Final
Pre-Remedial Design Data Gaps Memorandum

Budd Inlet Sub-Area 3 (Southern Budd Inlet)
Budd Inlet Sediment Site
Olympia, Washington

February 10, 2026

Prepared for

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EXECUTIVE SUMMARY

As shown on Figure 1-1, the Budd Inlet Sediment Remediation Site has been divided into Sub-Areas for sequential investigation, evaluation, design, and remedy implementation. This Pre-Remedial Design (PRD) Data Gaps Memorandum (PRD Memo) covers Budd Inlet Sub-Area 3 and discusses existing available data and data anticipated to further define the nature and extent of contamination needed for design of the Port of Olympia's (Port's) proposed remedy for Sediment Management Areas (SMAs) within Sub-Area 3, as presented in the draft for Washington State Department of Ecology (Ecology) review *Revised Identification and Evaluation of Interim Action Alternatives Memorandum, Budd Inlet Sediment Site, Olympia, Washington* (Dalton, Olmsted & Fuglevand [DOF] et al. 2023).

Various types of physical, chemical and environmental data are needed for the evaluation of source control and remedial design of the Port's proposed sediment remedy within Sub-Area 3. Data necessary for remedial design within the overall Budd Inlet Sediment Site includes the following for each of the Budd Inlet Sub-Areas.

- Site Maps
  - Accurate, up-to-date topographic and bathymetric data are needed to begin the design process within each sub-area.
- Source Control Data
  - Data are needed to evaluate potential ongoing chemical inputs to Budd Inlet for each Sub-Area. This includes data on the outfalls and creeks that drain into each Budd Inlet Sub-Area. The number of outfalls within Sub-Area 3 is limited compared to Sub-Areas 1 and 2.
- Sediment Data
  - Nature and extent of chemical contamination throughout each Sub-Area within Budd Inlet, including identification of "hot spots" as appropriate.
  - Surface sediment chemistry, at 0-10 centimeters (cm) depth in subtidal areas and 0-45 cm depth in intertidal areas, for calculation of site-wide and intertidal surface-weighted average concentrations (SWACs).
  - Chemical concentrations in sediment, both horizontally and vertically, to support design, investigate potential chemicals of concern (COCs) in the Z-layer (the surface exposed by dredging), and potential capping of contamination below the Z-layer if necessary.
  - Sediment chemistry in the vicinity of existing and former outfalls for identification of potential current or historical sources.
  - Sediment chemistry for the development and evaluation of potential dredged material management options, including onsite confined disposal facilities (CDFs) either upland or in-water.
  - Sediment physical parameters such as grain size and density to evaluate dredgeability, dredged material management, and sediment management approaches other than dredging, including capping or enhanced monitored natural recovery (EMNR).

- Existing Structures in Remediation Area
  - Data on the location, type, construction materials, and condition of existing structures within or adjacent to the potential remedial areas and SMAs is needed to evaluate potential impacts and management approaches to the existing structures.
- Existing Habitat Conditions
  - Data are needed to sequentially document existing habitat and environmental conditions within and adjacent to each Budd Inlet Sub-Area in order to evaluate potential project impacts and the potential for habitat restoration and to prepare required permitting applications.

Much of the necessary data are not currently available, and data that are available may be older, such that the applicability to remedial design is limited.

- Site Maps
  - Existing bathymetry and topographic data are not contiguous across the project area, the result of various surveys performed at various times for other purposes, with the exception of the US Army Corps of Engineers (USACE) 2025 survey data for the federal navigation channel and turning basin. NOAA's National Ocean Service performed a bathymetric survey that covers most of Sub-Area 3 but with a larger (81-foot) survey grid than typically needed for remediation design. Existing data collected outside the navigation channel are several years old and may not represent current conditions. As a result, up-to-date mapping will likely be needed so that current data are available for all remedial design and action areas.
- Source Control Data
  - Limited data are available on the multiple potential contaminant inputs to each sub-area within Budd Inlet. Up-to-date data are needed to evaluate existing surface and subsurface sediment conditions and the potential for recontamination. Existing surface sediment will provide insight into potential ongoing conditions, and subsurface sediment into potential historical sources.
- Sediment Data
  - Although several previous studies of sediment contamination have been performed in southern Budd Inlet, and one listed contaminated site is adjacent to Sub-Area 3, data regarding Sub-Area 3 are very limited. Fewer than 27 surface samples across 13 sample locations, and 13 subsurface samples across 10 sample locations, have been collected since 2002, over the approximately 820 acres that comprise Sub-Area 3.
- Existing Structures in Budd Inlet Sub-Area 3
  - West Bay Marina and docks at the Dunlap Towing property north of West Bay Marina are within Sub-Area 3 and have the potential to be impacted by the project, depending upon sediment sampling results. Up-to-date data on the condition of those structures are necessary to evaluate potential project impacts and prepare the remedial design if remediation is required in those areas.

- Existing Habitat Conditions
  - Although existing habitat conditions within Budd Inlet are generally considered impaired, detailed data on existing habitat and biological conditions across the project area are not available, including:
    - Fine-scale, location-specific substrate, slope, and vegetation data throughout the remedial area.
    - Detailed bathymetry of the remediation area.
  - A detailed shoreline habitat conditions survey will be conducted if needed, based on sediment results and potential remediation. The survey would collect habitat data sufficient to characterize the entire remedial area for the purpose of evaluating remedial alternatives for potential habitat impacts.

To determine areas potentially requiring remediation and support remedial design of the project, collection of new data documenting existing conditions is required. The timely collection of the necessary data will be a significant driver on the overall project schedule and influence when remedial construction can be implemented. It is anticipated that, as data from the initial data gaps investigation are analyzed, additional refinement of data gaps for remedial design may be necessary. Subsequent data gaps for Sub-Area 3 will be included in a separate future data gap work plan, as necessary.

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LIST OF ABBREVIATIONS AND ACRONYMS

Anchor	Anchor QEA, LLC
AO	Agreed Order
CDF	confined disposal facility
City	City of Olympia
cm	centimeter(s)
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSM	conceptual site model
CSO	combined sewer overflow
D/F	dioxin and furan
DOF	Dalton, Olmstead & Fuglevand
Draft Alternatives Memorandum	*Draft Revised Identification and Evaluation of Interim Action Alternatives Memorandum, Budd Inlet Sediment Site, Olympia, Washington*
Ecology	Washington State Department of Ecology
EMNR	enhanced monitored natural recovery
ft/foot	feet, foot
GIS	Geographic Information System
GPS	global positioning system
HTL	high tide line
LiDAR	light detection and ranging
MTCA	Model Toxics Control Act
NE	northeast
NFA	No Further Action
No.	number
NOS	National Ocean Service
NW	northwest
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Port	Port of Olympia
PRD	pre-remedial design
PRD Memo	Pre-Remedial Design Data Gaps Memorandum
SE	southeast
SLR	sea level rise
SMA	Sediment Management Area
Study Area	Port of Olympia Budd Inlet Sediment Site Study Area
SVOC	semivolatile organic compound

LIST OF ABBREVIATIONS AND ACRONYMS (CONTINUED)

SWAA ..... Southwest Washington Regional Airport Authority
SWAC ..... surface-weighted average concentration
USACE..... US Army Corps of Engineers

1.0 INTRODUCTION AND PURPOSE

This Pre-Remedial Design (PRD) Data Gaps Memorandum (PRD Memo) has been prepared as required by Amendment No. 2 (June 2023) to Agreed Order (AO) No. DE 6083, entered by the State of Washington, Washington State Department of Ecology (Ecology), and the Port of Olympia (Port) on December 5, 2008. This memorandum has been prepared consistent with the requirement of "Task 7: Pre-Remedial Design Data Gaps Memorandum" of AO Amendment No. 2, effective June 9, 2023.

As required by Task 7 of Amendment No. 2, this PRD Memo presents:

> *"…data gaps primarily focused on remedial dredging within the navigational areas (channels, marinas, and adjacent areas). The PRD Memo will present compiled existing data and a summary of data needs for design of dredging and dredging-related portions of the remedial action and be consistent with the Identification and Evaluation of Interim Action Alternatives Memorandum, including source control and remedy protection. In addition, the PRD Memo will address dredged material management considerations including data that will support evaluations of sediment reuse and disposal options. The PRD Memo will identify existing nearshore, shoreline, and overwater structures that could be impacted by an interim action and the data needed to evaluate remedial actions near these structures."*

The *Draft Revised Identification and Evaluation of Interim Action Alternatives Memorandum, Budd Inlet Sediment Site, Olympia, Washington* dated May 19, 2023 (Draft Alternatives Memorandum) currently under review by Ecology, is focused on the Port Peninsula and portions of the East and West Bays. This PRD Memo takes an approach similar to the Draft Alternative Memorandum and develops the Port's proposed remedial approach to Sub-Area 3.

The Budd Inlet Sediment Site (Site) is in South Puget Sound (Figure 1-1), in the southern portion of Budd Inlet. The northern extent of the Site is undefined.

Sub-Area 3 includes a portion of southern Budd Inlet that starts at the northern extents of Sub-Areas 1 and 2 and extends northward as detailed in the following sections. Separate PRD data gaps memorandums were previously prepared for Sub-Areas 1 and 2. It is anticipated that three separate work plans will be needed to guide future data collection to fill data gaps for Sub-Area 3:

- Sediment Chemistry Work Plan;
- Source Control Work Plan; and
- Shoreline and Overwater Structures Work Plan.

1.1 Project Areas Included in This Memorandum

This PRD Memo covers Budd Inlet Sub-Area 3 (Figure 1-2), which includes the following Sediment Management Areas (SMAs; Figure 3-1):

- West Bay Marina North
- Squaxin Park
- Open Water Northwest (NW)
- Open Water Northeast (NE)
- Navigational Channel – North.

2.0 SITE HISTORY AND BACKGROUND

The history of Budd Inlet, the Port Peninsula, previous operations, site investigations, and 2009 interim action dredging of Berths 2 and 3 are described in multiple site documents (Anchor QEA, LLC [Anchor] 2012 a,b,c, 2016) and are not repeated here. There is one other known contaminated site (Haumann Property), in addition to the Budd Inlet Sediment Site (Figure 2-1), in Sub-Area 3. The historic Pacific Reserve Fleet mooring and the Dunlap Towing sites are also in or near Sub-Area 3. Neither of these sites are currently listed as an Ecology cleanup site.

2.1 Haumann Property

The Haumann property site is located on the western shore of Budd Inlet adjacent to the mouth of Butler Creek, as shown on Figure 2-1. There were two underground gas and oil storage tanks on the site. These storage tanks were reported to have been removed and found to be in poor condition, with pitting and holes in the side walls. The soil around the tanks had visible sheen, and soil sample analysis confirmed the presence of benzene, xylene, and gasoline-range hydrocarbons at concentrations exceeding Model Toxics Control Act (MTCA) cleanup levels. Toluene, ethylbenzene, and diesel-range hydrocarbons were also detected, but at concentrations lower than MTCA cleanup levels (Ecology, 2008). No documents were found that provide evidence that the site has been remediated since the initial site assessment in 2008.

2.2 Pacific Reserve Fleet

The Navy moored surplus World War II ships on the east side of Budd Inlet, north of Sub-Area 3, between 1946 and 1972. This vessel anchorage area is shown on Figure 2-1. During this time the ships were maintained so that they could be put back into service if needed. Many of the ships were used for storage of bulk grain and other goods. The Pacific Reserve Fleet site is currently not listed as an Ecology cleanup site (O'Connell 2014).

2.3 Dunlap Towing

The Dunlap Towing site is located along the west shoreline of Budd Inlet just north of the West Bay Marina. The site was first developed as a lumber mill and veneer plant that operated until 1966. A hog fuel burner also operated on the site at that time. The site was also used for log sorting and storage from approximately the 1940s until 2022. Log bundles were floated to the site from logging operations around the Puget Sound. The log bundles were tied to mooring dolphins along the west shoreline north of the site. The logs were then pulled from the water and loaded on trucks. Subsurface sediment samples were collected in 2015 to support a proposed more than 4,000 cubic yard dredging project at the site. The sediment samples had a high percentage of wood waste with a TOC of 18.2% and 13%. All analytes tested were reportedly below regional background values with the exception of dioxin and furan (D/F) toxic equivalency; with results of 159 nanograms per kilogram (ng/kg) and 229 ng/kg (USACE, 2016). The Dunlap site is currently not listed as an Ecology cleanup site.

3.0 PORT OF OLYMPIA'S PROPOSED REMEDY

The Draft Alternatives Memorandum (DOF et al., 2023) presents approaches for sediment remediation and related dredged material management within the Port's Budd Inlet Sediment Site Study Area (Study Area) and adjacent areas of both East and West Bays based on multiple factors, including existing sediment data and current and future use of the site. Within that document, the Study Area and adjacent areas of both East and West Bays are divided into specific SMAs based on functional and environmental characteristics. Sub-Area 3 was not part of the initial Study Area and was added after the Draft Alternatives Memorandum was completed. Similar to SMAs in Sub-Areas 1 and 2, the SMAs within Sub-Area 3 are based on functional and environmental characteristics and are shown on Figure 3-1. The Port's proposed remedial approach for each SMA in Sub-Area 3 is based on the principles developed in the Draft Alternatives Memorandums for Sub-Areas 1 and 2 and is summarized below. Data gap identification is based on data needed to design the Port's proposed remedy, where a remedy is identified in the Draft Alternatives Memorandum, and on data needed to evaluate potential remedies within areas where a specific remedy was not proposed in the Draft Alternatives Memorandum.

Existing sediment data used in this document and in development of the regional background exceedance areas presented are generally 10 to 20 years old and very limited. As such, the areas exceeding regional background are likely to be modified as a result of future data collection.

3.1 Sediment Remediation

The Port's preliminary proposed alternative for sediment remediation within Sub-Area 3 is summarized as follows. Figure 3-2 depicts areas where surface sediments exceed the regional background concentrations for dioxin and furan (D/Fs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), or both, based on the limited historical data collected prior to the 2024 sediment sampling event in Sub-Area 1.

- Removal of impacted sediments (dredging) in all current navigational areas, including the Navigation Channel North SMA and West Bay Marina North SMA.
- Removal of impacted sediments (dredging) in areas of significantly elevated chemicals of concern (COCs) with the potential to cause recontamination and in erosional areas of the non-navigational areas of the two Open Water SMAs, Squaxin Park SMA, and the northern portion of the West Bay Marina North SMA.
- Capping/enhanced monitored natural recovery (EMNR) in the remaining non-navigational areas of the two Open Water SMAs, Squaxin Park SMA, and the northern portion of the West Bay Marina North SMA.
- Potential use of combined dredging and capping if areas of deep sediment contamination are identified within all SMAs, for example:
  - Within navigational areas, capping may be considered if the depth of contamination is such that a cap could be installed below the depth of future dredging, including a 2-foot

(ft) overdredge allowance and a 2-ft buffer below the overdredge depth and the top of any cap.

- Within non-navigational areas, capping may be considered if the depth of contamination below mudline is greater than 3 ft, such that dredging of 3 ft of sediment and cap construction could be completed without changing the elevation from the existing elevation within that area.

The Port's proposed alternative is preliminary and may change based on future use, the results of additional data collection for Sub-Area 3, and additional Ecology review of the Draft Alternatives Memorandum.

4.0 DATA REQUIRED FOR DESIGN, COMPARISON OF REQUIRED DATA TO EXISTING DATA, AND RESULTING DATA GAPS FOR DESIGN OF THE PORT OF OLYMPIA'S PROPOSED REMEDY

This section summarizes the data required for preparation of the remedial design, whether those data types exist, and the resulting data gaps for design of the Port's proposed remedy for either the project area as a whole or for specific areas or SMAs. Although several previous sediment studies have been performed within Budd Inlet, the existing sediment chemistry data are limited in geographic area and limited in analytes, which is inconsistent with project requirements, and surface sediment data may no longer be representative of existing conditions. In some areas, the data required for design and the data gaps are virtually identical because little to none of the existing data are suitable, cover only a small area, or do not exist, such that much of the data needed for remedial design are currently a data gap.

4.1 Project Area Base Map

4.1.1 Required Base Map Content and Mapping Data for Remedial Design

An up-to-date, accurate base map covering the extent of the project area and depicting current site bathymetry, topographic contours, and topographic features such as buildings, shoreline features, roads, paved area, utilities, etc., is needed for the design of the remedy and corresponding sediment management.

4.1.2 Existing Base Map Content and Mapping Data Suitable for Remedial Design

The existing project base map data consists of a mix of publicly available Geographic Information System (GIS) data, federal and local government topographic and hydrographic surveys, and a Port hydrographic condition survey. The data ranges from 2025 to 2017 or earlier, with the majority of upland and nearshore information originating from the 2017 Southwest Washington Regional Airport Authority light detection and ranging (LiDAR) survey (DNR, 2017). The National Ocean Service (NOS) recently published a bathymetric survey performed in 2022 that covers approximately two-thirds of Sub-Area 3 (NOAA, 2022). Coverage does not include the eastern shoreline, Dunlap Towing site, or West Bay Marina. The US Army Corps of Engineers (USACE) performed a survey of the navigational channel and adjacent area in 2025 (USACE, 2025). Existing locations and vertical elevations of shoreline features such as structures, piling, shoreline protection, outfalls, seeps, and vertical walls are either limited or non-existent. The USACE 2025 multibeam hydrographic navigation channel condition survey is sufficient for design-level work but limited in its extent of coverage. The NOS 2022 bathymetric survey is sufficient for design-level work for most of the open water areas west of the navigation channel and the open water area immediately adjacent to the navigational channel to the east but is limited along the western shoreline and most of the open water. The 2017 Southwest Washington Regional Airport Authority (SWAA) light detection and ranging (LiDAR) upland/nearshore coverage and accuracy quickly diminishes in the tidal flats area at the north end of the project area (Figure 4-1).

4.1.3 Base Map for Remedial Design Data Gaps

The USACE 2025 channel survey likely provides sufficient data for design, as needed, within the navigation channel area. For areas outside the navigation channel, additional surveying may be needed, depending upon results of sediment sampling and the potential need to perform remedial actions within portions of Sub-Area 3.

4.2 Nature and Extent of Sediment Contamination

4.2.1 Required Data on the Nature and Extent of Sediment Contamination for Delineation of Remedial Areas and Remedial Design

Data on the nature and extent of sediment contamination in site wide surface (0-10 centimeters [cm]), intertidal surface (0-45 cm), and subsurface sediment are required for multiple purposes, including:

- Nature and extent of chemical contamination throughout each Sub-Area within Budd Inlet, including identification of "hot spots."
- Surface sediment chemistry at 0-10 cm depth in both subtidal and intertidal areas, for calculation of sitewide surface-weighted average concentrations (SWACs).
- Intertidal surface sediment chemistry at 0-45 cm depth in intertidal areas, for calculation of intertidal SWACs.
- Chemical concentrations in sediment, both horizontally and vertically, to support design, investigate potential COCs in the Z-layer (the surface exposed by dredging, if dredging is performed), and evaluate potential capping of contaminated sediments within areas where capping is a selected remedy and below the Z-layer, if necessary, based on a proposed dredging remedy within that SMA.
    - Sufficient data density is required to define an accurate dredge prism, horizontally and vertically, to remove the impacted sediments.
- Sediment chemistry in the vicinity of existing and former outfalls for identification of potential current or historical sources.
- Sediment chemistry for the development and evaluation of potential dredged material management options, including onsite confined disposal facilities (CDFs).
- Sediment physical parameters, such as grain size and density, to evaluate dredgeability, dredged material management, and sediment management approaches other than dredging, including capping or EMNR.

Within each of the SMAs shown on Figure 3-1, the following data are required to address the purposes listed above.

Navigation Channel North SMA—The Port's proposed remedy for contamination within the Navigation Channel North SMA is removal by dredging. The horizontal and vertical extent of contaminated sediment is required to design a dredge prism to remove contaminated sediment, restore navigation depth, and allow USACE to resume maintenance dredging as needed.

West Bay Marina North SMA—The West Bay Marina uplands area was previously remediated and was issued a No Further Action (NFA) determination by Ecology in 2020. The NFA determination did not include offshore sediments. The Port's proposed remedy for contamination within the West Bay Marina North SMA will be evaluated after data gaps data collection is complete, with a combination of dredging and capping likely. The horizontal and vertical extent of contaminated sediment is required to design a dredge prism for the potential removal of contaminated sediment and restore navigation depth as needed. Wood waste evaluation is anticipated for this SMA based on historical information.

Open Water Northwest SMA—The horizontal and vertical extents of contaminated sediment are required to design a dredge prism to remove contaminated sediment from potential erosion areas or "hot spots" and to design a cap or EMNR as appropriate for non-erosional areas.

Open Water Northeast SMA—The horizontal and vertical extents of contaminated sediment are required to design a dredge prism to remove contaminated sediment from potential erosion areas or "hot spots" and to design a cap or EMNR as appropriate for non-erosional areas.

Squaxin Park SMA—The horizontal and vertical extents of contaminated sediment are required to design a dredge prism to remove contaminated sediment from potential erosion areas or "hot spots" and to design a cap or EMNR as appropriate for non-erosional areas.

Stormwater Outfall areas within any SMA—Four outfalls discharge into Budd Inlet within Sub-Area 3; three discharge into the West Bay Marina SMA, and the fourth discharges into the Open Water NW SMA just north of the West Bay Marina SMA, as shown on Figure 4-2. Multiple outfalls discharge to Ellis Creek, which discharges to the Squaxin Park SMA. Localized areas around outfalls or creeks may have different sediment impacts than the larger SMAs in which they are located. The horizontal and vertical extents of contamination in sediment associated with stormwater outfalls are necessary to evaluate contaminant contributions from stormwater and develop effective source control measures as part of the source control data gaps investigation for Sub-Area 3.

Creek discharge areas within any SMA— The main creek discharges identified to date in Sub-Area 3 are Ellis Creek and Butler Creek. Ellis Creek discharges to the Squaxin Park SMA and Butler Creek discharges to the Open Water Northwest SMA. Localized areas where creeks discharge into Budd Inlet may have different sediment impacts, , than the larger SMAs in which they are located. The horizontal and vertical extents of contamination in sediment associated with creek discharges are necessary to evaluate contaminant contributions from stormwater and upland drainage and develop effective source control measures.

4.2.2 Existing Data on the Nature and Extent of Sediment Contamination

The existing sediment chemistry data within each Sub-Area 3 SMA are outlined below and summarized in Tables 4-1 and 4-2 (surface and subsurface laboratory results, respectively). There are no historical intertidal surface 0-45 cm sediment analytical data.

Navigation Channel North SMA—The Navigation Channel North SMA covers approximately 3.9 million square feet of the project area. There is one surface (0-10 cm) data location (Figure 4-3) and five subsurface (more than 45 cm) data locations (Figure 4-4) for D/Fs; there are no surface (0-10 cm) data locations (Figure 4-5) or subsurface (more than 45 cm) data locations (Figure 4-6) for cPAHs within the Navigation Channel North SMA.

West Bay Marina North SMA—The West Bay Marina North SMA covers approximately 0.7 million square feet of the project area. There is one surface (0-10 cm) data location (Figure 4-2) and three subsurface (more than 45 cm) data locations (Figures 4-3) for D/Fs; there are four surface (0-10 cm) data locations (Figure 4-4) and three subsurface (more than 45 cm) data locations (Figures 4-5) for cPAHs within the West Bay Marina North SMA. Surface locations within the West Bay Marina North SMA that exceed regional background for D/Fs or cPAH TEQ are shown on Figure 4-7. D/Fs interpolation and cPAH interpolation for surface sediment are shown on Figures 4-8 and 4-9 respectively, using the limited available data.

Open Water Northwest SMA—The Open Northwest SMA covers approximately 9 million square feet of the project area. There are two surface (0-10 cm) data locations (Figure 4-2) and no subsurface (more than 45 cm) data locations (Figure 4-3) for D/Fs; there are two surface (0-10 cm) data locations (Figure 4-4) and no subsurface (more than 45 cm) data locations (Figure 4-5) for cPAHs within the Open Water Northwest SMA. Surface locations within the Open Water Northwest SMA that exceed regional background for D/Fs or cPAH TEQ are shown on Figure 4-7. D/Fs interpolation and cPAH interpolation for surface sediment are shown on Figures 4-8 and 4-9 respectively, using the limited available data.

Open Water Northeast SMA—The Open Water Northeast SMA covers approximately 14.3 million square feet of the project area. There are four surface (0-10 cm) data locations (Figure 4-2) and no subsurface (more than 45 cm) data locations (Figure 4-3) for D/Fs; there are three surface (0-10 cm) data locations (Figure 4-4) and no subsurface (more than 45 cm) data locations (Figure 4-5) for cPAHs within the Open Water Northeast SMA. Surface locations within the Open Water Northeast SMA that exceed regional background for D/Fs or cPAH TEQ are shown on Figure 4-7. D/Fs interpolation and cPAH interpolation for surface sediment are shown on Figures 4-8 and 4-9 respectively, using the limited available data.

Squaxin Park SMA—The Squaxin Park SMA covers approximately 7.6 million square feet of the project area. There are three surface (0-10 cm) data locations (Figure 4-2) and one subsurface (more than 45 cm) data location (Figure 4-3) for D/Fs; there is one surface (0-10 cm) data location (Figure 4-4) and no subsurface (more than 45 cm) data locations (Figure 4-5) for cPAHs within the Squaxin Park SMA. Surface locations within the Squaxin Park SMA that exceed regional background for either D/Fs or cPAH TEQ are shown on Figure 4-7. D/Fs interpolation and cPAH interpolation for surface sediment are shown on Figures 4-8 and 4-9, respectively using the limited available data.

4.2.3 Nature and Extent of Sediment Contamination Data Gaps

Sediment contamination data gaps within each SMA, based on differences between data needed for remedial design and existing data, are outlined below. Sediment contamination data gaps for Sub-Area 3 SMAs will be addressed in the Sub-Area 3 Sediment Chemistry Investigation Work Plan and Sub-Area 3 Sediment Chemistry Data Report. Three existing outfalls discharge into the West Bay Marina North SMA, and one outfall discharges into the southern portion of Open Water NW SMA (Figure 4-2). Several creeks also discharge to Budd Inlet within Sub-Area 3 (Figure 4-2). The areas around outfalls and creeks will be investigated accordingly to identify potential sediment impacts.

Navigation Channel North SMA—Available existing data in the navigation channel are limited to one surface and five subsurface samples. The existing surface and subsurface sample locations do not provide enough detail for delineation of areas requiring remediation or remedial design within this SMA. Additional borings are needed to determine the horizontal limits of subsurface contamination, depth of contamination, and resulting exposed (leave-behind or Z-layer) surface.

West Bay Marina North SMA—Existing surface data (4 samples) are limited to the southern portion of the SMA and indicate that the entire surface area within this SMA likely exceeds the regional background for cPAHs. Additional surface samples are needed to determine the nature and extent of surficial contamination. Available subsurface data for this SMA are limited, with all available data located near shore in the NW portion of West Bay Marina and near the former Dunlap Towing site ramp. Additional borings are needed to identify the horizontal limits of subsurface contamination, depth of contamination, and resulting exposed (leave-behind or Z-layer) surface for potential dredge areas, if dredging is to be performed.

Open Water Northwest, Northeast and Squaxin Park SMAs—The existing surface (9 samples) and subsurface (1 sample) sample locations do not provide enough data for delineation of remedial areas, evaluation of remedial alternatives, or remedial design within these SMAs. Additional borings are needed to determine the horizontal limits of subsurface contamination, depth of contamination, and resulting exposed (leave-behind or Z-layer) surface for potential dredged areas, if dredging is to be performed. Additional surface samples are needed to accurately define the limits of surficial contamination. This will include focused sampling near the four outfalls and mouths of Butler and Ellis creeks that flow into Budd Inlet, to identify any potential sources of recontamination.

4.3 Dredged Material Management Data

4.3.1 Required Sediment Properties Data for Sediment Management

Various data are required to support design of the proposed dredged material management options identified in the Draft Alternatives Memorandum (DOF et al. 2023) and include:

- Offsite disposal at an approved Subtitle D landfill.

- Several onsite potential beneficial reuse options are being investigated and were included in the Sub-Area 1 Data Gaps Memorandum (DOF et al. 2024). Beneficial reuse options include:
  - Placement in an upland CDF to be constructed within the Port Terminal area and incorporated into future sea level rise (SLR) plans, adjacent to the existing Cascade Pole Cleanup Site CDF; and,
  - Incorporation as fill into other SLR and shoreline resiliency improvements throughout the Port property.

Each dredged material management option has both unique and overlapping design data needs. A thorough understanding of the sediment chemical characteristics (COCs, leaching properties, etc.) is required for offsite disposal profiling and to develop safe containment strategies for onsite placement. The sediment physical properties are required to evaluate dewatering and material handling requirements during dredging, transfer, and processing of the sediment, and to determine potential amendment requirements (e.g., stabilization/solidification using cement fly ash, or other materials) for offsite transport and onsite placement.

4.3.2 Existing Sediment Properties Data for Sediment Management

As summarized in Section 4.2, numerous investigations have been performed within Budd Inlet to identify COCs, but those investigations have been extremely limited north of West and East Bays. In 2024 and 2025 investigations in Sub-Areas 1 and 2, respectively, were conducted by the Port to fill in surface and subsurface sediment chemistry data gaps from historical investigations. Additionally, multiple geotechnical investigations have been completed within selected portions of Budd Inlet and upland Port Peninsula property, but no geotechnical data are available outside these areas. Data from these investigations are summarized in the *Budd Inlet Sediment Site Existing Information Summary and Data Gaps Memorandum* (Anchor, 2012a), the *Final Investigation Report, Port of Olympia Budd Inlet Sediment Site* (Anchor, 2016) and the *Revised Budd Inlet Sub-Area 1 Data Report (DOF, 2025)*.

While the existing data are sufficient for feasibility evaluations in Sub-Areas 1 and 2, the data regarding Sub-Area 3 are too sparse or non-existent for feasibility evaluations.

4.3.3 Sediment Property Data Gaps for Sediment Management

To facilitate design of the dredged material management options identified above, representative sediment samples are needed from locations throughout the areas proposed for remediation by dredging, to supplement existing data (Table 4-3). To assess sediment characteristics and associated sediment processing requirements, it is anticipated that selected samples will be composited to represent the various SMAs defined in this PRD Memo. Compositing samples will allow adjustments to be made to the sediment processing design and to operations as the dredging progresses throughout Sub-Area 3. The composite samples will also be used for bench scale treatability testing to determine appropriate amendment materials (e.g., cement, bentonite, aggregate) and mixing ratios to achieve the properties required for both offsite transport and onsite placement of the sediment. Sediment

compositing will only be performed for the purpose of sediment management and treatability design. Samples will not be composited for site characterization. The anticipated sediment properties required for design of the sediment management project elements are summarized in Table 4-4.

Table 4-4. Sediment Management Design Data Needs

Data Need	Purpose				
	Sediment Dewatering/ Handling	Offsite Landfill Disposal	Nearshore CDF Placement	Upland CDF/SLR Placement	Effluent Treatment
Chemical Properties (Budd Inlet COCs)		✓	✓	✓	✓
Physical Properties (bulk density, grain size, plasticity, water content, total organic carbon, total solids)	✓	✓	✓	✓	
Strength Properties (compressibility and shear strength)			✓	✓	
Elutriate Properties	✓		✓	✓	✓
Settling/Consolidation Properties			✓	✓	
Leaching Properties			✓	✓	

Based on the lack of existing information, additional data detailed in Table 4-4 above will be required to supplement existing Sub-Area 3 data. The rationale, objectives, and details of these additional investigation activities will be developed as part of a future PRD Sub-Area 3 Shoreline & Overwater Structures Work Plan to support focused investigations (if required) and bench scale testing for onsite placement activities. This work plan will be prepared following initial PRD sediment chemistry investigation activities for Sub-Area 3 and identification of preliminary dredge limits and quantities within Sub-Area 3.

4.4 Sources of Contamination—Source Control and Remedy Protection

Source control is an essential element of the recommended remedial action for Sub-Area 3. Multiple transport pathways to the site, including stormwater, shoreline erosion, groundwater, in-water structures, overwater activities, and in-water sediment resuspension and release have the potential to contribute contamination. Source control will limit the potential for sediment recontamination and ensure that the remedy remains protective. This section presents the data required for remedial design, existing data, and data gaps specific to source control and remedy protection for Sub-Area 3.

4.4.1 Required Data for Source Control Evaluation

Based on information presented in the Draft Alternatives Memorandum, review of existing data, and communications with Ecology, the COCs for Sub-Areas 1 and 2 were D/Fs, dioxin-like polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbon (PAHs), arsenic, cadmium, mercury,

pentachlorophenol, and select semivolatile organic compounds (SVOCs; DOF et al. 2023). Based on data collected in West Bay and East Bay during 2024 and 2025 sampling events, (DOF et al. 2025), COCs for Sub-Area 3 have been further evaluated and should be refined. As will be discussed in the forthcoming Source Control Work Plan, a source control framework will define the source control approach, roles and responsibilities, and timing and deliverables associated with implementation of a source control evaluation for Sub-Area 3.

Initially, sediment will be collected to provide data in areas with potential sources of COCs (e.g., outfalls, creek discharges, marinas, cleanup sites) during the PRD Sub-Area 3 sediment chemistry investigation. This sampling program is designed to address known data gaps, such as outdated data and low data density. Based on the Sub-Area 3 sediment chemistry investigation results, additional data needs will be identified to further inform the source control investigation. The proposed Sub-Area 3 sediment chemistry investigation data collection scope is expected to be implemented in winter of 2026. Following receipt and analysis of results from that sampling effort, the Sub-Area 3 Source Control Work Plan will be prepared to describe the source control approach for Ecology review, in advance of additional data gap sampling.

For the purpose of identifying data gaps as part of this PRD Memo, it is anticipated that the source control evaluation will focus on identification of potential sources of COCs and potential pathways to Sub-Area 3. Anticipated pathways to Sub-Area 3 include stormwater, shoreline erosion, groundwater, in-water structures, overwater activities, and in-water sediment resuspension and release.

For example, stormwater discharges will be evaluated to identify any potential for an ongoing source of COCs to Sub-Area 3, which would require implementation of source control measures. The evaluation will likely involve reviewing whether stormwater permit thresholds are being met and reviewing recent stormwater and catch basin solids data. Data from sediment collected near outfalls and creeks discharging to Sub-Area 3 may be evaluated to support identification of sources that may result in an ongoing source of contamination.

A broader assessment of other potential transport pathways will be required to develop a comprehensive conceptual site model (CSM) for potential ongoing sources of COCs to sediments within Sub-Area 3. The CSM will inform other potential assessment needs along potentially complete pathways to Sub-Area 3, possibly including erosive shoreline embankments, groundwater seeps, bulkhead drains, and direct overwater or overland flow discharges.

Based on the limited available data, elevated D/F, cPAHs, mercury, arsenic and cadmium concentrations in Sub-Area 3 suggest ongoing contributions from diffuse sources. Diffuse sources may include local and regional background sources that potentially contribute to chemical concentrations in sediments within Budd Inlet. Background concentrations of chemicals such as D/F, cPAHs, and metals can be found in soils and sediments throughout much of the state, either due to natural occurrences or as a result of widespread regional human activities. The potential contributions from these ubiquitous sources and

the development of background concentrations for some widespread and/or naturally occurring contaminants and chemicals are considered data gaps that will be further assessed in the forthcoming Source Control Work Plan. For example, regional background concentrations have not been developed for cadmium.

4.4.2 Existing Source Control Data

Multiple studies offer regional and site-specific information relevant to southern Budd Inlet source characterization (Anchor 2012a, 2012b, 2014, 2016, 2017; Ecology 2018; SAIC 2008), with most of the focus on East and West Bays and limited detail provided for Sub-Area 3. These investigations included evaluation of stormwater, catch basin solids, and stormwater sediments, focusing on discharges. Additionally, the investigations identified that stormwater discharges potentially contribute to widespread input of COCs to Budd Inlet, particularly D/F and cPAHs. Outfalls and creeks discharging to Sub-Area 3 are shown on Figure 4-2.

Further, the studies mentioned above and in the Draft Alternatives Memorandum identify several historical and ongoing sources that likely contribute to elevated COC concentrations in Budd Inlet sediments. These studies have generally categorized potential historical and ongoing sources to Budd Inlet as follows: atmospheric deposition, other cleanup sites along Budd Inlet, and stormwater discharges to Budd Inlet. These potential sources will be further evaluated and discussed in the Source Control Work Plan. A comprehensive assessment of these potential sources to Sub-Area 3 and any potential effect on sediment quality will be needed to determine recontamination potential.

4.4.3 Source Control Evaluation Data Gaps

It is anticipated that based on the forthcoming preliminary source control strategy framework in the Sub-Area 3 Source Control Work Plan, the source control evaluation will primarily focus on potential sources discharging to Sub-Area 3 via the stormwater pathway, specifically, private and public outfalls and creeks discharging to Sub-Area 3 (Figure 4-2). A current evaluation of stormwater discharges to Sub-Area 3 will need to be completed to fully characterize stormwater sources. This evaluation will inform the scope of source control measures that may be required to ensure that the remedy for Sub-Area 3 remains protective.

Additionally, the recontamination CSM will identify additional sources and pathways to Sub-Area 3 for further evaluation. This could include additional public and private outfalls not previously investigated, erosive shoreline embankments, groundwater seeps, bulkhead drains, and direct overwater or overland flow discharges.

A refinement of data gaps will be completed based on a comprehensive review of available data following completion of sediment chemistry investigation to determine areas of potential impacts. Once specific data gaps have been identified, a sampling and investigation approach will be developed and

presented in the Sub-Area 3 PRD Source Control Work Plan. Sampling will require coordination with multiple parties and landowners.

4.5 Existing Structures

The project area covered by this PRD Memo includes several existing structures that could potentially affect or be impacted by the remedy construction and that need to be evaluated and addressed during the design process.

Existing structures within Sub-Area 3 that could be impacted by the remedial action (or have impacts on the remedial action) include the following:

- West Bay Marina docks, ramps, piling, and marina tenants in the West Bay Marina North SMA.
- Existing City of Olympia (City) outfalls on the west shoreline of Sub-Area 3 (four outfalls total).

4.5.1 Required Data for Potentially Impacted Structures

Currently, it is not fully known what data are required; therefore, potential impacts on structures cannot be fully quantified or evaluated at this time. As such, information on existing structures and potential impacts due to remediation and data needs will be evaluated based on remedial method (dredging, capping, etc.) after the nature and extent of the contamination is determined.

4.5.2 Existing Data for Potentially Impacted Structures

A preliminary review of the existing site conditions and search for available records was conducted.

A data gap analysis was conducted based on the lack of existing available information. The focus of the data gap analysis is on implementation of the Port's proposed remedy within Sub-Area 3, as detailed in Section 3 of this PRD Memo.

4.5.3 Potentially Impacted Structures Data Gaps

Investigation and data collection for structures that may be impacted by remedial activities will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan.

- **West Bay Marina docks, ramps, piling, and marina tenants in the West Bay Marina North SMA.** Depending on the extent of sediment remediation required and the selected remedial alternative, structural data may be needed.
- **Existing outfalls on shorelines of Sub-Area 3.** Three City stormwater outfalls are located on the west shoreline of Budd Inlet Sub-Area 3. Depending on the extent of sediment contamination identified during sediment sampling and on the resulting required remediation and remedial approach in the vicinity of these outfalls, structural data may be required to complete the remedial design in the vicinity of one or more outfalls. Data needs and existing data investigations and evaluations will be performed during design as needed based on remediation requirements.

Investigation and data collection for structures that may be impacted by remedial activities will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan and field investigation.

4.6 Geotechnical Data

4.6.1 Required Geotechnical Data

Geotechnical data are required to support several elements of the remedial design, including evaluating potential impacts to existing piling and docks within the West Bay Marina North SMA, depending upon the extent of sediment impacts and necessary remediation. Determining the geotechnical properties of the dredged material is also required.

4.6.2 Existing Geotechnical Data

No geotechnical data are available for Sub-Area 3. All historical geotechnical investigations have been focused on East Bay, West Bay, and the Port Peninsula.

4.6.3 Geotechnical Data Gaps

Geotechnical data gaps for this PRD have been identified for sediment properties relative to general sediment management and SLR/shoreline resiliency placement design. A Sub-Area 3 geotechnical data gaps investigation will be included in the Sub-Area 3 Shoreline & Overwater Structure Work Plan. Geotechnical data gaps related to remedial and design elements are as follows related to sediment properties for sediment management:

- Additional in-water exploration would be required to characterize the physical and strength properties of the sediment and to support the design of replacement float piles as necessary, based on remedy design within the West Bay marina where dredging is a potential remedy. Borings would generally extend 50 ft below the mudline. To support float pile design, one-dimensional consolidation tests and consolidated, undrained triaxial tests will be completed as necessary.
- To support dredge spoils characterization, samples collected within the anticipated dredging depths will be tested for bulk density, grain size, plasticity, and moisture content.

4.7 Permitting and Habitat Data

4.7.1 Required Permitting and Habitat Data and Data Gaps

Up-to-date data are required to evaluate habitat conditions as needed to support potential remedial actions. Areas where data are needed depend on areas requiring remediation, remedial approach and related permitting, and mitigation of habitat restoration needs and will be determined after sediment sampling and evaluation.

High tide line (HTL): The jurisdictional line for Section 10/404 permitting is the HTL. This line is field-located, site-specific, and is not correlated to any site-wide elevation.

Salt marsh coverage: Salt marsh—a type of coastal wetland—is present along much of the Budd Inlet shoreline and much of the remedial area. Owing to the potential for remedial design to affect salt marsh, its extent must be known and mapped for permitting and to track any impacts.

Salt marsh elevation: The elevation at which salt marsh begins and ends needs to be established with confidence.

Shoreline habitat conditions: Habitat required conditions include slope, substrate, and vegetation coverage. These data are necessary to characterize the habitat that may be affected by remediation.

Select sampling locations: The permitting process may require location-specific chemical contamination data within potential habitat areas, dependent on remedial design needs.

Bathymetry: Bottom depths of areas to be remediated need to be known.

Benthic debris: Benthic debris refers to human-made trash and pollution that settles on the seafloor (i.e. plastics, metals, and other discarded items). The presence of benthic debris on the benthic surface of the areas to be affected by remediation would affect the valuation of this habitat and thus need to be known for permitting in order to account for habitat impacts.

Overwater structures: If any overwater structures could be affected by the remedial action (i.e., removed or altered), these would need to be described in detail, including square footage, composition materials, pile counts, pile diameter, and whether the structures would be rebuilt.

Areas and volumes of removal and fill: Any sediment that would be removed or placed below the HTL needs to be quantified.

4.7.2 Existing Permitting and Habitat Data

Limited up-to-date data are available to support project permitting or potential habitat evaluations within Sub-Area 3. Previously the project completed limited initial evaluations of existing benthic debris and overwater structures, generally within Sub-Areas 1 and 2.

General natural resource information can be found in the following:

- Coast & Harbor Engineering's *City of Olympia West Bay Environmental Restoration Assessment* (Coast & Harbor Engineering 2016)
- JA Brennan Associates' *City of Olympia West Bay Restoration & Park Master Plan Alternatives 1, 2 & 5 Comparison Memorandum* (Brennan 2022).
- Additionally, Grette Associates has prepared a draft *Shoreline and Intertidal Habitat Technical Memorandum* (Grette 2023), which provides qualitative shoreline habitat data for the remedial area. A more detailed shoreline habitat conditions survey will be conducted prior to remedial design.

4.7.3 Permitting and Habitat Data Gaps

HTL: The HTL must be delineated in the field and included in the figure set. A site visit to delineate the HTL per USACE guidance along the entirety of the remedial area will be necessary for permitting. HTL delineation will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan.

Salt marsh coverage: Delineation and mapping of existing salt marsh coverage needs to be completed for the site. This would be done by conducting a site visit to record the extent of salt marsh using a sub-meter global positioning system (GPS) unit. Salt marsh coverage delineation will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

Salt marsh elevation: The elevation at which salt marsh begins and ends would need to be established with confidence based on potential remediation. Salt marsh elevation extents determination will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

Shoreline habitat conditions: Habitat conditions data may need to be collected. Habitat conditions include slope, substrate, and vegetation coverage. Shoreline habitat conditions data collection will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

Select sampling locations: Specific locations are not determined, but the habitat and permitting team would need the opportunity to direct the location, with Ecology review and approval, of some samples, as applicable. Sample location coordinates will be included in the Sub-Area 3 Sediment Chemistry Work Plan.

Bathymetry: Bottom depths of areas to be remediated would need to be known with a high degree of certainty and precision. This information would drive the calculations of the changes in aquatic habitat by elevation zone. Needed habitat bathymetry data will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

Benthic debris: Information regarding the existence of debris on the benthic surface and mapping of any existing debris is currently not available. A debris survey and mapping will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

Overwater structures: Data for structures that may be impacted by the planned remedy will need to be collected prior to remedy implementation. The data gap needs will vary by structure and remedy selection. Structure data gaps needs will be addressed in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as needed.

Areas and volumes of removal and fill: Removal/fill volumes would be calculated as part of the remedial design process. Bathymetric data needed to calculate these volumes will be included in the Sub-Area 3 Shoreline & Overwater Structures Work Plan as appropriate.

5.0 NEXT STEPS

This PRD Memo is for Sub-Area 3 within the Budd Inlet Study Area. Work in Sub-Areas 1 and 2 has been initiated and continues to advance. As work related to Sub-Areas 1 and 2 advances, pre-remedial design investigation work will continue in Sub-Area 3.

Three work plans for Sub-Area 3 will focus on sediment chemistry, source control, and shoreline and overwater structures. The Sediment Chemistry Work Plan and field investigation will be completed first. Evaluation of the resulting sediment chemistry data will allow for refinement of the nature and extent of sediment contamination within Sub-Area 3 and subsequent re-evaluation of proposed remedial alternatives. Then, work plans for Sub-Area 3 will be prepared and submitted for source control and shoreline and structural investigations. These work plans will be based on revised remedial alternatives and the proposed sediment chemistry investigation.

The PRD Sediment Chemistry Work Plan for Sub-Area 3 is currently in process so that the field investigation for Sub-Area 3 can start in the winter of 2026. Table 5-1 below correlates the data gaps outlined in Section 4.0 with the work plan/investigation where these data gaps are anticipated to be addressed as needed.

Table 5-1. Data Need and Anticipated Correlated Work Plan

Data Need	Anticipated Correlated Work Plan	Data Type to Be Collected
Nature and Extent of Sediment Contamination	Sub-Area 3 Sediment Chemistry Work Plan	Horizontal and vertical extents of contamination in sediment.
Sediment Geotech—Dredged Material Management	Sub-Area 3 Sediment Chemistry Work Plan	Sediment geotechnical data for sediment management, including soil classification and grain size.
Sources of Contamination—Source Control and Remedy Protection	Sub-Area 3 Source Control Work Plan	Sediment chemistry data to evaluate impacts of potential sources on Budd Inlet sediment.
Existing Structures	Sub-Area 3 Shoreline and Overwater Structures Work Plan	PRD for sediment properties for general sediment management. Potential impacts to existing structures based on the remedy construction.
Sediment Geotech—Remedy Design	Sub-Area 3 Sediment Chemistry Work Plan and Sub-Area 3 Shoreline & Overwater Structures Work Plan	Sediment geotechnical data to support potential slope stability for dredge slopes.
Project Area Base Map	Sub-Area 3 Shoreline & Overwater Structures Work Plan	Bathymetric and topographic survey data, as needed. To be revisited prior to design based on actual remedial areas.
Permitting and Habitat	Sub-Area 3 Shoreline & Overwater Structures Work Plan	Bathymetric, topographic and habitat surveys to delineate habitat areas.

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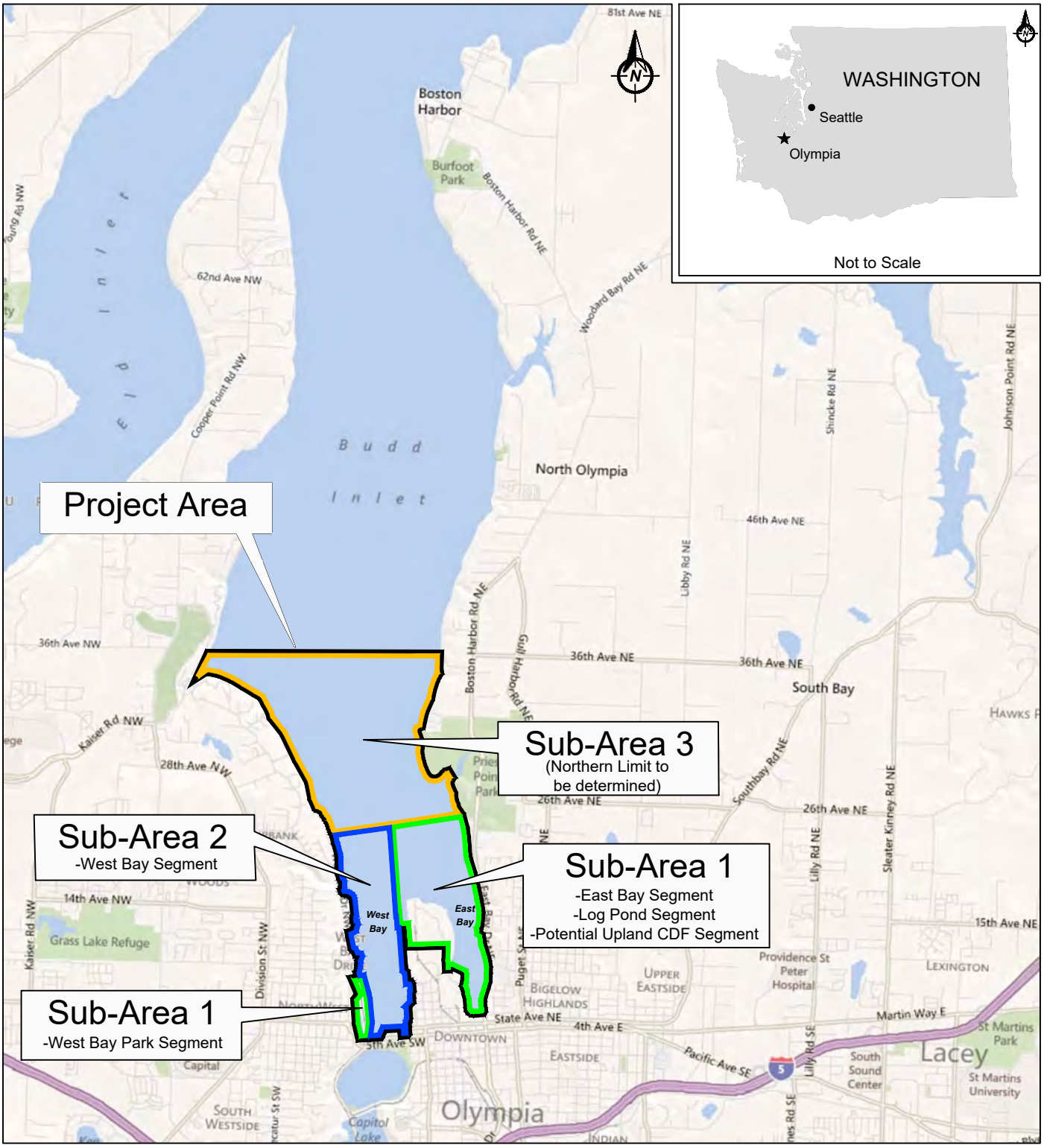

Note

1. Background imagery: Bing Maps
2. All boundaries are approximate.

Legend

- Project Area (Northern Limit to be determined)
- Sub-Area 1
- Sub-Area 2
- Sub-Area 3 (Northern Limit to be determined)

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Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

Vicinity Map & Budd Inlet Project Sub-Areas

Figure 1-1

January 13, 2026

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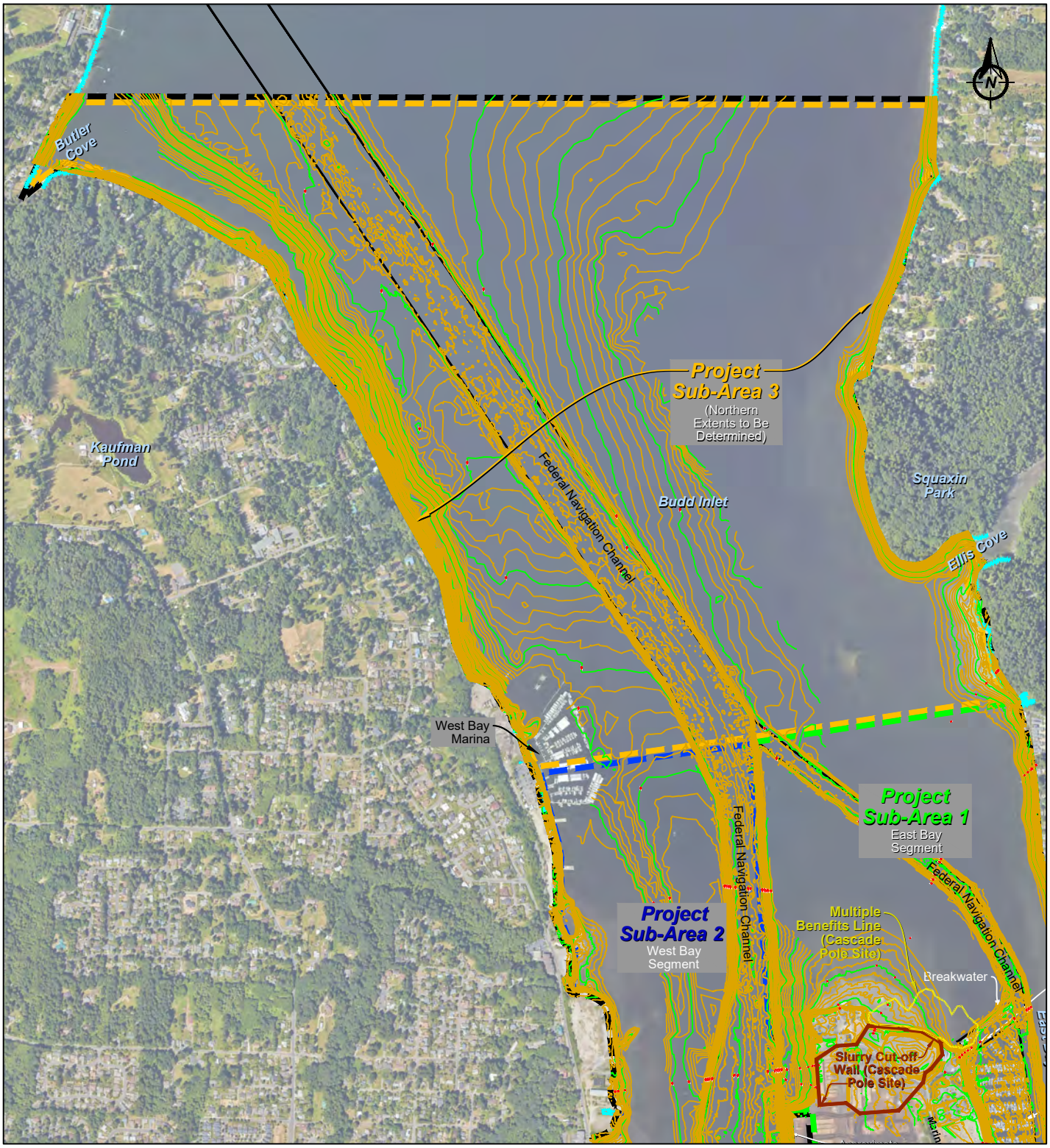

Notes

1. Horizontal Datum: Washington State Plane South, NAD83.
2. Background imagery: Google Earth Pro, 07/25/2022.
3. All boundaries are approximate.
4. Bathymetric contours from combine NOS 2022, USACE 2025 and SWAA LiDAR 2017.

Legend

- Project Area
- Sub-Area 1
- Sub-Area 2
- Sub-Area 3 (Northern Extents TBD)
- Multiple Benefits Line (Cascade Pole Site)
- Slurry Cut-off Wall (Cascade Pole Site)
- Federal Navigation Channel
- Mean Higher High Waterline (MHHW)
- -5 Major Bathymetric Countour
- Minor Bathymetric Countour

0 700 1400
Scale in Feet

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Project Areas & Site Features in South Budd Inlet

Figure 1-2

January 9, 2026

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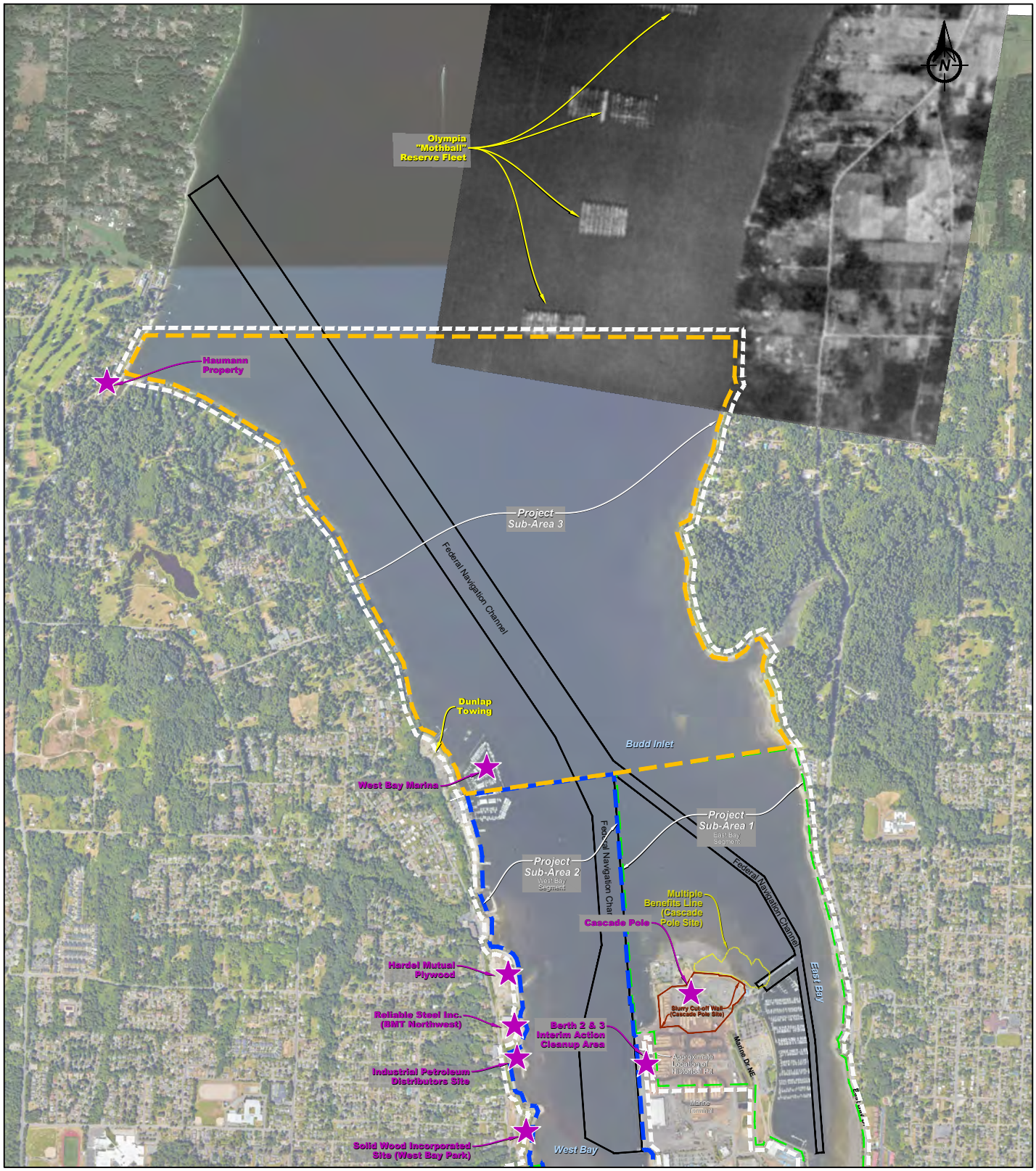

Notes

1. Background imagery: Google Earth Pro, 07/25/2022.
2. Source: Department of Ecology Website
3. "Mothball" Fleet aerial image (1957) from US Dept of Transportation website (https://www.maritime.dot.gov/outreach/history/olympia-reserve-fleet#)

Legend:

- Known Contaminated Site
- Project Area
- Sub-Area 1
- Sub-Area 2
- Sub-Area 3
- Multiple Benefits Line (Cascade Pole Site)
- Slurry Cut-off Wall (Cascade Pole Site)
- Federal Navigation Channel

0 1000 2000
Scale in Feet

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Locations of Other Known Contaminated Sites

Figure 2-1
DRAFT
September 6, 2025

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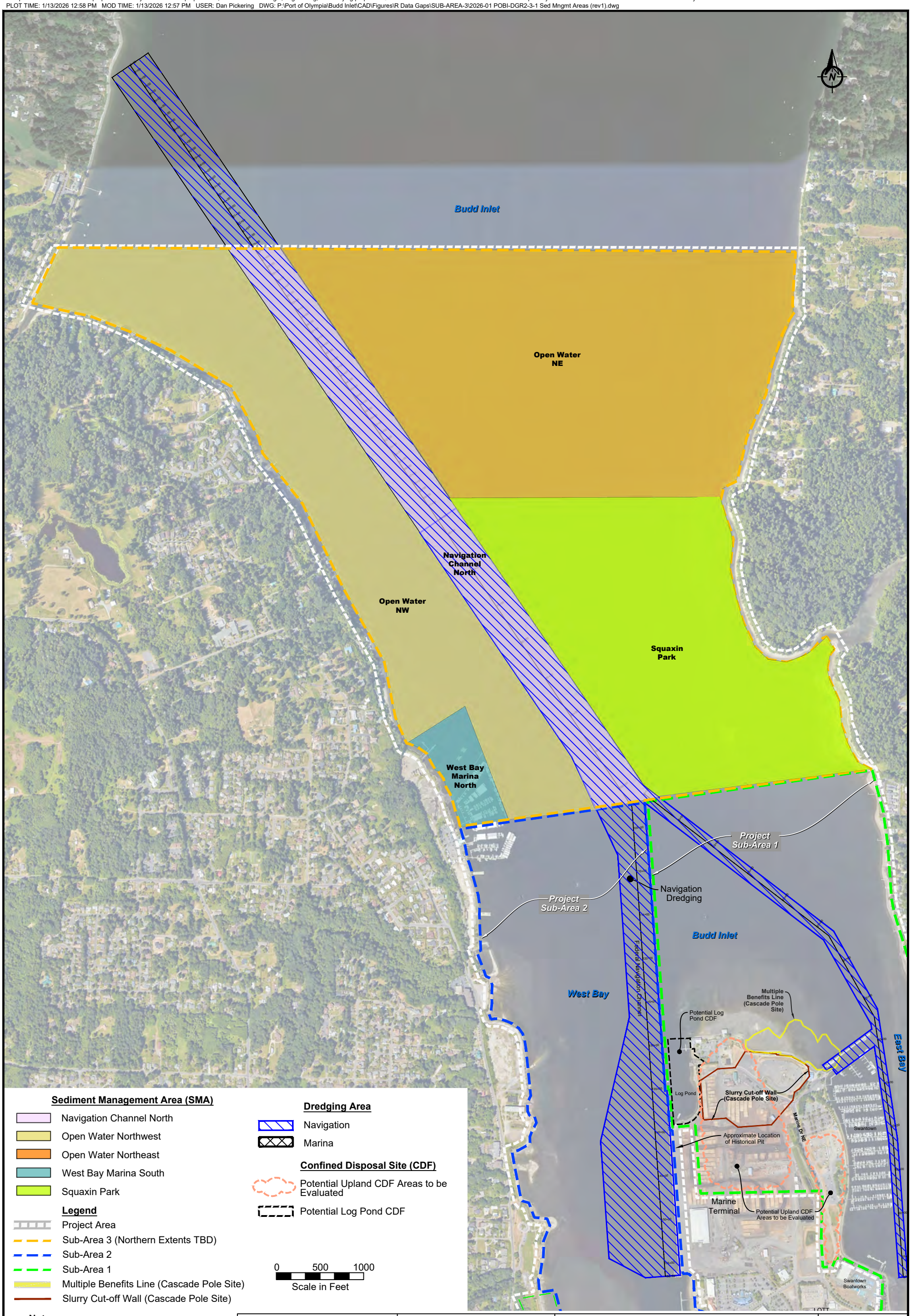
PLOT TIME: 1/13/2026 12:58 PM MOD TIME: 1/13/2026 12:57 PM USER: Dan Pickering DWG: P:\Port of Olympia\Budd Inlet\CAD\Figures\R Data Gaps\SUB-AREA-3\2026-01 POBI-DGR2-3-1 Sed Mngmt Areas (rev1).dwg



Sediment Management Area (SMA)

- Navigation Channel North
- Open Water Northwest
- Open Water Northeast
- West Bay Marina South
- Squaxin Park

Legend

- Project Area
- Sub-Area 3 (Northern Extents TBD)
- Sub-Area 2
- Sub-Area 1
- Multiple Benefits Line (Cascade Pole Site)
- Slurry Cut-off Wall (Cascade Pole Site)

Dredging Area

- Navigation
- Marina

Confined Disposal Site (CDF)

- Potential Upland CDF Areas to be Evaluated
- Potential Log Pond CDF

0 500 1000
Scale in Feet

Notes

1. Horizontal Datum: Washington State Plane South, NAD83.
2. Background imagery: Google Earth Pro, 07/25/2022.
3. All boundaries are approximate.

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Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

Budd Inlet Sub-Area 3 SMAs

Figure 3-1

January 13, 2026

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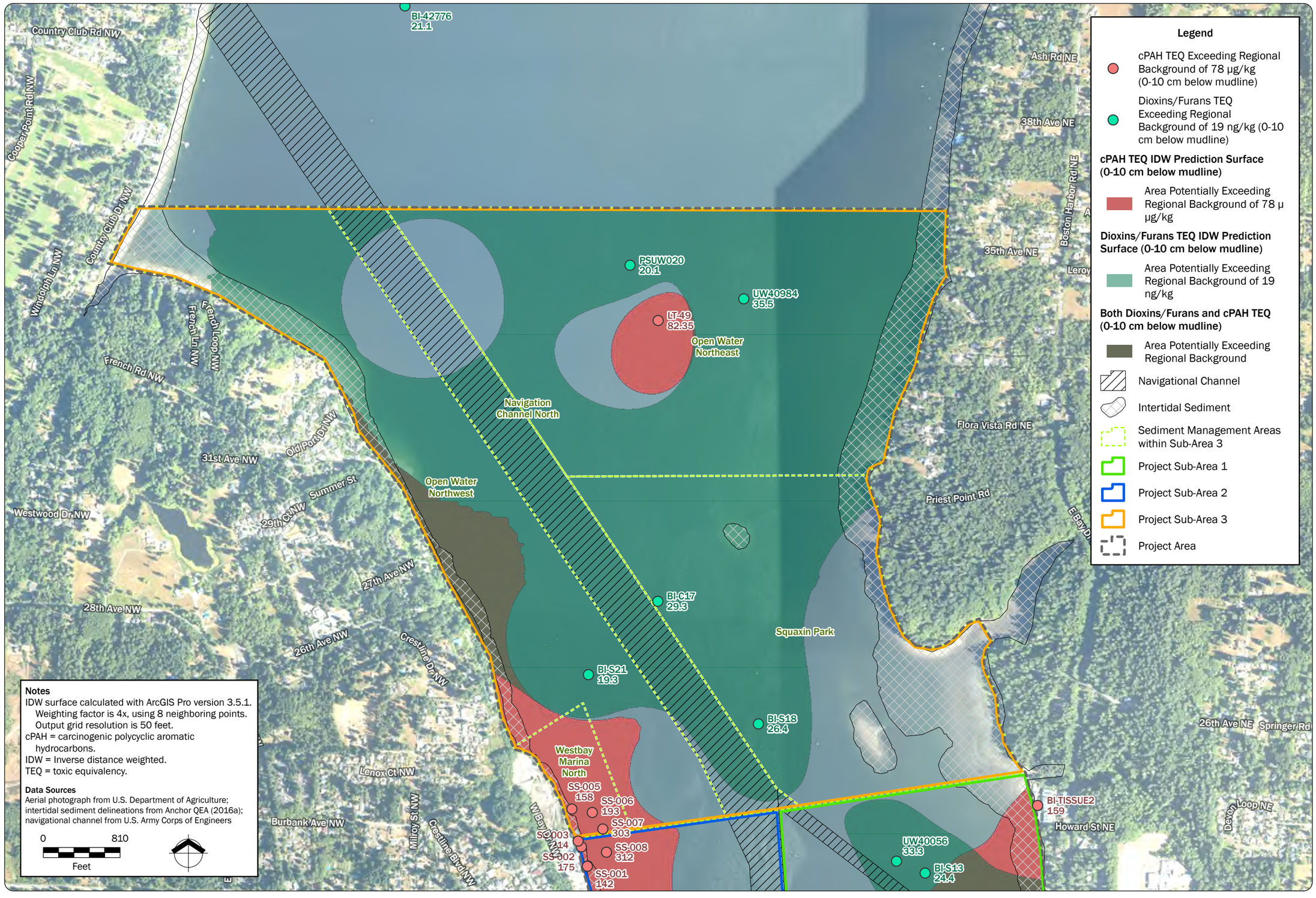

Notes
IDW surface calculated with ArcGIS Pro version 3.5.1.
Weighting factor is 4x, using 8 neighboring points.
Output grid resolution is 50 feet.
cPAH = carcinogenic polycyclic aromatic hydrocarbons.
IDW = Inverse distance weighted.
TEQ = toxic equivalency.

Data Sources
Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 810
Feet

Legend

- cPAH TEQ Exceeding Regional Background of 78 µg/kg (0-10 cm below mudline)
- Dioxins/Furans TEQ Exceeding Regional Background of 19 ng/kg (0-10 cm below mudline)

cPAH TEQ IDW Prediction Surface (0-10 cm below mudline)

- Area Potentially Exceeding Regional Background of 78 µ µg/kg

Dioxins/Furans TEQ IDW Prediction Surface (0-10 cm below mudline)

- Area Potentially Exceeding Regional Background of 19 ng/kg

Both Dioxins/Furans and cPAH TEQ (0-10 cm below mudline)

- Area Potentially Exceeding Regional Background
- Navigational Channel
- Intertidal Sediment
- Sediment Management Areas within Sub-Area 3
- Project Sub-Area 1
- Project Sub-Area 2
- Project Sub-Area 3
- Project Area

Figure 3-2

January 12, 2026

Areas Potentially Exceeding Regional Background

Based on Limited Existing Data

PORT of OLYMPIA
Budd Inlet - Olympia, WA
Project Sub-Area 3 Pre-Remedial Design
Data Gaps Memo

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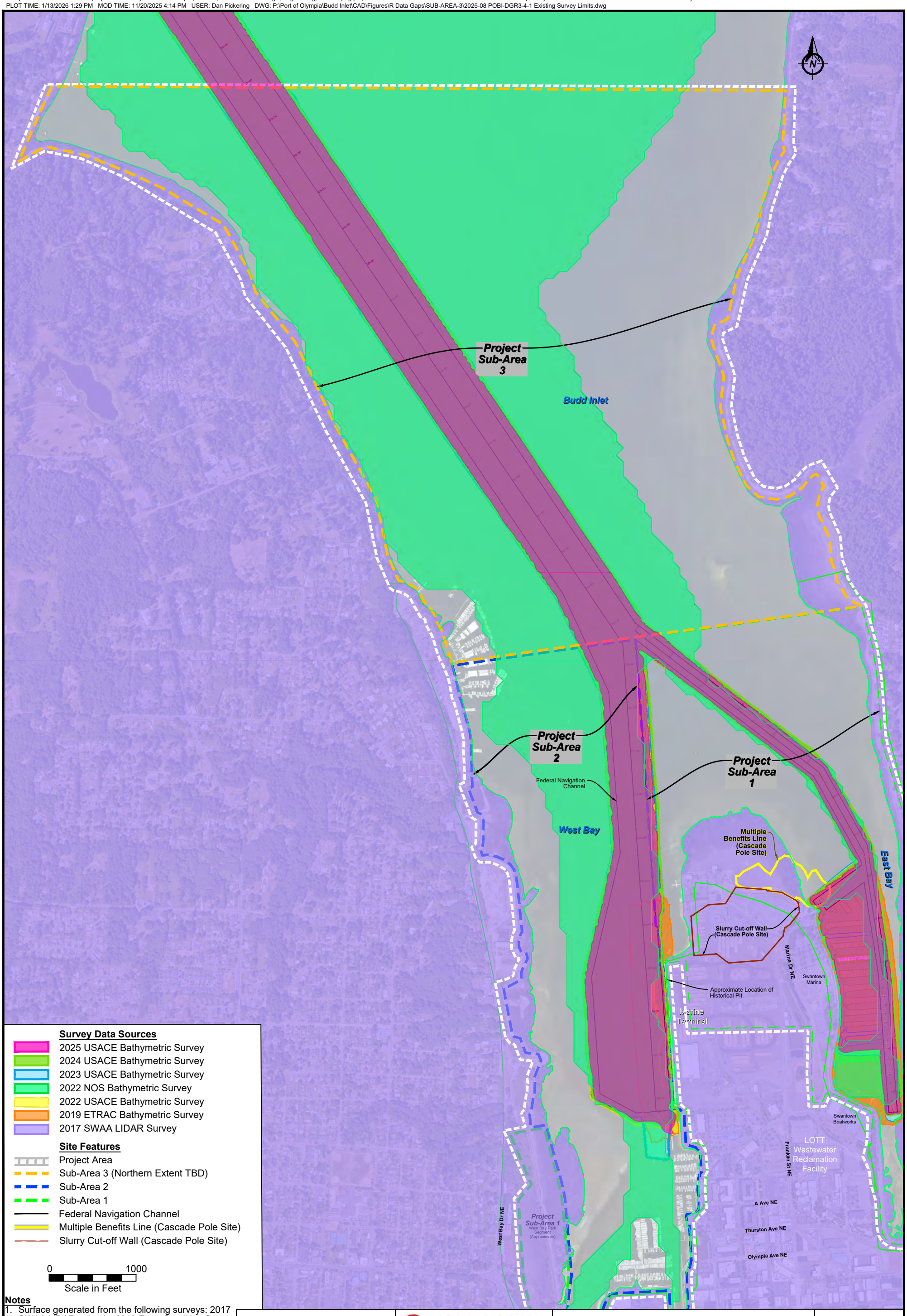
Path: C:\Workspace\0_MFA_Projects\M0781.03\002\Pro\M0781_03_002_005_SubArea_3_Data_Gaps.aprx\Fig 3-2 S43 DGM Areas Exceeding Regional Background
Print Date: 1/12/2026
Reviewed By: DOF
Produced By: jroberts
Project: M0781.03.002

PLOT TIME: 1/13/2026 1:29 PM MOD TIME: 11/20/2025 4:14 PM USER: Dan Pickering DWG: P:\Port of Olympia\Budd Inlet\CAD\Figures\R Data Gaps\SUB-AREA-3\2025-08 POBI-DGR3-4-1 Existing Survey Limits.dwg



Notes

1. Surface generated from the following surveys: 2017 SWAA LiDAR uplands, 2019 Etrac Condition Survey, 2023 USACE Condition Survey.
2. Data sets earlier than 2017 not included due to obsolescence.
3. Horizontal Datum: Washington State Plane South, NAD83.
4. Background imagery: Google Earth Pro, 07/25/2022.

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Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

Existing Survey Coverage

Figure 4-1

August 18, 2025

PLOT TIME: 1/13/2026 1:23 PM MOD TIME: 8/25/2025 9:58 PM USER: Dan Pickering DWG: D:\DOF\Projects\Port of Olympia - Budd Inlet\CAD\Figures\Sub-Area 3\Data Gaps Memo\SUB-AREA-3\2024-10 POBI-DGR2-4-2 Storm Drain.dwg

Butler Creek
Open Water NE SMA
Navigation Channel North SMA
Project Sub-Area 3
Federal Navigation Channel
Ellis Creek
Open Water NW SMA
Squaxin Park SMA
West Bay Marina North SMA
Budd Inlet
East Bay
West Bay
Project Sub-Area 2
Project Sub-Area 1
Federal Navigation Channel
Federal Navigation Channel
LOTT Outfall 001 (Permit WA0037061)
Multiple Benefits Line (Cascade Pole Site)
Slurry Cut-off Wall (Cascade Pole Site)
Approximate Location of Historical Pit
Marine Terminal
Marine Terminal
Project Area
Marine Dr NE
Steep slopes and riprap slopes without access not included (Marina, log pond, underpier)
Mixie Creek Mudflat
West Bay Dr NE

Drainage System
- City of Olympia Stormwater Outfall
- LOTT Wastewater/CSO Outfall
- Industrial Outfall
- Historical Outfall
- City of Olympia Storm Drain
- City of Olympia Force Main
- City of Olympia Combined Storm/Sewer
- Port of Olympia Storm Drain
- LOTT Wastewater Outfall Pipe

Legend
- Project Location Boundary
- Sub-Area 3 (Northern Extent TBD)
- Sub-Area 2
- Sub-Area 1
- SMA Boundaries
- Multiple Benefits Line (Cascade Pole Site)

N

0 1100
Scale in Feet

Notes
1. Horizontal Datum: Washington State Plane South, NAD83.
2. Background imagery: Google Earth Pro, 07/25/2022.
3. Source: Anchor QEA, Figure 2-4.

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Budd Inlet - Olympia, WA
Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

Stormwater / CSO Locations

Figure 4-2

January 13, 2026

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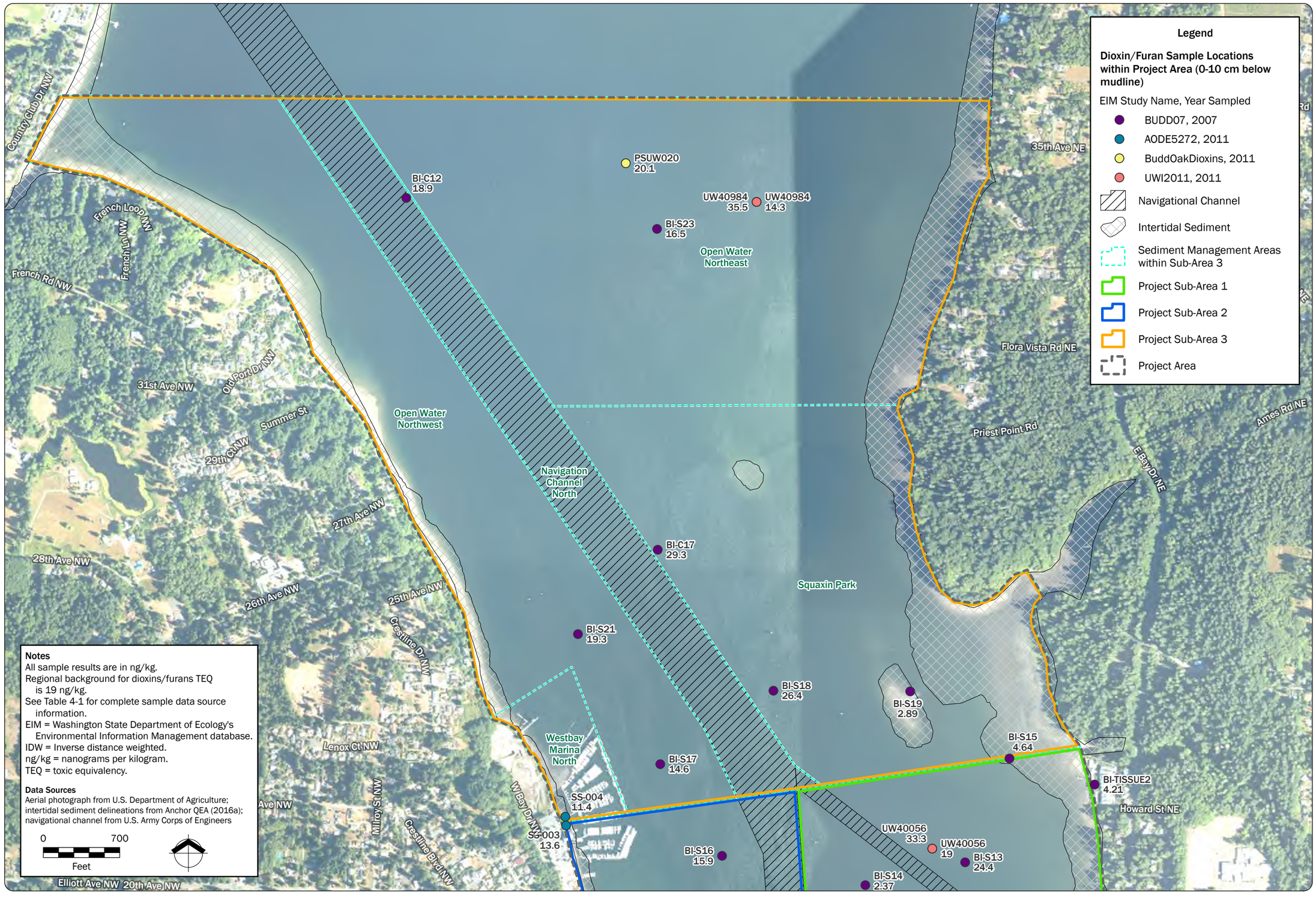

Legend

Dioxin/Furan Sample Locations within Project Area (0-10 cm below mudline)

EIM Study Name, Year Sampled

- BUDD07, 2007
- AODE5272, 2011
- BuddOakDioxins, 2011
- UWI2011, 2011

Navigational Channel

Intertidal Sediment

Sediment Management Areas within Sub-Area 3

Project Sub-Area 1

Project Sub-Area 2

Project Sub-Area 3

Project Area

Notes

All sample results are in ng/kg.
Regional background for dioxins/furans TEQ is 19 ng/kg.
See Table 4-1 for complete sample data source information.
EIM = Washington State Department of Ecology's Environmental Information Management database.
IDW = Inverse distance weighted.
ng/kg = nanograms per kilogram.
TEQ = toxic equivalency.

Data Sources

Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 700
Feet

Figure 4-3

January 12, 2026

Dioxins/Furans Sediment Surface (0-10 cm below mudline) Sample Density

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Budd Inlet - Olympia, WA
Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

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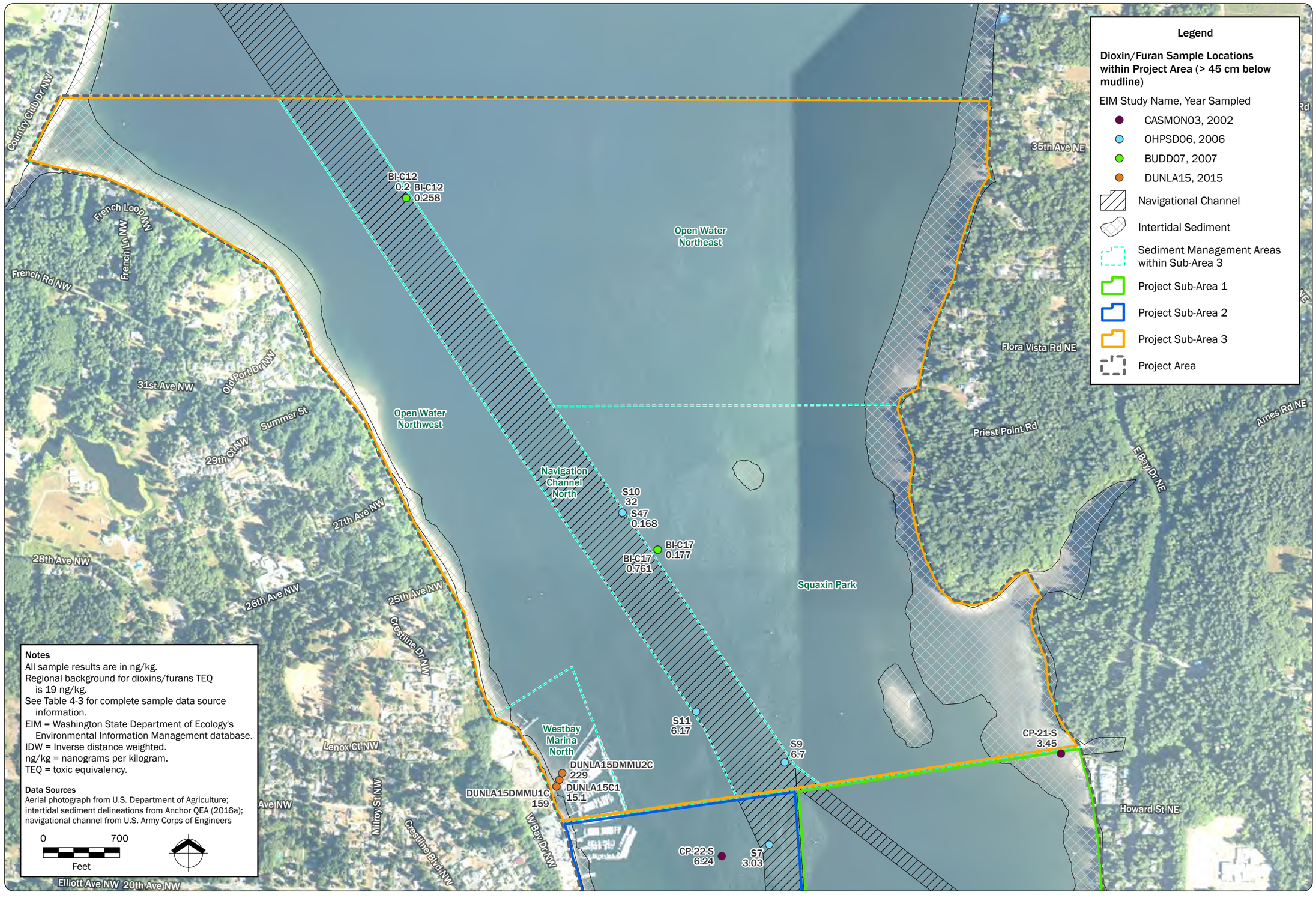
Path: C:\Workspace\0_MFA_Projects\M07813.03\002\Pro\M07813_03_002_005_SubArea_3_Data_Gaps.aprx\Fig 4-3 S43 DGM Dioxin-Furans Surface Sample Density
Print Date: 1/12/2026
Reviewed By: DOF
Produced By: jroberts
Project: M07813.03.002



Legend

Dioxin/Furan Sample Locations within Project Area (> 45 cm below mudline)

EIM Study Name, Year Sampled

- CASMON03, 2002
- OHPSD06, 2006
- BUDD07, 2007
- DUNLA15, 2015

Navigational Channel

Intertidal Sediment

Sediment Management Areas within Sub-Area 3

Project Sub-Area 1

Project Sub-Area 2

Project Sub-Area 3

Project Area

Notes

All sample results are in ng/kg.
Regional background for dioxins/furans TEQ is 19 ng/kg.
See Table 4-3 for complete sample data source information.
EIM = Washington State Department of Ecology's Environmental Information Management database.
IDW = Inverse distance weighted.
ng/kg = nanograms per kilogram.
TEQ = toxic equivalency.

Data Sources

Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 700
Feet

Figure 4-4

January 12, 2026

Dioxins/Furans Sediment Subsurface (> 45 cm below mudline) Sample Density

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Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

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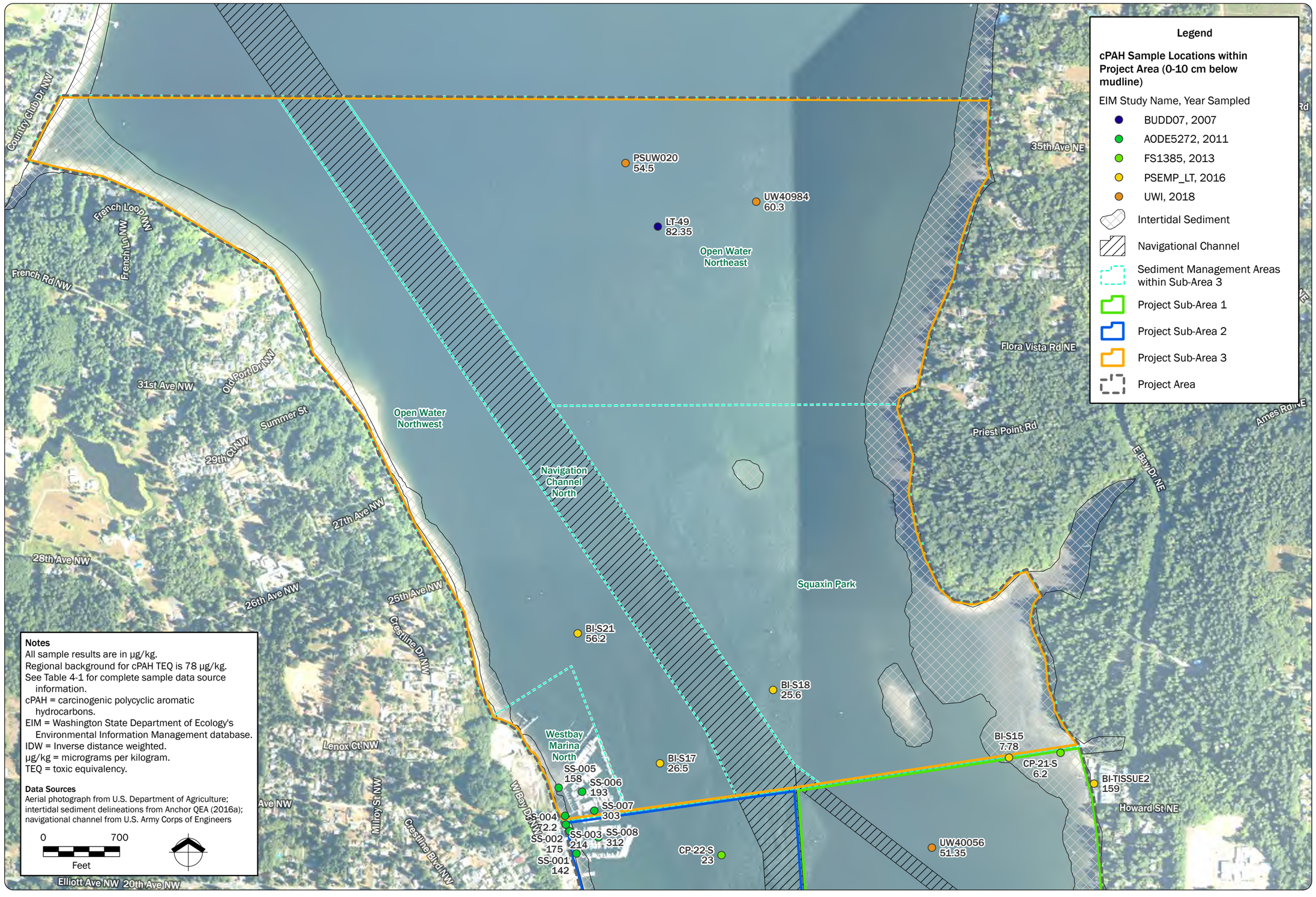
Path: C:\Workspace\0_MFA_Projects\M0781\03\002\Pro\M0781_03_002_005_SubArea_3_Data_Gaps.aprx\Fig 4-4 SA3 DGM Dioxin Furans Subsurface Sample Density
Print Date: 1/12/2026
Reviewed By: DOF
Produced By: jroberts
Project: M0781.03.002



Legend

cPAH Sample Locations within Project Area (0-10 cm below mudline)

EIM Study Name, Year Sampled

- BUDD07, 2007
- AODE5272, 2011
- FS1385, 2013
- PSEMP_LT, 2016
- UWI, 2018

- Intertidal Sediment
- Navigational Channel
- Sediment Management Areas within Sub-Area 3
- Project Sub-Area 1
- Project Sub-Area 2
- Project Sub-Area 3
- Project Area

Notes

All sample results are in µg/kg.
Regional background for cPAH TEQ is 78 µg/kg.
See Table 4-1 for complete sample data source information.
cPAH = carcinogenic polycyclic aromatic hydrocarbons.
EIM = Washington State Department of Ecology's Environmental Information Management database.
IDW = Inverse distance weighted.
µg/kg = micrograms per kilogram.
TEQ = toxic equivalency.

Data Sources

Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 700
Feet

Figure 4-5

January 12, 2026

cPAH Sediment Surface (0-10 cm below mudline) Sample Density

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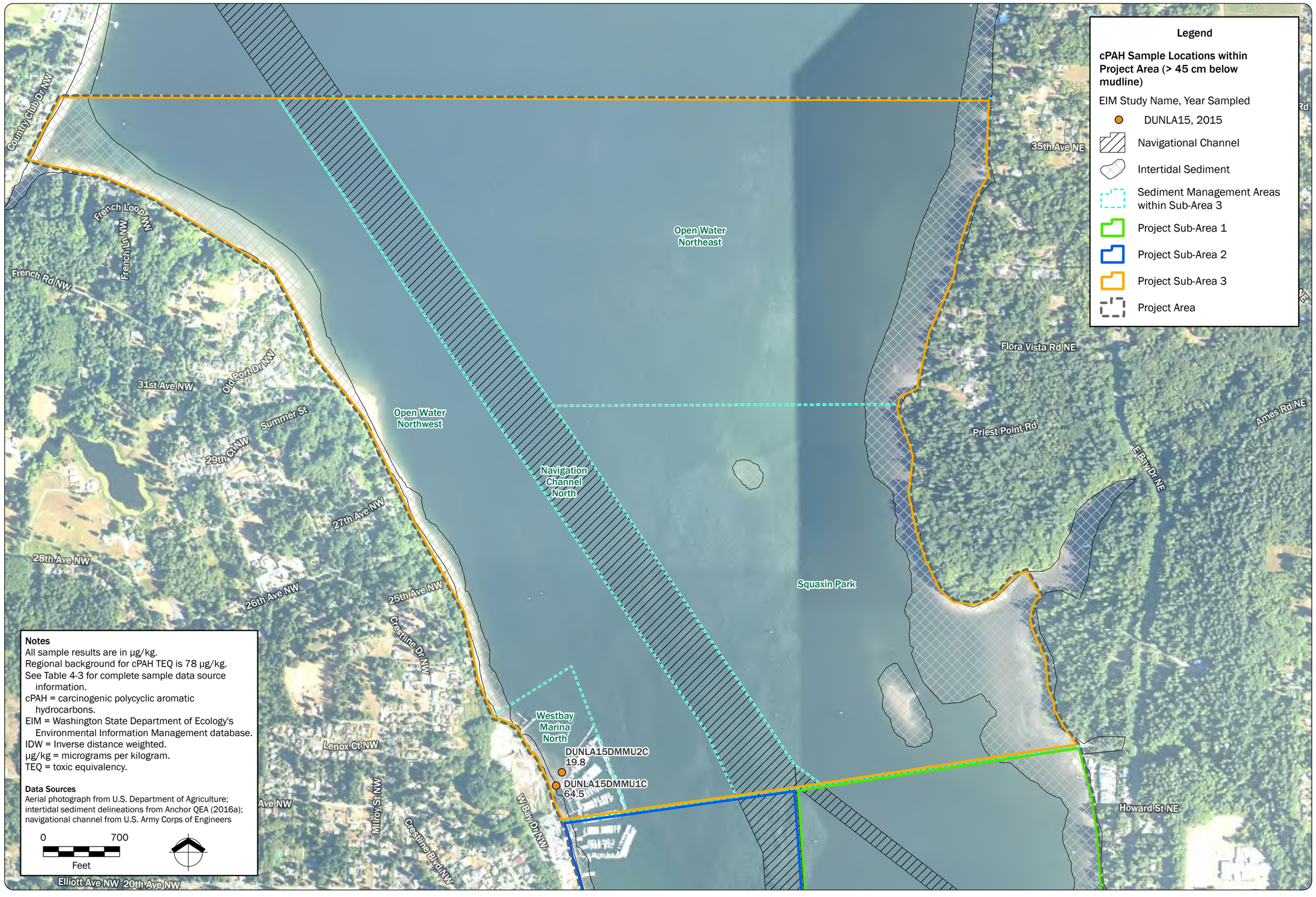

Notes
All sample results are in µg/kg.
Regional background for cPAH TEQ is 78 µg/kg.
See Table 4-3 for complete sample data source information.
cPAH = carcinogenic polycyclic aromatic hydrocarbons.
EIM = Washington State Department of Ecology's Environmental Information Management database.
IDW = Inverse distance weighted.
µg/kg = micrograms per kilogram.
TEQ = toxic equivalency.

Data Sources
Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 700
Feet

Figure 4-6
January 12, 2026

cPAH Sediment Subsurface (> 45 cm below mudline) Sample Density

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Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

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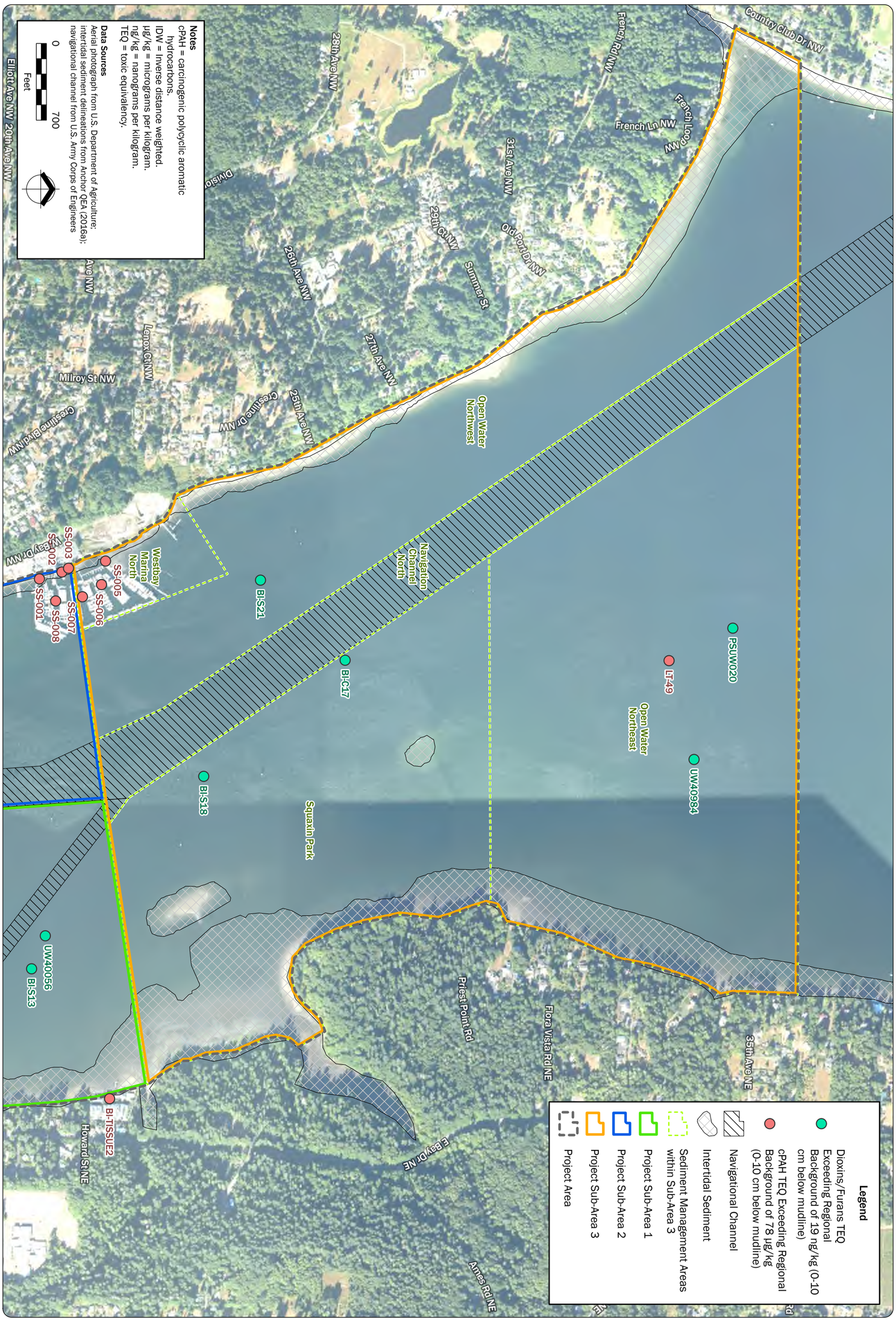
Path: C:\Workspace\O_MFA_Projects\M0781.03\002\Pro\M0781_03_002_005_Subarea_3_Data_Gaps.aprx\Fig 4-6 SA3 DGM cPAH Subsurface Sample Density
Print Date: 1/12/2026
Reviewed By: DOF
Produced By: jroberts
Project: M0781.03.002



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Dioxin/Furans and cPAH TEQ Sediment Surface (0-10 cm below mudline) Regional Background Exceedance

Figure 4-7
January 12, 2026

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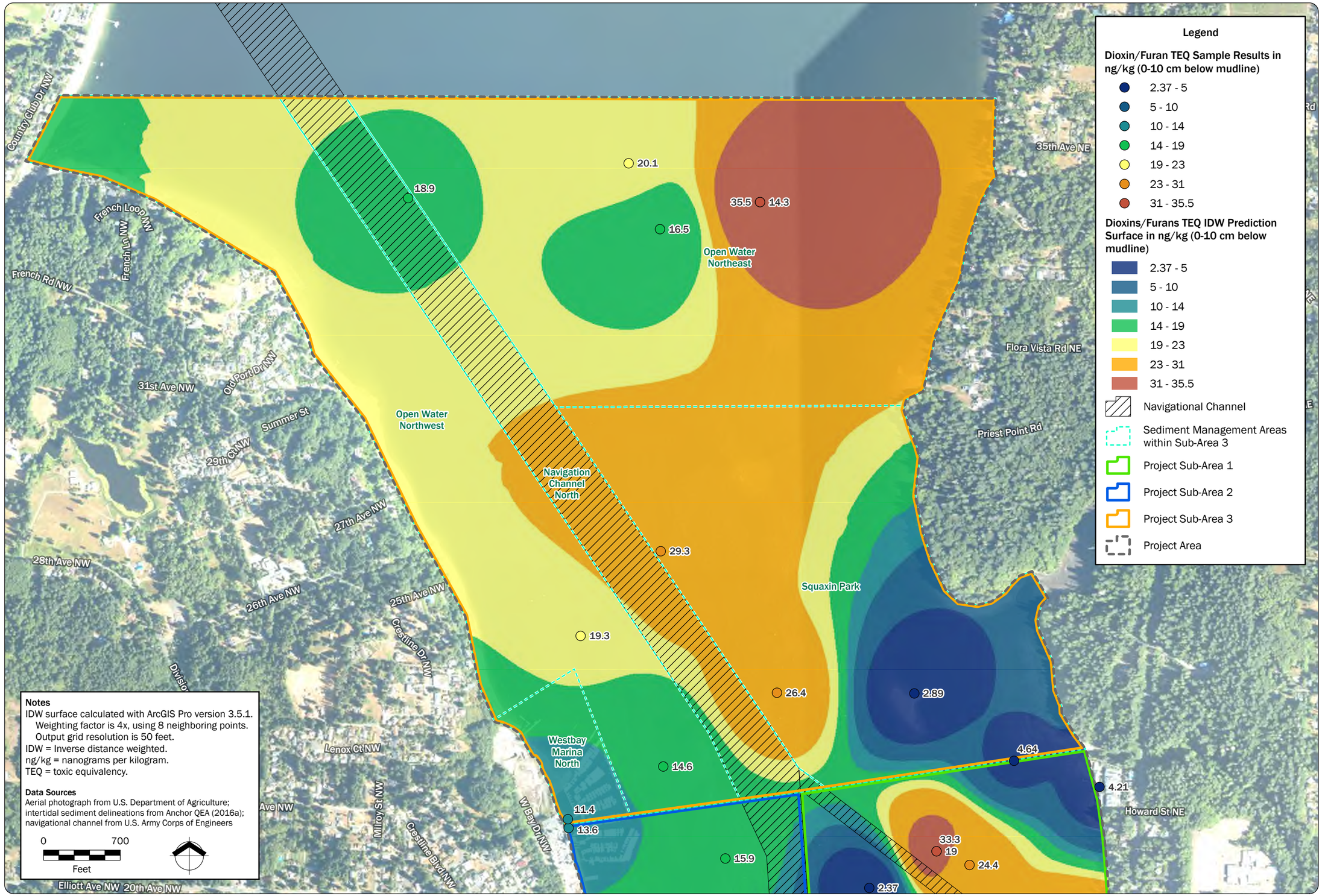

Notes
IDW surface calculated with ArcGIS Pro version 3.5.1.
Weighting factor is 4x, using 8 neighboring points.
Output grid resolution is 50 feet.
IDW = Inverse distance weighted.
ng/kg = nanograms per kilogram.
TEQ = toxic equivalency.

Data Sources
Aerial photograph from U.S. Department of Agriculture; intertidal sediment delineations from Anchor QEA (2016a); navigational channel from U.S. Army Corps of Engineers

0 700
Feet

Legend

Dioxin/Furan TEQ Sample Results in ng/kg (0-10 cm below mudline)
- 2.37 - 5
- 5 - 10
- 10 - 14
- 14 - 19
- 19 - 23
- 23 - 31
- 31 - 35.5

Dioxins/Furans TEQ IDW Prediction Surface in ng/kg (0-10 cm below mudline)
- 2.37 - 5
- 5 - 10
- 10 - 14
- 14 - 19
- 19 - 23
- 23 - 31
- 31 - 35.5

- Navigational Channel
- Sediment Management Areas within Sub-Area 3
- Project Sub-Area 1
- Project Sub-Area 2
- Project Sub-Area 3
- Project Area

Figure 4-9
January 12, 2025

Dioxins/Furans Sediment Surface (0-10 cm below mudline) Interpolation

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Budd Inlet - Olympia, WA
Project Sub-Area 3 Pre-Remedial Design
Data Gaps Memo

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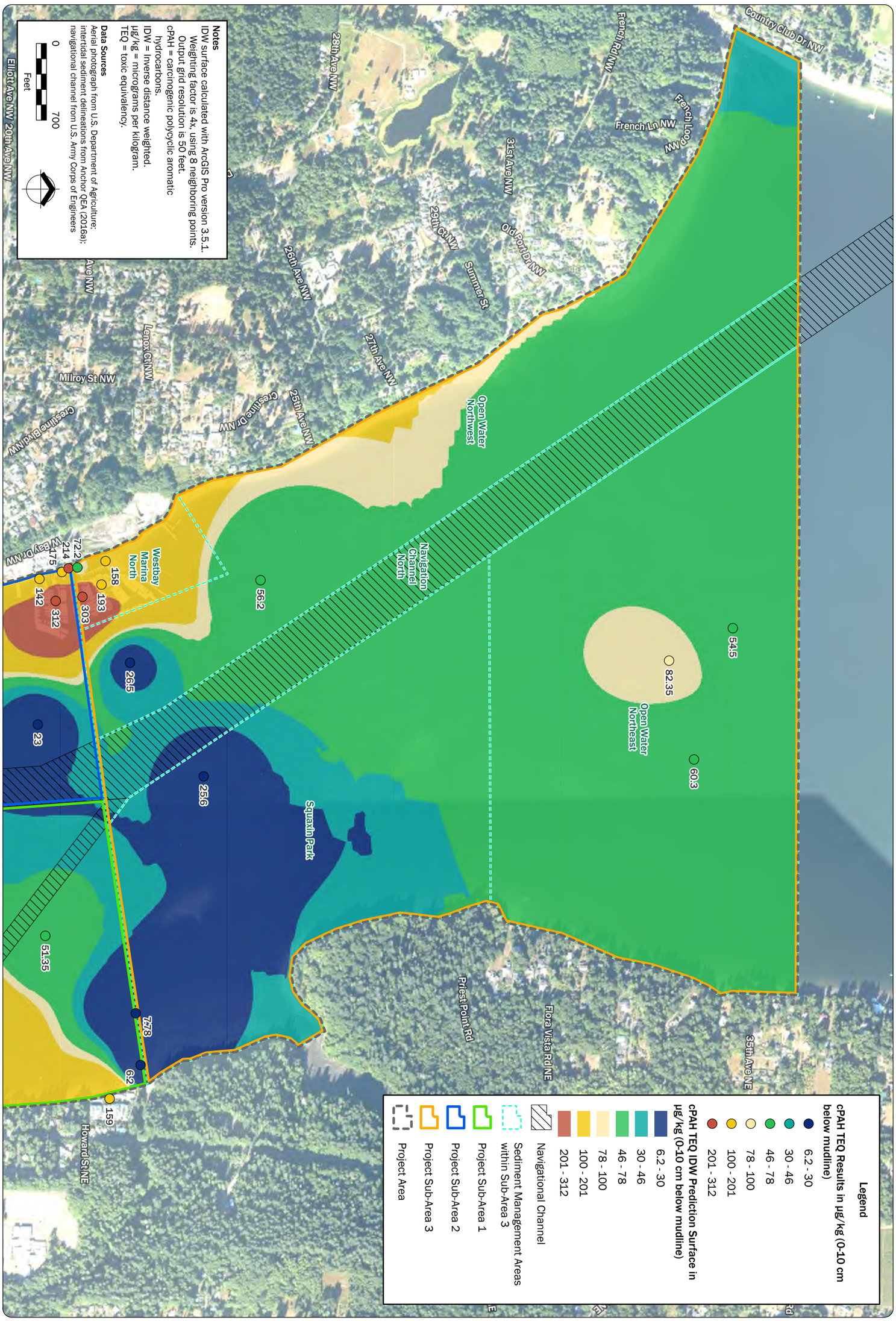
Path: G:\Workspace\0_MFA_Projects\M0781\03\002\Prv\M0781_03_002_005_SubArea_3_Data_Gaps.aprx\Fig 4-9 SA3 DGM Dioxins Furans Surface Interpolation
Print Date: 1/12/2026
Reviewed By: DOF
Produced By: jroberts
Project: M0781.03.002



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Budd Inlet - Olympia, WA
Project Sub-Area 3 Pre-Remedial Design Data Gaps Memo

cPAH Sediment Surface (0-10 cm below mudline) Interpolation

Figure 4-10
January 12, 2026

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Table 4-1
Sediment Management Area and Depth Summary—Surface Laboratory Results
Pre-Remedial Design Data Gaps Memorandum
Port of Olympia, Budd Inlet, Olympia Washington

Sample Location ID	Sample Date	SAMPLE_ID	EIM Study Name	Start Depth Below Mudline (cm)	End Depth Below Mudline (cm)	Sediment Management Area	Arsenic (mg/kg)	Cadmium (mg/kg)	Mercury (mg/kg)	Pentachlorophenol (ug/kg)	Total PCB Aroclors (ug/kg)	Dioxin /Furan like PCBs (ng/kg)	cPAHs TEQ (ug/kg)	Dioxins/Furans TEQ (ng/kg)
BI-C12	4/13/2007	25946139	BUDD07	0	10	Navigation Channel North	--	--	--	--	--	--	--	18.9 T
BI-S23	4/12/2007	25946207	BUDD07	0	10	Open Water Northeast	--	--	--	--	--	--	--	16.5 T
PSAMP_LT-49	4/18/2005	25946072	PSAMP_LT	0	3	Open Water Northeast	9.47	1.59	0.16	67 U	21 UT	**	100 T	--
PSAMP_LT-49	4/18/2005	25946073	PSAMP_LT	0	3	Open Water Northeast	10.2	1.64	0.19	68 UJ	18 JT	**	110 JT	--
PSAMP_LT-49	4/18/2005	25946074	PSAMP_LT	0	3	Open Water Northeast	10.2	1.64	0.319	63 UJ	8 JT	**	48.8 JT	--
PSAMP_LT-49	4/14/2010	25946036	PSAMP_LT	0	3	Open Water Northeast	12.1	1.57	0.201	190 UJ	14 T	**	71.9 JT	--
PSAMP_LT-49	4/14/2010	25946037	PSAMP_LT	0	3	Open Water Northeast	12.1	1.48	0.215	180 UJ	12 T	**	74.3 JT	--
PSAMP_LT-49	4/14/2010	25946038	PSAMP_LT	0	3	Open Water Northeast	10.8	1.33	0.181	180 UJ	21.2 T	**	64.4 JT	--
PSAMP_LT-49	4/14/2010	25946039	PSAMP_LT	0	3	Open Water Northeast	12.3	1.54	0.182	200 UJ	11 T	**	69.9 JT	--
PSAMP_LT-49	4/18/2016	25989203	PSEMP_LT	0	3	Open Water Northeast	12.4	1.86	0.177	--	17 JT	**	142 T	--
PSAMP_LT-49	4/18/2016	25989204	PSEMP_LT	0	3	Open Water Northeast	12.7	1.84	0.188	--	11.2 T	**	70.9 JT	--
PSAMP_LT-49	4/18/2016	25989205	PSEMP_LT	0	3	Open Water Northeast	12.9	1.96	0.213	--	17.5 JT	**	56.5 T	--
PSAMP_LT-49	4/18/2016	25989206	PSEMP_LT	0	3	Open Water Northeast	12.3	1.85	0.419	--	11 T	**	60 T	--
PSUW020	6/2/2011	25970400	BuddOakDioxins_EIMhistorical	0	10	Open Water Northeast	--	--	--	--	--	--	--	20.1 JT
PSUW020	6/2/2011	25970446	UWI2011_EIMhistorical	0	3	Open Water Northeast	11.5	1.44	0.178	210 UJ	11 T	**	65.9 T	--
PSUW020	6/12/2018	25989230	UWI	0	3	Open Water Northeast	13.6	1.77	0.211		11.9 JT	**	54.5 T	--
UW40984	6/6/2011	25970418	BuddOakDioxins_EIMhistorical	0	10	Open Water Northeast						--	--	35.5 JT
UW40984	6/6/2011	25970464	UWI2011_EIMhistorical	0	3	Open Water Northeast	10.5	1.72	0.219	220 UJ	28.7 T	**	86.4 T	14.3 JT
UW40984	6/12/2018	25989262	UWI	0	3	Open Water Northeast	11.8	1.92	0.21		13.6 JT	**	60.3 T	--
BI-S17	4/13/2007	25946202	BUDD07	0	10	Open Water Northwest	7.16 T	1.87	0.119	140 U	11 T	--	26.5 T	14.6 T
BI-S21	4/13/2007	25946206	BUDD07	0	10	Open Water Northwest	--	--	--	160 U	10 T	--	56.2 T	19.3 T
BI-C17	4/14/2007	25946165	BUDD07	0	10	Open Water Southeast	--	--	--	--	--	--	--	29.3 T
BI-S18	4/14/2007	25946203	BUDD07	0	10	Open Water Southeast	--	--	--	170 U	12 T	--	25.6 T	26.4 T
BI-S19	4/14/2007	25946204	BUDD07	0	10	Open Water Southeast	--	--	--	--	--	--	--	2.89 T
HC-Westbay-SS-005	3/30/2011	25946409	AODE5272	0	10	Westbay Marina North	16 U	2.9	0.09	200 U	9.9 U	--	158 T	--
HC-Westbay-SS-006	3/30/2011	25946410	AODE5272	0	10	Westbay Marina North	17	3.8	0.12	200 U	1100 T	--	193 T	--
HC-Westbay-SS-007	3/30/2011	25946411	AODE5272	0	10	Westbay Marina North	16	3.8	0.15	200 U	9.9 U	--	303 T	--

Notes:

** = not applicable, not all analytes were reported.

-- = no result or value reported.

E = result exceeded laboratory calibration range (historical laboratory qualifier).

J = estimated value.

T = result is based on calculation.

U = result is non-detect to reporting limit.

Abbreviations:

cm = centimeter

cPAH = carcinogenic polycyclic aromatic hydrocarbons

Ecology = Washington State Department of Ecology

EIM = Ecology's Environmental Information Management database (https://apps.ecology.wa.gov/eim/search/default.aspx)

ID = identification

TEQ = toxic equivalency [TEQ calculated as the sum of each constituent concentration multiplied by the corresponding mammalian toxic equivalent factor. Non-detect results are multiplied by one-half the detection/reporting limit (as applicable).]

Table 4-2
Sediment Management Area and Depth Summary—Subsurface Laboratory Results
Pre-Remedial Design Data Gaps Memorandum
Port of Olympia, Budd Inlet, Olympia Washington

Sample Location ID	Sample Date	SAMPLE_ID	EIM Study Name	Start Depth Below Mudline (cm)	End Depth Below Mudline (cm)	Sediment Management Area	Arsenic (mg/kg)	Cadmium (mg/kg)	Mercury (mg/kg)	Pentachlorophenol (ug/kg)	Total PCB Aroclors (ug/kg)	Dioxin /Furan like PCBs (ng/kg)	cPAHs TEQ (ug/kg)	Dioxins/Furans TEQ (ng/kg)
BI-C12	4/2/2007	25946140	BUDD07	60	90	Navigation Channel North	--	--	--	--	--	--	--	0.258 T
BI-C12	4/2/2007	25946142	BUDD07	100	200	Navigation Channel North	--	--	--	--	--	--	--	0.2 T
OHPSD0224-S8	3/7/2006	25988635	OHPSD06	0	100	Navigation Channel North	--	--	--	--	--	--	--	0.258 JT
OHPSD0224-S8	3/7/2006	25988636	OHPSD06	0	100	Navigation Channel North	--	--	--	--	--	--	--	0.166 JT
OHPSD0224-S9	3/7/2006	25988637	OHPSD06	0	94	Navigation Channel North	--	--	--	--	--	--	--	6.7 JT
OHPSD0224-S10	3/7/2006	25988603	OHPSD06	0	73	Navigation Channel North	--	--	--	--	--	--	--	32 T
OHPSD0224-S11	3/7/2006	25988604	OHPSD06	0	55	Navigation Channel North	--	--	--	--	--	--	--	6.17 JT
OHPSD0224-S47	3/9/2006	25988629	OHPSD06	60	90	Navigation Channel North	--	--	--	--	--	--	--	0.168 JT
BI-C17	4/2/2007	25946166	BUDD07	30	60	Open Water Southeast	--	--	--	--	--	--	--	0.761 T
BI-C17	4/2/2007	25946167	BUDD07	90	100	Open Water Southeast	--	--	--	--	--	--	--	0.177 T
DUNLA15C1	12/4/2015	25989396	DUNLA15	351	370	Westbay Marina North	--	--	--	--	--	--	--	15.1 T
DUNLA15DMMU1C	3/13/2015	25989390	DUNLA15	198	229	Westbay Marina North	2.6	0.2	0.03	29	--	--	64.5 T	159 T
DUNLA15DMMU2C	3/13/2015	25989391	DUNLA15	200	230	Westbay Marina North	2.7	0.6	0.07	20 U	--	--	19.8 T	229 T

Notes:

-- = no result or value reported.

E = result exceeded laboratory calibration range (historical laboratory qualifier).

J = estimated value.

T = result is based on calculation.

U = result is non-detect to reporting limit.

Abbreviations:

cm = centimeter

cPAH = carcinogenic polycyclic aromatic hydrocarbons

Ecology = Washington State Department of Ecology

EIM = Ecology's Environmental Information Management database (https://apps.ecology.wa.gov/eim/search/default.aspx)

ID = identification

TEQ = toxic equivalency [TEQ calculated as the sum of each constituent concentration multiplied by the corresponding mammalian toxic equivalent factor. Non-detect results are multiplied by one-half the detection/reporting limit (as applicable).]

Table 4-3
Sediment Study Summary
Pre-Remedial Design Data Gaps Memorandum
Port of Olympia, Budd Inlet, Olympia Washington

EIM Study Name	Study Description	Submitting Organization	# Discrete Samples[(a)]	Year	Sub-Area(s)	Chemical Groups Analyzed	Depth Intervals
CASMON03	Budd Inlet Dioxin & Tissue Mon-Post Sediment Remediation - Cascade Pole Company (CPC)	Unknown	9	2002	1, 2	Dioxins/Furans, Conventionals	Subsurface
CASCON03	Cascade Pole Sed Confirm Monitoring 2003	Unknown	1	2003	1	Dioxins/Furans, Conventionals	Subsurface
EB PSDDA*	East Bay PSDDA Characterization. *Not found in EIM. Originally cited in Anchor QEQ 2016b.	Unknown	16	2005	1	Dioxins/Furans, Metals, PCBs, Pesticides, SVOCs, VOCs, Conventionals	Subsurface
AJOH0049	Toxics in stormwater runoff from PS boatyards	Ecology	1	2006	1	Metals, PCBs, VOCs, Conventionals	Surface
NOAA-Mussel-1986-08	NOAA Mussel Watch Program	Hart Crowser	1	2006	NA (Upper Budd Inlet)	Metals, Pesticides, SVOCs,	Near Surface
OHPSD06	Olympia Harbor - Supplemental Dioxin Study, DY07	USACE	40	2006	2, 3	Dioxins/Furans, Metals, Pesticides, SVOCs, VOCs, Conventionals	Surface, Near Surface, Subsurface
Budd Inlet Hardel 07	C396_Hardel EIM Results	Integral	4	2007	2	Dioxins/Furans, Metals, PCBs, Pesticides, SVOCs, Conventionals	Surface
Budd Inlet W Bay 07	West Bay of Budd Inlet - Sediment Characterization Study: Berths 2 and 3 Interim Action Project.	Integral	23	2007	1, 2	Dioxins/Furans, Conventionals	Surface, Subsurface
BUDD07	Budd Inlet Sediment Characterization	SAIC	95	2007	1, 2, 3	Dioxins/Furans, Metals, PCBs, SVOCs, Conventionals	Surface, Subsurface
FS94656838Ph2	Solid Wood Inc. (West Bay Park) Rail Spur Phase II Environmental Site Assessment, Olympia, WA. Agreed Order # DE-08-TCP SR-5415	Parametrix	7	2007	1, 2	Dioxins/Furans, Conventionals	Surface
PERLA08	Percival Landing Redevelopment Project - Antidegradation Evaluation, DY10	USACE	6	2008	2	Dioxins/Furans, Metals, PCBs, Pesticides, SVOCs, VOCs, Conventionals	Subsurface
VCSW0762	Washington Department of Natural Resources (DNR) Marine Station, Olympia, WA (Federal ID Number: WAD337696)	Landau	16	2008	NA (Upper Budd Inlet)	Metals, PCBs, Pesticides, SVOCs, Conventionals	Subsurface
WB1577RIFS	Solid Wood Inc. (West Bay Park) RI/FS, Olympia, WA. Agreed Order # DE-08-TCP SR-5415	Parametrix	78	2008-2014	1, 2	Dioxins/Furans, Metals, PCBs, SVOCs, TPH, Conventionals	Surface, Subsurface
UWI	Urban Waters Initiative	Ecology	366	2018-2019	1, 2, 3	Metals, PCBs, Pharmaceuticals, SVOCs, Conventionals	Surface
2010_Unocal RIFS	RIFS, Former Unocal Bulk Plant 0828 and Hulco Property	Anchor QEA	19	2010-2011	2	Metals, TPH, VOCs, Conventionals	Surface, Subsurface
BuddOakDioxins	Budd Inlet and Oakland Bay Dioxin Study	Ecology	83	2011	1, 2, 3	Dioxins/Furans, Conventionals	Surface
OLYYC11	Olympia Yacht Club, DY13	USACE	14	2011	2	Dioxins/Furans, Metals, PCBs, Pesticides, SVOCs, Conventionals	Subsurface
UWI2011	Urban Waters Initiative	Ecology	66	2011	1, 2, 3	Dioxins/Furans, Metals, Pesticides, SVOCs, Conventionals	Surface
AODE5272	West Bay Marina Remedial Investigation, Olympia, WA	Hart Crowser	13	2009-2011	2, 3	Dioxins/Furans, Metals, PCBs, Pesticides, SVOCs, TPH, Conventionals	Surface
G1300053	Port of Olympia Budd Inlet Sediment Site 2013	Anchor QEA	223	2013	1, 2	Dioxins/Furans, Metals, PCBs, SVOCs, Conventionals	Surface, Near Surface, Subsurface
DUNLA15	Dunlap Towing, Olympia, WA, DY15	USACE	17	2015	3	Dioxins/Furans, Metals, SVOCs, VOCs, Conventionals	Subsurface

Table 4-3
Sediment Study Summary
Pre-Remedial Design Data Gaps Memorandum
Port of Olympia, Budd Inlet, Olympia Washington

EIM Study Name	Study Description	Submitting Organization	# Discrete Samples[(a)]	Year	Sub-Area(s)	Chemical Groups Analyzed	Depth Intervals
PSEMP_LT	Puget Sound Ecosystem Monitoring Program Long Term Sediment Component	Ecology	27	2016-2021	3	Metals, Pesticides, PFAS, SVOCs, Conventionals	Surface
LOTT2019	LOTT CWA 2019 Sediment Monitoring NPDES Permit No. WA0037061	Herrera Environmental Consultants	8	2019	1, 2	Metals, PCBs, SVOCs, Conventionals	Surface
FS1385	Cascade Pole Longterm Groundwater Compliance Monitoring and Sediment Sampling, Olympia, WA	Landau	103	2007-2022	1, 2	Dioxins/Furans, SVOCs, Conventionals	Surface, Near Surface, Subsurface
OlyMarineTerminal08	Port of Olympia: Berth 2 & 3 Interim Action Cleanup Sampling to Characterize Pre-Dredge, Post-Dredge, and Post-Cover conditions	Anchor QEA	183	2008-2010	2	Dioxins/Furans, Conventionals	Surface, Near Surface, Subsurface

Notes:

*Not documented in EIM. Cited in Anchor QEA 2016b.

[(a)]Discrete samples for all sub-areas.

Depth intervals are 0-10 cm for surface, 10-45 cm for near-surface, and >45 cm for subsurface.

Abbreviations and Acronyms:

cPAH = carcinogenic polycyclic aromatic hydrocarbons.
CPC = Cascade Pole Company
DNR = Washington State Department of Natural Resources
Ecology = Washington State Department of Ecology
EIM = Ecology's Environmental Information Management database (https://apps.ecology.wa.gov/eim/search/default.aspx)
ID = Identification
Integral = Integral Consulting, Inc.
Landau = Landau Associates, Inc.
LOTT = Lacey Olympia Tumwater Thurston County.
NOAA = National Oceanic and Atmospheric Administration
PSDDA = Puget Sound Dredged Disposal Analysis
SAIC = Science Applications International Corporation
USACE = US Army Corps of Engineers
WA = Washington