waterway and between Roeder Avenue and the aerated stabilization basin (wastewater treatment lagoon). The Central Waterfront Shoreline includes the properties within and outside of the Central Waterfront Site.
South Shoreline	The length of shoreline located along the GP West Site from the former GP West dock to the west end of the Central Avenue pier.

1 Introduction

This Whatcom Waterway Year 5 Compliance Monitoring Report (Report) summarizes Year 5 compliance monitoring activities performed by the Port of Bellingham (Port) as part of long-term monitoring for the Whatcom Waterway Cleanup in Phase 1 Site Areas (Project). Year 5 monitoring activities were performed between May and August 2021 in accordance with the Sampling and Quality Assurance Project Plan (SQAPP; Anchor QEA 2016) approved by the Washington State Department of Ecology (Ecology).

The Whatcom Waterway Site (Site) location and vicinity are shown in Figure 1. The Site includes sediments that have been impacted by mercury discharges from the former Georgia-Pacific West, Inc. (GP West) chlor-alkali plant. The Site boundary shown in Figure 1 was drawn based on the extent of potentially significant surface and subsurface mercury contamination in sediments as determined during the Remedial Investigation and Feasibility Study (Anchor Environmental and Hart Crowser 2000) process and during subsequent pre-remedial design investigations conducted in 2008 (Anchor QEA 2010).

Other Site-associated contaminants include wood waste and degradation products from historical log rafting activities, and phenolic compounds from pulp mill wastewater discharges.

The Project included cleanup construction in the Inner Waterway area, the Log Pond, and the Bellingham Shipping Terminal (BST) area (Phase 1 site areas; Figure 2). Major activities included remedial dredging, engineered capping, containment wall installation, structure removal, structure replacement, and ancillary nearshore habitat improvements.

Project construction was completed in 2016 in accordance with requirements of the Ecology-approved Whatcom Waterway Final Engineering Design Report (Anchor QEA 2015) and applicable permits and approvals. Details on completed construction activities and associated monitoring during the Project are documented in the As-built Report (Anchor QEA 2018). That report has been reviewed and approved by Ecology.

This cleanup action was performed in compliance with the requirements of the Model Toxics Control Act (MTCA) and Sediment Management Standards regulations. Compliance monitoring requirements subject to permit conditions include monitoring during and after the cleanup action in Phase 1 site areas. The SQAPP (Anchor QEA 2016) describes the sampling and analysis plan for compliance monitoring conducted during and immediately following cleanup construction actions (performance monitoring) as well as long-term (compliance) monitoring at the Site. Compliance monitoring is required in Years 1, 3, 5, 10, 20, and 30. Year 1 monitoring was completed in 2017, and Year 3 monitoring was completed in 2019.

Results of Year 5 monitoring activities are described in this Report. The Year 5 monitoring activities were conducted between May and August 2021 and include the following:

- Bathymetric surveys in cap areas
- Shoreline visual surveys in cap and containment wall areas
- Surface sediment monitoring within cap and natural recovery areas
- Monitoring of mercury in adult crab tissue
- Monitoring of porewater in Unit 4

2 Methods

Sample collection and processing for each program was conducted according to field, laboratory, and quality assurance and quality control methods detailed in the SQAPP (Anchor QEA 2016). Site environmental monitoring stations are shown in Figure 3, and reference monitoring stations are shown in Figure 4.

2.1 Work Performed

The environmental monitoring data described in this Report were collected between May and August 2021 in accordance with the SQAPP (Anchor QEA 2016) as approved by Ecology.

The sections of this Report present the data collected during the following monitoring activities:

- Bathymetric surveys to evaluate the in-water extents of the engineered cap in Units 2A, 3B, and 4, and the capped transition area between Units 1C and 2C, and to document conditions in the natural recovery area at the head of Whatcom Waterway (Unit 3A)
- Visual surveys to document physical condition of the above-water portions of engineered sediment caps, and exposed portions of the Central Waterfront containment walls and Maple Street Bulkhead
- Collection and analysis of surface sediment at 11 locations within Phase 1 remediation areas and 11 monitored natural recovery (MNR) locations to document effectiveness of remediation
- Testing of tissue mercury levels in adult Dungeness crabs (*Metacarcinus magister*) collected from the Site and from the Samish Bay clean reference area to evaluate changes over time
- Porewater monitoring in Unit 4 (Log Pond) to assess groundwater as a potential source of sediment recontamination.

2.2 Deviations from SQAPP

All activities and methods were performed as indicated in the SQAPP unless otherwise specified.

Selection of test organisms for confirmational bioassays was confirmed with Ecology prior to testing, as described in Section 4.2.3. One bioassay test was performed past holding times, but all performance criteria were met.

3 Surveys

This section describes the results of bathymetric and visual surveys conducted in Phase 1 capping and shoreline material placement areas.

Several different cap types were constructed during the Project using varying combinations and thicknesses of sand, filter, and stone, cobble, or riprap armoring materials. Engineered sediment caps were constructed both on dredged surfaces and on existing grade where no dredging occurred. Therefore, varying rates of consolidation of the engineered capping materials and settlement of underlying materials were anticipated at the time of design and construction. The Year 5 physical surveys were conducted to monitor these different processes and evaluate the amount of potential settlement that has occurred since the Year 0 post-construction and Year 1 and Year 3 monitoring conditions. Bathymetric and visual shoreline surveys were conducted in parallel to monitor in-water and intertidal capping and material placement areas, respectively.

3.1 Bathymetric Survey

A multibeam bathymetric survey was conducted to evaluate the in-water extent of the engineered caps in Units 2A, 3B, and 4, and the capped transition area between Units 1C and 2C. Collection of Year 5 survey data was performed on May 25, 2021, by Northwest Hydro Inc., during high tide conditions to maximize the bathymetric survey coverage area. Appendix A shows the survey coverage area.

Bathymetric survey activities were performed in accordance with the SQAPP (Anchor QEA 2016). After data collection, survey data were then compared with post-construction and Year 1 and Year 3 survey data to verify physical integrity of capped areas. The 2021 Year 5 monitoring bathymetric survey data are described in detail in the following sections for the BST, Log Pond, and Inner Waterway areas.

3.1.1 Bellingham Shipping Terminal (Unit 1C)

An engineered sediment cap consisting of stone armor was constructed in the BST at the transition between Unit 1C and Unit 2C, as shown in Figure 5a. The cap is built mainly on dredged surface but was tied into the undredged portion of the channel located toward the head of Whatcom Waterway from the BST. Upon comparison with post-construction data, the current mudline in the majority of the engineered cap placement is not significantly different (from 0.5 foot higher to 0.5 foot lower) from the post-construction surface, with localized areas up to 1.5 feet lower than post-construction conditions (Figure 5b).

Areas where the present-day mudline is between 0.5 foot and 1.5 foot lower than the post-construction mudline are indicative of consolidation of the underlying sediments due to the load from the engineering cap materials following completion of material placement activities. This consolidation is seen mostly in the portion of the cap area that was not dredged or near the top of the dredged slope where less material was removed. Consolidation/settlement analyses were performed as part of the Whatcom Waterway Final Engineering Design Report (Anchor QEA 2015). The observed values are consistent with estimated cap consolidation in other areas of the waterway. Comparing bathymetric data from Year 3 to Year 5 monitoring events, the rate of consolidation of the engineered sediment cap materials appears to have decreased significantly since Year 3, as expected (Figure 5c).

No areas of cap scour or erosion were identified. The portion of the engineered cap immediately adjacent to the BST Dock shows greater than 1.0 foot of material accumulation from Year 0 to Year 5. During construction, dredging was conducted up to the face of the dock, but no underpier material removal occurred; therefore, this observation is likely due to existing underpier material sloughing into the dredged area over time. Underpier areas are to be addressed as part of future Phase 2 cleanup activities.

3.1.2 Log Pond (Unit 4)

Engineered sediment caps were constructed in the Log Pond area to meet remediation goals. This occurred in two separate actions, including an interim action completed in 2001, which encompassed the majority of Unit 4, as shown in Figure 6a. Then in 2015 and 2016 an engineered cap was constructed along the shoreline. The stone armored cap was placed on the existing surface (i.e., no dredging took place) at varying thicknesses, building up from the existing bathymetry.

The bathymetric data collected in the Log Pond area are primarily within the 2001 interim action area. The bathymetric data in this area show that, although there are some active dynamics causing small changes to the cap elevations, no major scour or other disturbances have taken place to the 2001 interim action area cap between Year 0 and Year 5 monitoring events (Figure 6b).

The 2016 cap area is in very shallow water and was assessed primarily using visual inspections. Where bathymetric data could be collected within the 2016 cap area, 1.5 feet of consolidation can be seen between Year 0 and Year 5, and very little change (less than 0.5 foot) between Year 3 and Year 5 (Figures 6b and 6c). Visual inspection findings are summarized in Section 3.2.

Some larger elevation differences observed near the limits of the survey are artifacts. These can be attributed to a lower density of data points leading to jumps in the survey surface. These areas, along with areas too shallow for completion of an in-water bathymetric survey, were addressed with the intertidal visual survey as described in Section 3.2.

3.1.3 Inner Waterway (Unit 2A, 3B, and Portion of Unit 2C)

The Inner Waterway was capped using two different cap types, as shown in Figure 7a. In general, the waterway and offshore areas were capped with cobble armor, while the shoreline areas (South Shoreline and Central Waterfront Shoreline) were capped with stone armor. Caps were constructed in areas where dredging occurred and areas where no dredging occurred. The dredging that occurred varied greatly, from very thin to very thick cuts, to meet remedial objectives. Because of these different factors, a wide range of consolidation and settlement was expected.

Differences in cap surface elevation between Year 0 and Year 5 monitoring events are shown in Figure 7b. Some of the general trends observed in the comparison of the post-construction survey with the Year 5 monitoring survey include the following:

- Moderate accretion of material is observed at the head of the waterway and is consistent with historical accumulation of material in this area due to loading from Whatcom Creek.
- Minimal settlement and consolidation have occurred in the flat portion of the Inner Waterway where dredge cuts were thickest (i.e., near the head of the waterway). The thick dredge cuts exposed materials less prone to consolidation.
- A greater amount of settlement and consolidation was observed in the flat portion of the waterway where only thin cuts or no dredging was performed (i.e., the portion nearer to Bellingham Bay), and cap materials were placed on existing softer sediments.
- A moderate amount of settlement and consolidation was observed along the shoreline slopes. The stone armored engineered cap was placed in these areas (South Shoreline and Central Waterfront Shoreline). Placement of this heavier material has resulted in more consolidation of the underlying capping materials and subgrade.

Between Year 3 and Year 5 monitoring events, similar trends occur in the same areas but at a much lower rate, consistent with expectations (Figure 7c). No areas of cap scour or erosion were identified.

3.2 Visual Survey (Intertidal Shoreline Inspection)

A visual survey was conducted within the intertidal shoreline areas of the Inner Waterway and the Log Pond, during periods of optimal low tide, to document the physical condition of the engineered sediment caps and the exposed portions of the Central Waterfront containment walls and Maple Street Bulkhead.

Intertidal engineered sediment caps were visually inspected during periods of low tide over a 2-day duration (June 24 to 25, 2021). Inspections took place both by boat and on foot depending on access to the cap area, as shown in Figures 8a and 8b. Photomaps and corresponding photographs showing the general conditions of the above-water engineered caps are included in Appendix B.

Continuous inspections were conducted in cap areas to look for indications of erosion and settlement, presence of potential contamination and debris, or other disturbances or signs of impact to the integrity and function of the cap. Inspections in containment wall areas were conducted to look for indications of corrosion, groundwater seepage, and other disturbances or signs of impact to the integrity and function of the remedial wall structure. Any disturbance found was documented (i.e., location, description, and apparent cause if known) and photographed.

3.2.1 Engineered Caps

In general, the engineered sediment caps along the Central Waterfront, South Shoreline, and Log Pond shoreline were found to be in good condition:

- There was no evidence of significant erosion, settlement, or debris accumulation.
- There were no signs of contamination or significant groundwater seepage observed during the survey. As noted during Year 1 and Year 3 monitoring, some growth of algae and colonization by marine organisms (e.g., barnacles) were observed.

3.2.2 Containment Walls

The Central Waterfront and Maple Street Bulkhead containment walls were inspected as part of the visual survey efforts. This included a survey of the Central Waterfront containment wall during low tide and a separate inspection of the Maple Street Bulkhead containment wall during the rising tide on June 24, 2021. The Central Waterfront containment wall was observed to be in good condition with no signs of corrosion or other disturbances.

Consistent with observations during Year 3 monitoring, water seepage was noted at several of the tieback locations along the Maple Street Bulkhead. Between November 2021 and February 2022, a repair program was implemented by the Port to seal these tieback locations. A close-out inspection conducted during February 2022 indicated that the repairs had been successful and the seepage eliminated. The Port will formally document the results of the seepage repair efforts and provide that documentation to Ecology under separate cover. The documentation, and the details of future compliance monitoring, will also be part of the Central Waterfront Engineering Design Report.

In addition to a visual survey and inspection of the walls, Norton Corrosion performed an inspection of the Maple Street Bulkhead cathodic protection system on August 30, 2021. The inspection by Norton Corrosion confirmed that the Maple Street Bulkhead containment wall is receiving adequate protection, consistent with their design recommendations. No corrective actions were recommended.

4 Sediment Testing

This section describes surface sediment collection and testing conducted during Year 5 compliance monitoring activities. Sample locations described in this section are shown in Figure 3. Chemistry results are presented in Table 1, bioassay criteria are listed in Table 2, and bioassay results are presented in Table 3. Laboratory analytical reports are included in Appendix C, data validation reports are included in Appendix D, and bioassay results are presented in Appendix E.

Surface sediment monitoring included the following sample locations:

- Six locations in Phase 1 capping areas (P1CM-06 thru 11)
- Three locations in Log Pond areas previously capped (P1CM-03, 04, 05)
- Two locations within Phase 1 dredging areas of the Outer Waterway (P1CM-01, 02)
- Eleven locations within MNR areas

4.1 Sediment Distribution in Cap Areas

Within the Phase 1 cap placement areas, sufficient sediment had deposited since construction to allow for chemical testing at eight of nine cap area locations. Sediment deposition of accepted grabs ranged between 12 and 30 centimeters (cm), averaging 18.1 cm. Samples were collected from 0 to 12 cm depth at each of the nine locations. At station P1CM-11, adjacent to the C Street outfall, an additional sample was collected from 0 to 2 cm depth to assist in trend analysis. Photographs of the material encountered at stations where sufficient material for full testing was collected are included in Appendix F.

Insufficient sediment had deposited to allow for chemical testing at location P1CM-08. Four attempts were made, but an insufficient sediment was recovered for testing. Based on the absence of accumulated sediment, no chemical or biological testing was performed at this location. Sediment testing will be performed at this location in the future if sufficient sediment has accumulated to support testing.

4.2 Surface Sediment Testing

Chemical testing was performed (in compliance with the SQAPP) on 22 samples collected from 21 stations at which sediment was available for testing. Samples were collected from 0 to 12 cm depth all stations, and an additional 0 to 2 cm depth interval was collected at one of the stations to assist in trend analysis. Three field duplicates were also collected. The samples were tested for metals, phenolic compounds (phenols), polycyclic aromatic hydrocarbons (PAHs), dioxins/furans (D/F), total organic carbon, and total solids, consistent with the SQAPP (Anchor QEA 2016).

Table 1 summarizes the chemical testing data.

4.2.1 Mercury, Phenol, and PAH Concentrations

Figure 9 illustrates the mercury concentrations detected in surface sediment. Results are as follows:

- Mercury concentrations were below the site cleanup level for protection of human health and ecological receptors (1.2 milligrams per kilogram [mg/kg]).
- Measured mercury concentrations exceeded 0.41 mg/kg in samples collected from four stations and confirmational bioassays were performed. These included the following samples:
  - One location in the Log Pond near the former GP West dock (P1CM-04)
  - Two locations in MNR areas located offshore of the Aerated Stabilization Basin (MNR-06 and MNR-07)
  - One location in the Outer Waterway (P1CM-01)
- The phenol concentration at location MNR-07 was also above the numeric screening criteria. That sample was evaluated using confirmational bioassays as described previously.
- No PAH results from any samples were above numeric screening criteria.
- Sediment from the four locations (P1CM-04, MNR-06, MNR-07, and P1CM-01) that exceeded numeric criteria were subjected to confirmational bioassay testing consistent with the SQAPP (Section 4.1.3). All samples passed biological testing.

Results demonstrate that detected mercury, phenol, and PAH concentrations comply with site cleanup levels established in the Consent Decree for protection of benthic organisms and protection of human health and ecological receptors (Ecology 2011).

The surface-weighted average concentration (SWAC) of mercury in Site surface sediments is currently estimated at 0.345 mg/kg. The SWAC estimate was higher than that measured during Year 1 monitoring (0.24 mg/kg) but less than that measured during Year 3 monitoring (0.39 mg/kg). Between the Year 3 and Year 5 monitoring events, decreases in mercury concentrations were noted at 16 of 21 sampling locations. The Year 5 SWAC estimate was lower than the Year 3 monitoring estimate, indicating that recovery is occurring, and concentrations are decreasing on a site-wide basis. The natural background concentration for mercury in Puget Sound sediments has been established by Ecology as 0.20 mg/kg (Ecology 2021). Concentrations at the deeper, outlying MNR stations (MNR-01 and MNR-02) averaged 0.17 mg/kg, consistent with natural background levels.

4.2.2 Surface Sediment Dioxin/Furan Concentrations

D/F are known to be present in surface and subsurface sediments throughout most of Bellingham Bay and other urban bays within Puget Sound. The full range of sources for these compounds in Bellingham Bay has not yet been determined but may include contributions from many sources throughout the bay, including former combustion sources, former GP West pulp and paper mill operations, former wood-treating facilities, historical and ongoing stormwater and wastewater discharges, and atmospheric deposition.

Since execution of the First Amendment to the Consent Decree, Ecology conducted work to determine if regional background concentrations of certain bioaccumulative chemicals existed in Bellingham Bay (Ecology 2015). That work confirmed that, throughout most of Bellingham Bay, D/F concentrations exceed both the natural background level in non-urban portions of Puget Sound (4 nanograms per kilogram toxic equivalency quotient, or ng/kg TEQ) and the practical quantitation limit (5 ng/kg TEQ). Ecology identified the regional background D/F concentration to be 15 ng/kg TEQ.

As part of the Year 5 monitoring event, chemical testing for D/F was performed at 11 locations. Results are presented in Table 1 and in Figure 10. The locations included the following:

- One location within the Log Pond (Unit 4) capping area (WW-P1CM-04)
- One location within the Phase 1 dredging area of the Outer Waterway, adjacent to BST (WW-P1CM-02)
- Four locations within the Inner Waterway, including one MNR location located at the head of the Inner Waterway, adjacent to Roeder Avenue (MNR-11), two locations within the dredging and capping areas of the Inner Waterway (P1CM-06 and P1CM-10), and one location in the capping area adjacent to the C Street outfall (P1CM-11)
- Four MNR locations offshore of the Aerated Stabilization Basin and Outer Waterway areas (MNR-03, MNR-04, MNR-05, and MNR-07)
- One MNR location within a portion of the adjacent RG Haley Site (MNR-09)

One additional Inner Waterway location within the Phase 1 capping area had been designated in the SQAPP for D/F testing. However, insufficient sediment accumulation was present on top of the cap armor at location P1CM-08 to support sediment chemical testing (Section 4.1.1).

Figure 10 shows the reported D/F concentrations from Year 5 monitoring:

- D/F concentrations in the Log Pond capping area were 3.4 ng/kg, which is well below the regional background concentration (15 ng/kg TEQ). It is also below the natural background level (4.0 ng/kg TEQ) and the practical quantitation limit (5.0 ng/kg TEQ).
- D/F concentrations in the Unit 1C dredging area offshore of the BST averaged 9.5 ng/kg. Significant variability was observed in replicate sample analyses at this location (range 3.5 and 15.6 ng/kg, a relative percent difference [RPD] of over 64%). The high RPD value indicates heterogeneity in the sample matrix known as a "nugget effect" at this location. Measured RPD values at other locations with replicate samples were normal (less than 20%).
- Within the Inner Whatcom Waterway the D/F concentrations in most samples of recently deposited sediments were similar to those observed during the Year 3 monitoring. Sediment D/F concentrations measured at WW-MNR-11 have been gradually decreasing with each of the recent monitoring events, from 58.6 ng/kg TEQ in 2017, to 52.9 ng/kg TEQ during 2019 and 51.3 ng/kg TEQ during 2021. However, increases in D/F concentrations were noted at sampling WW-P1CM-11 located near the C Street stormwater outfall. In Year 3 the D/F

concentrations in bioactive zone samples collected at this location were 10.8 ng/kg. The concentration in the Year 5 sample was 50.9 ng/kg, significantly higher than the Year 3 event. A similar D/F concentration (48.6 ng/kg) was observed in the 0 to 2 cm sample used for analyzing time trends.

- Concentrations of D/F in the four offshore MNR samples were slightly higher than those measured in Year 3 (average of 12 ng/kg in Year 5 compared to 9.6 ng/kg in Year 3). Replicate analyses showed good reproducibility in these areas, with RPD values of 12% or less.
- Concentrations of D/F in the sample located within the RG Haley Site remediation area were 22.6 ng/kg. This is higher than was measured during Year 3 monitoring (13.6 ng/kg).

The results were pooled with other recent monitoring data available from Bellingham Bay to provide a best estimate of current SWACs of D/F compounds. Within the Whatcom Waterway Site area, after excluding the RG Haley, South State Street MGP, and I&J Waterway remediation areas, the D/F SWAC value is 9.6 ng/kg TEQ.

4.2.3 Confirmational Bioassay Testing

Confirmational bioassay testing was performed on four surface sediment samples that contained phenol or mercury concentrations in excess of site cleanup levels. This testing was performed by EcoAnalysts, Inc., in Port Gamble, Washington.

Testing included two acute toxicity tests (the 10-day amphipod survival test and the benthic larval development test) and one chronic toxicity test (20-day polychaete survival and growth test). The 10-day amphipod, 96-hour echinoderm, and 20-day juvenile polychaete tests were initiated on September 10, 2021, within the 56-day holding time. The 10-day amphipod test failed to meet acceptability criteria due to poor organism health upon receipt from the supplier. The test rerun was initiated using *Leptocheirus plumulosus* on October 8, 2021, 25 days past the 56-day holding time. Performance criteria were met, despite being conducted past the recommended holding time. The test developed fully acceptable data for use in management decisions.

Sediment samples from four locations (MNR-06, MNR-07, P1CM-01, and P1CM-04) were tested against clean reference samples collected from Carr Inlet by EcoAnalysts. Test methods followed guidance provided by the Puget Sound Estuary Program (PSEP 1995), the Sediment Cleanup User's Manual II (Ecology 2021), and the various updates presented during the Sediment Management Annual Review Meetings. The following describes the tests and species used, along with key observations from data review. Additional details regarding bioassay testing are in Appendix E.

10-Day Amphipod Mortality (Leptocheirus plumulosus)

The amphipod test was conducted using *Leptocheirus plumulosus*, an alternate amphipod species. *Leptocheirus* was used because reliable supplies of the amphipod *Ampelisca* were not available. The use of the alternate species was approved by Ecology.

Water quality conditions were maintained to ensure optimal health of the organisms and were within acceptable limits throughout the testing duration. Temperature, dissolved oxygen (DO), salinity, and pH from one replicate per treatment were monitored daily. Water quality parameters were within the acceptable limits throughout the duration of the test. Additionally, ammonia and sulfide concentrations were measured in both porewater and overlying water at the beginning and termination of testing. Concentrations were below trigger values, indicating mortality due to ammonia or sulfide was unlikely.

The test met the survival acceptability criteria specified in the test protocol with 1% mean mortality in the control and 1% to 6% mean mortality for reference samples, within the performance criteria. The reference toxicant test was conducted using total ammonia, resulting in a median lethal concentration of 126.2 milligrams per liter (mg/L), and was within the laboratory acceptability range of 56.3 to 275.9 mg/L.

All Project sediments pass the sediment cleanup objective (SCO) and cleanup screening level (CSL) criteria.

Larval Development (Dendraster excentricus)

The larval development test was conducted with the sand dollar, *Dendraster excentricus*, an alternate species to *Mytilus* as defined in the SQAPP, because spawning behavior with the mussels was poor. The use of the alternate species was approved by Ecology. Adult organisms were obtained from Taylor Shellfish in Shelton, Washington, and were held under flowing natural seawater at 14 ± 2°C prior to spawning induction. Testing was initiated on September 10, 2021, within the recommended holding time. Water quality conditions were maintained to ensure optimal health of the organisms and were within acceptable limits throughout the testing duration.

- Temperature, DO, salinity, and pH from one replicate per treatment were monitored daily.
- Water quality parameters were within protocol-specified ranges throughout the duration of the tests.
- Ammonia and sulfide concentrations were measured in overlying water at the beginning and termination of testing. Ammonia concentrations observed in the *D. excentricus* test were below the no observed effect concentration value derived from the concurrent ammonia reference toxicant test (1.61 mg/L total ammonia; Bioassay Testing Results, Table 3-13 [EcoAnalysts, Inc. 2021]). Initial unionized ammonia concentrations were above the trigger value of 0.014 mg/L for samples MNR-07 and P1CM-01, and above the trigger value for

sample MNR-07 at the final day of testing, indicating unionized ammonia concentrations may have adversely affected larvae exposed to these samples.

- Initial and final total sulfide and undissociated hydrogen sulfide concentrations were below trigger values for all samples (0.004 mg/L; Inouye 2015). Sulfide concentrations within the sediment samples should not have contributed to any adverse biological effects observed in the test treatments.
- The test met the survival acceptability criteria specified in the test protocol with 88% and 74% normal survivorship in the seawater and sediment controls, respectively.
- Reference sediment also met acceptability criteria, with mean normal survival between 104% and 107% of the sediment control response.
- The reference toxicant test was conducted using total and unionized ammonia. For total ammonia, the mean effective concentration of 3.44 was within the laboratory acceptability range of 1.48 to 8.00 mg/L. For unionized ammonia, the mean effective concentration of 0.056 was within the laboratory acceptability range of 0.018 to 0.170 mg/L.

No problems were found with the final test organisms or the testing procedure, and the test developed fully acceptable data for use in management decisions. All Project sediments pass the SCO and CSL criteria.

20-Day Juvenile Polychaete Survival and Growth (Neanthes arenaceodentata)

The test organisms were obtained from Aquatic Toxicology Support in Bremerton, Washington. Testing was initiated on September 10, 2021, within the appropriate holding time. Water quality conditions were maintained to ensure optimal health of the organisms and were mostly within acceptable limits throughout the testing duration.

- Temperature, DO, salinity, and pH from one replicate per treatment were monitored daily.
- DO in sample P1CM-01 dropped below the acceptable level on Day 12. An airline in the chamber was found to be above the waterline and was immediately adjusted. DO remained within the recommended range for the remainder of the test and no adverse effects were observed.
- Ammonia and sulfide concentrations were measured in both porewater and overlying water at the beginning and termination of testing. Concentrations were below trigger values, indicating mortality due to ammonia or sulfide was unlikely.
- The test met the acceptability criteria specified in the test protocol. No mortality was observed in the control treatment and mean individual growth rates as dry weight and ash-free dry weight (AFDW) were 0.800 and 0.565 milligram (mg) per individual per day, respectively. Mean mortality in reference treatments were 0% for all reference samples. Mean individual growth rates ranged from 0.712 to 0.875 mg per individual per day dry weight and 0.597 to 0.659 mg per individual per day AFDW.

- The reference toxicant test was conducted using total ammonia, resulting in a mean lethal concentration of 207.1 mg/L, and was within the laboratory acceptability range of 159.7 to 268.6 mg/L.

No problems were found with the test organisms or the testing procedure, and the test developed fully acceptable data for use in management decisions.

All Project sediments pass the SCO and CSL criteria when evaluated on a dry weight and AFDW basis.

5 Crab Tissue Monitoring

This section describes post-construction tissue monitoring performed in accordance with the SQAPP (Anchor QEA 2016). This monitoring was conducted during August 2021 and included testing of tissue mercury levels in adult Dungeness crabs collected from the Site and from the Samish Bay clean reference area.

Locations of samples described in this section are presented in Figure 3 (Site samples) and Figure 4 (reference area samples). Laboratory analytical reports are included in Appendix C, and data validation reports are included in Appendix D. Results were analyzed graphically, and statistics were calculated to compare Site and reference area findings (Appendix G).

Adult crabs were collected using crab traps deployed at three locations within the Site (Figure 3) and at two locations within the Samish Bay reference areas (Figure 4). One to three adult male Dungeness crabs with a carapace width of 13.4 cm or greater were collected at each station. Adequate numbers of crabs of sufficient size were not collected after 24 hours of collection attempts, so crabs less than the SQAPP-required 16.5-cm minimum size were collected and processed. One to three replicate samples for each Site station and three replicate samples for each reference station were created by homogenizing sternal plate, leg, and claw muscle tissue, resulting in a total of five composite samples from the Site and six composite samples from the Samish Bay reference area.

Adult Dungeness crabs utilize a large home range (estimated at approximately 10 square kilometers, which is larger than the Site). Therefore, the adult Dungeness crab collected at any one station within the Site are representative of the overall Site and not the individual sampling station. Similarly, the adult crabs collected at either of the Samish Bay reference areas are representative of the overall reference area and not the individual sampling station.

Table 4 and Figure 11 summarize the tissue monitoring data collected for adult crab for both the Site and the reference area stations. Mercury concentration trends in adult crab tissue are presented in Table 5 and summarized as follows:

- Tissue mercury levels detected in Site crab were well below those measured previously in 1991 and 1997 and were also lower than Year 0 and Year 1 compliance monitoring concentrations.
- Between 1991 and the Year 3 monitoring event, the average Site crab tissue mercury level had steadily decreased, consistent with an exponential (first-order) rate of decrease. This is consistent with natural recovery modeling expectations. By Year 3 the concentrations within the Site were not significantly different from those in the clean reference area. No significant changes were observed between Year 3 and Year 5, indicating that mercury concentrations have plateaued at naturally occurring concentrations.

- Year 5 tissue mercury concentrations were compared statistically between the Site and reference areas (Appendix G). The Site tissue mercury concentrations were not significantly different than those collected from the reference areas.
- The naturally occurring crab tissue mercury concentrations documented in the reference area samples (average 0.052 mg/kg wet weight as measured over eight sampling events) are well below the U.S. Environmental Protection Agency's consumption guideline for seafood tissue (0.3 mg/kg wet weight), and they are more than 70% lower than the tissue concentration identified as protective of tribal seafood consumption (0.18 mg/kg wet weight) (Anchor Environmental and Hart Crowser 2000).

Consistent with the SQAPP, monitoring objectives for adult crab tissue have been completed. The SQAPP specifies that adult crab monitoring will be discontinued when Site samples are not significantly different than reference samples for a second consecutive sampling event. Site concentrations were not significantly different from reference area concentrations in either the Year 3 or Year 5 monitoring events. Therefore, crab tissue monitoring will not be included in the next scheduled monitoring event (Year 10; 2026).

6 Porewater Monitoring in Unit 4

Porewater monitoring was conducted at two nearshore stations in the Log Pond to assess groundwater as a source of potential sediment recontamination.

Porewater samples were collected from each of two sampling stations (Figure 3). A set of nylon mesh diffusion samplers were deployed at each test location to measure porewater mercury concentrations and results are summarized as follows:

- The nylon mesh diffusion sampler deployment methodology was consistent with methods used by the U.S. Geological Survey and U.S. Environmental Protection Agency (Zimmerman et al. 2005).
- Samplers were constructed using 250-milliliter glass jars fitted with 22-micron mesh and screw-on lids.
- Samplers were buried 10 cm into the sediment and left in situ to equilibrate.
- Samplers were retrieved after 6 days of equilibration.
- Porewater samples were analyzed for total and dissolved mercury.

Results of Log Pond porewater testing are shown in Table 6:

- Dissolved mercury was not detected in any samples. These results, along with Year 1 data, support the theory that mercury concentrations in shoreline porewater are not bioavailable.
- Dissolved mercury concentrations were well below the Log Pond interpretive framework value of 0.0594 microgram per liter (µg/L) dissolved mercury. That value was established as part of remedial activities at the GP West Chlor-Alkali Remedial Action Unit and set to be protective of the Sediment Quality Standard (0.41 mg/kg). Results were all below the detection limit of 0.013 µg/L. The results were reported to the reporting limit of 0.1 µg/L (Table 6).

Results demonstrate that shoreline groundwater is not an ongoing source of sediment recontamination to Log Pond sediments.

7 Summary and Recommendations

The results of Year 5 compliance monitoring are summarized as follows:

- Phase 1 capping areas are performing within expectations, with no areas of erosion or cap damage noted during Year 5 bathymetric and visual surveys. Observed ranges of sediment consolidation have continued to decrease and are within expectations.
- Sediment containment walls are in good condition, with no observations of corrosion or other damage. Recent seep repairs to the Maple Street Bulkhead tieback anchors were effective, and previous groundwater seepage has been addressed. The Port will formally document the results of the seepage repair efforts and provide that documentation to Ecology under separate cover. The documentation, and the details of future compliance monitoring, will also be part of the Central Waterfront Engineering Design Report.
- Mercury levels in surface sediments comply with levels protective of benthic organisms and human health and ecological receptors. Results confirm the performance of the remedy within both the Phase 1 capping and Site MNR areas.
- D/F levels in excess of background concentrations were noted in sediments depositing on top of the engineered cap and MNR area at the head of the Inner Waterway.
- Phase 2 pre-remedial design investigation testing was conducted during 2020 and 2021 to evaluate potential sources of D/F in the Whatcom Creek and Inner Waterway areas. Findings of that testing will be incorporated into the Phase 2 Engineering Design Report.
- D/F levels were present at elevated concentrations in sediments adjacent to the City's C Street outfall in comparison to previous years. Given the recent increases in these D/F concentrations, further source control evaluation efforts for that outfall appear warranted.
- Mercury levels in adult crab tissue have recovered to naturally occurring concentrations and were measured in samples collected from the Samish Bay reference site. Mercury concentrations reached this naturally occurring concentration in Year 3 and have remained at that level in Year 5. As Site crab tissue mercury concentrations have decreased to reference area levels for two consecutive monitoring events, the objectives of crab tissue monitoring have been completed and no further crab tissue monitoring is required under the SQAPP.

The next scheduled monitoring event is Year 10 (2026). That work will be performed consistent with the SQAPP (Anchor QEA 2016). Planned testing includes bathymetric and visual surveys, surface sediment testing (chemistry and contingent bioassay testing), subsurface sediment chemistry testing, and Log Pond porewater testing.

8 Year 10 Compliance Monitoring

Year 10 monitoring will be performed in 2026. Consistent with the SQAPP (Anchor QEA 2016) and recommendations based on Year 5 results (Section 7), the scope of monitoring will include the following:

- Bathymetric surveys
- Visual surveys
- Surface sediment testing
- Subsurface sediment testing
- Porewater monitoring in Unit 4

Field work will be conducted from June through August 2026. Analytical results from chemical and biological testing and data validation are expected to be complete in November 2026. Completion of the Year 10 Compliance Monitoring Report is anticipated by February 2027. Data will be submitted to the Ecology Environmental Information Management database by March 1, 2027.

9 References

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Tables

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other Task Location ID Sample ID Sample Date Depth Sample Type Matrix X Y	WWY5_Compliance WW-MNR-01_21 WW-MNR-01-SS-210719 7/19/2021 0 - 12 cm N SE 1236591.4 641689.85	WWY5_Compliance WW-MNR-02_21 WW-MNR-02-SS-210720 7/20/2021 0 - 12 cm N SE 1236335.2 636672.13	WWY5_Compliance WW-MNR-03-SS_21 WW-MNR-03-SS-210719 7/19/2021 0 - 12 cm N SE 1237323.9 643042.11	WWY5_Compliance WW-MNR-03-SS_21 WW-MNR-03-SS-210719RE 7/19/2021 0 - 12 cm N SE 1237323.9 643042.11
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**1.42**	**1.7**	**1.51**	--
Total Solids	SM2540G				**46.4**	**39.16**	**49.74**	--
Metals (mg/kg)								
Copper	SW6020B	390	390		**48.4**	**33.2**	**51.1**	--
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.169**	**0.173**	**0.337**	--
Zinc	SW6020B	410	960		**98.2**	**67.2**	**100**	--
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		100 UJ	100 U	83.2 UJ	--
2-Methylphenol (o-Cresol)	SW8270E	63	63		20 U	20 U	16.6 U	--
4-Methylphenol (p-Cresol)	SW8270E	670	670		**26.7**	**100**	**17.8**	--
Pentachlorophenol	SW8270E	360	690		100 UJ	100 U	83.2 UJ	--
Phenol	SW8270E	420	1200		**186**	**40.5**	**97.5**	--
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		1.4085 U	**0.3 J**	1.0993 U	--
Acenaphthene	SW8270E	16	57		1.4085 U	1.1765 U	1.0993 U	--
Acenaphthylene	SW8270E	66	66		1.4085 U	1.1765 U	1.0993 U	--
Anthracene	SW8270E	220	1200		1.4085 U	1.1765 U	1.0993 U	--
Benzo(a)anthracene	SW8270E	110	270		1.4085 U	**0.5294 J**	**0.3841 J**	--
Benzo(a)pyrene	SW8270E	99	210		1.4085 U	**0.6706 J**	**0.298 J**	--
Benzo(g,h,i)perylene	SW8270E	31	78		1.4085 U	1.1765 U	1.0993 U	--
Chrysene	SW8270E	110	460		**0.838 J**	**0.7941 J**	**0.5364 J**	--
Dibenzo(a,h)anthracene	SW8270E	12	33		1.4085 U	1.1765 U	1.0993 U	--
Fluoranthene	SW8270E	160	1200		**0.7183 J**	**1.3353**	**1.0728 J**	--
Fluorene	SW8270E	23	79		1.4085 UJ	1.1765 U	1.0993 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		1.4085 U	1.1765 U	1.0993 U	--
Naphthalene	SW8270E	99	170		**0.4366 J**	**0.8059 J**	**0.3377 J**	--
Phenanthrene	SW8270E	100	480		**0.6197 J**	**1.0353 J**	**0.4834 J**	--
Pyrene	SW8270E	1000	1400		**0.5915 J**	**1.3529**	**0.8808 J**	--
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		2.8169 U	**1.4118 J**	**0.6093 J**	--
Total HPAH (SMS) (U = 0)		960	5300		**2.1479 J**	**6.0941 J**	**3.7815 J**	--
Total LPAH (SMS) (U = 0)		370	780		**1.0563 J**	**1.8412 J**	**0.8212 J**	--
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				20 U	20 U	16.6 U	--
2-Methylnaphthalene	SW8270E	670	670		20 U	**5.1 J**	16.6 U	--
Acenaphthene	SW8270E	500	500		20 U	20 U	16.6 U	--
Acenaphthylene	SW8270E	1300	1300		20 U	20 U	16.6 U	--
Anthracene	SW8270E	960	960		20 U	20 U	16.6 U	--
Benzo(a)anthracene	SW8270E	1300	1600		20 U	**9 J**	**5.8 J**	--
Benzo(a)pyrene	SW8270E	1600	1600		20 U	**11.4 J**	**4.5 J**	--
Benzo(b,j,k)fluoranthenes	SW8270E				40 U	**24 J**	**9.2 J**	--
Benzo(g,h,i)perylene	SW8270E	670	720		20 U	20 U	16.6 U	--
Chrysene	SW8270E	1400	2800		**11.9 J**	**13.5 J**	**8.1 J**	--
Dibenzo(a,h)anthracene	SW8270E	230	230		20 U	20 U	16.6 U	--
Fluoranthene	SW8270E	1700	2500		**10.2 J**	**22.7**	**16.2 J**	--
Fluorene	SW8270E	540	540		20 UJ	20 U	16.6 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		20 U	20 U	16.6 U	--

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-01_21	WW-MNR-02_21	WW-MNR-03-SS_21	WW-MNR-03-SS_21
				Sample ID	WW-MNR-01-SS-210719	WW-MNR-02-SS-210720	WW-MNR-03-SS-210719	WW-MNR-03-SS-210719RE
				Sample Date	7/19/2021	7/20/2021	7/19/2021	7/19/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	N	N
				Matrix	SE	SE	SE	SE
				X	1236591.4	1236335.2	1237323.9	1237323.9
				Y	641689.85	636672.13	643042.11	643042.11
Naphthalene	SW8270E	2100	2100		**6.2 J**	**13.7 J**	**5.1 J**	--
Phenanthrene	SW8270E	1500	1500		**8.8 J**	**17.6 J**	**7.3 J**	--
Pyrene	SW8270E	2600	3300		**8.4 J**	**23**	**13.3 J**	--
itoring		3200	3600		40 U	**24 J**	**9.2 J**	--
Total HPAH (SMS) (U = 0)		12000	17000		**30.5 J**	**103.6 J**	**57.1 J**	--
Total LPAH (SMS) (U = 0)		5200	5200		**15 J**	**31.3 J**	**12.4 J**	--
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	--	0.546 U	**0.428 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	--	**1.42**	**2.22**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**3.92 J**	**2.82**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**12.7**	**8.7**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**7.17**	**5.03**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	--	**226**	**200**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				--	--	**1710**	**1380**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	--	**93.5**	**94.4**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	--	**78.3**	**89.1**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**218**	**163**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	--	**458**	**401**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				--	--	**4.06 J**	**2.87**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	**1.2**	**0.89 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	0.742 U	**0.803 J**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**3.55**	**2.88**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**1.37 J**	**1.25**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	1.29 U	**1.1**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**1.61**	**1.85**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**42.4**	**36.8**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**2.68**	**2.26**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				--	--	**124**	**100**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				--	--	**8.65**	**10.6**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	**12.6**	**13.1**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**56.1**	**53.4**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**162**	**136**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					--	--	**8.155 J**	**8.4002 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	--	--	**8.6038 J**	**8.4002 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	--	--	**8.604 J**	**8.4 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					--	--	**8.155 J**	**8.4 J**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-04-SS_21	WW-MNR-04-SS_21	WW-MNR-05_21	WW-MNR-05_21
				Sample ID	WW-MNR-04-SS-210719	WW-MNR-04-SS-210719RE	WW-MNR-05-SS-210719	WW-MNR-05-SS-210719RE
				Sample Date	7/19/2021	7/19/2021	7/19/2021	7/19/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	N	N
				Matrix	SE	SE	SE	SE
				X	1237151	1237151	1237852.4	1237852.4
				Y	639909.49	639909.49	638105.6	638105.6
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**1.45**	--	**1.59**	--
Total Solids	SM2540G				**45.37**	--	**43.58**	--
Metals (mg/kg)								
Copper	SW6020B	390	390		**49.9**	--	**51.6**	--
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.304**	--	**0.296**	--
Zinc	SW6020B	410	960		**99.2**	--	**102**	--
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		99.8 UJ	--	100 UJ	--
2-Methylphenol (o-Cresol)	SW8270E	63	63		20 U	--	20 U	--
4-Methylphenol (p-Cresol)	SW8270E	670	670		**32.5**	--	**51.7**	--
Pentachlorophenol	SW8270E	360	690		99.8 UJ	--	100 UJ	--
Phenol	SW8270E	420	1200		**98.6**	--	**20 J**	--
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		1.3793 U	--	1.2579 U	--
Acenaphthene	SW8270E	16	57		1.3793 U	--	1.2579 U	--
Acenaphthylene	SW8270E	66	66		1.3793 U	--	1.2579 U	--
Anthracene	SW8270E	220	1200		1.3793 U	--	1.2579 U	--
Benzo(a)anthracene	SW8270E	110	270		**0.4483 J**	--	1.2579 U	--
Benzo(a)pyrene	SW8270E	99	210		**0.3862 J**	--	**0.327 J**	--
Benzo(g,h,i)perylene	SW8270E	31	78		1.3793 U	--	1.2579 U	--
Chrysene	SW8270E	110	460		**0.7241 J**	--	**0.6101 J**	--
Dibenzo(a,h)anthracene	SW8270E	12	33		1.3793 U	--	1.2579 U	--
Fluoranthene	SW8270E	160	1200		**1.1793 J**	--	**1.0881 J**	--
Fluorene	SW8270E	23	79		1.3793 UJ	--	1.2579 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		1.3793 U	--	1.2579 U	--
Naphthalene	SW8270E	99	170		**0.6207 J**	--	**0.4403 J**	--
Phenanthrene	SW8270E	100	480		**1.1724 J**	--	**0.5849 J**	--
Pyrene	SW8270E	1000	1400		**1.0621 J**	--	**0.9245 J**	--
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**0.7793 J**	--	**0.6352 J**	--
Total HPAH (SMS) (U = 0)		960	5300		**4.5793 J**	--	**3.5849 J**	--
Total LPAH (SMS) (U = 0)		370	780		**1.7931 J**	--	**1.0252 J**	--
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				20 U	--	20 U	--
2-Methylnaphthalene	SW8270E	670	670		20 U	--	20 U	--
Acenaphthene	SW8270E	500	500		20 U	--	20 U	--
Acenaphthylene	SW8270E	1300	1300		20 U	--	20 U	--
Anthracene	SW8270E	960	960		20 U	--	20 U	--
Benzo(a)anthracene	SW8270E	1300	1600		**6.5 J**	--	20 U	--
Benzo(a)pyrene	SW8270E	1600	1600		**5.6 J**	--	**5.2 J**	--
Benzo(b,j,k)fluoranthenes	SW8270E				**11.3 J**	--	**10.1 J**	--
Benzo(g,h,i)perylene	SW8270E	670	720		20 U	--	20 U	--
Chrysene	SW8270E	1400	2800		**10.5 J**	--	**9.7 J**	--
Dibenzo(a,h)anthracene	SW8270E	230	230		20 U	--	20 U	--
Fluoranthene	SW8270E	1700	2500		**17.1 J**	--	**17.3 J**	--
Fluorene	SW8270E	540	540		20 UJ	--	20 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		20 U	--	20 U	--

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-04-SS_21	WW-MNR-04-SS_21	WW-MNR-05_21	WW-MNR-05_21
				Sample ID	WW-MNR-04-SS-210719	WW-MNR-04-SS-210719RE	WW-MNR-05-SS-210719	WW-MNR-05-SS-210719RE
				Sample Date	7/19/2021	7/19/2021	7/19/2021	7/19/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	N	N
				Matrix	SE	SE	SE	SE
				X	1237151	1237151	1237852.4	1237852.4
				Y	639909.49	639909.49	638105.6	638105.6
Naphthalene	SW8270E	2100	2100		**9 J**	--	**7 J**	--
Phenanthrene	SW8270E	1500	1500		**17 J**	--	**9.3 J**	--
Pyrene	SW8270E	2600	3300		**15.4 J**	--	**14.7 J**	--
itoring		3200	3600		**11.3 J**	--	**10.1 J**	--
Total HPAH (SMS) (U = 0)		12000	17000		**66.4 J**	--	**57 J**	--
Total LPAH (SMS) (U = 0)		5200	5200		**26 J**	--	**16.3 J**	--
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				0.345 U	0.827 UJ	**0.567 J**	**0.516 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**3.28**	**2.73 J**	**4.43**	**3.38**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**7.34**	**5.11 J**	**10.4**	**9.53**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**14.3**	**10.5 J**	**18.2**	**15.3**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**10.1**	**7 J**	**17.6**	**11.5**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**229**	**189 J**	**267**	**248**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				**1460**	**1250**	**1590**	**1480**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				**321**	**268**	**374 J**	**356**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**306**	**222**	**295**	**350**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**516**	**341**	**704**	**614**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**438**	**376**	**488**	**455**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				**7.8**	**5.17 J**	**8.54 J**	**9.43**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**1.35**	**1.57 J**	**1.44 J**	**1.47**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**1.24 J**	0.499 UJ	**0.97 J**	**1.33**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**2.89**	**2.38 J**	**2.89**	**3.82**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**1.49**	**1.65 J**	**1.65 J**	**1.56**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				**1.1**	0.677 UJ	**0.916 J**	**0.992 J**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**1.47 J**	0.506 UJ	**1.09 J**	1.59 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				**36**	**30.1 J**	**34.3**	**33.2**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				**2.45**	**2.77 J**	**2.37**	**2.01**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				**111**	**74**	**103**	**102**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				**23.2**	**12**	**33.3 J**	**37.3**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				**16.3**	**6.78**	**9.43**	**19.2**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				**49.6**	**38.5**	**45**	**46.7**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				**135**	**104**	**121**	**125**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					**11.4873 J**	**8.574 J**	**15.0044 J**	**12.859 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	**11.6598 J**	**9.1215 J**	**15.0044 J**	**12.9385 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	**11.66 J**	**9.121 J**	**15.004 J**	**12.939 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					**11.487 J**	**8.574 J**	**15.004 J**	**12.859 J**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other				
				Task	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-05_21	WW-MNR-06_21	WW-MNR-07-SS_21	WW-MNR-07-SS_21
				Sample ID	WW-MNR-105-SS-210719	WW-MNR-06-SS-210719	WW-MNR-07-SS-210719	WW-MNR-07-SS-210719RE
				Sample Date	7/19/2021	7/19/2021	7/19/2021	7/19/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	FD	N	N	N
				Matrix	SE	SE	SE	SE
				X	1237852.4	1239216.4	1238790.9	1238790.9
				Y	638105.6	642301.93	641461.66	641461.66
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**1.51**	**7.55**	**1.84**	--
Total Solids	SM2540G				**43.45**	**44.7**	**45.65**	--
Metals (mg/kg)								
Copper	SW6020B	390	390		**51**	**46.6**	**49.6**	--
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.296**	**0.755**	**0.672**	--
Zinc	SW6020B	410	960		**102**	**82.3**	**99.6**	--
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		127 UJ	99 UJ	111 UJ	--
2-Methylphenol (o-Cresol)	SW8270E	63	63		25.3 U	19.8 U	22.2 U	--
4-Methylphenol (p-Cresol)	SW8270E	670	670		**80.8**	**57.7**	**60.6**	--
Pentachlorophenol	SW8270E	360	690		127 UJ	99 UJ	111 UJ	--
Phenol	SW8270E	420	1200		**19.1 J**	**21.7**	**448**	**1140**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		**0.3974 J**	**0.1152 J**	**0.3533 J**	--
Acenaphthene	SW8270E	16	57		1.6755 U	0.2623 U	1.2065 U	--
Acenaphthylene	SW8270E	66	66		1.6755 U	0.2623 U	1.2065 U	--
Anthracene	SW8270E	220	1200		1.6755 U	**0.1417 J**	**0.538 J**	--
Benzo(a)anthracene	SW8270E	110	270		**0.6623 J**	**0.2887**	**1.5272**	--
Benzo(a)pyrene	SW8270E	99	210		**0.7086 J**	**0.2662**	**1.3859**	--
Benzo(g,h,i)perylene	SW8270E	31	78		1.6755 U	0.2623 U	**0.8967 J**	--
Chrysene	SW8270E	110	460		**1.1391 J**	**0.4993**	**2.8098**	--
Dibenzo(a,h)anthracene	SW8270E	12	33		1.6755 U	0.2623 U	1.2065 U	--
Fluoranthene	SW8270E	160	1200		**2.1126 J**	**0.5377 J**	**2.4946 J**	--
Fluorene	SW8270E	23	79		1.6755 UJ	0.2623 UJ	1.2065 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		1.6755 U	0.2623 U	**0.8967 J**	--
Naphthalene	SW8270E	99	170		**1.0795 J**	**0.2344 J**	**0.9511 J**	--
Phenanthrene	SW8270E	100	480		**1.2252 J**	**0.2861 J**	**1.3967 J**	--
Pyrene	SW8270E	1000	1400		**1.8079**	**0.5695**	**2.4348**	--
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**1.5033 J**	**0.5735**	**3.3261**	--
Total HPAH (SMS) (U = 0)		960	5300		**7.9338 J**	**2.7351 J**	**15.7717 J**	--
Total LPAH (SMS) (U = 0)		370	780		**2.3046 J**	**0.6623 J**	**2.8859 J**	--
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				25.3 U	**5.5 J**	22.2 U	--
2-Methylnaphthalene	SW8270E	670	670		**6 J**	**8.7 J**	**6.5 J**	--
Acenaphthene	SW8270E	500	500		25.3 U	19.8 U	22.2 U	--
Acenaphthylene	SW8270E	1300	1300		25.3 U	19.8 U	22.2 U	--
Anthracene	SW8270E	960	960		25.3 U	**10.7 J**	**9.9 J**	--
Benzo(a)anthracene	SW8270E	1300	1600		**10 J**	**21.8**	**28.1**	--
Benzo(a)pyrene	SW8270E	1600	1600		**10.7 J**	**20.1**	**25.5**	--
Benzo(b,j,k)fluoranthenes	SW8270E				**22.7 J**	**43.3**	**61.2**	--
Benzo(g,h,i)perylene	SW8270E	670	720		25.3 U	19.8 U	**16.5 J**	--
Chrysene	SW8270E	1400	2800		**17.2 J**	**37.7**	**51.7**	--
Dibenzo(a,h)anthracene	SW8270E	230	230		25.3 U	19.8 U	22.2 U	--
Fluoranthene	SW8270E	1700	2500		**31.9 J**	**40.6 J**	**45.9 J**	--
Fluorene	SW8270E	540	540		25.3 UJ	19.8 UJ	22.2 UJ	--
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		25.3 U	19.8 U	**16.5 J**	--

Table 1
Surface Sediment Analytical Results

				Task	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-05_21	WW-MNR-06_21	WW-MNR-07-SS_21	WW-MNR-07-SS_21
				Sample ID	WW-MNR-105-SS-210719	WW-MNR-06-SS-210719	WW-MNR-07-SS-210719	WW-MNR-07-SS-210719RE
				Sample Date	7/19/2021	7/19/2021	7/19/2021	7/19/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	FD	N	N	N
				Matrix	SE	SE	SE	SE
				X	1237852.4	1239216.4	1238790.9	1238790.9
		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other Y	638105.6	642301.93	641461.66	641461.66
Naphthalene	SW8270E	2100	2100		**16.3 J**	**17.7 J**	**17.5 J**	--
Phenanthrene	SW8270E	1500	1500		**18.5 J**	**21.6 J**	**25.7 J**	--
Pyrene	SW8270E	2600	3300		**27.3**	**43**	**44.8**	--
itoring		3200	3600		**22.7 J**	**43.3**	**61.2**	--
Total HPAH (SMS) (U = 0)		12000	17000		**119.8 J**	**206.5 J**	**290.2 J**	--
Total LPAH (SMS) (U = 0)		5200	5200		**34.8 J**	**50 J**	**53.1 J**	--
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	--	0.308 U	**0.81 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	--	**4.08**	**3.57**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**8.41**	**6.65**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**22.3**	**16**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**11.8**	**9.8**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	--	**477**	**359**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				--	--	**3750**	**2330**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	--	**325**	**261**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	--	**255**	**235**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	--	**529**	**404**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	--	**936**	**731**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				--	--	**8.61**	**6.12**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	**2.1**	**1.67**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	**1.93**	**1.43 J**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**8.36**	**4.78**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**2.86**	**1.99**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**3.16**	**1.29 J**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**1.69**	**2.67**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**76.7**	**53.7**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**5.41**	**3.25**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				--	--	**206**	**138**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				--	--	**35.9**	**26.3**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				--	--	**29.7**	**23**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				--	--	**124**	**84.8**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				--	--	**286**	**195**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					--	--	**18.2189**	**14.689 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	--	--	**18.3729**	**14.689 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	--	--	**18.373**	**14.689 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					--	--	**18.219**	**14.689 J**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other Task / Location ID / Sample ID / Sample Date / Depth / Sample Type / Matrix / X / Y	WWY5_Compliance / WW-MNR-08_21 / WW-MNR-08-SS-210719 / 7/19/2021 / 0 - 12 cm / N / SE / 1239018.3 / 639147.28	WWY5_Compliance / WW-MNR-09_21 / WW-MNR-09-SS-210719 / 7/19/2021 / 0 - 12 cm / N / SE / 1240194.9 / 640229.95	WWY5_Compliance / WW-MNR-09_21 / WW-MNR-09-SS-210719RE / 7/19/2021 / 0 - 12 cm / N / SE / 1240194.9 / 640229.95	WWY5_Compliance / WW-MNR-10_21 / WW-MNR-10-SS-210721 / 7/21/2021 / 0 - 12 cm / N / SE / 1241812.5 / 643426.84
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**1.74**	**3.49**	--	**0.83**
Total Solids	SM2540G				**40.02**	**54.56**	--	**71.2**
Metals (mg/kg)								
Copper	SW6020B	390	390		**59.6**	**31.9**	--	**16.2 J**
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.264**	**0.276**	--	**0.0302**
Zinc	SW6020B	410	960		**117**	**71.3**	--	**59.4 J**
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		135 UJ	80 UJ	--	99.8 U
2-Methylphenol (o-Cresol)	SW8270E	63	63		27 U	16 U	--	20 U
4-Methylphenol (p-Cresol)	SW8270E	670	670		**46.8**	**96.9**	--	20 U
Pentachlorophenol	SW8270E	360	690		135 UJ	80 UJ	--	99.8 U
Phenol	SW8270E	420	1200		**12 J**	**27.8**	--	**7.2 J**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		1.5517 U	**1.1232**	--	2.4096 U
Acenaphthene	SW8270E	16	57		1.5517 U	**0.4928**	--	**0.7711 J**
Acenaphthylene	SW8270E	66	66		1.5517 U	**0.6905**	--	2.4096 U
Anthracene	SW8270E	220	1200		1.5517 U	**0.8797**	--	**2.1446 J**
Benzo(a)anthracene	SW8270E	110	270		**1.3563 J**	**1.639**	--	**5.012**
Benzo(a)pyrene	SW8270E	99	210		**1.2874 J**	**1.1547**	--	**5.6265**
Benzo(g,h,i)perylene	SW8270E	31	78		1.5517 U	**0.7822**	--	**2.5783 J**
Chrysene	SW8270E	110	460		**2.0345**	**3.381**	--	**8.4578**
Dibenzo(a,h)anthracene	SW8270E	12	33		1.5517 U	0.4585 U	--	2.4096 U
Fluoranthene	SW8270E	160	1200		**2.908 J**	**5.817 J**	--	**9.4217**
Fluorene	SW8270E	23	79		1.5517 UJ	**0.7077 J**	--	2.4096 U
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		1.5517 U	**0.6762**	--	**2.759**
Naphthalene	SW8270E	99	170		**0.6092 J**	**6.046**	--	**0.759 J**
Phenanthrene	SW8270E	100	480		**1.1264 J**	**3.123 J**	--	**4.6024**
Pyrene	SW8270E	1000	1400		**2.7529**	**4.928**	--	**9.6024**
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**2.3678 J**	**2.7822**	--	**13.253**
Total HPAH (SMS) (U = 0)		960	5300		**12.7069 J**	**21.1605 J**	--	**56.7108 J**
Total LPAH (SMS) (U = 0)		370	780		**1.7356 J**	**11.9398 J**	--	**8.2771 J**
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				27 U	**21**	--	20 U
2-Methylnaphthalene	SW8270E	670	670		27 U	**39.2**	--	20 U
Acenaphthene	SW8270E	500	500		27 U	**17.2**	--	**6.4 J**
Acenaphthylene	SW8270E	1300	1300		27 U	**24.1**	--	20 U
Anthracene	SW8270E	960	960		27 U	**30.7**	--	**17.8 J**
Benzo(a)anthracene	SW8270E	1300	1600		**23.6 J**	**57.2**	--	**41.6**
Benzo(a)pyrene	SW8270E	1600	1600		**22.4 J**	**40.3**	--	**46.7**
Benzo(b,j,k)fluoranthenes	SW8270E				**41.2 J**	**97.1**	--	**110**
Benzo(g,h,i)perylene	SW8270E	670	720		27 U	**27.3**	--	**21.4 J**
Chrysene	SW8270E	1400	2800		**35.4**	**118**	--	**70.2**
Dibenzo(a,h)anthracene	SW8270E	230	230		27 U	16 U	--	20 U
Fluoranthene	SW8270E	1700	2500		**50.6 J**	**203 J**	--	**78.2**
Fluorene	SW8270E	540	540		27 UJ	**24.7 J**	--	20 U
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		27 U	**23.6**	--	**22.9**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-08_21	WW-MNR-09_21	WW-MNR-09_21	WW-MNR-10_21
				Sample ID	WW-MNR-08-SS-210719	WW-MNR-09-SS-210719	WW-MNR-09-SS-210719RE	WW-MNR-10-SS-210721
				Sample Date	7/19/2021	7/19/2021	7/19/2021	7/21/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	N	N
				Matrix	SE	SE	SE	SE
				X	1239018.3	1240194.9	1240194.9	1241812.5
				Y	639147.28	640229.95	640229.95	643426.84
Naphthalene	SW8270E	2100	2100		**10.6 J**	**211**	--	**6.3 J**
Phenanthrene	SW8270E	1500	1500		**19.6 J**	**109 J**	--	**38.2**
Pyrene	SW8270E	2600	3300		**47.9**	**172**	--	**79.7**
itoring		3200	3600		**41.2 J**	**97.1**	--	**110**
Total HPAH (SMS) (U = 0)		12000	17000		**221.1 J**	**738.5 J**	--	**470.7 J**
Total LPAH (SMS) (U = 0)		5200	5200		**30.2 J**	**416.7 J**	--	**68.7 J**
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	**0.742 J**	**0.773 J**	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**4.06**	**4.41**	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**5.66**	**5.19**	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**26.4**	**25.2**	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**10.3**	**9.91**	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**680**	**750**	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				--	**5290 J**	**5330**	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	**81.2**	**96.6**	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**82.9**	**94.5**	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**260**	**270**	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**1450**	**1640**	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				--	**4.2**	**3.91 J**	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**2.36**	**2.11**	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**2.41**	**2.32**	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**10.7**	**10.3**	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**3.77**	**3.53**	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**4.01**	**4**	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**2.35 J**	**5.62**	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**112**	**114**	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**6.86**	**6.98**	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				--	**299**	**286**	--
Total Tetrachlorodibenzofuran (TCDF)	E1613B				--	**24.1**	**25**	--
Total Pentachlorodibenzofuran (PeCDF)	E1613B				--	**41.3**	**38.3**	--
Total Hexachlorodibenzofuran (HxCDF)	E1613B				--	**192**	**213**	--
Total Heptachlorodibenzofuran (HpCDF)	E1613B				--	**421**	**427**	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					--	**22.0001 J**	**23.1029 J**	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	--	**22.0001 J**	**23.1029 J**	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	--	**22 J**	**23.103 J**	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					--	**22 J**	**23.103 J**	--

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other				
				Task	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-10_21	WW-MNR-11_21	WW-P1CM-01_21	WW-P1CM-02_21
				Sample ID	WW-MNR-110-SS-210721	WW-MNR-11-SS-210721	WW-P1CM-01-SS-210720	WW-P1CM-02-SS-210720
				Sample Date	7/21/2021	7/21/2021	7/20/2021	7/20/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	FD	N	N	N
				Matrix	SE	SE	SE	SE
				X	1241812.5	1241961.8	1239687.3	1239885.1
				Y	643426.84	643289.24	641217.34	641364.24
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**0.94**	**4.69**	**1.96**	**1.75**
Total Solids	SM2540G				**75.29**	**38.04**	**22.86**	**18.53**
Metals (mg/kg)								
Copper	SW6020B	390	390		**17.6 J**	**67.4 J**	**45.5**	**47.4**
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.0246 J**	**0.376**	**0.552**	**0.31**
Zinc	SW6020B	410	960		**78.8 J**	**182 J**	**87.3**	**89.8**
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		99.8 U	99.9 U	397 U	474 U
2-Methylphenol (o-Cresol)	SW8270E	63	63		20 U	20 U	79.5 U	94.8 U
4-Methylphenol (p-Cresol)	SW8270E	670	670		**20**	**42.5**	79.5 U	94.8 U
Pentachlorophenol	SW8270E	360	690		99.8 U	99.9 U	397 U	474 U
Phenol	SW8270E	420	1200		**23.8**	**25.2**	**23.6 J**	**35.4 J**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		**0.6277 J**	**0.4968**	**1.2245 J**	5.4171 U
Acenaphthene	SW8270E	16	57		**0.6064 J**	**0.4691**	**1.1378 J**	5.4171 U
Acenaphthylene	SW8270E	66	66		2.1277 U	**0.6439**	4.0561 U	5.4171 U
Anthracene	SW8270E	220	1200		**1.5106 J**	**4.499**	**2.0561 J**	**3.64 J**
Benzo(a)anthracene	SW8270E	110	270		**3.4255**	**5.501**	**5.306**	**7.714**
Benzo(a)pyrene	SW8270E	99	210		**3.5319**	**5.352**	**4.4847**	**4.0629 J**
Benzo(g,h,i)perylene	SW8270E	31	78		**1.766 J**	**1.9424**	4.0561 U	5.4171 U
Chrysene	SW8270E	110	460		**4.8298**	**10.597**	**10.255**	**11.429**
Dibenzo(a,h)anthracene	SW8270E	12	33		2.1277 U	**0.6951**	4.0561 U	5.4171 U
Fluoranthene	SW8270E	160	1200		**10.5532**	**8.742**	**9.235**	**11.086**
Fluorene	SW8270E	23	79		2.1277 U	**0.9019**	4.0561 U	5.4171 U
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		**1.6596 J**	**2.132**	4.0561 U	5.4171 U
Naphthalene	SW8270E	99	170		**0.7872 J**	**1.1578**	**1.3724 J**	**1.1714 J**
Phenanthrene	SW8270E	100	480		**3.2128**	**4.243**	**5.816**	**8.571**
Pyrene	SW8270E	1000	1400		**10.638**	**10.64**	**8.776**	**10.114**
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**8.9574**	**13.284**	**10.816**	**9.143 J**
Total HPAH (SMS) (U = 0)		960	5300		**45.3617 J**	**58.8849**	**48.8724**	**53.5486 J**
Total LPAH (SMS) (U = 0)		370	780		**6.117 J**	**11.9147**	**10.3827 J**	**13.3829 J**
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				20 U	**12.7 J**	79.5 U	94.8 U
2-Methylnaphthalene	SW8270E	670	670		**5.9 J**	**23.3**	**24 J**	94.8 U
Acenaphthene	SW8270E	500	500		**5.7 J**	**22**	**22.3 J**	94.8 U
Acenaphthylene	SW8270E	1300	1300		20 U	**30.2**	79.5 U	94.8 U
Anthracene	SW8270E	960	960		**14.2 J**	**211**	**40.3 J**	**63.7 J**
Benzo(a)anthracene	SW8270E	1300	1600		**32.2**	**258**	**104**	**135**
Benzo(a)pyrene	SW8270E	1600	1600		**33.2**	**251**	**87.9**	**71.1 J**
Benzo(b,j,k)fluoranthenes	SW8270E				**84.2**	**623**	**212**	**160 J**
Benzo(g,h,i)perylene	SW8270E	670	720		**16.6 J**	**91.1**	79.5 U	94.8 U
Chrysene	SW8270E	1400	2800		**45.4**	**497**	**201**	**200**
Dibenzo(a,h)anthracene	SW8270E	230	230		20 U	**32.6**	79.5 U	94.8 U
Fluoranthene	SW8270E	1700	2500		**99.2**	**410**	**181**	**194**
Fluorene	SW8270E	540	540		20 U	**42.3**	79.5 U	94.8 U
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		**15.6 J**	**100**	79.5 U	94.8 U

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-MNR-10_21	WW-MNR-11_21	WW-P1CM-01_21	WW-P1CM-02_21
				Sample ID	WW-MNR-110-SS-210721	WW-MNR-11-SS-210721	WW-P1CM-01-SS-210720	WW-P1CM-02-SS-210720
				Sample Date	7/21/2021	7/21/2021	7/20/2021	7/20/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	FD	N	N	N
				Matrix	SE	SE	SE	SE
				X	1241812.5	1241961.8	1239687.3	1239885.1
				Y	643426.84	643289.24	641217.34	641364.24
Naphthalene	SW8270E	2100	2100		**7.4 J**	**54.3**	**26.9 J**	**20.5 J**
Phenanthrene	SW8270E	1500	1500		**30.2**	**199**	**114**	**150**
Pyrene	SW8270E	2600	3300		**100**	**499**	**172**	**177**
itoring		3200	3600		**84.2**	**623**	**212**	**160 J**
Total HPAH (SMS) (U = 0)		12000	17000		**426.4 J**	**2761.7**	**957.9**	**937.1 J**
Total LPAH (SMS) (U = 0)		5200	5200		**57.5 J**	**558.8**	**203.5 J**	**234.2 J**
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	**1.35 J**	--	1.12 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**11.7**	--	**2.77 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**16.6**	--	**6.06**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**62**	--	**18.6**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**39.2**	--	**10**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**1490**	--	**471**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				--	**11800 J**	--	**3970**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	**220**	--	**172**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**265**	--	**169**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**747**	--	**346**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**3280**	--	**1060**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				--	**8.02**	--	**5.68**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**4.14**	--	**1.64**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**3.73**	--	**1.57**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**14.8**	--	**5.49**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**7.82**	--	**1.92**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**4.64**	--	**2.27**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**7.4 J**	--	**2.25**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**218**	--	**58.2**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**13.5 J**	--	**4.15 J**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				--	**556**	--	**161**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				--	**48**	--	**9.83**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				--	**93.9**	--	**18.7**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				--	**312**	--	**92.7**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				--	**673**	--	**212**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					--	**51.263 J**	--	**15.09 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	--	**51.263 J**	--	**15.65 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	--	**51.26 J**	--	**15.65 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					--	**51.26 J**	--	**15.09 J**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-P1CM-02_21	WW-P1CM-03_21	WW-P1CM-03_21	WW-P1CM-04_21
				Sample ID	WW-P1CM-02-SS-210720RE	WW-P1CM-03-SS-210726	WW-P1CM-103-SS-210726	WW-P1CM-04-SS-210726
				Sample Date	7/20/2021	7/26/2021	7/26/2021	7/26/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	FD	N
				Matrix	SE	SE	SE	SE
				X	1239885.1	1240497.3	1240497.3	1240689.6
				Y	641364.24	641293.8	641293.8	641404.7
Conventional Parameters (%)								
Total organic carbon	SW9060AM				--	**1.52**	**1.31**	**0.85**
Total Solids	SM2540G				--	**52.37**	**53.54**	**68.69**
Metals (mg/kg)								
Copper	SW6020B	390	390		--	**38.8**	**33.3**	**19.2**
Mercury	SW7471B	0.41	0.59	1.2[1]	--	**0.29**	**0.195**	**1.0**
Zinc	SW6020B	410	960		--	**77.8**	**67.7**	**46.2**
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		--	**4.7 J**	100 U	99.8 U
2-Methylphenol (o-Cresol)	SW8270E	63	63		--	20 U	20 U	20 U
4-Methylphenol (p-Cresol)	SW8270E	670	670		--	**19 J**	**20.8**	**9 J**
Pentachlorophenol	SW8270E	360	690		--	100 UJ	100 UJ	99.8 UJ
Phenol	SW8270E	420	1200		--	**11.7 J**	**11.2 J**	**11.8 J**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		--	**0.9539 J**	**0.8473 J**	**1.2353 J**
Acenaphthene	SW8270E	16	57		--	**0.6513 J**	**0.6336 J**	**0.7176 J**
Acenaphthylene	SW8270E	66	66		--	**0.6447 J**	**0.6412 J**	2.3529 U
Anthracene	SW8270E	220	1200		--	**1.7039**	**1.8092**	**1.5176 J**
Benzo(a)anthracene	SW8270E	110	270		--	**3.9276**	**4.1832**	**3.6235**
Benzo(a)pyrene	SW8270E	99	210		--	**3.1908**	**2.9618**	**2.6824**
Benzo(g,h,i)perylene	SW8270E	31	78		--	**2.5132**	**2.0687**	**1.6588 J**
Chrysene	SW8270E	110	460		--	**7.763**	**8.321**	**5.0941**
Dibenzo(a,h)anthracene	SW8270E	12	33		--	1.3158 U	1.5267 U	2.3529 U
Fluoranthene	SW8270E	160	1200		--	**9.145**	**9.924**	**9.9882**
Fluorene	SW8270E	23	79		--	**1.3092 J**	**1.3511 J**	2.3529 U
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		--	**2.3092**	**2.1374**	2.3529 U
Naphthalene	SW8270E	99	170		--	**1.4276**	**1.4275 J**	**1.1882 J**
Phenanthrene	SW8270E	100	480		--	**3.9408**	**4.0992**	**4.1765**
Pyrene	SW8270E	1000	1400		--	**7.632**	**8.015**	**9.5529**
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		--	**9.079**	**8.55**	**7.7647**
Total HPAH (SMS) (U = 0)		960	5300		--	**45.5592**	**46.1603**	**40.3647 J**
Total LPAH (SMS) (U = 0)		370	780		--	**9.6776 J**	**9.9618 J**	**7.6 J**
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				--	**9.3 J**	**9 J**	**7.4 J**
2-Methylnaphthalene	SW8270E	670	670		--	**14.5 J**	**11.1 J**	**10.5 J**
Acenaphthene	SW8270E	500	500		--	**9.9 J**	**8.3 J**	**6.1 J**
Acenaphthylene	SW8270E	1300	1300		--	**9.8 J**	**8.4 J**	20 U
Anthracene	SW8270E	960	960		--	**25.9**	**23.7**	**12.9 J**
Benzo(a)anthracene	SW8270E	1300	1600		--	**59.7**	**54.8**	**30.8**
Benzo(a)pyrene	SW8270E	1600	1600		--	**48.5**	**38.8**	**22.8**
Benzo(b,j,k)fluoranthenes	SW8270E				--	**138**	**112**	**66**
Benzo(g,h,i)perylene	SW8270E	670	720		--	**38.2**	**27.1**	**14.1 J**
Chrysene	SW8270E	1400	2800		--	**118**	**109**	**43.3**
Dibenzo(a,h)anthracene	SW8270E	230	230		--	20 U	20 U	20 U
Fluoranthene	SW8270E	1700	2500		--	**139**	**130**	**84.9**
Fluorene	SW8270E	540	540		--	**19.9 J**	**17.7 J**	20 U
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		--	**35.1**	**28**	20 U

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	
				Task	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-P1CM-02_21	WW-P1CM-03_21	WW-P1CM-03_21	WW-P1CM-04_21
				Sample ID	WW-P1CM-02-SS-210720RE	WW-P1CM-03-SS-210726	WW-P1CM-103-SS-210726	WW-P1CM-04-SS-210726
				Sample Date	7/20/2021	7/26/2021	7/26/2021	7/26/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
				Sample Type	N	N	FD	N
				Matrix	SE	SE	SE	SE
				X	1239885.1	1240497.3	1240497.3	1240689.6
				Y	641364.24	641293.8	641293.8	641404.7
Naphthalene	SW8270E	2100	2100		--	**21.7**	**18.7 J**	**10.1 J**
Phenanthrene	SW8270E	1500	1500		--	**59.9**	**53.7**	**35.5**
Pyrene	SW8270E	2600	3300		--	**116**	**105**	**81.2**
itoring		3200	3600		--	**138**	**112**	**66**
Total HPAH (SMS) (U = 0)		12000	17000		--	**692.5**	**604.7**	**343.1 J**
Total LPAH (SMS) (U = 0)		5200	5200		--	**147.1 J**	**130.5 J**	**64.6 J**
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				**0.12 J**	--	--	0.113 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**0.709**	--	--	**0.829 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**1.31**	--	--	**0.985 J**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**3.67**	--	--	**4**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**2.14**	--	--	**2.06**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**98**	--	--	**92.3**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				**680**	--	--	**762**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				**47.6**	--	--	**9.76**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**42.2**	--	--	**9.64**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**83.4**	--	--	**42.6**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**212**	--	--	**210**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				**1.32**	--	--	**1.17**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**0.329**	--	--	**0.925 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**0.284**	--	--	**0.473 J**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**1.13**	--	--	**2.6**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**0.429**	--	--	**0.882 J**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				**0.339**	--	--	**0.564 J**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**0.711**	--	--	**0.516 J**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				**12.2**	--	--	**13.3 J**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				**0.763**	--	--	**1.13 J**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				**28.4**	--	--	**25.6**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				**5.47**	--	--	**3.01**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				**5.44**	--	--	**7.07**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				**21.8**	--	--	**23.2**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				**43.4**	--	--	**41.6**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					**3.35112 J**	--	--	**3.57993 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	**3.35112 J**	--	--	**3.63643 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	**3.351 J**	--	--	**3.636 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					**3.351 J**	--	--	**3.58 J**

Table 1
Surface Sediment Analytical Results

Task					WWY5_Compliance	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
Location ID					WW-P1CM-05_21	WW-P1CM-06_21	WW-P1CM-07_21	WW-P1CM-09_21
Sample ID					WW-P1CM-05-SS-210720	WW-P1CM-06-SS-210721	WW-P1CM-07-SS-210721	WW-P1CM-09-SS-210721
Sample Date					7/20/2021	7/21/2021	7/21/2021	7/21/2021
Depth					0 - 12 cm	0 - 12 cm	0 - 12 cm	0 - 12 cm
Sample Type					N	N	N	N
Matrix					SE	SE	SE	SE
X					1240813.3	1241508.5	1241351.8	1241714.1
Y					641877.67	642842	642988.47	643039.13
		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other				
Conventional Parameters (%)								
Total organic carbon	SW9060AM				**1.17**	**3.86**	**3.46**	**4.89**
Total Solids	SM2540G				**58.32**	**41.02**	**39.54**	**39.11**
Metals (mg/kg)								
Copper	SW6020B	390	390		**23.1**	**52.9 J**	**52.5 J**	**63.2 J**
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.278**	**0.404**	**0.266**	**0.368**
Zinc	SW6020B	410	960		**58.1**	**135 J**	**119 J**	**154 J**
Semivolatile Organics (µg/kg)								
2,4-Dimethylphenol	SW8270E	29	29		99.9 U	99.9 U	100 U	100 U
2-Methylphenol (o-Cresol)	SW8270E	63	63		20 U	20 U	20 U	20 U
4-Methylphenol (p-Cresol)	SW8270E	670	670		**11.5 J**	**119**	**123**	**99.9**
Pentachlorophenol	SW8270E	360	690		99.9 U	99.9 U	100 U	100 U
Phenol	SW8270E	420	1200		**6.4 J**	**21.5**	**88**	**72**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)								
2-Methylnaphthalene	SW8270E	38	64		**0.9915 J**	**0.7953**	**3.873**	**0.3436 J**
Acenaphthene	SW8270E	16	57		**0.8889 J**	**0.9301**	**0.3931 J**	**0.4029 J**
Acenaphthylene	SW8270E	66	66		**1.2821 J**	**1**	**0.3757 J**	**0.411**
Anthracene	SW8270E	220	1200		**3.359**	**3.575**	**1.1561**	**1.2638**
Benzo(a)anthracene	SW8270E	110	270		**9.915**	**10.855**	**2.89**	**3.681**
Benzo(a)pyrene	SW8270E	99	210		**8.1026**	**7.306**	**2.685**	**3.272**
Benzo(g,h,i)perylene	SW8270E	31	78		**4.5385**	**2.3834**	**1.3208**	**1.4908**
Chrysene	SW8270E	110	460		**19.658**	**16.244**	**5.405**	**6.524**
Dibenzo(a,h)anthracene	SW8270E	12	33		**1.9145**	**1.2047**	0.578 U	**0.5215**
Fluoranthene	SW8270E	160	1200		**19.145**	**27.979**	**6.561**	**7.669**
Fluorene	SW8270E	23	79		**1.3077 J**	**1.399**	**0.7803**	**0.6503**
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		**4.8205**	**2.72**	**1.3555**	**1.5072**
Naphthalene	SW8270E	99	170		**1.2137 J**	**1.9093**	**3.295**	**0.6074**
Phenanthrene	SW8270E	100	480		**6.5214**	**7.461**	**2.977**	**2.699**
Pyrene	SW8270E	1000	1400		**21.795**	**24.456**	**6.185**	**7.444**
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**25.043**	**17.176**	**6.763**	**7.812**
Total HPAH (SMS) (U = 0)		960	5300		**114.9316**	**110.3238**	**33.1647**	**39.9202**
Total LPAH (SMS) (U = 0)		370	780		**14.5726 J**	**16.2746**	**8.9769 J**	**6.0348 J**
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E				**6.6 J**	**16.1 J**	**63.7**	**9.4 J**
2-Methylnaphthalene	SW8270E	670	670		**11.6 J**	**30.7**	**134**	**16.8 J**
Acenaphthene	SW8270E	500	500		**10.4 J**	**35.9**	**13.6 J**	**19.7 J**
Acenaphthylene	SW8270E	1300	1300		**15 J**	**38.6**	**13 J**	**20.1**
Anthracene	SW8270E	960	960		**39.3**	**138**	**40**	**61.8**
Benzo(a)anthracene	SW8270E	1300	1600		**116**	**419**	**100**	**180**
Benzo(a)pyrene	SW8270E	1600	1600		**94.8**	**282**	**92.9**	**160**
Benzo(b,j,k)fluoranthenes	SW8270E				**293**	**663**	**234**	**382**
Benzo(g,h,i)perylene	SW8270E	670	720		**53.1**	**92**	**45.7**	**72.9**
Chrysene	SW8270E	1400	2800		**230**	**627**	**187**	**319**
Dibenzo(a,h)anthracene	SW8270E	230	230		**22.4**	**46.5**	20 U	**25.5**
Fluoranthene	SW8270E	1700	2500		**224**	**1080**	**227**	**375**
Fluorene	SW8270E	540	540		**15.3 J**	**54**	**27**	**31.8**
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		**56.4**	**105**	**46.9**	**73.7**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other				
				Task	**WWY5_Compliance**	**WWY5_Compliance**	**WWY5_Compliance**	**WWY5_Compliance**
				Location ID	**WW-P1CM-05_21**	**WW-P1CM-06_21**	**WW-P1CM-07_21**	**WW-P1CM-09_21**
				Sample ID	**WW-P1CM-05-SS-210720**	**WW-P1CM-06-SS-210721**	**WW-P1CM-07-SS-210721**	**WW-P1CM-09-SS-210721**
				Sample Date	**7/20/2021**	**7/21/2021**	**7/21/2021**	**7/21/2021**
				Depth	**0 - 12 cm**	**0 - 12 cm**	**0 - 12 cm**	**0 - 12 cm**
				Sample Type	**N**	**N**	**N**	**N**
				Matrix	**SE**	**SE**	**SE**	**SE**
				X	**1240813.3**	**1241508.5**	**1241351.8**	**1241714.1**
				Y	**641877.67**	**642842**	**642988.47**	**643039.13**
Naphthalene	SW8270E	2100	2100		**14.2 J**	**73.7**	**114**	**29.7**
Phenanthrene	SW8270E	1500	1500		**76.3**	**288**	**103**	**132**
Pyrene	SW8270E	2600	3300		**255**	**944**	**214**	**364**
itoring		3200	3600		**293**	**663**	**234**	**382**
Total HPAH (SMS) (U = 0)		12000	17000		**1344.7**	**4258.5**	**1147.5**	**1952.1**
Total LPAH (SMS) (U = 0)		5200	5200		**170.5 J**	**628.2**	**310.6 J**	**295.1 J**
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	0.414 U	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**5.07 J**	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**7.98**	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**30.4**	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**16.5**	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**854**	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				--	**7500 J**	--	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				--	**155**	--	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				--	**184**	--	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				--	**462**	--	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				--	**2090**	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				--	**4.19 J**	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**1.97 J**	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				--	**1.79**	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**7.01**	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**3.92**	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**2.86**	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				--	**3.24**	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**109**	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				--	**7.89 J**	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				--	**342**	--	--
Total Tetrachlorodibenzofuran (TCDF)	E1613B				--	**18.6**	--	--
Total Pentachlorodibenzofuran (PeCDF)	E1613B				--	**43.1**	--	--
Total Hexachlorodibenzofuran (HxCDF)	E1613B				--	**156**	--	--
Total Heptachlorodibenzofuran (HpCDF)	E1613B				--	**374**	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					--	**25.3376 J**	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	--	**25.5446 J**	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	--	**25.545 J**	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					--	**25.338 J**	--	--

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other			
				Task	**WWY5_Compliance**	**WWY5_Compliance**	**WWY5_Compliance**
				Location ID	**WW-P1CM-10_21**	**WW-P1CM-11_21**	**WW-P1CM-11_21**
				Sample ID	**WW-P1CM-10-SS-210721**	**WW-P1CM-11-SS-0-12-210720**	**WW-P1CM-11-SS-0-2-210720**
				Sample Date	**7/21/2021**	**7/20/2021**	**7/20/2021**
				Depth	**0 - 12 cm**	**0 - 12 cm**	**0 - 2 cm**
				Sample Type	**N**	**N**	**N**
				Matrix	**SE**	**SE**	**SE**
				X	**1241559.9**	**1240814.1**	**1240814.1**
				Y	**643183.57**	**642753.7**	**642753.7**
Conventional Parameters (%)							
Total organic carbon	SW9060AM				**4.7**	**3.78**	**4.27**
Total Solids	SM2540G				**36.63**	**36.34**	**32.19**
Metals (mg/kg)							
Copper	SW6020B	390	390		**57.6 J**	**83.4**	**74.9**
Mercury	SW7471B	0.41	0.59	1.2[1]	**0.3**	**0.301**	**0.327**
Zinc	SW6020B	410	960		**158 J**	**163**	**148**
Semivolatile Organics (µg/kg)							
2,4-Dimethylphenol	SW8270E	29	29		100 U	100 U	100 U
2-Methylphenol (o-Cresol)	SW8270E	63	63		20 U	20 U	20 U
4-Methylphenol (p-Cresol)	SW8270E	670	670		**53.9**	**36.2**	**39.2**
Pentachlorophenol	SW8270E	360	690		100 U	100 U	100 U
Phenol	SW8270E	420	1200		**40.3**	**17.2 J**	**19 J**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)							
2-Methylnaphthalene	SW8270E	38	64		**0.2404 J**	**0.4048 J**	**0.4895**
Acenaphthene	SW8270E	16	57		**0.3936 J**	**0.254 J**	**0.4052 J**
Acenaphthylene	SW8270E	66	66		**0.2681 J**	**0.3624 J**	**0.3396 J**
Anthracene	SW8270E	220	1200		**1.1064**	**1.2672**	**1.8267**
Benzo(a)anthracene	SW8270E	110	270		**3.596**	**5.423**	**4.778**
Benzo(a)pyrene	SW8270E	99	210		**2.915**	**5.476**	**4.778**
Benzo(g,h,i)perylene	SW8270E	31	78		**1.3064**	**2.884**	**2.2904**
Chrysene	SW8270E	110	460		**6.021**	**8.095**	**9.719**
Dibenzo(a,h)anthracene	SW8270E	12	33		**0.4319**	**1.2354**	**0.6698**
Fluoranthene	SW8270E	160	1200		**7.34**	**9.55**	**8.712**
Fluorene	SW8270E	23	79		**0.4617**	0.5291 U	**0.6581**
Indeno(1,2,3-c,d)pyrene	SW8270E	34	88		**1.317**	**3.016**	**2.1077**
Naphthalene	SW8270E	99	170		**0.3809 J**	**0.6058**	**0.7658**
Phenanthrene	SW8270E	100	480		**2.447**	**2.857**	**4.145**
Pyrene	SW8270E	1000	1400		**6.957**	**10.026**	**9.836**
Total Benzofluoranthenes (b,j,k) (U = 0)		230	450		**7.064**	**11.429**	**9.602**
Total HPAH (SMS) (U = 0)		960	5300		**36.9489**	**57.1349**	**52.4918**
Total LPAH (SMS) (U = 0)		370	780		**5.0574 J**	**5.3466 J**	**8.1405 J**
Polycyclic Aromatic Hydrocarbons (µg/kg)							
1-Methylnaphthalene	SW8270E				**8.1 J**	**10.5 J**	**14.4 J**
2-Methylnaphthalene	SW8270E	670	670		**11.3 J**	**15.3 J**	**20.9**
Acenaphthene	SW8270E	500	500		**18.5 J**	**9.6 J**	**17.3 J**
Acenaphthylene	SW8270E	1300	1300		**12.6 J**	**13.7 J**	**14.5 J**
Anthracene	SW8270E	960	960		**52**	**47.9**	**78**
Benzo(a)anthracene	SW8270E	1300	1600		**169**	**205**	**204**
Benzo(a)pyrene	SW8270E	1600	1600		**137**	**207**	**204**
Benzo(b,j,k)fluoranthenes	SW8270E				**332**	**432**	**410**
Benzo(g,h,i)perylene	SW8270E	670	720		**61.4**	**109**	**97.8**
Chrysene	SW8270E	1400	2800		**283**	**306**	**415**
Dibenzo(a,h)anthracene	SW8270E	230	230		**20.3**	**46.7**	**28.6**
Fluoranthene	SW8270E	1700	2500		**345**	**361**	**372**
Fluorene	SW8270E	540	540		**21.7**	20 U	**28.1**
Indeno(1,2,3-c,d)pyrene	SW8270E	600	690		**61.9**	**114**	**90**

Table 1
Surface Sediment Analytical Results

		SMS Marine SCO or SCO AET	SMS Marine CSL or CSL AET	Other	WWY5_Compliance	WWY5_Compliance	WWY5_Compliance
				Location ID	WW-P1CM-10_21	WW-P1CM-11_21	WW-P1CM-11_21
				Sample ID	WW-P1CM-10-SS-210721	WW-P1CM-11-SS-0-12-210720	WW-P1CM-11-SS-0-2-210720
				Sample Date	7/21/2021	7/20/2021	7/20/2021
				Depth	0 - 12 cm	0 - 12 cm	0 - 2 cm
				Sample Type	N	N	N
				Matrix	SE	SE	SE
				X	1241559.9	1240814.1	1240814.1
				Y	643183.57	642753.7	642753.7
Naphthalene	SW8270E	2100	2100		**17.9 J**	**22.9**	**32.7**
Phenanthrene	SW8270E	1500	1500		**115**	**108**	**177**
Pyrene	SW8270E	2600	3300		**327**	**379**	**420**
itoring		3200	3600		**332**	**432**	**410**
Total HPAH (SMS) (U = 0)		12000	17000		**1736.6**	**2159.7**	**2241.4**
Total LPAH (SMS) (U = 0)		5200	5200		**237.7 J**	**202.1 J**	**347.6 J**
Dioxin Furans (ng/kg)							
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				**0.793 J**	**0.993 J**	**1.09**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**6.33 J**	**12**	**11.2**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**9.34**	**17.9**	**17.4**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**33.3**	**62.5**	**57.2**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**21.2**	**42.4**	**39.9**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**839**	**1460**	**1400**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B				**7490 J**	**10500 J**	**10800 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				**58.6**	**117**	**96.5**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				**58.5**	**112**	**116**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				**281**	**499**	**461**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B				**1720**	**2690**	**2690**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B				**3.58**	**5.48 J**	**4.45**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**2.03 J**	**3.12 J**	**2.64 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B				**2.15**	**3.32**	**3.3**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**8.02**	**14.5**	**14.2**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**5.04**	**8.77**	**8.61**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B				**3.61**	**5.7**	**4.91**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B				**4.88**	**7.72 J**	**7.99 J**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B				**136**	**227**	**224**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B				**9.31 J**	**13.8 J**	**13.9 J**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B				**396**	**562**	**571**
Total Tetrachlorodibenzofuran (TCDF)	E1613B				**22.3**	**25.7**	**27.8**
Total Pentachlorodibenzofuran (PeCDF)	E1613B				**45.2**	**65.3**	**75**
Total Hexachlorodibenzofuran (HxCDF)	E1613B				**189**	**334**	**307**
Total Heptachlorodibenzofuran (HpCDF)	E1613B				**427**	**688**	**662**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)					**28.9348 J**	**50.9062 J**	**48.6155 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		5.0[2]		15[3]	**28.9348 J**	**50.9062 J**	**48.6155 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2) (EMPC included)		5.0[2]		15[3]	**28.935 J**	**50.906 J**	**48.62 J**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0) (EMPC included)					**28.935 J**	**50.906 J**	**48.62 J**

Table 1
Surface Sediment Analytical Results

Notes:

TOC in range (0.5% - 3.5%)

(yellow)	Detected concentration is greater than SMS_Marine_SCO_SCUMII screening level
(cyan)	Detected concentration is greater than SMS_Marine_CSL_SCUMII screening level

TOC out of range

(green)	Detected concentration is greater than AET_Marine_SCO_SCUMII screening level
(orange)	Detected concentration is greater than AET_Marine_CSL_SCUMII screening level
(blue)	Exceeds other/site-specific screening level, independent of TOC

1. Site-specific bioaccumulation screening level (1.2 mg mercury/kg dry weight) for mercury in the Whatcom Waterway Site.
2. Ecology has determined that the SCO for D/F in Bellingham Bay sediment sites is 5.0 ng/kg TEQ based on the practical quantitation limit.
3. Value is based on assessment of anti-degradation provisions based on final data report documenting regional background concentration of dioxin/furans in Bellingham Bay (Ecology 2015).

Bold: Detected result
J: Estimated value
U: Compound analyzed for, but not detected above detection limit
UJ: Compound analyzed for, but not detected above estimated detection limit

µg/kg: microgram per kilogram
AET: apparent effects threshold
cm: centimeter
CSL: cleanup screening level
D/F: dioxin/furan
EMPC: estimated maximum possible concentration
HPAH: high-molecular weight polycyclic aromatic hydrocarbon
ID: identification
LPAH: low-molecular weight polycyclic aromatic hydrocarbon
mg/kg: milligram per kilogram
ng/kg: nanogram per kilogram
OC: organic carbon
SCO: sediment cleanup objective
SCUM II: Sediment Cleanup User's Manual II
SMS: Sediment Management Standards
TEQ: toxic equivalency quotient
TOC: total organic carbon

Table 2
Summary of Consent Decree Biological Effects Criteria

Biological Test Endpoint	Performance Standard		Sediment Quality Standard[3]	Minimum Cleanup Level[3]
	Control[1]	Reference[2]		
Ampelisca abdita				
10-day mortality	M_C <10%	M_R <25%	$M_T - M_C$ >25% and M_T vs. M_R SD (p = 0.05)	$M_T - M_C$ >30% and M_T vs. M_R SD (p = 0.05)
Neanthes arenaceodentata				
20-day growth and mortality	M_C <10% and MIG_F >0.72 mg/individual day	MIG_R/MIG_C >0.80	MIG_T/MIG_R <0.85 and MIG_T/MIG_R SD (p = 0.05)	MIG_T/MIG_R <0.50 and MIG_T/MIG_R SD (p = 0.05)
Mytilus galloprovencialis				
Larval Development	N_C /I >0.70	N_R/N_C ≥0.65	N_T/ N_R <0.85 and N_T vs. N_R SD (p = 0.10)	N_T/ N_R <0.70 and N_T vs. N_R SD (p = 0.10)

Notes:

Source: Ecology 2019

1. Laboratory control
2. Collected reference samples
3. Performance standards as articulated at the time of the Consent Decree. These values are consistent with the current sediment cleanup objective/sediment quality standards and cleanup screen level/minimum cleanup level values contained in SCUM II (Ecology 2017).

C: control
F: final
I: stocking density
M: mortality
MIG: mean individual growth at time final
mg: milligram
N: normal survivorship expresses as actual counts.
p: probability
R: reference
SD: significant difference
T: test

Table 3
Summary of Bioassay Testing Results

Sample ID	Applicable Reference	*Leptochirus plumulosus* 10-Day Mortality (%)		*Neanthes arenaceodentata* (mg/individual/day)[1]		*Dendraster excentricus* Mean Normal Survival[2,3] (%)	
Seawater Control	--	--	--	--	--	156.6	Pass QA
Sediment Control	--	1	Pass QA	0.565	Pass QA	132.0	Pass QA
Eoh Control (Coarse Grained)	--	4	Pass QA	--	--	--	--
Reference CARR34 (34% fines)	--	6	Pass QA	0.659	Pass QA	141.8	Pass SQS
Reference CARR86 (86% fines)	--	1	Pass QA	0.597	Pass QA	136.8	Pass SQS
WW-MNR-06-SS-210719	CARR34	1	Pass SQS	0.577	Pass SQS	137.8	Pass SQS
WW-MNR-07-SS-210719	CARR86	4	Pass SQS	0.447	Pass SQS	153.2	Pass SQS
WW-P1CM-01-SS-210720	CARR86	3	Pass SQS	0.681	Pass SQS	127.8	Pass SQS
WW-P1CM-04-SS-210726	CARR34	6	Pass SQS	0.666	Pass SQS	167.4	Pass SQS

Notes:

Bioassay results were screened using SQS and MCUL criteria as defined in the Consent Decree and Table 2.

A summary of bioassay results, including all supporting laboratory reports and a QA summary, is included in Appendix E.

1. Growth as measured by ash-free dry weight. See bioassay laboratory report in Appendix E for full details.

2. Compared to Sediment Control

3. All mean sample survivals are not significantly different than Sediment Control mean survivals ($p = 0.10$)

-- : not applicable

Eoh: Coarse-grain control treatment sediment

MCUL: minimum cleanup level

mg: milligram

p: probability

QA: quality assurance

SQS: Sediment Quality Standards

Table 4
Adult Crab Tissue Monitoring Data

Station ID	Sample ID	Number of Individuals in Composite	Mean Carapace Length (cm)	Mean Organism Weight (g)	Mercury (mg/kg ww)
Whatcom Waterway Site Areas					
MNR-03	WW-MNR-03-CM-COMP1-210812	1	13.4	385	0.046
MNR-04	WW-MNR-04-CM-COMP1-210812	1	15.7	547	0.045
MNR-07	WW-MNR-07-CM-COMP1-210812	3	14.2	500	0.048
	WW-MNR-07-CM-COMP2-210812				0.049
	WW-MNR-07-CM-COMP3-210812				0.086
	Site Area Mean		**14.4**	**477**	**0.055**
Samish Bay Reference Areas					
REF-01	WW-REF-01-CM-COMP1-210812	3	15.5	664	0.038
	WW-REF-01-CM-COMP2-210812				0.070
	WW-REF-01-CM-COMP3-210812				0.035
REF-05	WW-REF-05-CM-COMP1-210812	3	15.5	643	0.047
	WW-REF-05-CM-COMP2-210812				0.038
	WW-REF-05-CM-COMP3-210812				0.123
	Reference Area Mean		**15.5**	**653**	**0.058**

Notes:
cm: centimeter
g: gram
kg: kilogram
mg: milligram
ww: wet weight

Table 5
Mercury Concentration Trends in Adult Crab Tissue

Location	Whatcom Waterway Site Areas						Samish Bay Reference				
Sampling Year	**1991**	**1997**	**2016**	**2017**	**2019**	**2021**	**1997**	**2016**	**2017**	**2019**	**2021**
Adult Crab Mercury Tissue Concentration	0.160	0.100	0.070	0.054	0.0687	0.046	0.081	0.045	0.040	0.0449	0.038
	0.15	0.119	0.077	0.0477	0.0752	0.045	0.027	0.05	0.0386	0.0478	0.070
	--	0.211	0.075	0.064	0.0532	0.048	0.031	0.047	0.038	0.0493	0.035
	--	0.204	0.073	0.0602	0.0515	0.049	--	0.068	0.0539	0.0466	0.047
	--	0.100	0.098	0.067	0.0419	0.086	--	0.060	0.056	0.0488	0.038
	--	0.108	0.111	0.0711	0.0401	--	--	0.072	0.0527	0.0483	0.123
Summary Statistics											
Average Total Mercury (mg/kg ww)	0.155	0.140	0.084	0.061	0.055	0.055	0.046	0.057	0.046	0.048	0.058
Standard Deviation (mg/kg ww)	0.007	0.053	0.017	0.009	0.014	0.017	0.030	0.011	0.008	0.002	0.034
Number per sampling event	2	6	6	6	6	5	3	6	6	6	6
Multi-year Average (reference; mg/kg ww)							0.052				

Notes:

--: not applicable

kg: kilogram

mg: milligram

ww: wet weight

Table 6

Mercury Concentration in Log Pond Porewater

	Task	WWY5_Compliance	WWY5_Compliance
	Location ID	WW-P1CM-03_21	WW-P1CM-04_21
	Sample ID	WW-P1CM-03-PW-210726	WW-P1CM-04-PW-210726
	Sample Date	7/26/2021	7/26/2021
	Depth	0 - 12 cm	0 - 12 cm
	Sample Type	N	N
	Matrix	WX	WX
	X	1240497.3	1240689.6
	Y	641293.8	641404.7
Metals (porewater) (µg/L)			
Mercury	SW7470A	0.1 U	0.1 U
Metals, Dissolved (porewater) (µg/L)			
Mercury	SW7470A	0.1 U	0.1 U

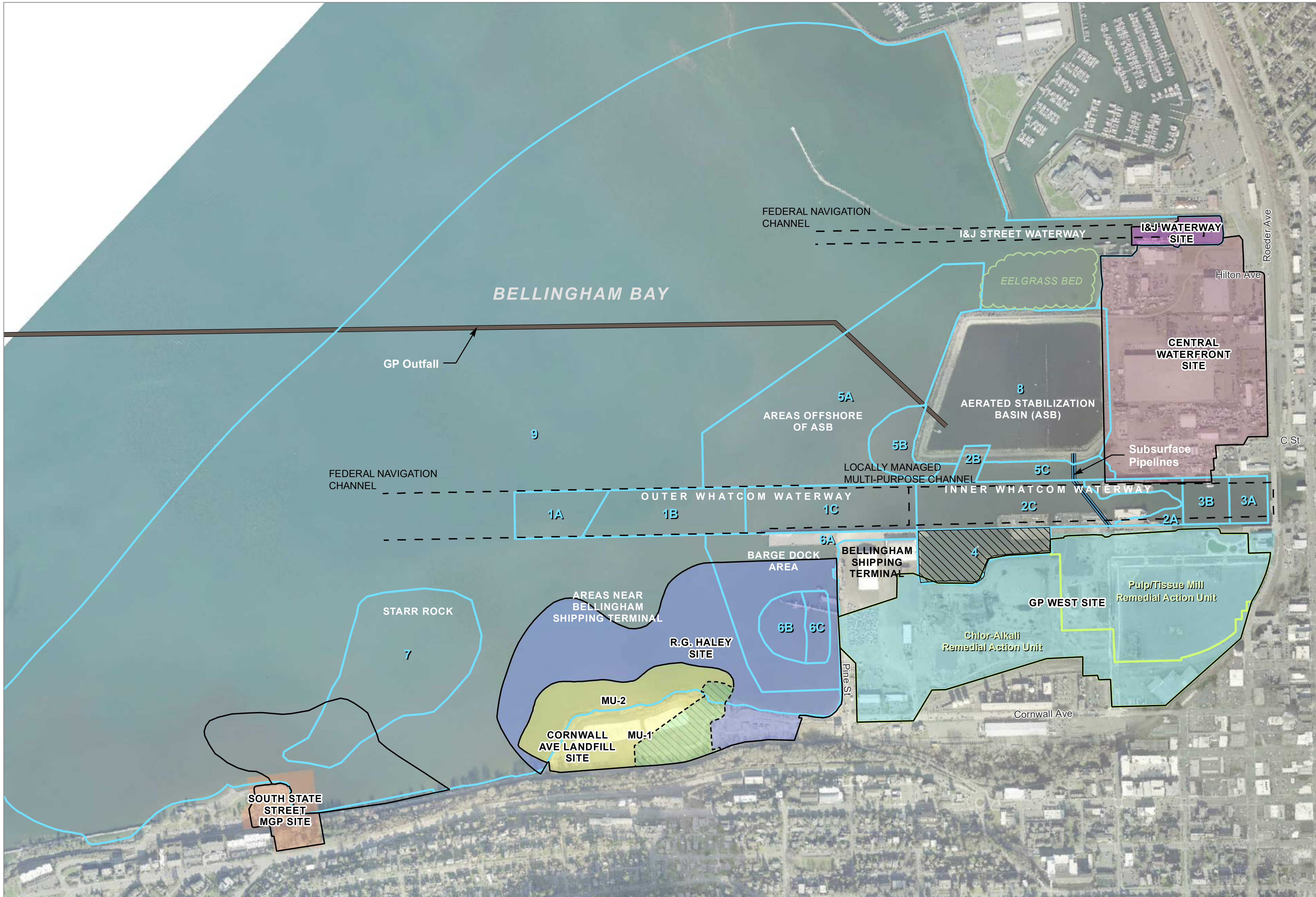
Notes:

The report limit was 0.1 µg/L. The method detection limit was 0.013 µg/L.

U: Compound analyzed for, but not detected above detection limit

µg/L: microgram per liter

Figures



LEGEND:

- Outfall
- Subsurface Pipeline
- Remedial Action Unit Boundaries
- Sediment Site Unit
- Adjacent Cleanup Site Area
- Previously Capped Area (Log Pond Interim Remedial Action)

NOTES:

1. Site units are shown based on those in Figure 2-3 Cleanup Action Plan, Whatcom Waterway Site, September 2007. Unit 9 boundary updated based on PRDI findings.
2. Horizontal datum: Washington State Plane North, NAD 83 Feet.
3. Unit 2B was established in the Cleanup Action Plan based on the anticipated marina access channel location. This location will be adjusted during final design.
4. Remedial Action Unit (RAU) boundaries were defined in the Final Cleanup Action Plan for the GP West Pulp and Tissue Remedial Action Unit (Aspect 2014).
5. Aerial imagery is Whatcom County 2019 and does not represent current conditions at the site.

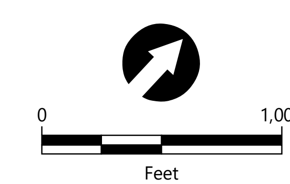


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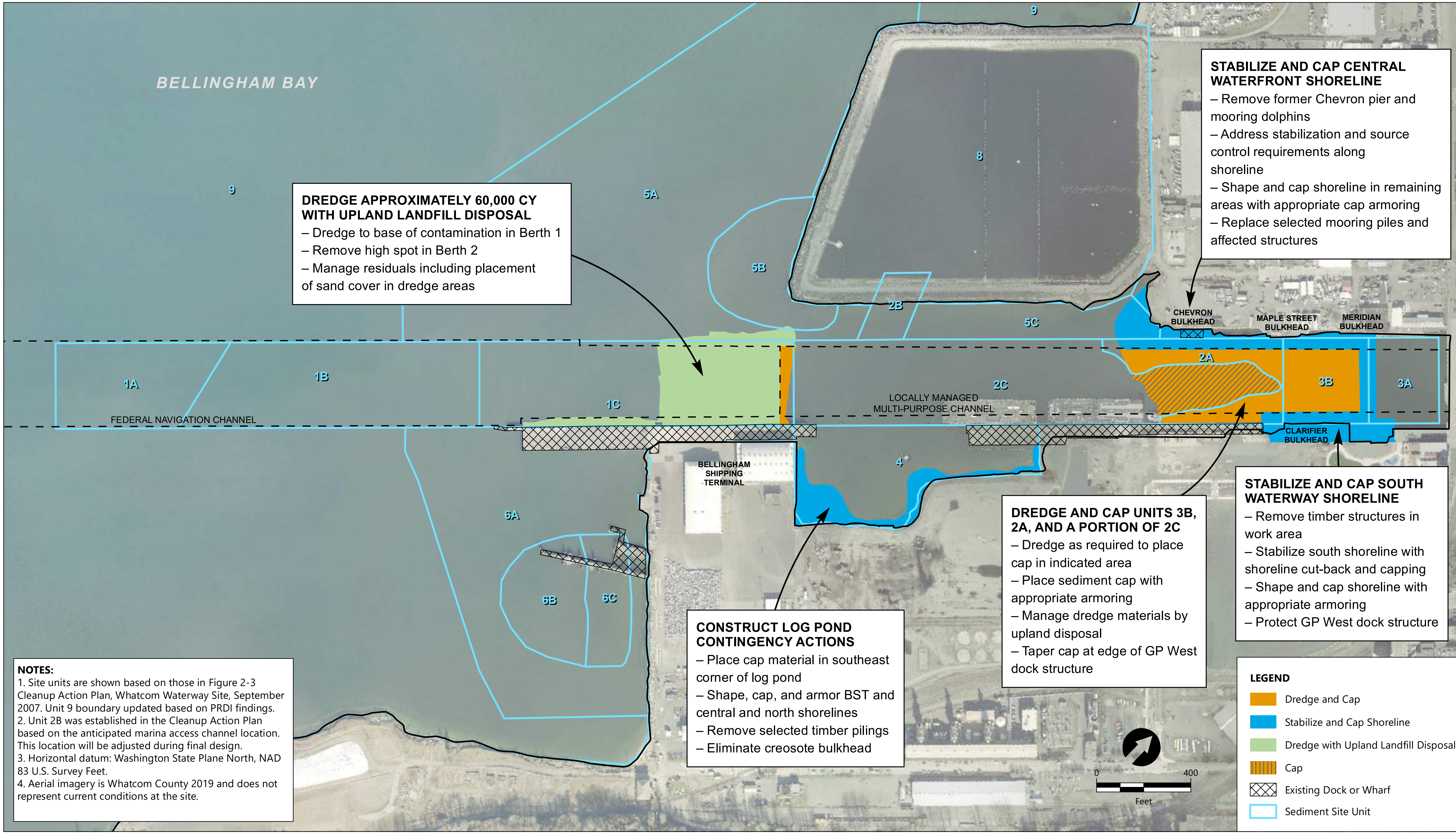
Figure 1
Site Vicinity Map
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



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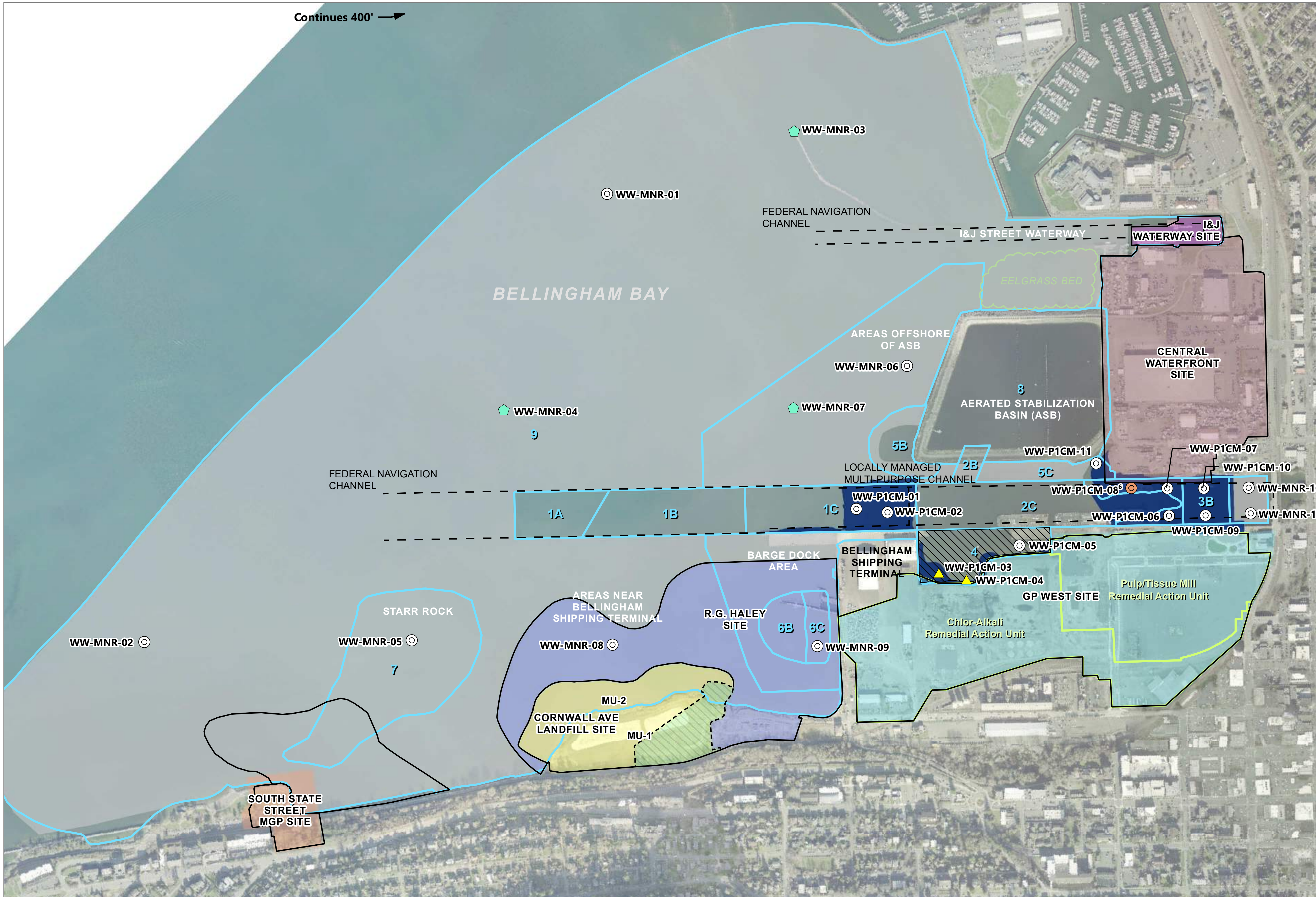
ANCHOR QEA

Figure 2
Completed Cleanup in Phase 1 Site Areas
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



LEGEND:

- Surface Sediment Location
- Surface Sediment and Porewater Location
- Surface Sediment and Crab Tissue Location
- No Sediment Collected[6]
- Remedial Action Unit Boundaries
- Sediment Site Unit
- Previously Capped Area (Log Pond Interim Remedial Action)
- Phase 1 MNR Area
- Phase 1 Dredging or Capping

NOTES:

1. Site units are shown based on those in Figure 2-3 Cleanup Action Plan, Whatcom Waterway Site, September 2007. Unit 9 boundary updated based on Pre-remedial Design Investigation findings.
2. Horizontal datum: Washington State Plane North, North American Datum 1983 (NAD83) Feet.
3. Vertical datum: Mean Lower Low Water (MLLW).
4. Unit 2B was established in the Cleanup Action Plan based on the anticipated marina access channel location. This location will be adjusted during final design.
5. Trawl stations represent actual start and end points of each individual trawl.
6. No recent sediment accumulations over cap armoring at this location.
7. Remedial Action Unit (RAU) boundaries were defined in the Final Cleanup Action Plan for the GP West Pulp and Tissue Remedial Action Unit (Aspect 2014).
8. Aerial imagery is Whatcom County 2019 and does not represent current conditions at the site.

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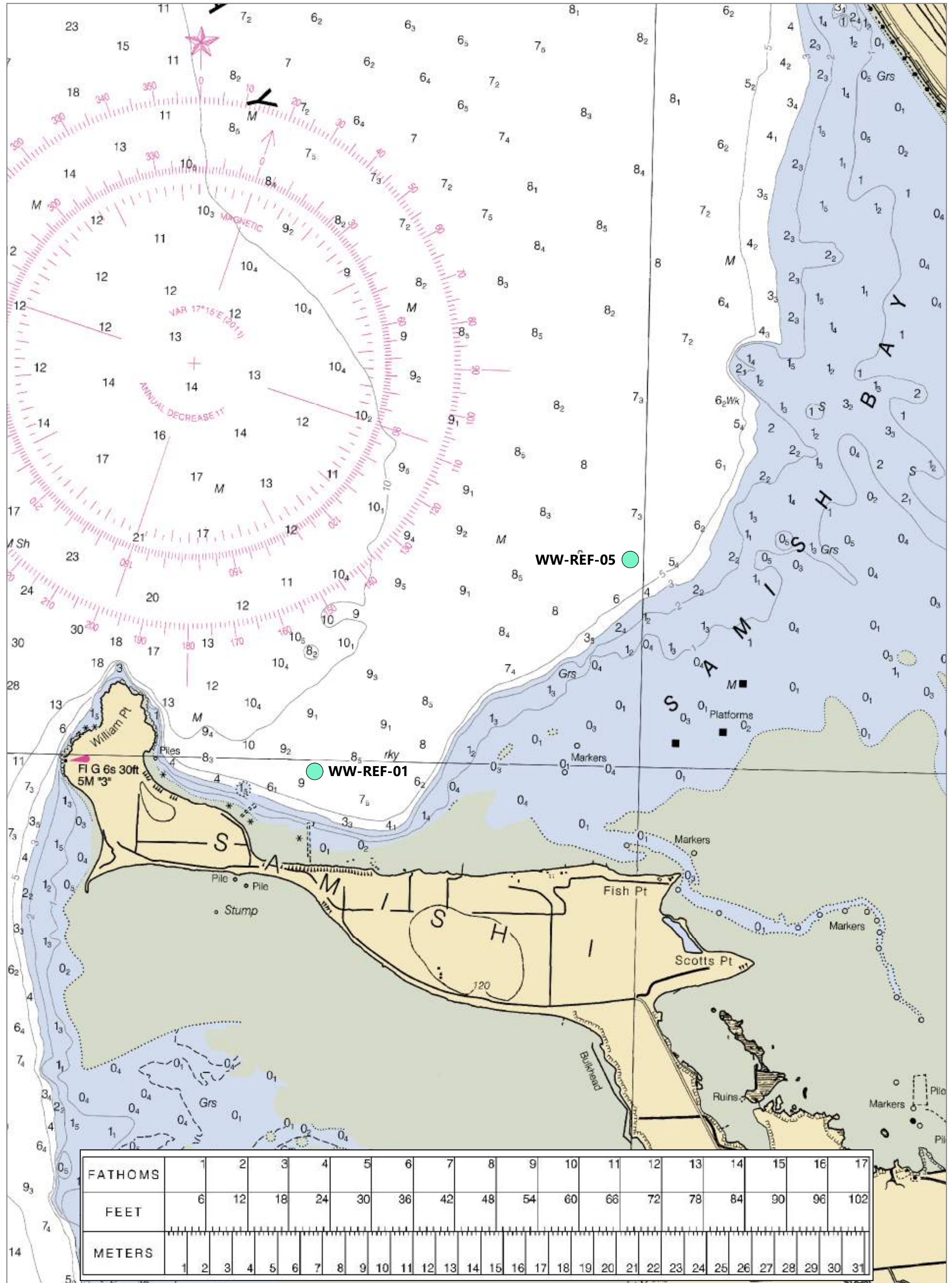
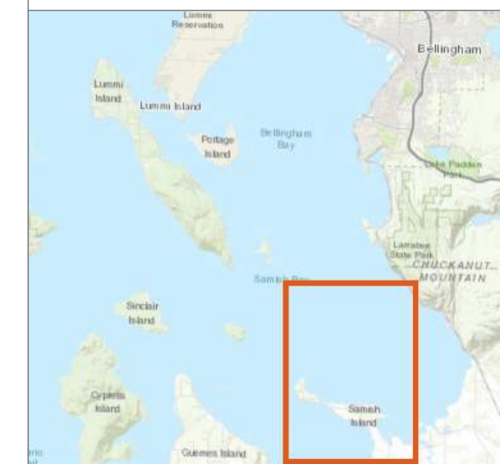
Figure 3
Site Locations for Year 5 Environmental Monitoring
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup Phase 1 Site Areas



LEGEND:

Crab Tissue Station



NOTES:
1. Horizontal datum: Washington State Plane North, North American Datum 1983 (NAD83) Feet.
2. Vertical datum: Mean Lower Low Water (MLLW).

0 4,000
Feet

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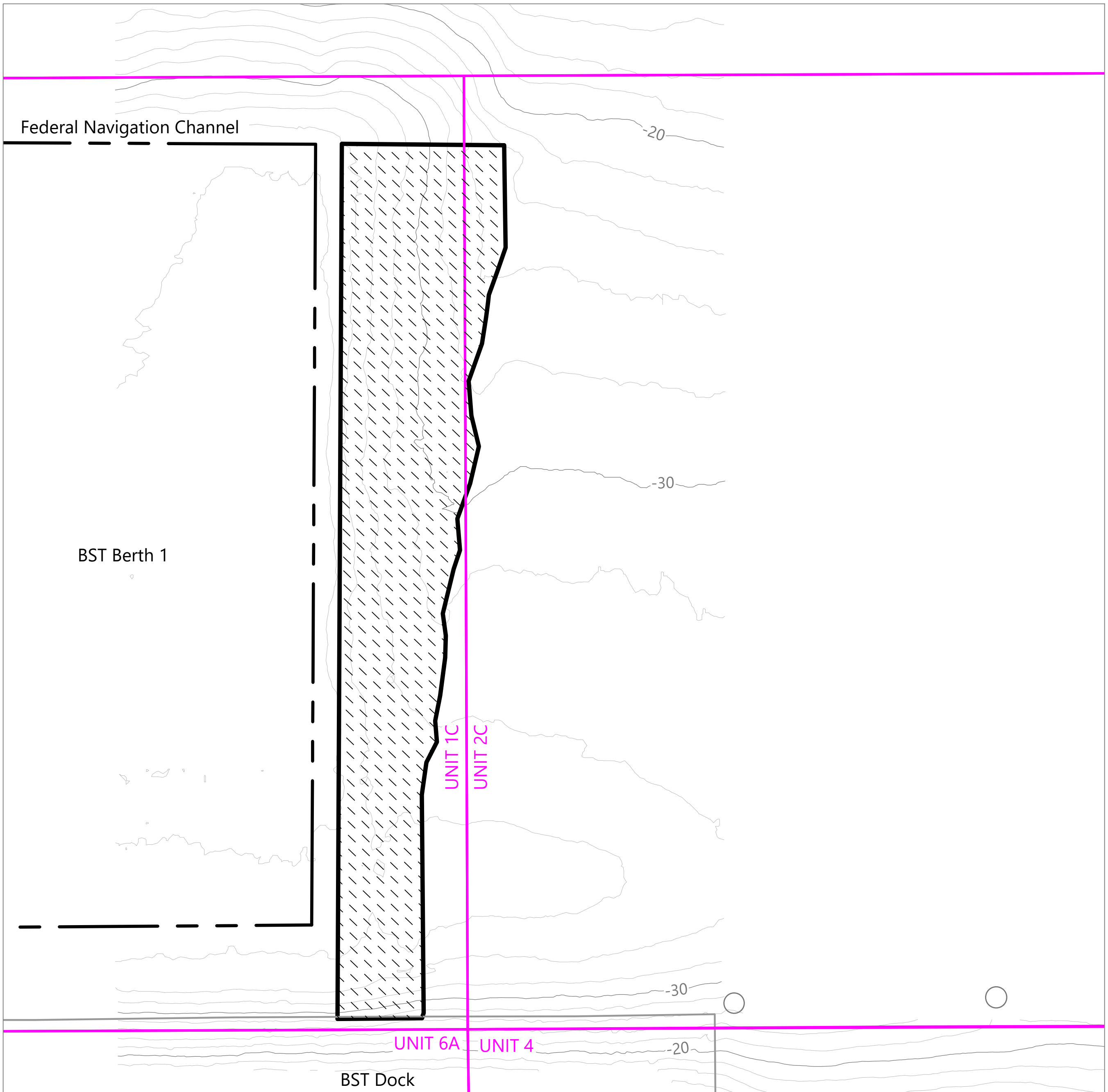
Figure 4
Reference Area Sampling Locations for Year 5 Monitoring
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

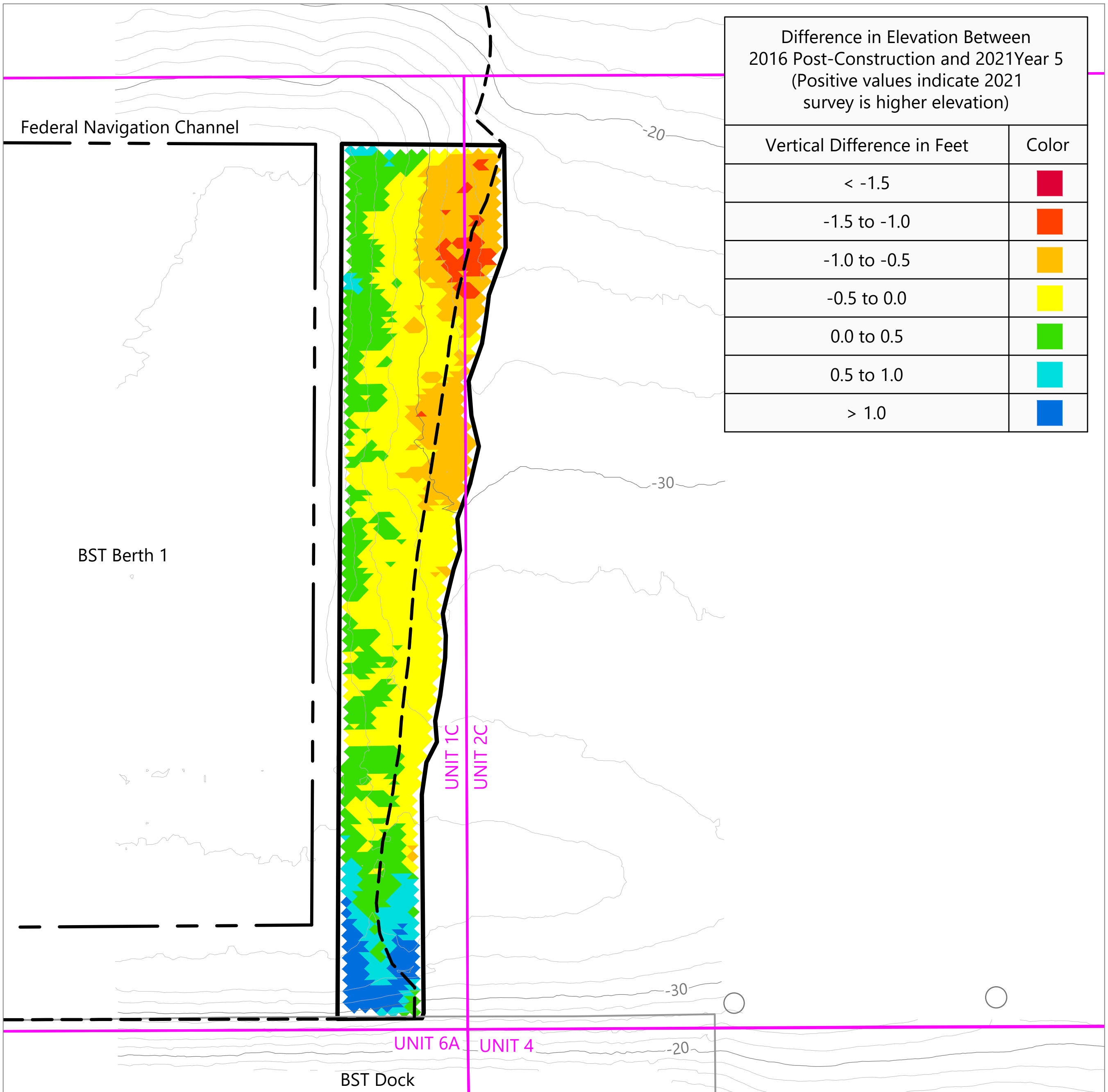
10 — NW Hydro Year 5 Survey (2-ft intervals, May 2021)
2016 Post-Construction Dredge Boundary
2016 Post-Construction Cap Placement Boundary
Sediment Site Unit
2016 Stone Armored Cap

0 60
Feet

Publish Date: 2021/08/19 2:38 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 5a

ANCHOR QEA

Figure 5a
Engineered Sediment Cap - BST



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

10 — NW Hydro Year 5 Survey (2-ft intervals, May 2021)

2016 Post-Construction Dredge Boundary

2016 Post-Construction Cap Placement Boundary

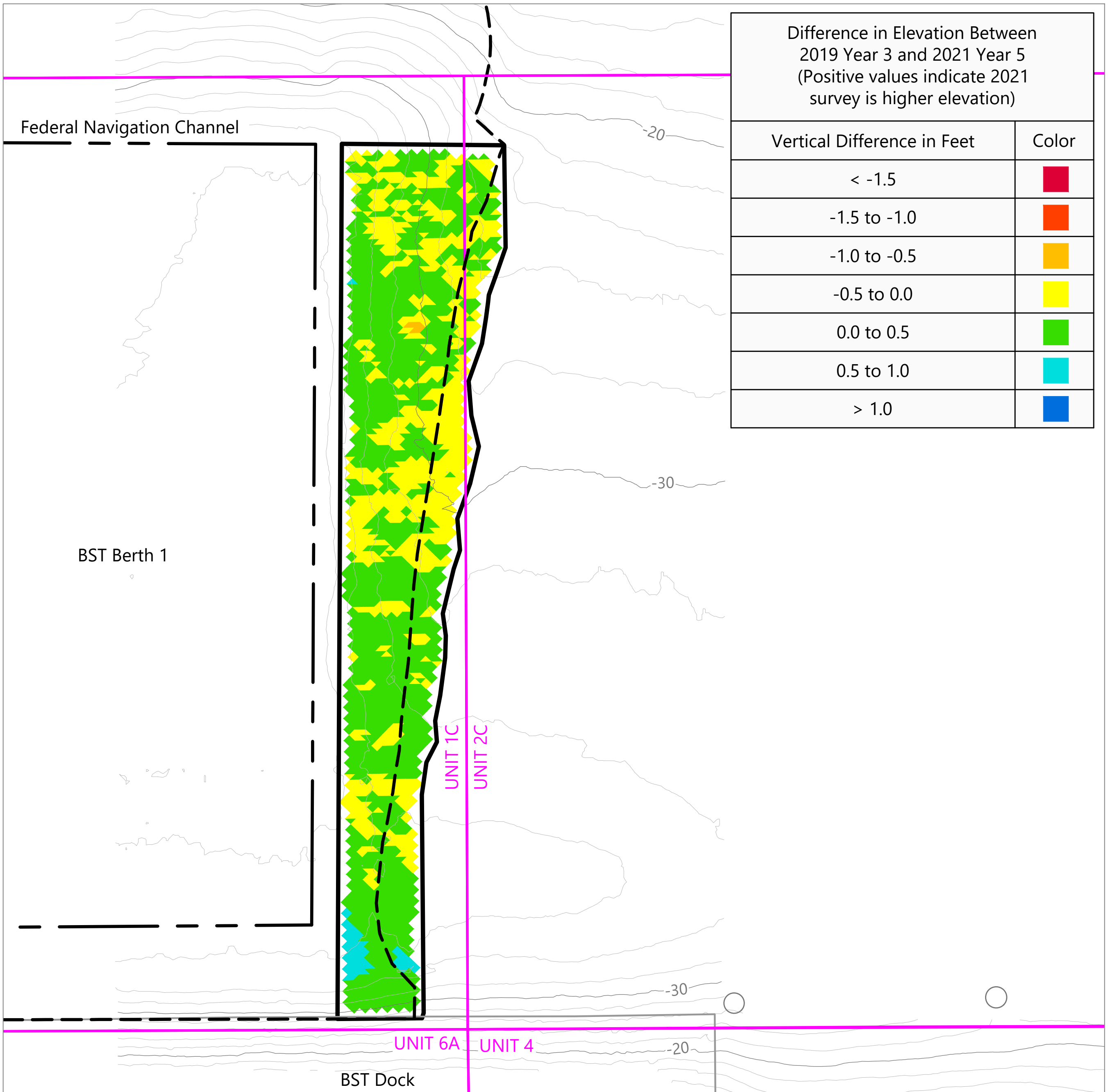
Sediment Site Unit

0 60
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 5b

ANCHOR QEA

Figure 5b
Isopach for BST: 2016 Post-Construction vs. 2021 Year 5 Survey



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

10 NW Hydro Year 5 Survey (2-ft intervals, May 2021)

2016 Post-Construction Dredge Boundary

2016 Post-Construction Cap Placement Boundary

Sediment Site Unit

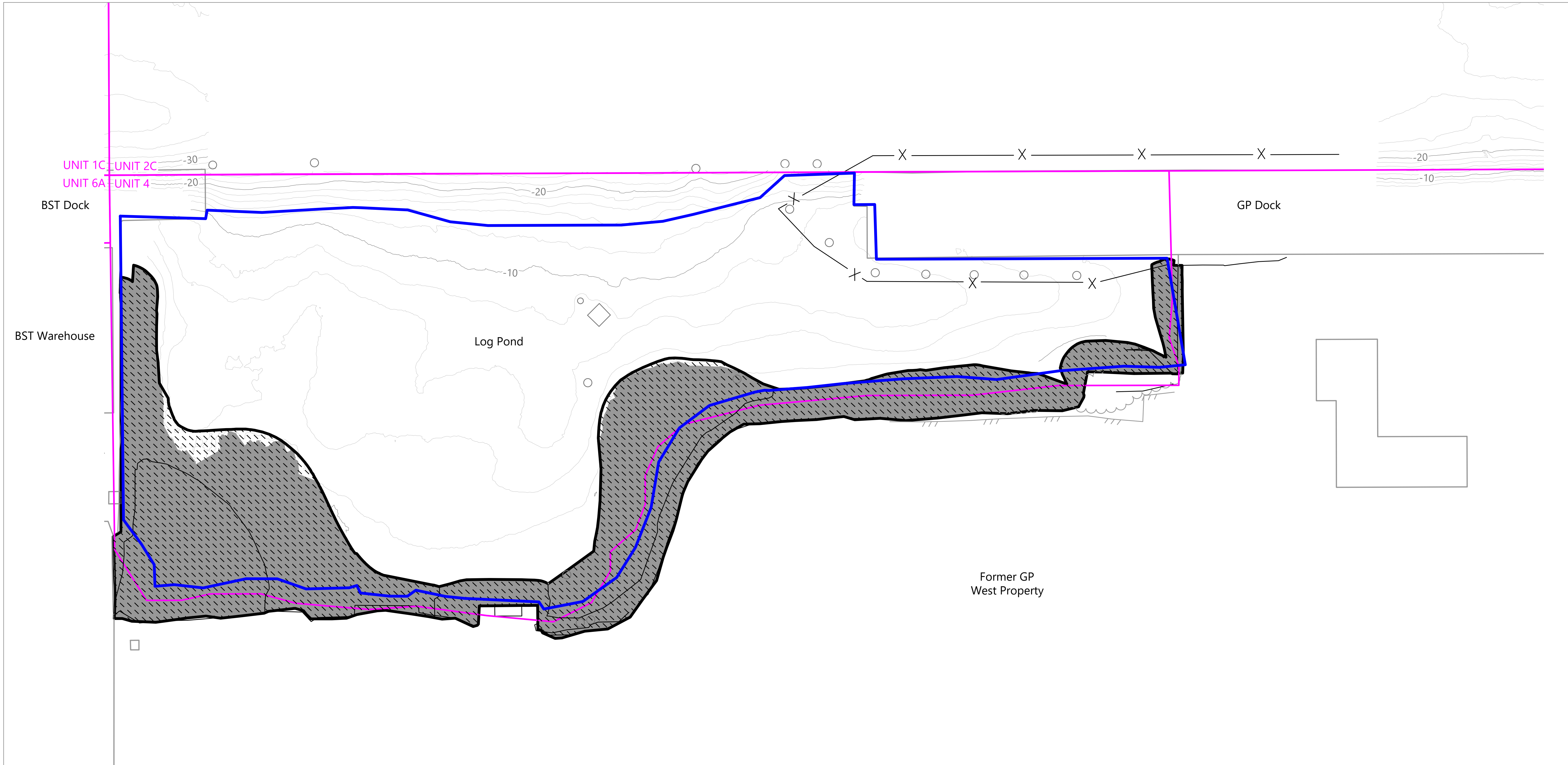
0 60
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 5c

ANCHOR QEA

Figure 5c
Isopach for BST: 2019 Year 3 Survey vs. 2021 Year 5 Survey

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- 10 — NW Hydro Year 5 Survey (2-ft intervals, May 2021)
- 2016 Post-Construction Cap Placement Boundary
- Sediment Site Unit
- Approximate Tidal Range of Visual Inspection
- 2001 Log Pond Cap
- 2016 Stone Armored Cap

0 100
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 6a

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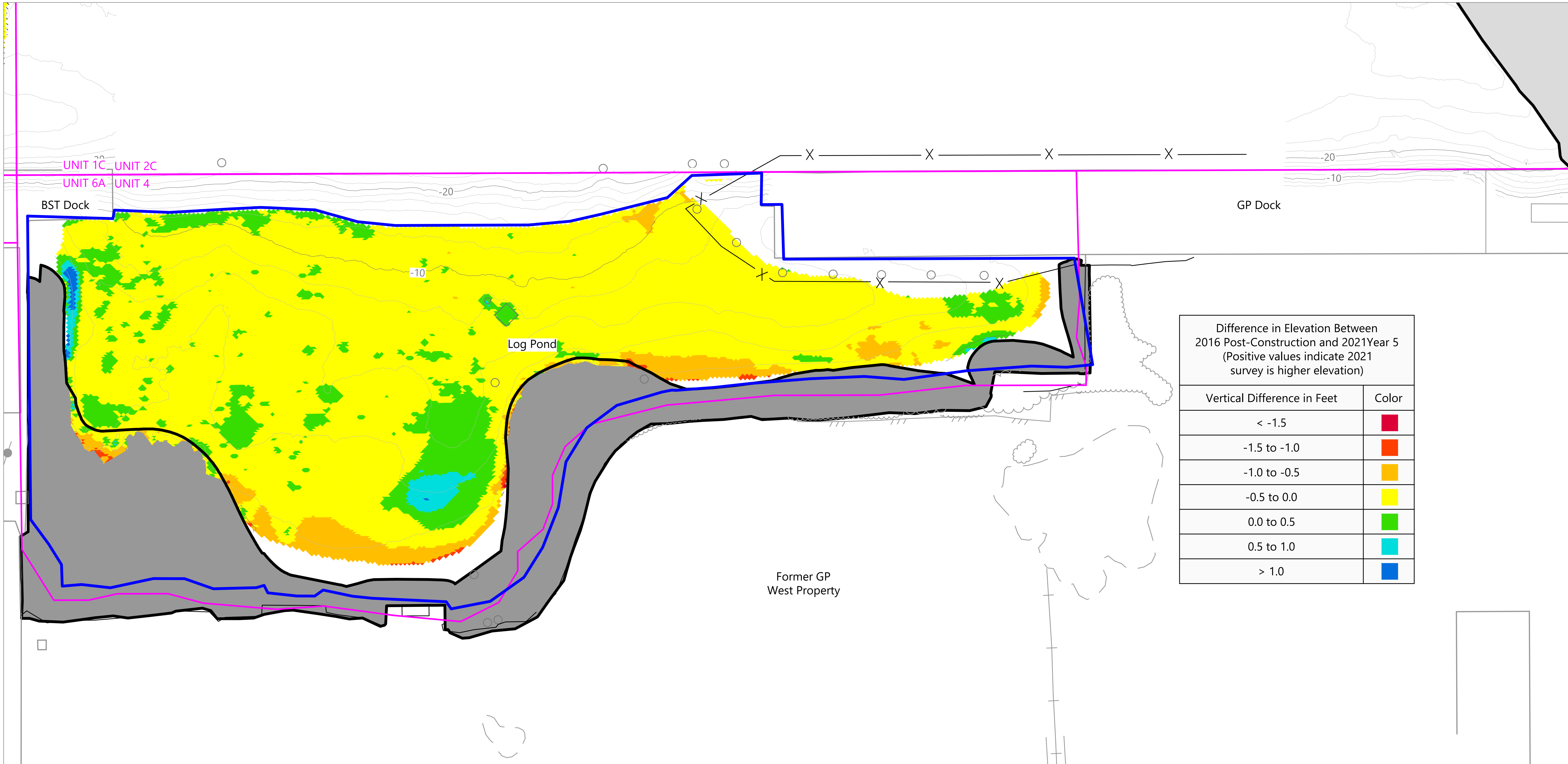
Figure 6a
Engineered Sediment Cap - Log Pond

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

NW Hydro Year 5 Survey (2-ft intervals, May 2021)

2016 Post-Construction Cap Placement Boundary

Sediment Site Unit

Approximate Tidal Range of Visual Inspection

2001 Log Pond Cap

0 100
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 6b

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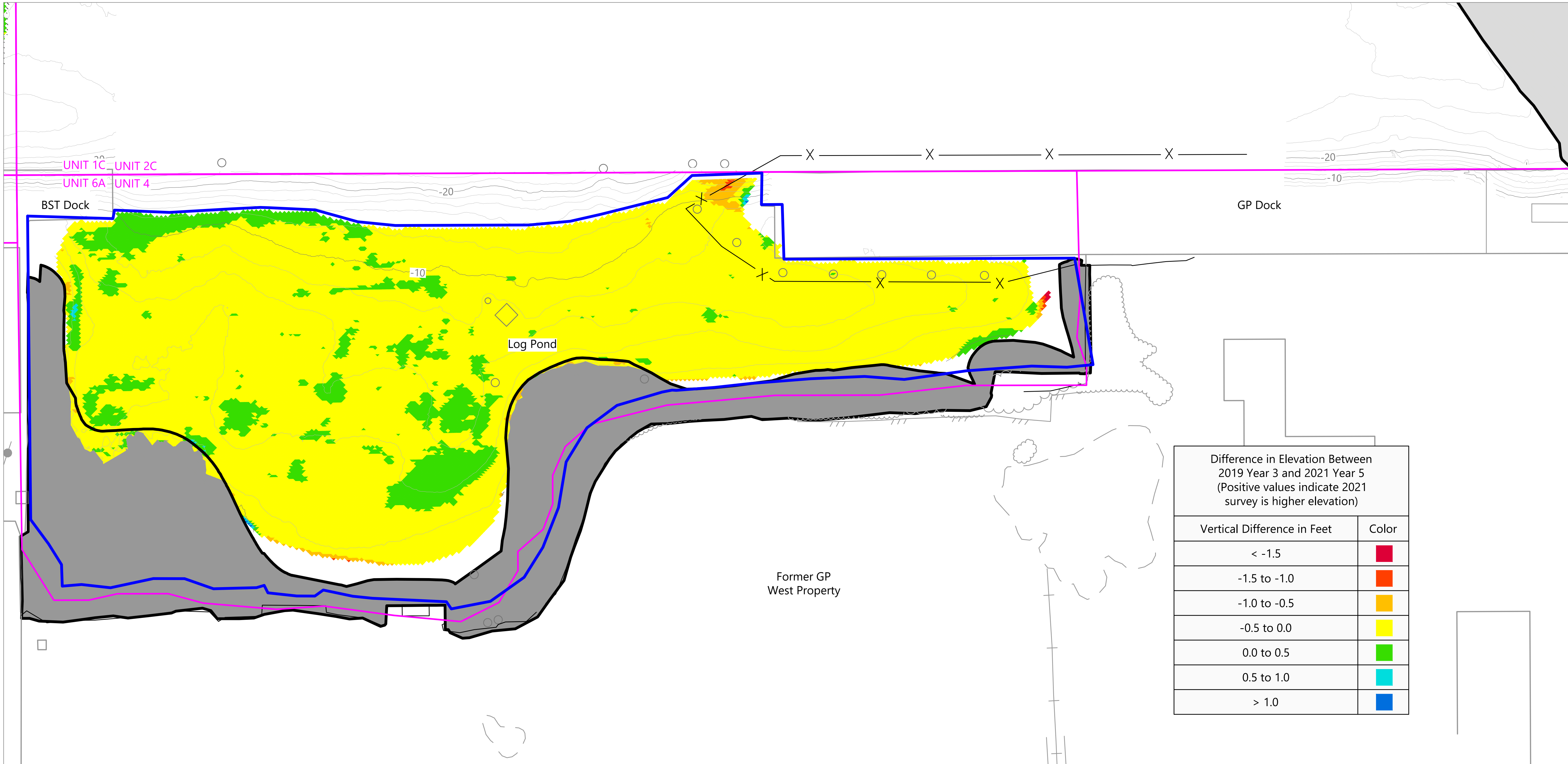
Figure 6b
Isopach for Log Pond: 2016 Post-Construction vs. 2021 Year 5 Survey

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



Difference in Elevation Between 2019 Year 3 and 2021 Year 5 (Positive values indicate 2021 survey is higher elevation)	
Vertical Difference in Feet	Color
< -1.5	
-1.5 to -1.0	
-1.0 to -0.5	
-0.5 to 0.0	
0.0 to 0.5	
0.5 to 1.0	
> 1.0	

SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- NW Hydro Year 5 Survey (2-ft intervals, May 2021)
- 2016 Post-Construction Cap Placement Boundary
- Sediment Site Unit
- Approximate Tidal Range of Visual Inspection
- 2001 Log Pond Cap

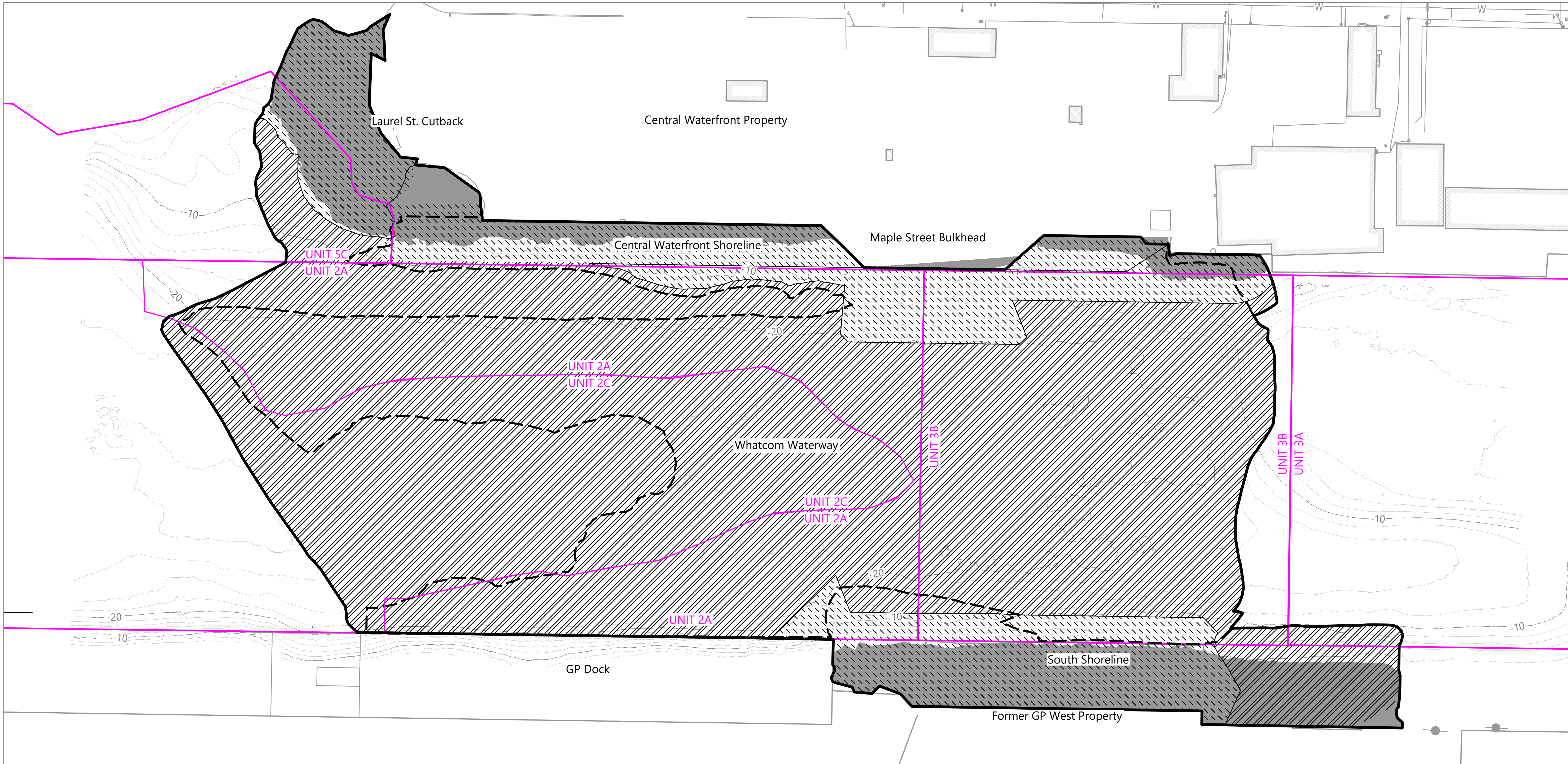
0 100
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 6c

ANCHOR QEA

Figure 6c
Isopach for Log Pond: 2019 Year 3 Survey vs. 2021 Year 5 Survey

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- NW Hydro Year 5 Survey (2-ft intervals, May 2021)
- 2016 Post-Construction Dredge Boundary
- 2016 Post-Construction Cap Placement Boundary
- Sediment Site Unit
- Approximate Tidal Range of Visual Inspection
- 2016 Cobble Armored Cap
- 2016 Stone Armored Cap

0 100
Feet

Publish Date: 2021/08/19 2:39 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 7a

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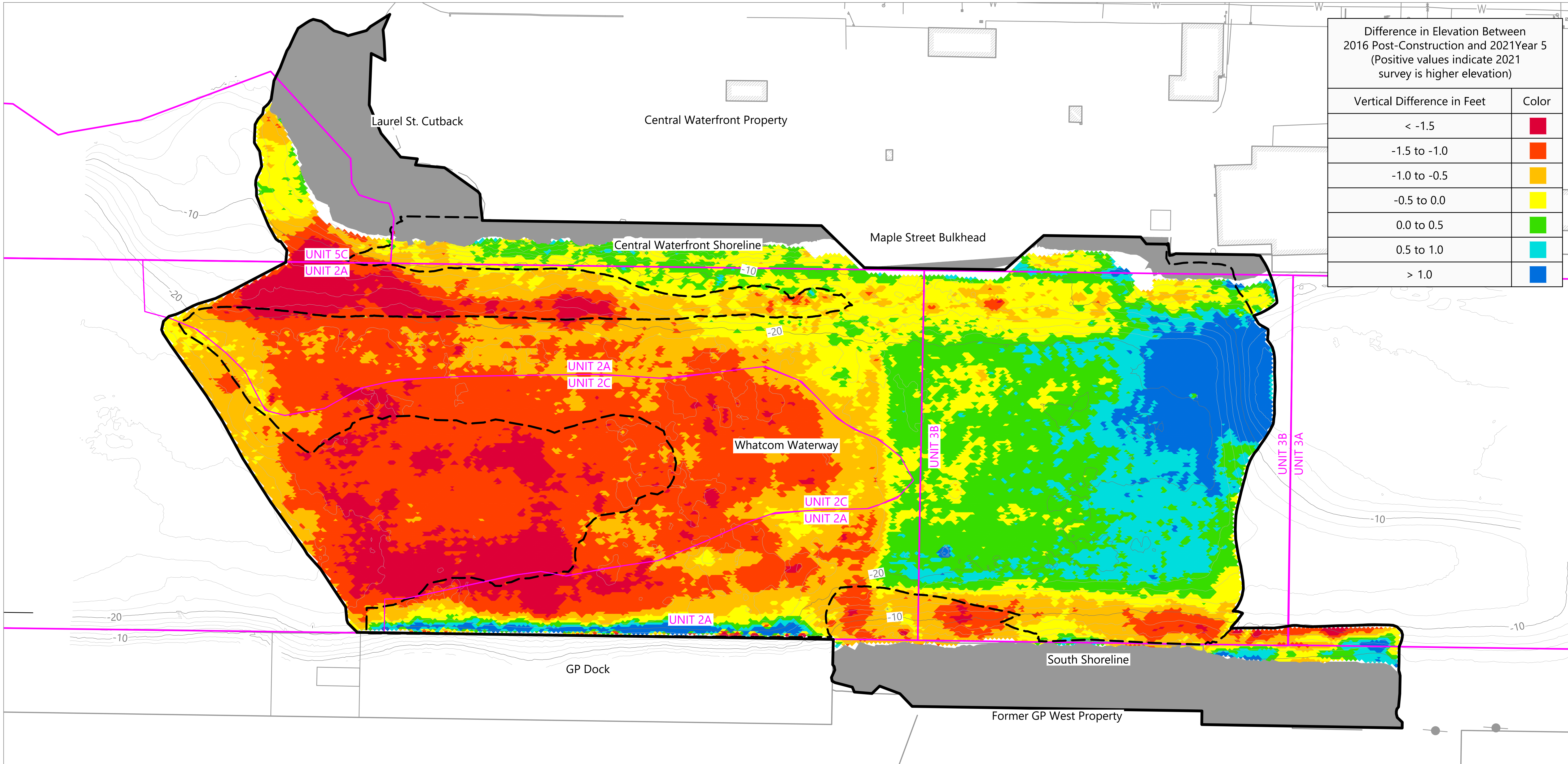
Figure 7a
Engineered Sediment Cap - Inner Waterway

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



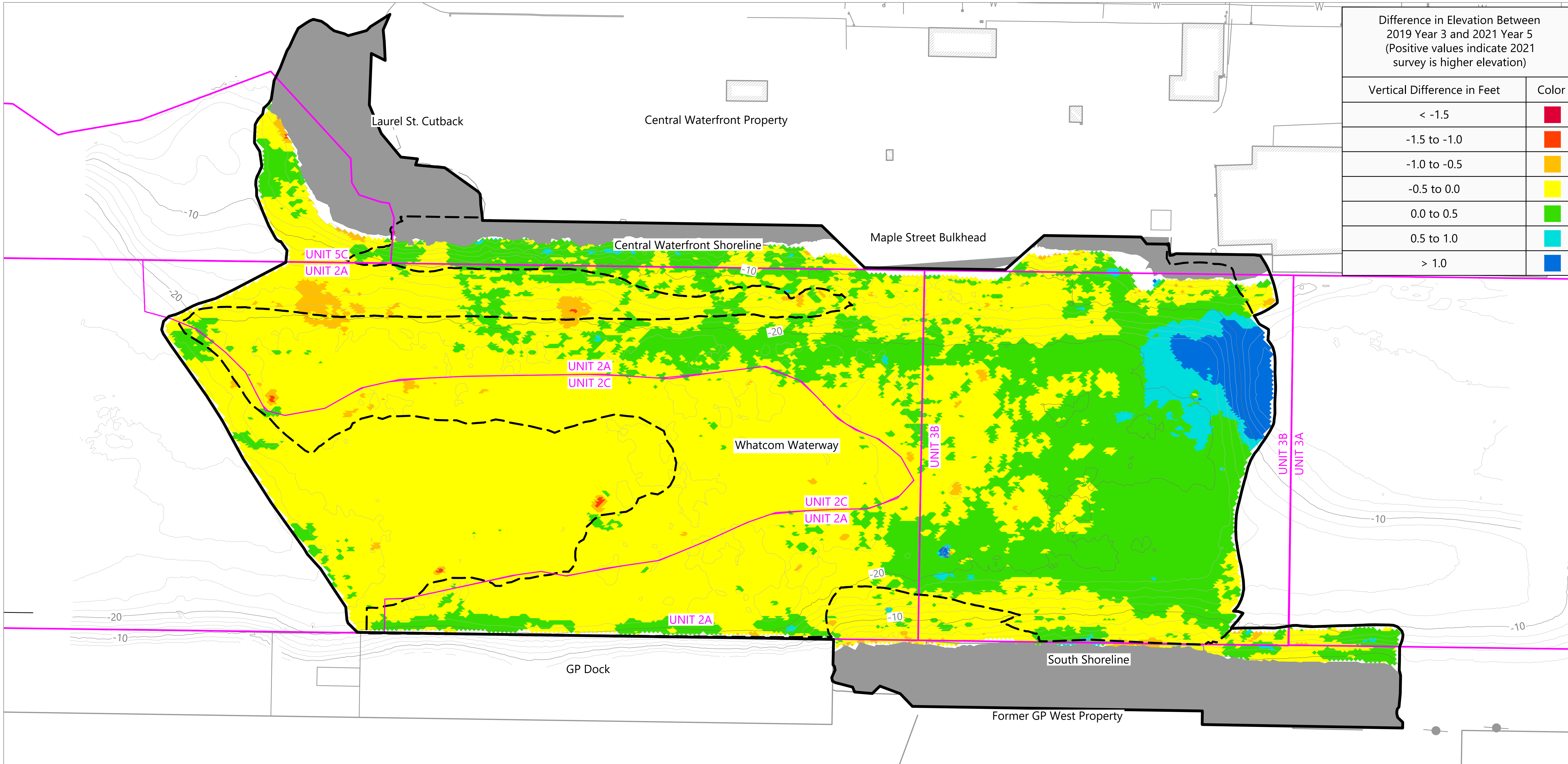
SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- NW Hydro Year 5 Survey (2-ft intervals, May 2021)
- 2016 Post-Construction Dredge Boundary
- 2016 Post-Construction Cap Placement Boundary
- Sediment Site Unit
- Approximate Tidal Range of Visual Inspection

Publish Date: 2021/08/19 2:40 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 7b

Figure 7b
Isopach for Inner Waterway: 2016 Post-Construction vs. 2021 Year 5 Survey



Difference in Elevation Between 2019 Year 3 and 2021 Year 5 (Positive values indicate 2021 survey is higher elevation)	
Vertical Difference in Feet	Color
< -1.5	
-1.5 to -1.0	
-1.0 to -0.5	
-0.5 to 0.0	
0.0 to 0.5	
0.5 to 1.0	
> 1.0	

SOURCE: 2016 Post-construction surveys by NW Hydro compiled into surface labeled "Whatcom Post Construction_Combined_03-29-16.xml". 2019 Year 3 survey by NW Hydro, dated October 2019, and Wilson Engineering, dated November 2019. 2021 Year 5 survey by NW Hydro, Dated May 25 & 30.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

10 NW Hydro Year 5 Survey (2-ft intervals, May 2021)

2016 Post-Construction Dredge Boundary

2016 Post-Construction Cap Placement Boundary

Sediment Site Unit

Approximate Tidal Range of Visual Inspection

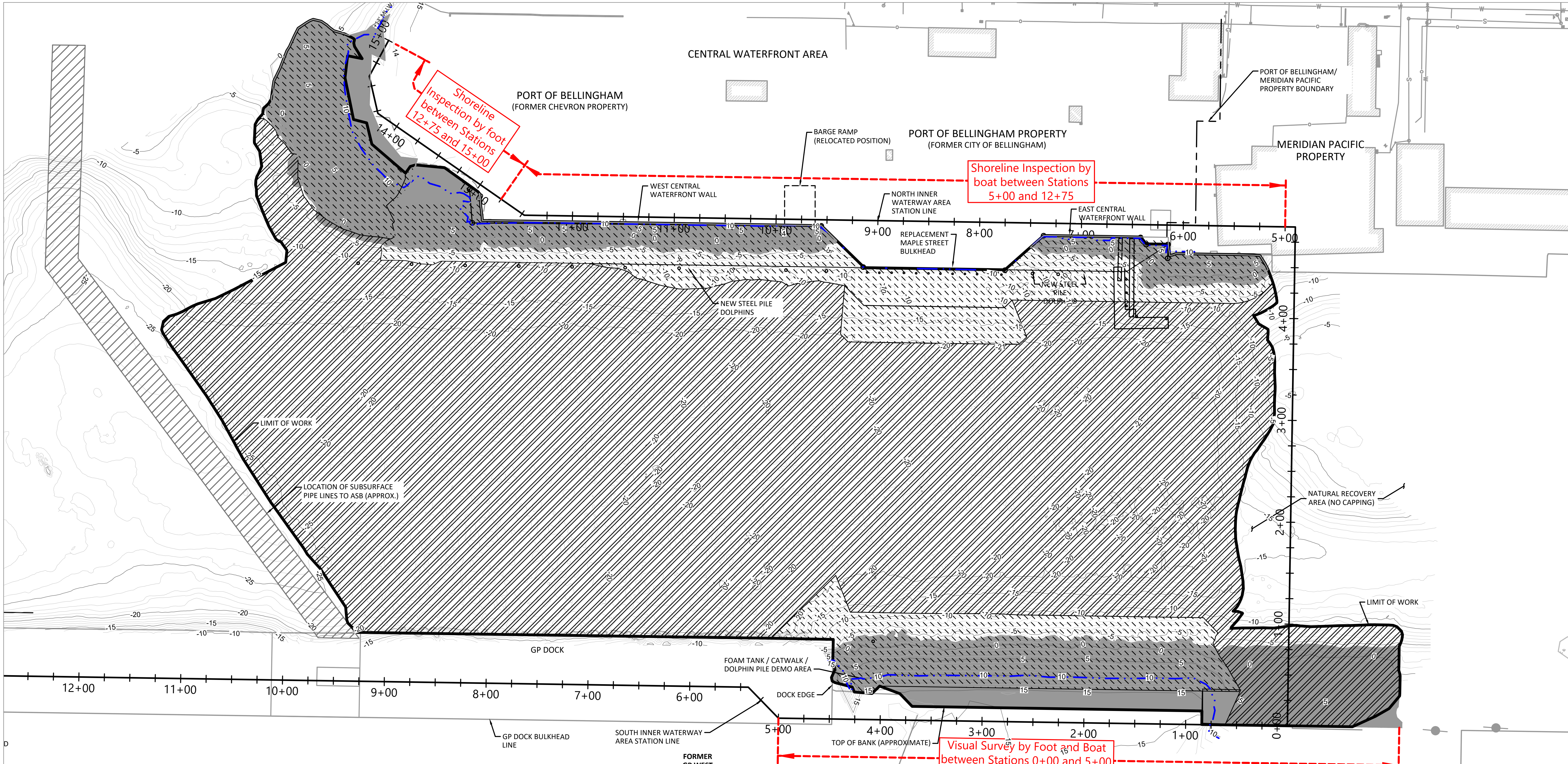
0 100
Feet

Publish Date: 2021/08/19 2:40 PM | User: dholmer
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Phase 2 Cleanup\0007-RP-028-Y5 Isopach.dwg Figure 7c

ANCHOR QEA

Figure 7c
Isopach for Inner Waterway: 2019 Year 3 Survey vs. 2021 Year 5 Survey

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: Bathymetric survey from 2016 provided by Northwest Hydro, Inc.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

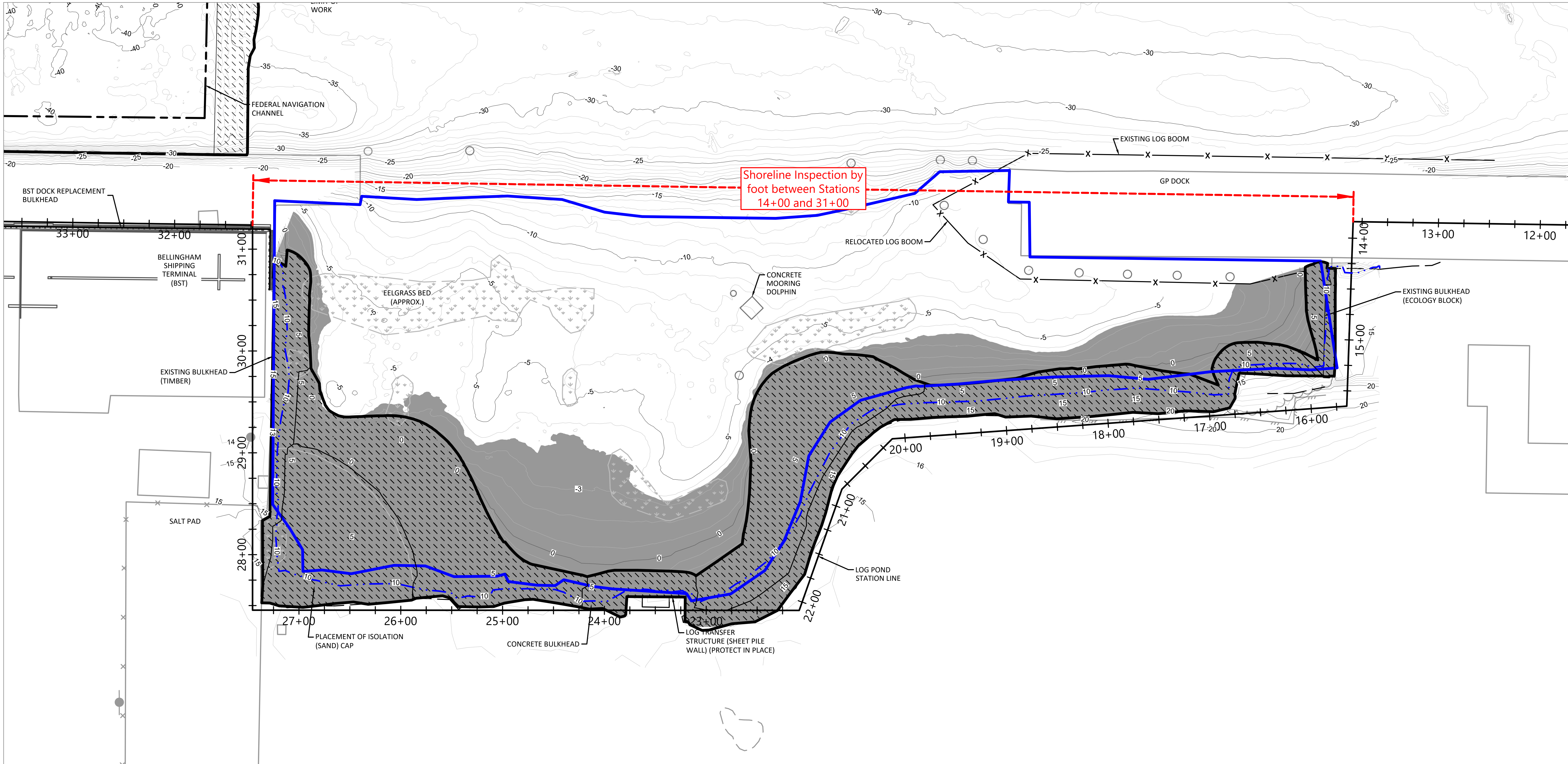
- 10 Post-construction Bathymetry
- Approximate Tidal Range of Visual Inspection
- OHWL (Elevation 10.2 ft MLLW)
- 2016 Post-Construction Cap Placement Boundary
- 2016 Cobble Armored Cap
- 2016 Stone Armored Cap

0 100
Feet

Publish Date: 2022/01/19 11:15 AM | User: chewett
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Cleanup Inner Wtr\0007-RP-030-Survey Coverage_Y5.dwg Figure 8a

Figure 8a
Visual Survey Coverage - Inner Waterway

Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup in Phase 1 Site Areas



SOURCE: Bathymetric survey from 2016 provided by Northwest Hydro, Inc.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

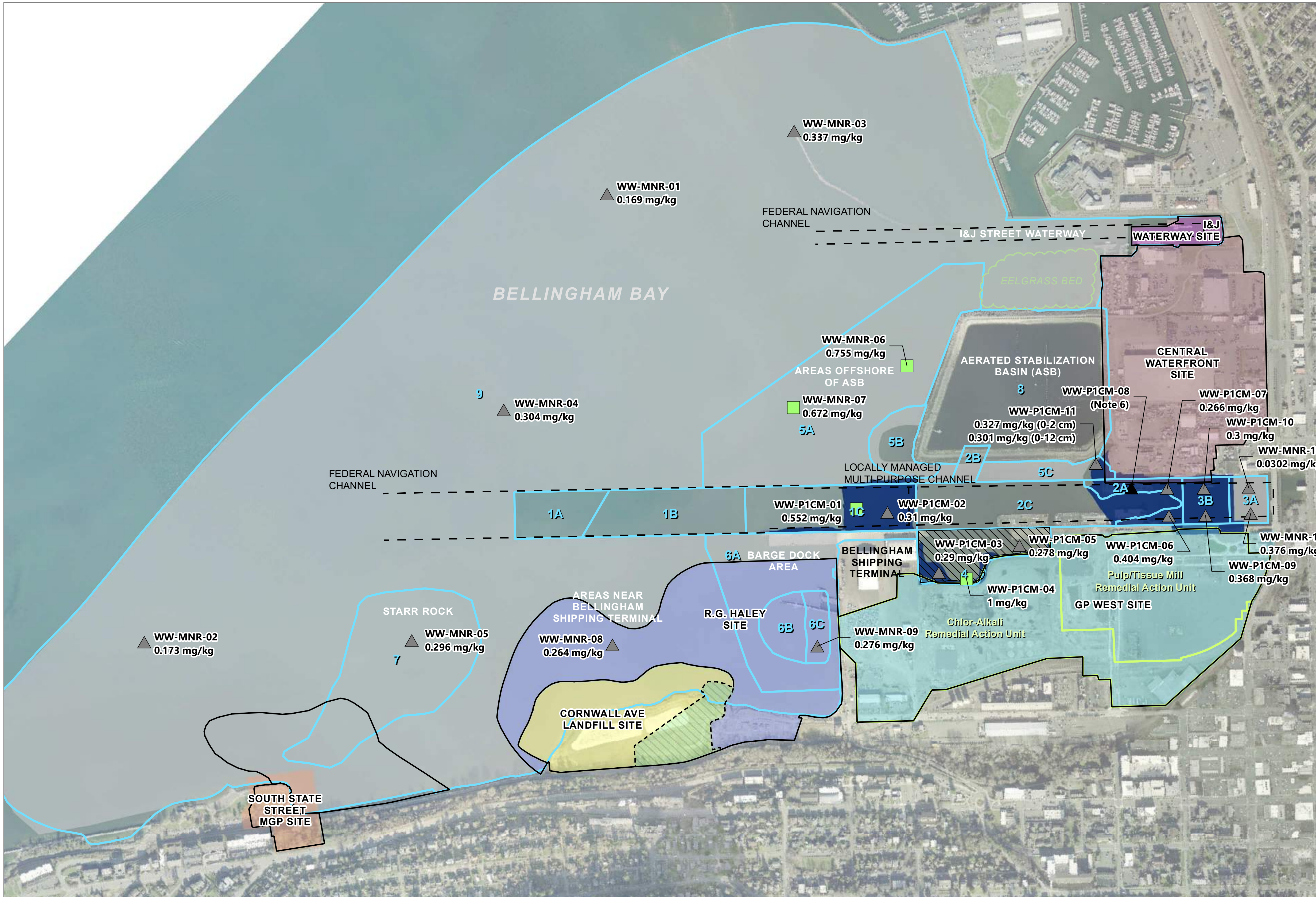
- 10 Post-construction Bathymetry
- 2001 Log Pond Cap
- 2016 Stone Armored Cap
- Approximate Tidal Range of Visual Inspection
- OHWL (Elevation 10.2 ft MLLW)

0 100
Feet

Publish Date: 2022/01/19 11:15 AM | User: chewett
Filepath: K:\Projects\0007-Port of Bellingham\Whatcom Waterway Cleanup Inner Wtr\0007-RP-030-Survey Coverage_Y5.dwg Figure 8b

ANCHOR QEA

Figure 8b
Visual Survey Coverage - Log Pond



LEGEND:

- Bioassay Tested
- Bioassay Testing Not Performed
- No Sediment Collected[6]
- Remedial Action Unit Boundaries
- Sediment Site Unit
- Adjacent Cleanup Site Area
- Previously Capped Area (Log Pond Interim Remedial Action)
- Phase 1 MNR Area
- Phase 1 Dredging or Capping

NOTES:

1. Site units are shown based on those in Figure 2-3 Cleanup Action Plan, Whatcom Waterway Year 1 Monitoring Report, Whatcom Waterway Site, 2017. Unit 9 boundary updated based on PRDI findings.
2. Horizontal datum: Washington State Plane North, NAD 83 Feet.
3. Unit 2B was established in the Cleanup Action Plan based on the anticipated marina access channel location. This location will be adjusted during final design.
4. Remedial Action Unit (RAU) boundaries were defined in the Final Cleanup Action Plan for the GP West Pulp and Tissue Remedial Action Unit (Aspect 2014).
5. Aerial imagery is Whatcom County 2019 and does not represent current conditions at the site.
6. No recent sediment accumulations over cap armoring at this location. No surface sediment mercury testing preformed.

Publish Date: 2022/01/20, 1:33 PM | User: epipkin
Filepath: Q:\Jobs\080007-01_Whatcom_Waterway\Maps\Year5Monitoring\AQ_Fig9_YR5_Hg.mxd

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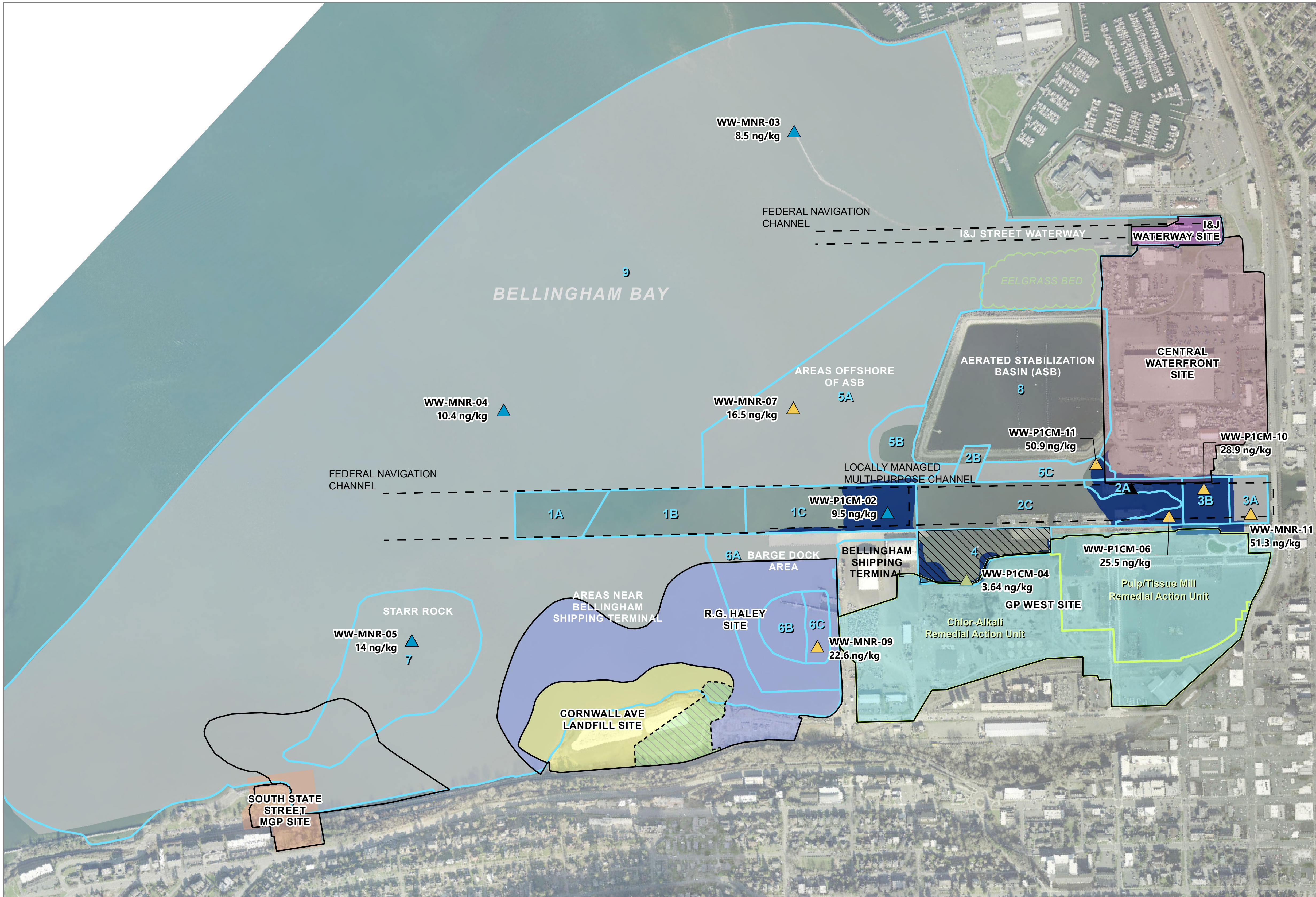
Figure 9
Surface Sediment Mercury Testing Results
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup Phase 1 Site Areas



LEGEND:

- Result Below PQL (5 ng/kg TEQ)
- Result Below Regional Background (15 ng/kg TEQ)
- Result Above Regional Background (15 ng/kg TEQ)
- No Sediment Collected[6]
- Remedial Action Unit Boundaries
- Sediment Site Unit
- Adjacent Cleanup Site Area
- Previously Capped Area (Log Pond Interim Remedial Action)
- Phase 1 MNR Area
- Phase 1 Dredging or Capping

NOTES:

1. Site units are shown based on those in Figure 2-3 Cleanup Action Plan, Whatcom Waterway Year 1 Monitoring Report, Whatcom Waterway Site, 2017. Unit 9 boundary updated based on PRDI findings.
2. Horizontal datum: Washington State Plane North, NAD 83 Feet.
3. Unit 2B was established in the Cleanup Action Plan based on the anticipated marina access channel location. This location will be adjusted during final design.
4. Remedial Action Unit (RAU) boundaries were defined in the Final Cleanup Action Plan for the GP West Pulp and Tissue Remedial Action Unit (Aspect 2014).
5. Dioxin/furan concentrations calculated as TEQ 2005 (mammal) (U = 1/2) (EMPC = U).
6. D/F compliance is measured on an area-wide basis. SWAC is 15.36 ng/kg TEQ.
7. Aerial imagery is Whatcom County 2019 and does not represent current conditions at the site.
8. Results presented at locations WW-MNR-03-SS, WW-MNR-04-SS, WW-MNR-05, WW-MNR-07-SS, WW-MNR-09, and WW-P1CM-02 are mean result values between two samples at location.

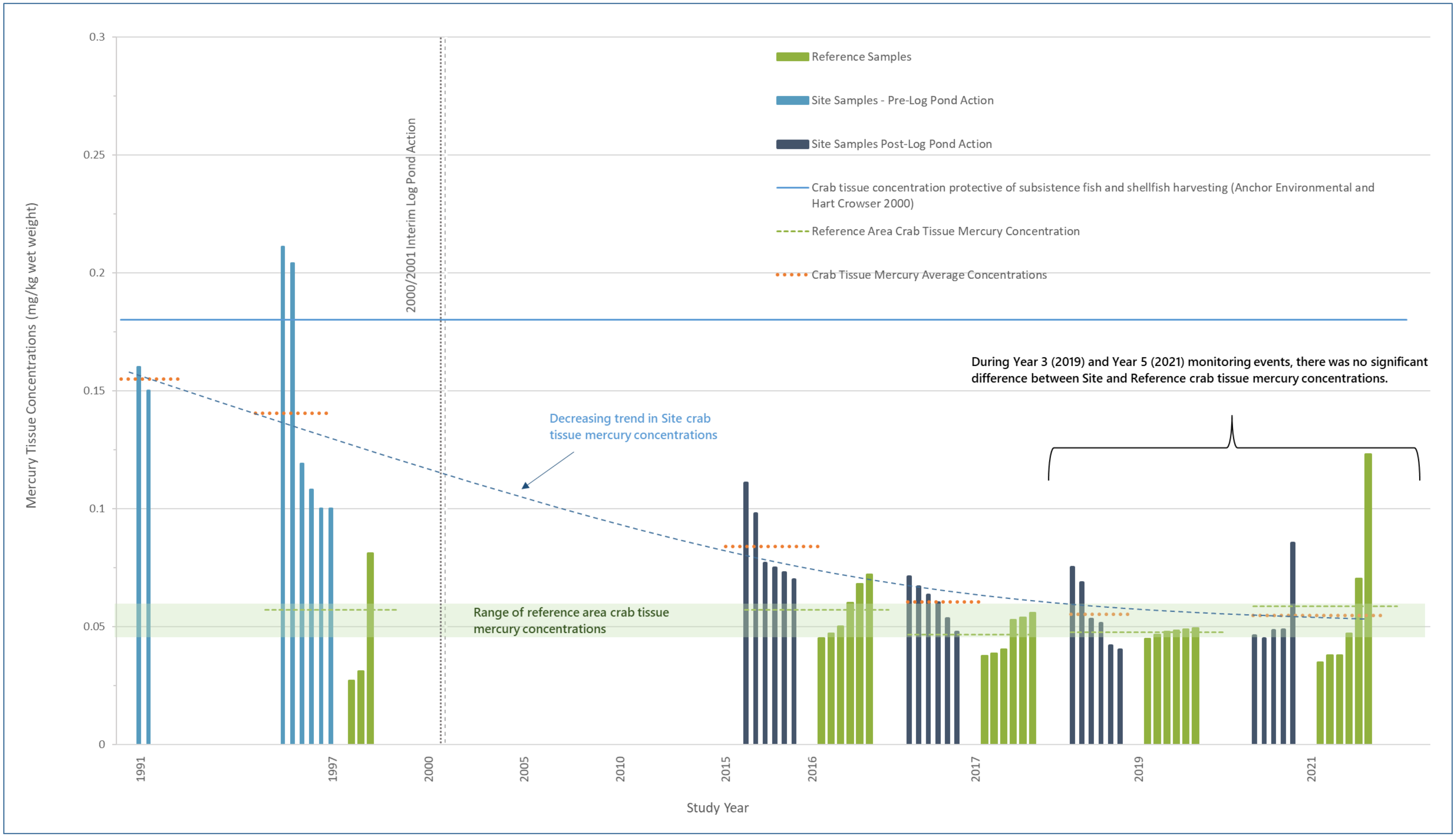
PQL: Practical Quantitation Limit

0 1,600
Feet

Publish Date: 2022/04/22, 8:46 AM | User: jsfox
Filepath: \\orcas\GIS\Jobs\080007-01_Whatcom_Waterway\Maps\Year5Monitoring\AQ_Fig10_YR5_DF.mxd

ANCHOR QEA

Figure 10
Surface Sediment Dioxin/Furan Testing Results
Year 5 Compliance Monitoring Report
Whatcom Waterway Cleanup Phase 1 Site Areas



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ANCHOR QEA

Figure 11

Mercury Concentrations in Adult Dungeness Crab Tissue

Year 5 Compliance Monitoring Report

Whatcom Waterway Cleanup Phase 1 Site Areas

Appendix A
Bathymetric Survey Data Coverage

Appendix B
Visual Survey Photographs

Appendix C
Analytical Reports

Appendix D
Data Validation Reports

Appendix E
Bioassay Results and Validation

Appendix F
Photographs of Surface Sediment Samples

Appendix G
Statistical Analysis Output