# INVESTIGATION WORK PLAN
# BUDD INLET SEDIMENT SITE


**Prepared by**

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**On behalf of**

Port of Olympia

915 Washington Street NE

Olympia, Washington 98501


**October 2012**

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACGs | analytical concentration goals |
| Alternatives | Identification and Evaluation of Interim Action Alternatives |
| Memo | Memorandum |
| AO | Agreed Order |
| CSL | Cleanup Screening Level |
| CSO | Combined sewer overflow |
| COPCs | contaminants of potential concern |
| D/F | dioxin and furan |
| Ecology | Washington State Department of Ecology |
| EIM | Environmental Information Management |
| EISDGM | Existing Information Summary and Data Gaps Memorandum |
| GIS | geographic information system |
| HASP | Health and Safety Plan |
| IAP | Interim Action Plan |
| Initiative | Puget Sound Initiative |
| MLLW | mean lower low water |
| MTCA | Model Toxics Control Act |
| Olympia | City of Olympia |
| OSHA | Occupational Safety and Health Administration |
| Port | Port of Olympia |
| PAHs | polycyclic aromatic hydrocarbons |
| PCBs | polychlorinated biphenyls |
| PSEP | Puget Sound Estuary Program |
| QA/QC | quality assurance/quality control |
| QAPP | quality assurance project plan |
| RCW | Revised Code of Washington |
| SAP | sampling and analysis plan |
| SMS | Sediment Management Standards |
| SOW | Statement of Work |
| SQS | Sediment Quality Standards |
| TEQ | toxicity equivalency |
| USEPA | U.S. Environmental Protection Agency |
| WAC | Washington Administrative Code |

# 1 INTRODUCTION

The Port of Olympia (Port) is implementing activities required under the Washington State Department of Ecology's (Ecology's) Amendment to Agreed Order (AO) No. DE 6083 (Ecology 2012). The amended AO requires the Port to undertake work to define the nature and extent of contamination in the Study Area (Figure 1-1), investigate potential sources of contamination to sediments in East and West Bays of Budd Inlet, prepare an Investigation Report, identify and analyze interim action alternatives for the Study Area, and prepare a draft Interim Action Plan (IAP)[1] for contaminated sediments in the Study Area. The purpose of these remedial actions is to provide sufficient data, analysis, and evaluations into the nature and extent of contamination in the Study Area, which includes the Port's berthing areas, log pond, and under the Marine Terminal pier in West Bay, and in-water areas adjacent to the Port's properties in East Bay of Budd Inlet (Figure 1-2) to enable Ecology to evaluate interim action alternatives to address contamination above applicable cleanup levels in the Study Area and to provide additional information to Ecology on potential sources of contamination to sediments in Budd Inlet.

This Investigation Work Plan (Work Plan) describes the remedial actions that will be undertaken by the Port as it develops a draft IAP. The Work Plan complies with the requirements of the AO and the AO's accompanying Exhibit G, Statement of Work (SOW), signed by the Port and Ecology for conducting activities necessary to develop the draft IAP. The following six tasks were identified in the SOW and are briefly described below:

### Task 1 – Investigation Work Plan

This Work Plan, which addresses the requirements of SOW Task 1, presents the steps and deliverables that will be prepared to collect and evaluate data to support development of the Interim Action Alternatives and draft IAP.

Task 1 also includes development of the Existing Information Summary and Data Gaps Memorandum (EISDGM), which assembles readily available data and other site information and identifies data appropriate for project use. The EISDGM is being developed concurrent

[1] Approval of a Final Interim Action Work Plan and implementation of the interim action are not a part of the 2012 amendment to the AO. Ecology and the Port intend to negotiate a second amendment to the AO for approval and implementation of an interim action.

with this Work Plan. Data and information summarized in the EISDGM will be used to identify and prioritize data gaps to determine nature and extent of contamination, develop and evaluate potential remedial alternatives, and develop the IAP. The data gaps assessment identifies areas of further study to address the identified data gaps. Final project data needs will be identified collectively with Ecology.

Subsequent to Ecology review and approval of the Work Plan and the EISDGM, Task 1 also includes development of the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) to describe detailed methodologies, approaches, and descriptions of the analyses the Port proposes to conduct for each of the identified data gaps. Development of the EISDGM, SAP, and QAPP are described in Section 3.1 and 3.2.

**Task 2 - Implement Investigation Work Plan**

Task 2 involves conducting the investigation in accordance with the Work Plan as approved by Ecology and its associated schedule. Field sampling and analysis will be conducted in accordance with the Ecology approved SAP and QAPP.

**Task 3 – Investigation Report**

The results of the investigation efforts conducted under Task 2 will be presented in a Draft and Final Investigation Report (Section 3) that will provide validated analytical results (Section 3.3).

**Task 4 – Identification and Evaluation of Interim Action Alternatives Memorandum**

The Identification and Evaluation of Interim Action Alternatives Memorandum (Alternatives Memo) will identify and evaluate potential remedial alternatives, following Ecology's final approval of the Investigation Report (Section 4).

**Task 5 – Draft Interim Action Plan**

The IAP will be developed for the Ecology preferred interim action following Ecology review and approval of the Alternatives Memo. Development of the draft IAP is discussed in Section 5.

**Task 6 - Progress Reports**

Progress reports will be submitted to Ecology monthly with updates on the progress and status of the project, as discussed in Section 6.

## 1.1 Site Regulatory Background

In May 2007, the Puget Sound Initiative (Initiative) was enacted to begin work restoring the health of Puget Sound by 2020. One of the objectives of the Initiative is to protect and restore Puget Sound by cleaning up contaminated sites within one-half mile of Puget Sound. These cleanup actions are designed to reduce pollution and restore habitat and shorelines in Puget Sound (Ecology 2008b). Ecology identified Budd Inlet as a high priority cleanup area that required focused sediment cleanup and source control primarily due to elevated dioxin and furan (D/F) concentrations in sediment. In April 2007, Ecology began a bay-wide investigation of the sediments in Budd Inlet. As part of the Initiative, Ecology is issuing AOs to property owners to investigate and cleanup contaminated sites within the Budd Inlet Sediment Site.

The remedial action for the Port's Study Area will be carried out as an interim remedial action within the Budd Inlet Sediments Site, which is one of seven bays identified by Ecology's Initiative as priority bays in Puget Sound. Under the Model Toxics Control Act's (MTCA's) current regulatory framework, the remedial action will be interim since Ecology is still evaluating the sediment quality in all of Budd Inlet and has not yet defined the boundary of the Budd Inlet Sediment Site. Until Ecology has completed its assessment of Budd Inlet and developed recommended actions, all actions conducted within Budd Inlet are interim; however, it is Ecology's goal for interim actions to be the final remedy for the cleanup sites within Budd Inlet.

Ecology and the Port signed AO No. DE 6083 on December 5, 2008, which requires the Port to perform remedial actions in response to releases of hazardous substances at the Budd Inlet Sediments Site (Ecology 2008a). In compliance with the AO, the Port completed an interim action to remove elevated concentrations of D/F in sediment from portions of the berth area adjacent to its docking facility in West Bay of Budd Inlet. The project also served as a pilot study to assess the characteristics of the in-place sediments and analysis of the benefits of proposed dredging technologies for future cleanup of Budd Inlet.

The AO was amended on February 15, 2012, requiring the Port to "conduct additional remedial actions at a portion of a facility where there has been a release or threatened release of hazardous substances. The Site boundaries have not yet been defined. The remedial actions required by the Amendment include investigation of the nature and extent of contamination within the Study Area, investigation into potential sources of contamination to sediments in the vicinity of the Port's peninsula in Budd Inlet, preparation of an Investigation Report, identification and analysis of remedial action alternatives to address sediments containing contaminants above applicable cleanup levels in the Study Area, and preparation of a draft Interim Action Plan" (Ecology 2012).

Use of interim actions may result in a faster and more cost effective cleanup and is consistent with Washington Administrative Code (WAC) 173-340-430. To complete cleanup activities with the Study Area in an efficient manner, Ecology may select a remedial action alternative that will be implemented as an Interim Action. As defined by Ecology, an interim remedial action:

- Is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance;
- Corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed; or
- Is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study, or a cleanup action design.

The Cascade Pole site is another cleanup site the Port has been addressing under separate MTCA AOs or Consent Decrees since 1990, and is located within the northwest portion of the Study Area. In 1995, the Port took over the responsibility for cleaning up the Cascade Pole site , which includes both upland and aquatic areas with previous cleanup activities (Figure 1-2). The previous cleanup activities include several interim actions to remove and contain contamination on both the uplands and in the sediments. The Port continues to conduct ongoing Cascade Pole site cleanup activities and monitoring under a separate AO with Ecology.

## 1.2 Site Description

The Port is located in the northern portion of the City of Olympia (Olympia) on a peninsula within Budd Inlet, which is a small embayment in southern Puget Sound (Figure 1-1). Budd Inlet is divided into the West and East Bays in the southernmost point of Budd Inlet. The filling of tidelands in the late 1800s and early 1900s created the Port's peninsula, the West and East Bays of Budd Inlet, and the downtown area of Olympia. The Port peninsula consists of approximately 150 acres; the entire Study Area is approximately 271 acres. The construction of the peninsula was the last phase of tideland filling that occurred from the late 1800s through the early 1900s to accommodate the growing City of Olympia (Port of Olympia 2008).

### *1.2.1 West Bay*

The Olympia Harbor federal navigation channel extends into Budd Inlet West Bay and widens into a turning basin near its southern end, adjacent to the Port's Marine Terminal berthing area (Figure 1-3). The navigation channel is 500 feet wide, and the turning basin is 900 feet wide, each of which is authorized to elevation -30 feet mean lower low water (MLLW). The Port manages the harbor area under a Port Management Agreement with Washington State Department of Natural Resources. Along the marine terminal, the harbor area is mostly defined as a 54-foot-wide swath that extends from the south end of the marine terminal to the north end and beyond (Figure 1-3). This narrow swath extends from the face of the Port's marine terminal pier landward, thus including the under-pier area of the marine terminal. Waterward of the Marine Terminal, the Port's berthing areas are within the federal turning basin (Port of Olympia 2008).

The Marine Terminal is approximately 60 acres and provides approximately 2,500 lineal feet of wharf and 76,000 square feet of warehousing. Three modern ships, or a combination of vessels, can be hosted simultaneously at the Marine Terminal. Current land use immediately adjacent to the berths and turning basin includes log storage yards and loading docks (Port of Olympia 2008).

The area south of the Study Area includes a boat basin and waterfront shops and restaurants. West Bay also contains three marinas: Fiddlehead, Martin, and the Olympia Yacht Club.

Within West Bay, five contaminated sites under separate AOs with Ecology are located along the western shoreline: West Bay Marina, Hardel Mutual Plywood, Reliable Steel, Solid Wood, and Industrial Petroleum, Inc. (Figure 1-4).

At the southern end of West Bay, the Deschutes River drains into Capitol Lake. This area was once an estuary where freshwater from the Deschutes River intermingled with saltwater from Budd Inlet. The lake was created in 1951 as a reflection pond for the state capital by installing an earthen dam and a 82-foot-wide tide gate with spillways across the mouth of the Deschutes river under the 5th Avenue Bridge in Olympia (USGS 2006). The flow of freshwater into West Bay is controlled by gated discharges from Capitol Lake.

### *1.2.2 East Bay*

A second federal navigation channel is authorized from north of the peninsula that extends into East Bay and is authorized to elevation –13 feet MLLW. The primary commercial facilities in East Bay are Swantown Marina and Boatworks, located on the eastern side of the peninsula (Figure 1-3). The federal navigation channel also extends to the boat launch ramp located just north of Swantown Marina. Swantown Marina has been in operation since 1983 and is owned and operated by the Port and maintains slips for approximately 700 vessels. Swantown Boatworks provides vessel service, haul out, and a vessel storage facility.

Two contaminated sites under AOs with Ecology are located on the Port's peninsula adjacent to the East Bay (Figure 1-4). The Cascade Pole cleanup site is located on the north end of the peninsula that includes a portion of the sediment within East Bay, and the East Bay redevelopment site is on the southern portion of the peninsula.

Moxlie Creek, which originates from an artesian spring approximately 1.5 miles south of Budd Inlet, flows into East Bay through a mile-long culvert that discharges into the southern end of East Bay (Thurston County 2007). East Bay was placed on the 1998 303(d) impaired water list for polychlorinated biphenyls (PCBs) based on a single composite sample of mussel tissue collected from the culvert at the mouth of Moxlie Creek (Ecology 2003 as cited in SAIC 2008).

### 1.2.3 Study Area Boundary

The AO Amendment defines the Study Area boundary and is shown on Figure 1-2 however, the interim action remediation boundary may extend beyond the Study Area. The Study Area boundary includes the aquatic areas adjacent to property owned by the Port as well as the Port's berthing areas, under pier areas, and log pond in West Bay, and areas adjacent to Port property north of the peninsula and in East Bay, as shown in Figure 1-2. The former Cascade Pole site is excluded from the Study Area since it is being investigated and remediated under a separate AO between the Port and Ecology (Figure 1-2).

### 1.2.4 Contaminants of Potential Concern

The contaminants of potential concern (COPCs) in the Study Area were identified based on sediment chemistry results for contaminants exceeding Washington State Sediment Management Standards (SMS) criteria or for chemicals that have been identified as being released, but do not have SMS criteria. The following COPCs were identified:

- Dioxins and furans
- Acenaphthene
- Mercury

Elevated dioxin and furan concentrations have been identified in surface and subsurface sediment. Acenaphthene was detected above Sediment Quality Standards (SQS) criteria in one subsurface sediment sample within the Study Area (BI-C5, 6-7 foot interval, located in the Port's berthing area just north of the Berth 2 & 3 interim action area). Mercury was detected above Cleanup Screening Level (CSL) criteria in the same subsurface sediment sample within the Study Area.

Other COPCs may include copper and lead due to the presence of these chemicals exceeding state water quality monitoring criteria in storm water. However, additional sediment analysis in the vicinity of the storm drain outfalls with these exceedances will be conducted to determine if elevated stormwater concentrations contribute to SMS exceedances in sediment. There may also be additional contaminants of concern associated with the Cascade Pole site. Besides dioxin, these include pentachlorophenol and PAHs. These may also be considered COPCs for the Study Area, pending further monitoring results. Recent

groundwater and soil compliance monitoring results indicate that contamination at Cascade Pole are below the site cleanup levels and do not appear to be migrating off-site (Landau 2011). The COPC list may expand as additional sediment data is collected, analyzed, and compared to SMS criteria. The COPC list may expand as additional sediment data is collected, analyzed, and compared to SMS criteria.

### *1.2.5 Other Contaminated Sites*

The southern portion of Budd Inlet has been used for a variety of industrial, commercial, and shipping activities since the 1890s. Due to the nature of the activities and historical practices, chemical releases have resulted in documented contamination at sites in the southern portion of Budd Inlet. Since 2007, under the Initiative, Ecology has been investigating the Budd Inlet Sediment Site, primarily focusing on D/Fs in addition to SMS chemicals. In addition to the Port peninsula Study Area, there are seven other contaminated sites within the Budd Inlet Sediment Site that are in various stages of investigation, remediation, or completion. Table 1-1 summarizes other contaminated sites in the vicinity of the Study Area and within the Budd Inlet Sediment Site. The locations of the contaminated sites are shown on Figure 1-4.

**Table 1-1**
**Summary of Other Contaminated Sites under AOs with Ecology with in Budd Inlet**

| Project Name | Contaminants of Concern | Current Status |
|---|---|---|
| **West Bay** | | |
| Solid Wood, Inc. | TPHs and cPAHs | Phase 1 complete and opened as West Bay Park; Remedial Investigation ongoing for additional portions of the site |
| Reliable Steel, Inc. | Arsenic, copper, and TPHs | Remedial Investigation ongoing |
| Industrial Petroleum, Inc. | TPHs and lead | Remedial Investigation ongoing |
| Hardel Mutual Plywood | TPHs, cPAHs, and NAPL | Cleanup Action Plan is in public review; contaminated soil removed and groundwater treated; Ecology is proposing to remove the site from the Hazardous Sites List |
| West Bay Marina | Copper, nickel, zinc, arsenic, and dioxins | Remedial Investigation ongoing |

| Project Name | Contaminants of Concern | Current Status |
|---|---|---|
| **East Bay** | | |
| Cascade Pole | PAHs, PCP, and dioxins | Interim Actions complete; long-term monitoring ongoing |
| East Bay Redevelopment | TPHs, cPAHs, dioxins, and metals | Remedial Investigation/Feasibility Study ongoing |

Notes:
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
NAPL = non aqueous phase liquid
PAHs = polycyclic aromatic hydrocarbons
PCP = pentachlorophenol
TPHs = total petroleum hydrocarbons

## 1.3 Evaluation of Cleanup Requirements under SMS and MTCA

The approach and schedule presented in this Work Plan have been developed based on Ecology's prior input and consideration. In fully defining the nature and extent of contamination in the Study Area, investigating the potential sources of contamination to sediments in East and West Bays of Budd Inlet, and in evaluating interim action alternatives, the requirements of WAC 173-340-350 through 370 and WAC 173-204-560 through 580 must be followed. The remedial actions, as identified in the AO Amendment, will be conducted in accordance with Chapter 70.105D Revised Code of Washington (RCW), WAC 173-340, and WAC 173-204. Conducting an interim action does not relieve the Port of responsibility to conduct future remedial action(s) within the Study Area, if and to the extent required under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

## 1.4 Document Organization

The remainder of this document is organized as follows:

- Section 2 presents the sequence work to conduct AO Amendment required investigation work and the review and finalization process for the various deliverables
- Section 3 presents the approach to develop the following deliverables and proposed process for the Port and Ecology to determine required sampling and analyses for various media of interest (e.g., sediment, groundwater, stormwater):
  - EISDGM

  - SAP, QAPP, and Health and Safety Plan (HASP)
  - Investigation Report

- Section 4 presents the approach and information that will be contained in the Alternatives Memo
- Section 5 presents the approach and information that will be contained in the draft IAP
- Section 6 describes the information that will be included the monthly progress reports submitted to Ecology.
- Section 7 presents the project schedule
- Section 8 presents the references cited in this document

## 2 SEQUENCE OF WORK

This section describes the general sequence of work to conduct AO Amendment required investigation work, and the proposed process by which the Port will prepare required draft deliverables for Ecology review and comments, respond to Ecology comments, and finalize the deliverables. The AO Amendment schedule is shown in Section 7 and identifies the required Schedule of Deliverables. The following sequence of work complies with the Schedule of Deliverables and provides additional milestones that are intended to help the Port remain on schedule. The Port will not undertake any investigation work without the approval of Ecology.

1. Port prepares and submits both the draft Investigation Work Plan and the EISDGM concurrently. Post-submission, Port will meet with Ecology to present an overview of the draft Work Plan and findings from the EISDGM.
2. Ecology reviews draft Work Plan and EISDGM and provides comments to the Port. If needed, Ecology and Port will meet to discuss Ecology comments.
3. Prior to preparing the draft SAP, QAPP and HASP, Ecology and Port will meet to discuss key objectives of the field investigation, and discuss preliminary sampling and analyses needs, including preliminary sampling locations.
4. Based on Ecology preliminary feedback on field investigation objectives and locations, Port prepares the draft SAP, QAPP and HASP. Post-submission, Port will meet with Ecology to present an overview of the draft SAP, QAPP and HASP.
5. Ecology reviews the draft SAP, QAPP and HASP and provides comments to the Port; If needed, Ecology and Port will meet to discuss Ecology comments.
6. Port finalizes the SAP, QAPP and HASP and finalizes the Investigation Work Plan, including the project schedule that will identify the duration of field investigation and subsequent Work Plan activities.
7. Port conducts field investigation work per the Ecology approved SAP, QAPP and HASP. Deviations from the approved SAP, QAPP and HASP will be communicated to Ecology immediately and documented as required by Ecology. During the field investigation work, the Port will meet with Ecology at an agreed upon frequency to update Ecology on the progress of field investigation work. The Port will also provide

interim data reports to Ecology as new data becomes available as required in the AO Amendment.

8. After all field investigation and analyses activities are completed, the Port will prepare the draft Investigation Report that will summarize all field sampling and laboratory analyses data. The Port will submit all validated data to Ecology to enter into Ecology's Environmental Information Management System (EIM). Post-submission, the Port will meet with Ecology to present the results of the field investigations.
9. Ecology reviews the draft Investigation Report and provides comments to the Port. Ecology will determine whether there is a need for additional investigation work. Should Ecology determine additional investigation is required, the Port and Ecology will meet to discuss next steps for investigation.
10. If no additional investigation is required by Ecology, the Port will respond to Ecology comments and finalize the Investigation Report.
11. Prior to preparing the draft Alternatives Memo, Ecology and the Port will meet to develop an evaluation approach to meet Ecology expectations for the objectives and level of analyses to be conducted for the Alternatives Memo. Ecology and the Port will discuss potential interim action cleanup levels for the Study Area since the larger Budd Inlet Site likely will not have established its cleanup level by this time. It is Ecology's goal that the interim action will be the final remedy. The Port and Ecology will continue to discuss how cleanup levels will be developed to meet this goal.
12. Port prepares and submits the draft Alternatives Memo to Ecology. During preparation of the draft Alternatives Memo, the Port anticipates having a series of meetings with Ecology to actively discuss draft alternatives and to help focus the evaluation. Post-submission, the Port will meet with Ecology to present the draft Alternatives Memo.
13. Ecology reviews the draft Alternatives Memo and provides comments to the Port. Ecology and the Port will meet to discuss Ecology comments.
14. Port finalizes the Alternatives Memo and submits to Ecology.
15. After Ecology approval of the final Alternatives Memo, and selection of a preferred interim action, the Port will prepare a draft Interim Action Plan to submit to Ecology, and will present an overview of the draft Interim Action Plan to Ecology. This AO Amendment does not cover finalization of the draft Interim Action Plan.

# 3 INVESTIGATION DELIVERABLES

This section describes the content of each of the AO Amendment required deliverables associated with site investigation to define the nature and extent of contamination in the Study Area.

## 3.1 Existing Information Summary and Data Gaps Memorandum

The EISDGM will compile available existing information that describes general facility information, history, previous sediment and habitat investigation data collection efforts and results, previous remedial actions, and other data in compliance with WAC 173-340-350 and WAC 173-204-560. The EISDGM will also present potential data gaps that may need to be addressed to define nature of extent of contamination, sources of contamination, and to support evaluation of remedial alternatives.

Available existing sediment Budd Inlet data will be identified in the EISDGM and evaluated for project use within the Study Area, and to a limited extent within the remainder of Budd Inlet. Data quality objectives will be established in the EISDGM.

The area of interest to evaluate potential ongoing sources of contamination will extend beyond the Study Area and include drainage basins for stormwater and combined sewer overflows (CSOs); potentially nearshore contaminated sites, including sites along both the eastern and western shorelines of West and East Bay; and potential influence from the Deschutes River/Capitol Lake and Moxlie Creek, which discharge directly to West and East Bay, respectively, in the vicinity of the Study Area.

The data gaps will be identified based on the existing information and will form the basis for potential additional data collection activities. Identified data gaps are intended to support the following goals:

- Fully define the nature of extent of contamination within the Study Area
- Evaluate potential ongoing sources to the Study Area
- Support the identification and evaluation of interim action alternatives

The data gaps assessment will identify the type of data and studies that are not available or included in the existing information. Additional data needed for the project will be presented in the SAP and QAPP, including the specific details of the additional investigations (e.g., locations, sample type, sample count).

The EISDGM will include, at a minimum, the following elements:

- Introduction and a statement of the purpose of the report.
- Brief description of the current physical, ecological, and human-use characteristics of Budd Inlet and the Study Area.
- Identification of relevant property owners and operators of upland and aquatic portions of the Study Area and vicinity.
- A complete description of what is known about the nature and extent of contamination in all Study Area environmental media (surface water, groundwater, sediment, tissue), including a summary of existing surface and subsurface sediment data (including sediment bioassay results).
  - A summary of the nature and extent of D/F toxicity equivalency (TEQ) concentrations in surface and subsurface sediment in the Study Area and a comparison of Study Area surface and subsurface sediment results compared to Washington State SMS (SQS and CSL).
  - The information summarized also will include all existing information from environmental investigations or cleanups within or near the Study Area (e.g., Cascade Pole, East Bay Redevelopment Site).
  - A summary of the nature and extent of D/F TEQ concentrations in Budd Inlet surface sediment.
  - Upland soil and groundwater data to the extent it is relevant to potential historic or ongoing sources of contamination to sediment.
- Identification of all known historical and ongoing sources of contamination to the Study Area or vicinity, including an overview of completed or ongoing source control activities, to the extent that this information is available.
- Summary of hydrology and subsurface geology/hydrogeology. Hydrology, if available, will include flows, tidal information, surface water drainage area, outfalls, runoff rates and outfall flow rates, and stormwater/CSO discharge data.

Geology/hydrogeology will include regional aquifers, flow directions, known and listed contaminated soil and groundwater sites, existing groundwater wells with in the Study Area, and specific local groundwater data.

- Summary of tissue data taken from the vicinity of the Study Area.
- Other information (including geographic information system [GIS] maps and figures) as necessary to gain a complete understanding of the Budd Inlet and the Study Area.
- An evaluation of the existing data and data gaps analysis

## 3.2 Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan

The Port will prepare a draft and final SAP and QAPP in compliance with WAC 173-340-820 and WAC 173-204-600, as required under Task 1 of the AO Amendment, which will document the planned collection of field samples, sampling protocols, lab methods and required detection limits, and quality assurance methodology. A HASP that will also be included with the SAP and QAPP.

The SAP will identify the proposed number, type, media, and locations of samples. The SAP will describe the sampling objectives, the rationale for the sampling approach (based upon the identified data gaps), and plans for data use, and will provide a detailed description of sampling tasks. The sampling methods and equipment will also be described in the SAP. Sampling activities described in the SAP are anticipated to include additional surface and subsurface sampling, end of pipe discharge from outfalls in the vicinity of Port property, and procedures for identification and evaluation of potential sources of contamination in the vicinity of Port property, depending on the conclusions in the EISDGM and discussion with Ecology.

The QAPP will describe the DQOs for the sampling and analysis activities, describe the methods and procedures for chemically analyzing samples, and presents the QA/QC and data management process that will be used for all data generated for this project. The QAPP will follow Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology 2004) and Sediment Sampling and Analysis Plan Appendix (Ecology 2008c). The QAPP will also be prepared in accordance with the Guidance for

Preparation of Quality Assurance Project Plans, U.S. Environmental Protection Agency (USEPA) Region 10, Quality Data Management Program QA/R-5 and requirements of the USEPA Contract Laboratory Program (USEPA 2002).

The Port will also prepare a HASP that will be implemented during all field investigations. The HASP is primarily an internal document to be used by the Port's consultant, Anchor QEA during field sampling, but Ecology may request to review the HASP. The HASP will be designed to ensure protection of the field investigation crew while conducting the field sampling efforts. This plan will comply with all currently applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 CFR Part 1910.120, Washington Industrial Safety and Health Act (WISHA) Chapter 49.17 Revised Code of Washington, and the Port's safety requirements.

All sampling data generated under the SAP will be validated and submitted to Ecology for entry into Ecology's EIM in accordance with WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840: Data Submittal Requirements.

The Port will develop the SAP and QAPP for sampling efforts identified as data gaps in the EISDGM that Ecology and Port agree need to be filled to meet the project objectives and fulfill the requirements of the AO and SOW. The SAP and QAPP will comply with Ecology guidance and ensure that sample collection and analytical activities are conducted in accordance with the Puget Sound Estuary Program (PSEP) protocols (PSEP 1986) and any adopted updates/improvements as part of the Sediment Management Annual Review process. The SAP and QAPP will address sampling objectives; sampling procedures; a detailed description of sampling activities; sample locations; station positioning; sampling equipment and procedures; sample custody; sample analysis, analytical procedures; data reduction, validation, and reporting; and personnel qualifications.

Where applicable, the QAPP will provide risk-based analytical concentration goals (ACGs) (e.g., SQS) compared to the target reporting limits provided by the laboratory to evaluate the sensitivity of the proposed analyses relative to ACGs. The analytical laboratory selected to analyze the samples will be qualified based on the use of appropriate methods and analytical protocols for the chemicals of concern in the media of interest, and within detection and

quantification limits consistent with both quality assurance/quality control (QA/QC) procedures and Data Quality Objectives (DQOs) in the Ecology-approved in the QAPP.

## 3.3 Investigation Report

The Port will prepare a draft and final Investigation Report that will summarize all information regarding the field sampling events and laboratory analyses, including validated analytical results. The final Investigation Report will address Ecology comments provided on the draft.

The Investigation Report will include, at a minimum, the following information:

- Introduction and Purpose
- Summary of the field sampling effort (sample types, vessel and equipment used, dates of field effort, recovery information, field observations, sample and station locations)
- Deviations from the methods and procedures outlined in the SAP and QAPP
- Health and safety incidents, if any, that occurred during implementation of the SAP and QAPP
- Summary of sample handling and shipment
- Summary of all data (physical and chemical; field and laboratory measurements, including quality control data)
- A data validation report
- Copies of field sampling notes
- Sample descriptions and photographs
- GIS maps of sampling locations
- Complete electronic raw data output generated during the chemical analysis of samples, including the chain of custody documentation and the worksheet and supporting data for validation

All data (including station locations) will be provided electronically in EIM format. Information necessary for Ecology to perform an independent review of the validated data will also be provided.

# 4 IDENTIFICATION AND EVALUATION OF INTERIM ACTION ALTERNATIVES

The information obtained and reported during the AO Amendment investigation tasks (Tasks 2 and 3) will be evaluated to identify and analyze potential remedial alternatives to address contaminated sediments in the Study Area. This information will be presented in a draft and final Alternatives Memo. The potential remedial alternatives will be consistent with MTCA requirements to ensure protection of human health and the environment by eliminating, reducing, or otherwise controlling risk posed by sediments exceeding applicable cleanup levels and by reducing risks associated with exposure pathways, and consistent with WAC 173-204-560(f). This evaluation will be consistent with the SMS and any revisions thereof, and may be based on regional background sediment concentrations in Budd Inlet.

The Alternatives Memo will include a list of contaminates of concerns, the development of preliminary cleanup levels and boundaries for the interim action based on the nature and extent of contamination in the Study Area. The approach for developing and selecting cleanup levels and remediation boundaries will be discussed with Ecology prior to the preparation of the draft Alternatives Memo.

The Alternatives Memo will include an evaluation of candidate remedial technologies, which will be assembled into remedial alternatives for the Study Area. Remedial technologies to be evaluated are anticipated to include natural recovery, capping of contaminated sediments, dredging and upland disposal or beneficial reuse of sediments, on-site aquatic confinement, treatment, and/or a mixture of the above-listed technologies.

Each remedial alternative will be evaluated consistent with MTCA remedy selection requirements, as defined in WAC 173-340-360. The range of alternatives will include consideration of special subareas of the site (e.g., underpier contaminated areas), which may require special technologies or for which remedial costs may be substantially different from other similarly contaminated site areas with similar physical characteristics. Detailed cost estimates and drawings will be prepared for each alternative evaluated. Cost estimates will include short- and long-term costs, including the costs of mitigation for land use or habitat impacts. .

Source control is a critical part of Ecology's Initiative to support the overall effort for the cleanup of Budd Inlet contaminated sediments. The assessment and control of contaminant sources often involves the work of multiple agencies operating under multiple regulatory programs, with different types of assessment and control activities implemented under various timeframes. The Port recognizes the need to evaluate all potential sources of sediment recontamination and to coordinate source control activities during the course of the project. If contaminant sources into West Bay or East Bay of Budd Inlet in the vicinity of the Port peninsula are identified, options for source control and remedial alternatives for these sources will be evaluated, in addition to remedial alternatives for the sediment in the Study Area.

# 5 DRAFT INTERIM ACTION PLAN

The draft Interim Action Plan (IAP) will be developed after completion of the Alternatives Memo and will describe the scope, objective and implementation of the interim action to be performed. The draft IAP must meet the requirements of WAC 173-340-430(7) and include, as appropriate:

- A description of the interim action including its purpose, general requirements, and relationship to the (final) cleanup action (to the extent known)
- A summary of relevant investigation information, including at a minimum existing conditions and alternative interim actions considered
- Information regarding design and construction requirements, including a proposed schedule and personnel roles and responsibilities
- A Compliance Monitoring Plan
- A SAP and QAPP (if additional data is needed)
- A HASP for the interim action activities.

Approval of a Final IAP and implementation of the interim action is not a part of this task or AO. Ecology and the Port intend to negotiate an amendment to the AO or a subsequent AO for approval and implementation of an interim action.

# 6 PROGRESS REPORTS

Monthly progress reports will be submitted to Ecology in accordance with Section IX of the amended AO until the requirements of the amended AO are fulfilled (i.e., submittal of the draft IAP to Ecology). Progress reports will be submitted to the Ecology project coordinator by the 15th of the month following the reporting month. At a minimum, progress reports must contain the following information regarding the preceding reporting period:

- A description of the actions that have been taken to comply with the amended AO
- Summaries of sampling and testing reports and other data reports received by the Port
- Summaries of deviations from approved work plans
- Summaries of contacts with representatives of the local community, public interest groups, press, and federal, state, or tribal governments
- Summaries of problems or anticipated problems in meeting the schedule or objectives set forth in the SOW and Work Plan
- Summaries of solutions developed and implemented or planned to address any actual or anticipated problems or delays
- Changes in key personnel
- A description of work planned for the next reporting period

# 7 SCHEDULE OF DELIVERABLES

An overview of the anticipated schedule of deliverables is provided in Table 6-1. This table is consistent with Exhibit H of the AO Amendment Scope of Work. Actual dates for each deliverable are contingent on Ecology review periods and actual completion timeframes for deliverable completion. This schedule may be revised based on actual Ecology review periods. Changes in scope may also affect the overall project schedule.

**Table 6-1 Anticipated Schedule and Deliverables**

| Deliverable | Anticipated Completion Timeframe[a] |
|---|---|
| Draft Investigation Work Plan and EISDGM | 120 days from the effective date (February 15, 2012) of the AO Amendment |
| Draft SAP, QAPP, and HASP | 75 days from Ecology's comments on the draft Investigation Work Plan and draft EISDGM |
| Final Investigation Work Plan and final SAP, QAPP, and HASP | 60 days from receipt of Ecology's final comments on the draft SAP, QAPP, and HASP |
| Implement Investigation Work Plan | 30 days from Ecology's approval of the final Investigation Work Plan |
| Draft Investigation Report | 90 days from completion of field sampling activities and receipt of final validated data |
| Final Investigation Report | 90 days after receipt of Ecology's final comments on the Draft Investigation Report |
| Draft Alternatives Memo | 90 days from Ecology approval of the Final Investigation Report |
| Final Alternatives Memo | 90 days from receipt of Ecology's final comments on the draft Identification and Evaluation of Interim Action Alternatives Memorandum |
| Draft Interim Action Plan | 75 days from receipt of Ecology's approval of the Final Identification and Evaluation of Interim Action Alternatives Memorandum |
| Progress Reports | 15th of every month beginning after the completion of the first full month after the effective date (February 15, 2012) of the AO Amendment |

Notes:
a = timeframes based on calendar days
Alternatives Memorandum = Identification and Evaluation of Interim Action Alternatives Memorandum
AO = Agreed Order
EISDGM = Existing Information Summary and Data Gaps Memorandum
HASP = Health and Safety Plan
QAPP = Quality Assurance Project Plan
SAP = Sampling and Analysis Plan

## 8 REFERENCES


Ecology, 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Publication No. 04-03-030. Environmental Assessment Program, Washington State Department of Ecology. Manchester, Washington. 2004.

Ecology, 2008a. Agreed Order No. DE 6083. Washington State Department of Ecology. October 2008.

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Thurston County, 2007. Thurston County Storm & Surface Water Program. Available at: http://www.co.thurston.wa.us/wwm/stream/onthego.htm

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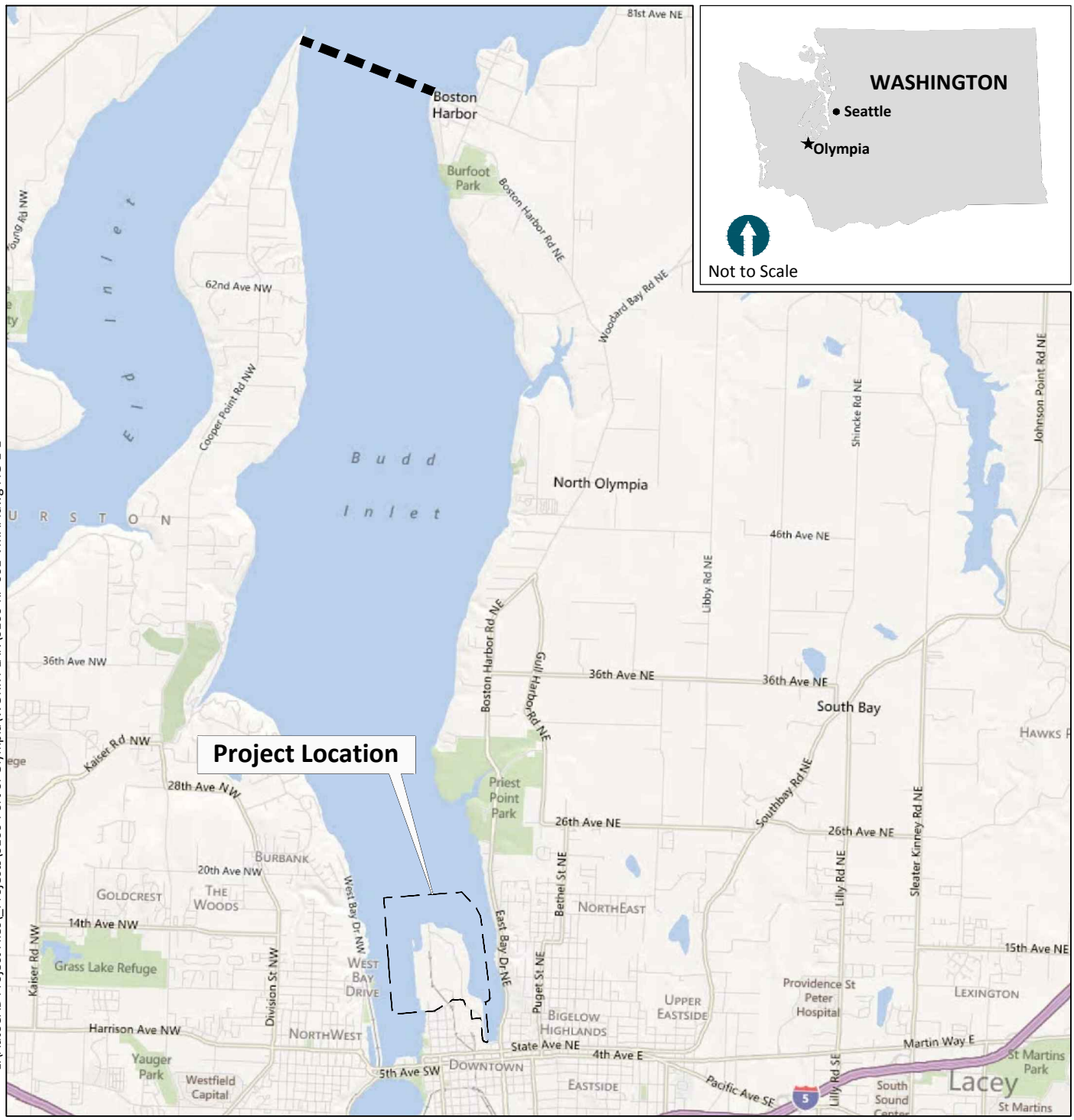
USGS, 2006. Deschutes Estuary Feasibility Study – Hydrodynamics and Sediment Transport Modeling. Final Report. Available at http://www.ga.wa.gov/CLAMP/HSTA.pdf

# FIGURES




L:\AutoCAD Project Files_Projects\0166-Port of Olympia\WORK PLAN\0166-RP-001-VMAP.dwg FIG-1-1

Oct 19, 2012 12:37pm chewett

**SOURCE**: Image from Bing Maps
**HORIZONTAL DATUM**: Washington State Plane South, NAD83.
**VERTICAL DATUM**: Mean Lower Low Water (MLLW).

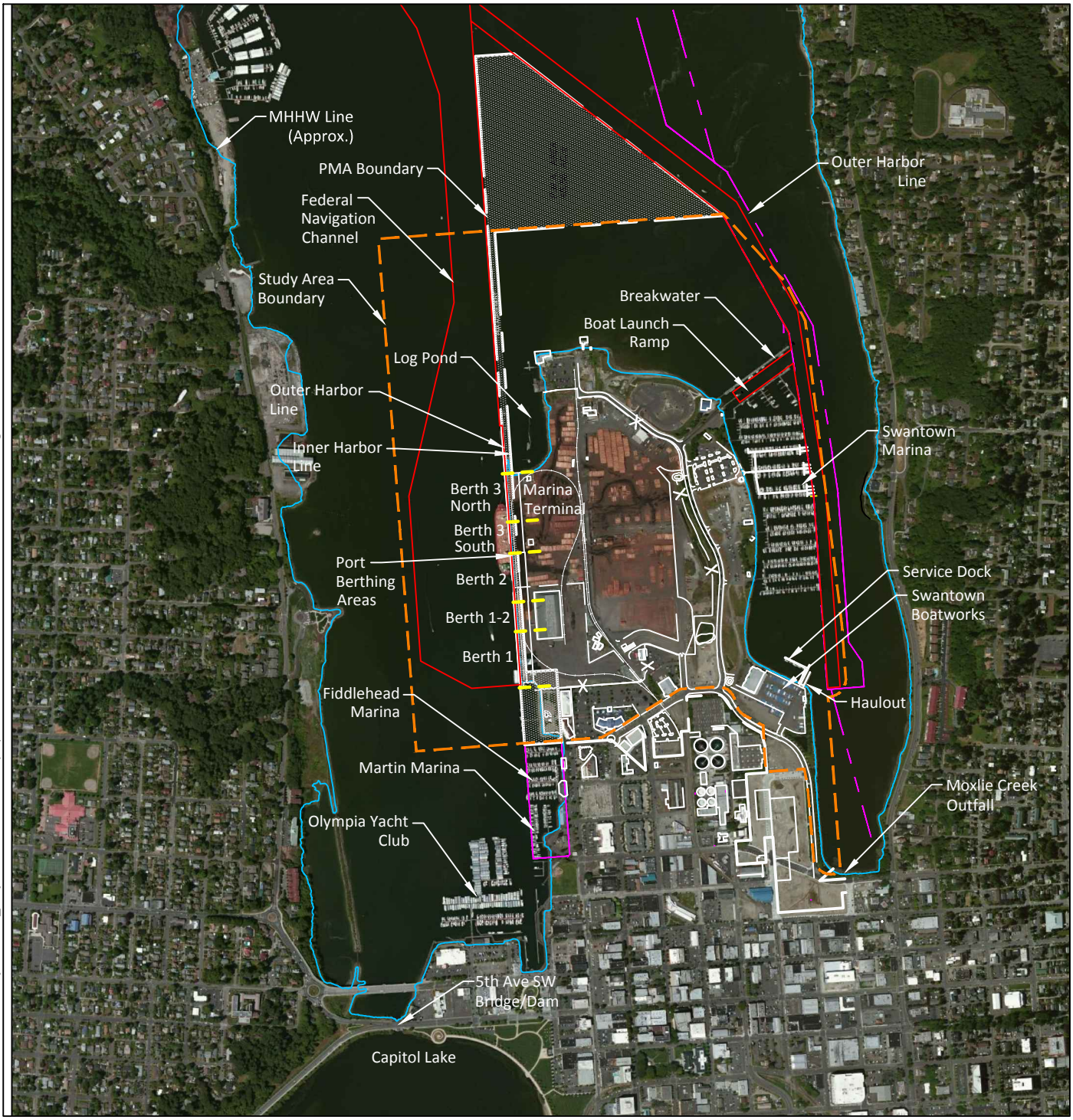
0 1
Scale in Miles

**Figure 1-1**
Vicinity Map
Investigation Work Plan
Port of Olympia Budd Inlet Sediment Site

ANCHOR QEA


**NOTE:**
Area within Cascade Pole Cleanup Boundary is excluded from the Study Area.

**Figure 1-2**
Study Area Map
Investigative Work Plan
Port of Olympia Budd Inlet Sediment Site




L:\AutoCAD Project Files_Projects\0166-Port of Olympia\WORK PLAN\0166-RP-002-MJR-FEATURES.dwg FIG 1-3

Oct 19, 2012 12:43pm chewett

**SOURCE:** Aerial image from ESRI data. Basemap from Port of Olympia, dated June, 2008.
**HORIZONTAL DATUM**: Washington State Plane South, NAD83.
**VERTICAL DATUM**: Mean Lower Low Water (MLLW).

0 1200
Scale in Feet

ANCHOR QEA

**Figure 1-3**
Major Aquatic Features
Investigation Work Plan
Port of Olympia Budd Inlet Sediment Site


L:\AutoCAD Project Files_Projects\0166-Port of Olympia\WORK PLAN\0166-RP-003-CONTAM-SITES-1.dwg FIG 1-4

Oct 19, 2012 12:50pm chewett

**SOURCE: Aerial image from ESRI data.**
**HORIZONTAL DATUM**: Washington State Plane South, NAD83.
**VERTICAL DATUM**: Mean Lower Low Water (MLLW).

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Scale in Feet

**Figure 1-4**
Location of Other Contaminated Sites
Investigation Work Plan
Port of Olympia Budd Inlet Sediment Site

ANCHOR QEA