

**Olympia Harbor Maintenance Dredging and Minor Widening
Olympia, Thurston County, Washington
Draft Environmental Assessment
May 2007**

Responsible Agency: The responsible agency for this project is the Seattle District, U.S. Army Corps of Engineers (Corps).

Abstract: This draft environmental assessment evaluates the potential impacts of the proposed maintenance dredging and minor widening of the channel bend of the Olympia Harbor Federal navigation project at Olympia, Thurston County, Washington. The proposed work is planned for winter 2007-2008.

This proposed work would perform maintenance dredging and widening of the channel bend to the authorized minus 30 foot depth channel with up to 2 feet of allowable overdepth. Approximately 101,000 cubic yards (cy) of material would be removed from the Federal channel under this proposal (about 48,000 cy for maintenance dredging, about 53,000 cy for the widening). The channel bend widening would occur within a roughly triangular shape of 2.1 acres with a maximum width of 110 feet. All of the material has been approved as suitable for unconfined, open water disposal or beneficial use. Up to 60,000 cy may be placed in Budd Inlet for beneficial use and 1.0 acres of advance mitigation for a potential future dredging phase. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (ppt) Toxic Equivalence (TEQ) to less than 1 ppt TEQ. Clean sediment that is not used for beneficial uses would be disposed at the PSDDA Anderson Island open-water disposal site.

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DRAFT ENVIRONMENTAL ASSESSMENT
Olympia Harbor Maintenance Dredging and Minor Widening
Federal Navigation Channel



May 2007



US Army Corps
of Engineers
Seattle District

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1. INTRODUCTION

Pursuant to the National Environmental Policy Act (NEPA), this Environmental Assessment (EA) evaluates the impacts of proposed maintenance dredging and minor bend widening of the Federal navigation project in Budd Inlet, Olympia Harbor, Washington. The proposed work would restore authorized navigational depths and increase vessel safety in the navigation channel.¹ Dredged sediment would be disposed either at the Anderson Island open water disposal site and/or at a site in Budd Inlet for beneficial use and potential advance mitigation for potential future widening (see Section 5.2).

1.1 Location

The Federal navigation project in Budd Inlet is located generally north of the city of Olympia, Thurston County, Washington (Figure 1) and provides shipping access to and from Olympia into Puget Sound and beyond (Figure 2). The dredged material would be disposed either at (1) the non-dispersive Anderson Island open-water disposal site located at latitude 47° 9.42 minutes north, longitude 122°, 39.47 minutes west, or (2) a beneficial use site located in Budd Inlet southwest of the channel bend (Figure 3)

1.2 Background

Olympia's Federal navigation channel within Budd Inlet requires sporadic maintenance dredging to maintain the existing authorized depths of the Federal navigation channel, turning basin, and berthing areas (the last maintenance dredging occurred in 1973). The Port of Olympia (Port) formally requested the U.S. Army Corps of Engineers, Seattle District, via a meeting that occurred on April 8, 2004, and letter dated August 26, 2004, to perform authorized maintenance dredging and minor widening to promote navigational safety and free movement of deep draft commercial vessels within the Harbor.

1.3 Authority

The Olympia Harbor Project and maintenance dredging by the Department of the Army were authorized by the River and Harbor Acts of 3 July 1930 and August 1937 (House Document 244, 69th Congress, 1st Session, House Document 5, 71st Congress, 1st Session, House Document 21, 73rd Congress, 2nd Session, and House Document 75, 74th Congress, 2nd Session). In July 2005, the Seattle District Corps of Engineers received authorization from Corps Headquarters to use Corps' Operation and Maintenance authority to perform minor widening at Olympia Harbor for the free movement of vessels.

The authorized project provides for an entrance channel 300- to 500-feet wide and 30 feet deep (at mean lower low water) from deepwater in Budd Inlet to the Port terminal, with suitable widening at the bend, and a turning basin adjacent to the Port terminal. The authorized dimensions of the turning basin are 3,350 feet long, varying width of 500 to 900 feet, and 30 feet deep. The federally approved depth of the inner and outer entrance channels and turning basin is -30 feet at mean lower low tide.

¹ In addition to the proposed Federal work, the Port of Olympia proposes maintenance dredging to restore authorized navigation depths in West Bay Berths 2 and 3, located along the docking facility on the west side of the Port's Marine Terminal as part of the overall federal navigation channel (see Appendix A).

The existing outer channel is 500 feet wide and is oriented in a south-southeast direction. At the southern end of the outer channel a 30-degree bend to the south is made into the 300 foot-wide entrance channel. The turning basin is located at the southern end of the project and has a maximum width of 800 feet, including the 110 foot-wide berthing area. The effective width of the existing Federal turning basin is 690 feet.

1.4 Project Purpose and Need

The Port has received numerous letters from pilots that guide cargo ships into the Port voicing major concerns about the navigation channel being too narrow and shallow and having to wait for high tides to provide safe access to the Port. Based upon bathymetric surveys conducted in 1998 and again in 2004, siltation is variable over these areas with greatest accumulations reducing depths to below the authorized minus 30 feet (MLLW), especially on the margins of the federal channel. The depth varies but on average is around minus 28 feet (MLLW) in the shoaled areas.

The purpose of the proposed project is to allow timely and safe passage of ships entering and leaving the Port. Maintenance dredging of the federal channel will provide authorized navigational depths through maintenance dredging and minor widening in areas of the Federal navigation channel.

The project would widen the channel bend to address safety criteria for maneuvering and bank clearance for approach channels. Based on recent Corps guidelines for approach channels (MarCom Working Group 30, 1997), an approach channel into Budd Inlet should provide a maneuvering lane width of 2.5 times the vessel beam (2.5B). This width includes an allowance of 1.5B for a basic maneuvering lane, 0.4B for wind effects, 0.2B for minimal aids to navigation and poor visibility, and 0.4B for channel depths that can be less than 1.15 times the vessel draft. Added to this would be a bank clearance on either side of the maneuvering lane. Because this portion of the channel has steep side slopes and is cut deeply into the surrounding bottom, Corps analysis indicates that a bank clearance of 0.5B to 1.0B on each side of the maneuvering lane is warranted. When the maneuvering lane width is added to the bank clearance, the total channel width should be between 3.5B and 4.5B. For a ship beam of 100 feet, the appropriate channel width is between 350 and 450 feet. A minor widening of the channel bend is justified since the beam of vessels using the channel is approximately 100 feet. Additionally, the widening has been recommended as justified in the best professional judgment of Seattle District, this recommendation received the concurrence of the Northwestern Division, and the minor channel widening at the bend was authorized by Corps Headquarters.

The project is also necessary since the current condition of the federal channel causes delays in vessel arrivals and departures in order to work around tides. Vessel operating costs for 37 vessels delayed in 2004 amounted to a total of \$138,750. In addition, some of the Port customers must be in berth in Vancouver by 8:00 AM for a full day of operations after it leaves Olympia. It must leave Olympia by 3:00 PM or lose a day of work in Vancouver. There were 12 vessels that fell into this category in 2004 of which 4 did not make the departure time because of tidal delays. The estimated cost of this delay for the 4 vessels is \$160,000 plus labor and other associated cost with operation of the vessel. Maintenance dredging is required to allow vessels to avoid delays caused by working arrival and departure schedules around the tides.

Federal dredging to the authorized dredging depth of -30 feet Mean Lower Low Water (MLLW) with 2 feet of allowable overdepth will result in a volume of approximately 48,000 cy. The estimated minor widening areas volume is approximately 53,000 cy which represents dredging to a authorized depth of -30 feet MLLW with 2 feet of allowable overdepth. All of the proposed Federal dredged materials have been tested and are suitable for open-water disposal at the Anderson Island open-water disposal site and/or beneficial uses.

2. ALTERNATIVES

This discussion relates specifically to Federal proposals designed to meet the project purpose and need (i.e. the proposed Federal actions that will be specifically evaluated for impacts in the EA).

Concurrent to the Federal dredging of navigation channel by the Corps, the Port proposes to maintenance dredge approximately 40,500 cy of material contaminated with dioxin from the Port's Marine Terminal berths 2 and 3 to restore the berths to their safe depth of minus 42 feet MLLW, with 2 feet of allowable over dredge. See Appendix A for more information on the Port's proposed berth dredging. The Port's maintenance dredging would be conducted independently of the Federal dredging and is evaluated in this document as part of the cumulative impact analysis (See Section 4). The Port's application for a Corps of Engineers authorization for this distinct project will be independently addressed under NEPA pursuant to the Corps regulatory program.

2.1 No Action

If no action is taken, ships entering and leaving the Port would continue to be required to wait for high tides in order to allow safe passage to and from the Port terminal. Significant tide delay economic impacts and safety concerns would continue and potentially increase as shoaling continues to reduce the depth of the navigational channel. Per NEPA requirements, the no action alternative will be carried forward as the baseline for evaluating potential impacts of other alternatives.

2.2 Maintenance Dredging and Minor Widening of Entrance Channel, Channel Bend, and Turning Basin

This alternative would dredge all previously dredged areas where shoaling has created areas shallower than the authorized depths. Maintenance dredging would occur in the entrance channel, the channel bend, and the west side of the turning basin. Dredging to the authorized dredging depth of -30 feet MLLW with two feet of allowable overdepth will result in a volume of approximately 234,000 cy. The estimated minor widening areas volume is approximately 163,000 cy which represents dredging to a required depth of -30 feet MLLW with 2 feet of allowable overdepth. Total dredged volume would be approximately 397,000 cy. The widening would be about 100 feet at the turning basin, 50 feet for the bottleneck reach, and between 0 and 110 feet for the channel bend (i.e. it would be a triangular footprint in the bend area).

Of the total dredged volume, approximately 220,500 cy has been approved by the regional Dredged Material Management Program (DMMP) for the State of Washington for unconfined, open water disposal or beneficial use (Corps 2006). Of the material suitable for in-water disposal, up to 60,000 cy would be placed in Budd Inlet for beneficial use and as mitigation for widening in areas that would convert shallow subtidal areas (less than minus 10 feet MLLW) to

depths of minus 30 feet (MLLW); clean sediment that is not used for beneficial uses would be disposed at the Puget Sound Dredged Material Analysis (PSDDA) Anderson Island open-water disposal site. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (ppt) Toxic Equivalence (TEQ) to less than 1 ppt TEQ. About 238,000 cy is not suitable for open water disposal at the Anderson Island open-water site or beneficial uses due to elevated levels of dioxin and furans, so it would be disposed at an approved upland site.

Dredging would be accomplished by a clamshell dredge, with the dredged material deposited in bottom dump barges for transport and disposal.

The maintenance dredging would remove shoaling in the Federal navigation channel that has occurred since the last Corps dredging in 1973. The maintenance dredging would meet the purpose of allowing ships to enter and exit the Port without need to wait for high tide; the minor widening would provide a necessary safety margin to allow maneuvering room for ships navigating the channel bend. While this alternative would provide safe and timely shipping access to and from the Port Marine Terminal facilities, it will not be carried forward for detailed analysis due to the substantial logistical, technical, regulatory, and economic problems posed by upland or confined disposal of such a large quantity of dioxin contaminated sediment. Dredging in the areas of the channel currently contaminated with dioxin may become more feasible in the future if proposed non-Federal actions pursuant to the Washington Model Toxics Control Act successfully remove the sediments containing the highest levels of dioxin.

2.3 Maintenance Dredging of and Minor Widening of Channel Bend

This is the preferred alternative and the proposed Federal action.

Extensive testing of the sediment found dioxins/furans in varied areas within the boundaries of the authorized federal channel (including some portions of previously proposed minor widening) in Budd Inlet. The discovery of the extent of contaminated sediment resulted in modification of the proposed dredging to limit work to areas with clean sediments (which includes both maintenance dredging and minor widening). Under this alternative, the Corps proposes to dredge the areas that have been determined to be suitable for open-water disposal and potentially reuse a portion of them beneficially within Budd Inlet or dispose them at the Anderson Island open-water disposal site.

This alternative would perform maintenance dredging and widening of the channel bend to the authorized minus 30 foot depth channel with up to 2 feet of allowable overdepth. Approximately 101,000 cy of material would be removed from the Federal channel under this proposal (about 48,000 cy for maintenance dredging, about 53,000 cy for the widening). The channel bend widening would occur within a roughly triangular shape of 2.1 acres with a maximum width of 110 feet. All of the material has been approved by the DMMP as suitable for unconfined, open water disposal or beneficial use (Corps 2006). Up to 60,000 cy may be placed in Budd Inlet for beneficial use and 1.0 acres of advance mitigation for a potential future dredging phase. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (ppt) Toxic Equivalence (TEQ) to less than 1 ppt TEQ. Clean sediment that is not used for beneficial uses would be disposed at the PSDDA Anderson Island open-water disposal site.

Dredging would be accomplished by a clamshell dredge, with the dredged material deposited in bottom dump barges for transport and disposal.

The maintenance dredging would remove shoaling in the channel bend that has occurred since the last Corps dredging in 1973. The maintenance dredging would meet the purpose of allowing ships to enter and exit the Port without need to wait for high tide; the minor widening would provide a necessary safety margin to allow maneuvering room for ships navigating the channel bend.

3. EXISTING ENVIRONMENT and ENVIRONMENTAL EFFECTS

3.1 Hydrology

3.1.1 Existing Conditions

Budd Inlet is small (1.6- by 6.9-mile), shallow (average depth 26.9 feet at MLLW) embayment without an entrance sill, and has been classified as a stratified, partially mixed estuary (Eisner and Newton 1997). Budd Inlet demonstrates a two layer flow pattern, with saltier, generally colder water entering at depth from Puget Sound, and fresher, typically warmer water exiting at the surface. The tidal range in Budd Inlet is about 13 feet (Eisner and Newton 1997). Tides play a major role in flushing the inlet.

Flushing rates are one day for the inner inlet and the whole inlet flushes within 10 days (Ebbesmeyer and Coomes 1998). The Deschutes River is the major fresh water source into Budd Inlet discharging fresh water into Capitol Lake at a location near the southern end of the Federal navigation project. A control structure at the outlet of Capitol Lake allows discharge into Budd Inlet. Average discharge of the Deschutes River is 406 cubic feet per second (cfs; Roberts *et al.*, 2004). The highest discharges typically occur during the late fall and winter months, with peak daily discharges occasionally reaching 6,000 cfs.

3.1.2 Impacts

No Action

If this alternative were chosen, there would be no impacts to hydrology for the proposed project.

Preferred Alternative

The maintenance dredging and minor widening will remove some shoaling within the boundaries of the Federal navigation project, but changes to the hydrology of Budd Inlet are expected to be insignificant. Seattle District's hydraulics analysis of the maintenance dredging and minor widening of the turning basin, entrance channel, and channel bend (i.e., Alternative 2.2), which together comprise a larger scope than the Preferred Alternative, determined that those proposed dredging actions would not significantly change in the flow regime in Budd Inlet. Given the comparatively reduced scope of the preferred alternative, the conclusion of no significant changes in hydrology remains valid.

3.2 Water Quality

3.2.1 Existing Conditions

Water quality in Puget Sound is monitored by the Washington Department of Ecology. In particular, the DO and other water column characteristics of Budd Inlet have been well studied by the Washington Department of Ecology and the Lacey-Olympia-Thurston-Tumwater partnership (LOTT) (e.g., URS Company, 1986; Eisner et al., 1994; Eisner and Newton, 1997; Aura Nova, et al., 1998).

Washington state classifies the portion of Budd Inlet in the project area as providing good levels of aquatic life uses, no uses for shellfish harvest, secondary contact uses for recreation, along with uses for wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics (WAC 173-201A-612).

According to the most recent Washington State Marine Water Quality study (Newton *et al.*, 2002), Budd Inlet is an area of high concern for marine water quality due to observations of dissolved oxygen levels less than 3 mg/L, high levels of fecal coliform, low dissolved oxygen (DO) levels, high (greater than 0.14 mg/L) ammonium-N concentrations, and persistent stratification. Based on a use classification of good for aquatic life uses, the minimum dissolved oxygen level for Budd Inlet is 5.0 mg/L (WAC 173-201A-210(d)). Nutrient removal from Lacey-Olympia-Thurston-Tumwater (LOTT) wastewater treatment plant effluent started in 1994, likely resulting in less eutrophication and oxygen demand. Monitoring in the last decade since the LOTT upgrades has indicated that DO levels in inner Budd Inlet are increasing.

Water quality varies substantially on an inter-annual basis and is influenced by local weather, river discharge and location within the inlet. The lowest DO concentrations are found towards the head of the inlet. Stratification is Strong-Persistent in inner Budd Inlet, due to freshwater input from the Deschutes River/Capitol Lake system, with Moderate-Infrequent stratification in the central inlet. The minimum DO concentrations recorded in Budd Inlet between 1996 and 2000 are all above 4 mg/L and higher than those seen in earlier years when values of 2 and 3 mg/L were recorded.

3.2.2 Impacts

No Action

If the no action alternative is chosen then no additional temporary impacts to the water quality of Budd Inlet will occur from the authorized navigational project.

Preferred Alternative

Under the Preferred Alternative, there will be short-term impacts to water quality of Budd Inlet. Dredging would occur in the winter months (see Section 5) when freshets occur most often, biological oxygen demand is low, and water temperatures are low. The disturbance of sediment and the sediment plume will be short lived and the impacts to water quality will be minor since the inner inlet flushes within one day, while the whole inlet does so every 10 days (Ebbesmeyer and Coomes 1998). Low DO levels are not expected to be an issue for dredging during the winter since the level of DO during the winter (generally greater than 9 mg/L) is sufficient to support any increased biological oxygen demand while maintaining DO levels above 5 mg/L,

which is the minimum DO level for Budd Inlet pursuant to state water quality standards (WAC 173-201A-210(d) and 173-201A-612).

Disposal of the material at the open water site or the beneficial use site would result in short-term impacts to localized turbidity, DO, and other water quality indicators, but water quality is expected to quickly return to ambient background conditions. The sediments to be dredged in the Preferred Alternative are suitable for open water unconfined disposal. Accordingly, release of contaminants into the water column would not occur during the proposed work.

Water quality monitoring would be conducted to assure that water quality in the project area does not violate state standards outside of the specified dilution zones for the dredging and disposal operations.

3.3 Geology and Sediment

3.3.1 Existing Conditions

Budd Inlet lies in the southern Puget lowlands, which were subjected to multiple glaciations during the Pleistocene. This resulted in the present subdued and streamlined topography and a thick accumulation of glacial drift over Tertiary bedrock. Except for the head of Budd Inlet, surrounding slopes are moderate to very steep. The eastern shore of the inlet near its mouth has only gentle slopes. Considering that the last maintenance dredging of the Olympia Federal Navigation Project occurred more than 30 years ago, the rate of sediment deposition in Budd Inlet is low. Much of the sediment that would have entered Budd Inlet prior to 1951 now settles out upstream of the dam at the outlet of Capitol Lake. Recent modeling indicates that Capitol Lake traps more than half of the sediment supplied by the Deschutes River each year (George *et al.* 2006)

Within the maintained portion of the navigation channel, finer grained sediments predominate (typically about 30% clay, 40% silt, 25% sand, 1% gravel). Larger grain sizes occur in the Port berthing areas (with about 25% gravel) and in the area of the minor widening at the channel bend (about 15% clay, 25% silt, 50% sand, and 5% gravel).

The Federal Navigation Project and the Port berthing areas have been tested pursuant to the Puget Sound Dredged Disposal Analysis program three times within the last two decades (Corps 2006). The most current and applicable analysis of sediment quality in the vicinity of the project comes from a 2006 evaluation of the suitability of 458,734 cy of sediment in the Federal channel and Port berthing areas for open-water disposal at the Anderson Island disposal site or for beneficial use.² Previous testing in 1988 and 1999 indicated that, based on comparison to contamination by metals, hydrocarbons, phthalates, phenols, pesticides, and other potential contaminants, the majority of the material in the Federal Navigation Project and Port berthing areas was suitable for open-water disposal or beneficial uses. However, the 2006 supplemental

² The suitability determination reflects the consensus of the agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington. The Corps, Washington Department of Ecology, Washington Department of Natural Resources, and the Environmental Protection Agency comprise the DMMP.

testing included analysis of dioxins and furans³ and found that only 220,500 cy, which includes the material that would be dredged from the channel bend area, are suitable for disposal at the Anderson Island disposal site or beneficial uses contingent on agency approval of the specific beneficial use location and project.

The 2006 testing found that 238,234 cy of the tested material are unsuitable for open-water disposal at the Anderson Island disposal site due to contamination with dioxin and would need to be disposed at a Washington Department of Ecology-approved upland disposal site, in-water confined disposal site, or in another DMMO-approved non-dispersive open water site (i.e. not Anderson Island open-water site). The dioxin contamination is highest in the Port berthing areas. Dioxin levels in surface layers (generally shallower than 4 feet below the sediment surface) of the turning basin and the bottleneck reach of the entrance channel also exceeded thresholds for dioxins and furans. Even in the contaminated areas, dioxin/furan levels in sediment more than 4 feet below the sediment surface generally were low enough to meet criteria for open-water disposal or beneficial uses. At the beneficial use site, the concentration of dioxin/furans in the top 10 centimeters of sediment was measured at between 20 and 25 ppb TEQ.

The weighted mean concentration of dioxin/furans for the 60,000 cy of material likely to be used for the beneficial uses project is 0.47 ppb TEQ, well below the 3.8 ppb Tier 2 limit for open-water disposal or beneficial uses.

3.3.2 Impacts

No Action

This alternative, if chosen, would not affect geology or sediment. The quality of the sediment at the beneficial use site would continue to have high levels of surface contamination. Shoals in the navigation channel would remain in place.

Preferred Alternative

The preferred alternative would not affect the geology of the area. A relatively minor volume of sediment would be removed from Budd Inlet. The sediment remaining after the proposed dredging would be generally similar to that which would be removed, although areas where the channel is widened may accumulate finer grained sediments over time (leading to less sand and gravel, more silt and clay). The proposed dredging would not alter the sediment quality in the dredged areas. Re-distribution of sediment during dredging activities is expected to be minimal and very localized.

Disposal of the dredged sediment at the proposed beneficial use site would reduce the concentration of dioxin/furans in surface sediments from more than 20 ppb TEQ to less than 1

³ As stated in Corps (2006), "The DMMP agencies acknowledge the complexity of setting interpretive guidelines for [dioxin/furans]... The DMMP agencies have developed an interim interpretive approach for [dioxin/furans] based on maintaining "background" concentrations currently existing at and in the vicinity of the Anderson-Ketron site." For the 2006 suitability determination, the Tier 1 dioxin limit for open-water disposal or beneficial uses was set at the maximum observed sediment dioxin/furan level at the Anderson Island site of 7.3 ppb TEQ. The Tier 2 dioxin limit compares the volume-weighted mean concentration within defined sediment units to ensure that the mean concentration of the sediment unit does not exceed the disposal site mean concentration of 3.8 ppb TEQ, which would mean that the unit is not suitable for open-water disposal or beneficial uses.

pptr TEQ. Disposal of dredged sediments at the Anderson Island open water site would result in dioxin/furan levels in the sediment no higher than pre-existing conditions at the site.

3.4 Air Quality and Noise

3.4.1 Existing Conditions

Olympia Region Clean Air Agency (ORCAA) works cooperatively with the Washington State Department of Ecology and the regional United States Environmental Protection Agency to measure criteria ambient air pollutants, meteorological parameters, and other air-related data. These measurements are conducted daily throughout the region. The air quality for the project area historically is in the good to moderate range (Table 1), with generally poorer air quality conditions from late spring through early fall (EPA 2007). No areas in Washington State, including the project area, are designated as non-attainment areas due to persistent air quality problems. The project area is designated as a maintenance area for airborne particulate matter, which means that air monitoring has shown that an area is meeting health-based air quality standards and has a 10-year plan for continuing to meet and maintain air quality standards and other requirements of the Clean Air Act.

Table 1. Air Quality Index

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected

Noise in the project area is associated with the movement of commercial ships, pleasure craft, and/or fishing vessels. Additional noise is generated at the Port from activities associated with the loading and off-loading of cargo from the commercial ships. The project area is also under the flight path of airline flights to and from Seatac International Airport.

3.4.2 Impacts

No Action

With this alternative there would be no change in air quality or noise levels in the project area.

Preferred Alternative

This alternative would temporarily add to the pollution in the air from the use of dredging vessels and tugs to move the barges for disposal. Dredging during the winter would help ensure that the added sources of pollutants do not cause degradation in air quality as measured by the air quality index. An increase in noise would also be associated with the dredging vessels and tugs. This impact would be considered short term and short lived and would not be a significant impact.

The Clean Air Act established National Ambient Air Quality Standards (NAAQS) for States to attain or maintain. States are responsible for developing a State Implementation Plan (SIP) for eliminating or reducing the severity and number of violations of the NAAQS. Olympia Harbor is not located in a NAAQS non-attainment area. The Act requires that Federal agencies do not engage in any activity which does not conform to a SIP. Maintenance dredging and disposal activities are specifically excluded from CAA conformity determination requirements because they are expected to result in no emissions increase or an increase in emissions that is clearly *de minimis* [40 CFR 51.853 (c)(1)(ix)].

3.5 Fish

3.5.1 Existing Conditions

Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum salmon (*O. keta*), sea-run cutthroat (*O. clarki clarki*) and steelhead trout (*O. mykiss*) currently utilize Budd Inlet for migration into the Deschutes River or could potentially use the estuary during their transition to the marine environment. The closest Puget Sound tributary with migratory bull trout (*Salvelinus confluentus*) is the Puyallup River (USFWS 2004), located more than 30 miles via water to the northeast⁴; anadromous bull trout from the Puyallup or other more northerly Puget Sound rivers may periodically utilize Budd Inlet for foraging.

Forage fish are an important part of the food chain for salmonids, many sea birds and other animals associated with the marine nearshore. Those species are the Pacific sand lance (*Ammodytes hexapterus*), surf smelt (*Hypomesus pretiosus*), and Pacific herring (*Clupea pallasii*). Given their importance those species are provided regulatory protection in the form of construction restrictions during critical spawning periods.

Sand lance and surf smelt spawn directly onto small gravel (pea gravel) and sandy substrates in the upper tidal zone, generally between +5 feet and Mean Higher High Water (MHHW). Surf smelt spawning areas have been documented on beaches about 3 miles northeast of the project area. Sand lance spawning has also been documented on beaches about 3 miles from the project

⁴ Studies indicate that the Nisqually River does not likely support a population of anadromous bull trout (USFWS 2004).

area. The closest herring spawning ground is near Squaxin Island and Passage, located about 6 miles north of the project area. According to the Washington Department of Fish and Wildlife Priority Habitats and Species program, surf smelt and Pacific sand lance spawn on beaches along the east and west shores of Budd Inlet but not within the project area or on beaches adjacent to the project area.

Many varieties of marine fish occur in south Puget Sound and likely occur in Budd Inlet. Common species likely include various sole and flounder species, spiny dogfish, various rockfish, and various sculpin species.

3.5.2 Impacts

No Action

Under this alternative, there would be no construction impacts to fish in Budd Inlet. Due to continuing high levels of dioxins and furans in the surface sediments, the beneficial use area would continue to pose risks to fish species in the area, particularly those living along the bottom.

Preferred Alternative

During construction, fish would likely re-locate to other areas of Budd Inlet, with minor impacts to their fitness or survival. The preferred alternative would not disturb any forage fish spawning areas. The work would be done with a clamshell dredge, thus minimizing the likelihood of entraining fish during the dredging. Impacts to salmonid species would be minimal since the work would result in minor adverse impacts to water quality in the immediate vicinity during construction and no long-term adverse impacts to water quality. The minor widening of the channel bend would deepen approximately 2.1 acres from a depth of about minus 10 feet (MLLW) to minus 30 feet, with up to 2 feet of allowable overdredge. Both the pre- and post-dredge depths are in the subtidal range that is inhabited by similar fish species assemblages. Placement of the dredged material at the beneficial use area would create up to 8 acres of aquatic habitat that is shallower than minus 10 feet (MLLW), thus converting an area with a current depth of about minus 12 feet to shallow subtidal habitat. This would represent a net benefit to the fish communities of Budd Inlet on the dual fronts of decreased surface contamination and increased shallow subtidal habitat. Impacts to the benthic community may effect fish that rely on benthic infauna. The benthic infauna community does not support Chinook or bull trout feeding nor is it directly linked to their common prey (e.g. herring, sand lance) since these fish feed on pelagic prey (Hart 1973 in Pacific International Engineering and Pentec Environmental 1999). Given the small size of the benthic disturbance in relation to the benthic resources in the vicinity of the dredging and disposal sites, impacts to fish are expected to be minimal.

3.6 Benthic Community

3.6.1 Existing Conditions

Sampling of the benthic invertebrates was conducted on February 15 and 16, 2005 (Jones and Stokes 2005). There were 24 subtidal stations sampled within the turning basin and the federal channel. Six stations were placed outside the channel and in the intertidal zones to the west of the turning basin. A grab sample using a 1/4-cubic yard clamshell bucket was used to take a

sample and bring the material to the surface as slowly as possible, where core subsamples were then taken. Results indicated that the taxa primarily collected were adult organisms and were in very low abundances at most stations. The abundance and numbers of taxa in the study area were very low at the intertidal and especially subtidal stations. Benthic communities in and immediately adjacent to the Turning Basin appear to be stressed to a greater extent than communities in the entrance channel (Jones and Stokes 2005).

The dominant large macroinvertebrate species was the bent-nosed clam (*Macoma nasuta*). This species of *Macoma* grows to 2 to 3 inches in length. It is one of the most common species on the west coast of the U.S. and lives about 15 cm below the sediment surface (Abbott 1974 in Jones and Stokes 2005). There were an estimated 30 to 40 individuals in each clamshell bucket sample. However, because of their depth in the sediment, few were found in the actual core samples collected for analysis. The most noticeable crustacean was the commensal pea crab *Pinnixa* spp. The near absence of microcrustaceans, such as amphipods and cumaceans, in both intertidal and subtidal samples was likely a result of the sampling technique used.

Several families and genera of polychaetes were found in the clamshell bucket and core samples. The largest polychaete, *Glycera americana*, was seen in several clamshell samples at depth of 50 to 60 cm below the sediment surface. None were found in the core samples. Smaller individuals in the genus *Glycera* were also found in the core samples. Polychaetes in the genus *Nephtys* and in the family *Nereidae* were also noted. The above polychaetes are all considered to be free living and motile. In general, members of these families tend to feed on other organisms and organic debris within the sediment. Tube dwelling polychaetes were also found in the bucket and core samples.

3.6.2 Impacts

No Action

Under this alternative the benthic community would not be impacted.

Preferred Alternative

Disturbance to the benthic community in the dredged area (both in the channel and in the areas of minor widening) and disposal areas would be minor and temporary. Based on the results of studies (McCauley *et al.* 1977, Swartz *et al.* 1980, Albright and Borithilette 1981, Romberg *et al.* 1995, Wilson and Romberg 1996, Jones and Stokes 1998, all in Pacific International Engineering and Pentec Environmental 1999), the subtidal benthic community is expected to recover within 1 to 3 years following dredging. The reproductive biology of the benthic community provides for some spawning in all seasons. Re-colonization by some species will occur immediately following the dredging activity. Adjacent undisturbed habitat will provide a continuing source of organisms to colonize the newly disturbed subtidal substrate through migration and spawning (Pacific International Engineering and Pentec Environmental 1999). Given the mechanism of disturbance and recovery, the duration of time until recovery of the benthic community is expected to be similar for both the dredging and disposal sites. The areas of minor widening would remove habitat for some of the benthic community. The minor widening will change 2.1 acres of deeper subtidal habitat from minus 10 to minus 30 MLLW. This would provide a minor impact to the availability of prey species for salmonids and other species.

The dredged material has been determined to be suitable for open water disposal (see Section 3.3). Since the sediment standards on which this determination is based are designed to be protective of organisms that come into contact with sediments, concentrations and bioavailability of contaminants in sediments suspended during dredging are expected to be below levels that may cause harm to benthic species that come into contact with dredged material.

The Corps proposes to mitigate in advance for 0.4 acres of shallow subtidal habitat that may be dredged during potential future minor widening of the bottleneck reach by creating 1.0 acres of shallow subtidal habitat within Budd Inlet. The Corps is also proposing to utilize a significant portion of the dredged material beneficially, by creating a total of about 8 acres (including the 1.0 acres of advance mitigation) of shallow subtidal habitat (as shown in Figure 3), pending agency approval of beneficial use of the dredged material. Impacts to the benthic community at the Anderson Island disposal site are expected to be minimal given the depth of the site, its routine use as a disposal site, and the clean nature of the sediments that would be disposed there.

3.7 Wildlife

3.7.1 Existing Conditions

Avian fauna (water birds) in south Puget Sound are represented by a diversity of species and are numerous through the winter months. Mammalian fauna is restricted to smaller species, principally rodents due to the urbanized and industrialized nature of the area.

Marine mammals known to frequently forage in Budd Inlet include harbor seals and California sea lions. The harbor porpoise is also seen infrequently and is a state candidate species. Harbor porpoise and harbor seals are year-round residents, while California sea lions utilize the area for winter feeding (Pfeifer 1991). Both the harbor seal and California sea lion are state monitor species and have been observed hauled out on floating structures near the site.

3.7.2 Impacts

No Action

Under this alternative, wildlife would not be impacted.

Preferred Alternative

Disturbance to water birds would occur during the dredging and placement of dredged material. However this would be short term and the species would return upon project completion. Most species would just move to an area of non-disturbance and remain within the boundary of Budd Inlet. Other mammalian species would not be affected or impacted by the project. Marine mammals would also be displaced temporarily during construction of the project, but would likely remain in nearby areas outside of the area of dredging and disposal.

3.8 Threatened and Endangered Species

3.8.1 Existing Conditions

Since the Federal navigation channel was last dredged in 1973 a number of species in the area have been listed as threatened or endangered pursuant to the Endangered Species Act (ESA) of

1973 (16 USC 1531-1544). Species protected under the Endangered Species Act of 1973 that may occur in the project vicinity are:

- Bald eagle (*Haliaeetus leucocephalus*), threatened;
- Puget Sound Chinook Salmon, threatened, with designated critical habitat;
- Coastal/Puget Sound bull trout, threatened, with designated critical habitat (but the project area is not included⁵);
- Puget Sound steelhead, threatened;
- Southern resident killer whale (*Orcinus orca*), endangered, with designated critical habitat;
- Marbled murrelet (*Brachyramphus marmoratus*), threatened, with designated critical habitat (but none in marine areas)
- Steller sea lion (*Eumetopias jubatus*), threatened, with designated critical habitat (but none in Puget Sound)
- Humpback whale (*Megaptera novaeangliae*), endangered;
- Leatherback sea turtle (*Dermochelys coriacea*), endangered;

In Thurston County, the golden paintbrush (*Castilleja levisecta*), a threatened plant, occurs in certain terrestrial areas and northern spotted owls (*Strix occidentalis caurina*) occur in forested areas, but neither of these species would occur in the marine environment or developed areas such as the city of Olympia.

Salmonids represent the most important anadromous fish present in the vicinity of the proposed project. Chinook salmon are common throughout Puget Sound. Multiple migratory runs of native and hatchery reared salmonid stocks occur seasonally in Budd Inlet and Deschutes River. Returning adult salmon congregate at the mouth of the Deschutes River in the vicinity of the project area prior to upstream migration and juvenile salmonids may use the nearshore reaches of the project area for transition to marine waters.

Bull trout appear to be relatively rare in Budd Inlet, specifically, and southern Puget Sound, in general, most likely because no south Puget Sound tributaries support anadromous populations of bull trout.

Bald eagles have been observed in the vicinity of the project area. Bald eagles may feed on fish occurring at the water surface of Budd Inlet. The marbled murrelet (state and federally threatened) depends on nesting in old growth and feeding in coastal marine environments. The murrelet is more common in northern Puget Sound. Other species that winter in Puget Sound and may be present in the project area include the harlequin duck (federal species of concern).

3.8.2 Impacts

No Action

⁵ Designated bull trout critical habitat in the marine portions of Puget Sound does not extend south of Nisqually Head at the western edge of the Nisqually River delta (Federal Register 2005).

If the no action alternative were chosen there would be no effect to the listed species or critical habitat.

Preferred Alternative

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended, the Corps is required to assure that its actions have taken into consideration impacts to federally listed or proposed threatened or endangered species for all federally funded, permitted, or licensed projects. The Corps prepared a biological evaluation (BE) of the potential effects on listed species which addressed proposed maintenance dredging of the entrance channel, channel bend, turning basin, and Port berths (which corresponds to the alternative described in Section 2.2; note that the work covered by the BE includes the Port maintenance dredging of Berths 2 and 3, which is discussed in more detail in Appendix A). The Corps sent the BE to U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) in November 2005.

The project would include the following conservation measures:

1. The Corps will adhere to all agreed timing restrictions that are protective of migratory periods for juvenile salmonids and potential use periods for bull trout. Dredging and disposal operations would occur between October 1 and February 14.
2. Water quality monitoring will be conducted to aid in ensuring that applicable standards are not exceeded outside specified dilution zones (by Ecology's Clean Water Act Section 401 compliance determination).
3. The Corps will require that all prudent and necessary steps (based on best management practices) be taken to assure that no petroleum products, chemicals, or other toxic materials will enter the water from the dredging equipment.
4. If a spill should occur, work will stop immediately, steps will be taken to contain the material, and the appropriate agencies will be notified.
5. If fish are observed in distress or a fish kill occurs, work will stop immediately and appropriate agencies will be notified.

For the project elements addressed in the BE, the Corps concluded that the project would have no effect on Southern resident killer whale, marbled murrelet, Steller sea lion, humpback whale, or leatherback sea turtle. In 2005, the Corps concluded that the project elements addressed in the 2005 BE would not be likely to adversely affect bald eagle, Puget Sound Chinook salmon, or Coastal/Puget Sound bull trout; additionally, there would be no effect on designated critical habitat for Chinook salmon and bull trout. The rationale for the species-specific effects determinations is summarized below.

Dredging and disposal will result in temporary degradation of the water quality indicators, which would likely result in short-term impacts to Chinook salmon through minor, short-term adverse effects on benthic prey availability. However, these effects would be limited to the immediate dredging and disposal site and would not have an overall adverse effect on the action area. Conservation measures, including avoidance of the juvenile salmon migration period, would prevent adverse short-term effects to salmon during dredging and disposal. Accordingly, the Corps had determined that the proposed action may affect, but is not likely to adversely affect, Chinook salmon.

Bull trout have not been previously found in the project area due to the distance of this water body from the major river systems known to support bull trout (Puyallup and Skagit Rivers). However, individuals have been caught on the western side of Puget Sound, so their use of any available habitat must be assumed. Bull trout are opportunistic apex predators that likely follow juvenile salmonid and also likely use the same habitats for additional feeding and refugia. As such, the Corps determined that the proposed action may affect, but is not likely to adversely affect, bull trout for the same reasons identified for Chinook salmon.

The proposed action will not result in any long-term degradation of habitat or other adverse effects on bald eagles. There are no active bald eagle territories within ¼-mile of the navigation channel and bald eagles that forage along the Budd Inlet shoreline are accustomed to regular recreational boat traffic and human activities. No sediments containing bio-accumulating toxins will be deposited in the marine environment. Short-term effects such as noise disturbance and reduced prey availability will not occur or will be very small in magnitude. The survival or reproductive success of eagles in the project vicinity will not be affected. Therefore, the proposed action may affect, but is not likely to adversely affect, the bald eagle.

Steller sea lions are not expected to be present in the project area. Any Steller sea lions that might be present will experience only localized and temporary effects from the action. Because Steller sea lions are highly mobile, they are expected to readily avoid the project area. Therefore, the proposed action will have no effect on the Steller sea lion.

The proposed action will have no effect on the humpback whale since they are rarely in the project area and, since they are highly mobile, any individual whales in the vicinity of the work would be able to avoid the work area with no adverse effects. For similar reasons, the proposed action will have no effect on the leatherback sea turtle.

The proposed action will not result in any long-term degradation of habitat or other adverse effects on marbled murrelets. Short-term effects such as noise disturbance and reduced prey availability will not occur or will be very small in magnitude. The survival or reproductive success of marbled murrelet in the project vicinity will not be affected. Therefore, the proposed action will have no effect on the marbled murrelet.

The proposed action will not result in any long-term degradation of habitat or other adverse effects on killer whales. Short-term effects such as noise disturbance and reduced prey availability will not occur or will be very small in magnitude. The survival or reproductive success of killer whales in the project vicinity will not be affected. Therefore, the proposed action may affect, but is not likely to adversely affect killer whales.

In a letter dated May 15, 2006, the USFWS concurred with the Corps determination that the project elements addressed in the Corps' 2005 BE are not likely to adversely affect bald eagle, bull trout, and marbled murrelet.

The Corps continues to consult with NMFS on effects to species under their jurisdiction. Since the 2005 BE, southern resident killer whales have been listed as endangered and critical habitat

has been designated. The Corps will update the 2005 BE to address the updated status of killer whales and to provide additional information requested by NMFS.

3.9 Vegetation

3.9.1 Existing Conditions

The project vicinity is highly industrialized and therefore minimal vegetation exists. The project area has no vegetation associated with it, as the project is located in deep water within or directly adjacent to the Federal navigation channel. No eelgrass is located within the Federal navigation channel. There are no eelgrass beds within the Budd Inlet estuary (Washington Department of Natural Resources 2001).

3.9.2 Impacts

Since there is no vegetation in the project area, neither the No Action nor Preferred Alternative would have any impact on vegetation.

3.10 Cultural and Native American Concerns

3.10.1 Existing Conditions

The Corps evaluated the project area to determine the likelihood that historic properties may be present within the area of potential effect. The information below summarizes this analysis (Kelly and Grant 2007).

Approximately 13,000 years ago, sea level in the Puget Sound was more than 300 feet lower than today and Budd Inlet was an interior valley of the Deschutes River where the river flowed into the Puget Sound. Sea levels rose between 8,000 and 5,000 years ago and inundated the lower portion of Budd Inlet, with the southern portion remaining a floodplain of the Deschutes River Valley. By around 5,000 years ago, Puget Sound levels were within a meter or two of modern sea level elevations. Budd Inlet was probably the ancestral delta of the Deschutes River. Salmon runs at that time were likely. About 1,100 years ago an earthquake dropped the area (Budd Inlet and downtown Olympia) two or three feet in elevation. Skookum Inlet (ten miles west) shows an archaeological site buried ten feet under a tidal marsh. It is likely that the southern portion of Budd Inlet in what is now Capitol Lake was probably inundated for the first time around 1,100 years ago. The confluence of Percival Creek and the Deschutes River, located southwest of the project area, would have been a likely locale for an occupation prior to the rise in sea level. The terrace on the west side of the Deschutes floodplain was available for use over the past 14,000 years.

Archaeological, historical and ethnographical evidence supports heavy use of this region by a number of people. There are several archaeological/cultural sites located within a few miles of the navigation project, the location and type of which corroborate ethnographic evidence. There are no known cultural or Native American or historical areas within the footprint of the proposed project.

Based on geologic analysis, it is not likely that the project area was emergent before the earthquake 1,100 years ago. It is, however, likely that the area was emergent approximately

6,000 years ago. Exploration holes drilled in 1989 show marine deposition to an approximate elevation of 17 to 46 feet below MLLW. It is, therefore, most likely that the sediment overlying the project area was deposited after the area became submergent. Due to the geologic history of the sediments that would be disturbed by the project, the Corps has determined that there is little potential for the existence of archaeological deposits in the area of potential effect.

Budd Inlet and Olympia Harbor have been dredged numerous times since the first Corps channel dredging/widening circa 1895. The earliest map found (dated 1891) shows the proposed channel modifications and the proposed location for the channel, and the proposed design of bulkheads. It is not clear to what degree the proposed project matched the project as completed. Maintenance dredging has been required infrequently since construction of the Capitol Lake dam in 1951. Federal dredging was last conducted in 1973.

The Anderson Island open-water disposal site is an on-going dredge material disposal location. Compliance under Section 106 of the NHPA was achieved for the Puget Sound Dredged Disposal Area in 1988 (DAHP Log Reference: 1008-F-COE-S-04). At that time it was determined that there were no historic properties in the disposal area.

Corps will require the contractor to coordinate the work with any Tribal fishing in the project area.

3.10.2 Impacts

No Action

There would be no impacts associated with this alternative.

Preferred Alternative

The maintenance dredging would remove materials which have settled in since the last maintenance dredging. Based on the geologic analysis, the areas of the minor widening and the beneficial use site are considered to have low potential for pre-contact, ethno-historical, and historic period archaeology since the sediments were deposited once the area was submerged. Based on this rationale, the Corps determined that no historic properties would be affected by the proposed work. In a letter dated March 29, 2007, the Washington Department of Archaeology and Historic Preservation concurred with the Corps determination of “no historic properties affected.”

The Squaxin Island Indian Tribe and the Nisqually Indian Tribe are the nearest federally-recognized tribes to the Budd Inlet and Olympia Harbor area. A letter soliciting knowledge and concerns for the project area was sent to these tribes on December 20, 2005. At the behest of Rhonda Foster (the Squaxin Tribal Historic Preservation Officer) a government-to-government meeting was convened on March 14, 2006. Although Ms. Foster was unable to attend, Larry Ross (tribal archaeologist) expressed concerns about the potential effect of the minor widening portion of the proposed project to intact archaeological deposits. The result of the meeting was an agreement that the sediment in the minor widening portion of the project should be evaluated for any potential to contain cultural deposits. It was further agreed that if the sediment did demonstrate potential for archaeological deposits, the minor widening area would be tested through the use of vibracore samples, especially in the area near the inundated confluence of

Percival Creek and the Deschutes River. An evaluation by Corps geologists indicated that the depositional layer in question was the result of submarine sedimentation, which precluded the need for further evaluation.

3.11 Socioeconomics

3.11.1 Existing Conditions

The Federal navigation channel provides access to the marine terminal at the Port. The following statistics are compiled in the Port's most recent economic impact study (BST Associates 2005).

In 2004, the marine terminal shipped almost 325,000 metric tons (mt) of cargo, which included about 220,000 mt of logs, 78,000 mt of aluminum, and 13,000 mt of Department of Defense cargo. The marine terminal generated about 130 direct jobs in the community in 2004 and generated 360 jobs across Washington State. Wages for jobs for businesses using the marine terminal averaged about \$59,000 per year.

In 2007, the marine terminal is projected to generate \$2.9 million (38%) of the projected \$7.5 million in total revenue generated from Port enterprises (Port of Olympia 2006).

3.11.2 Impacts

No Action

Currently, the average delay of vessels to work around the tides is approximately 3 hours per vessel. Vessel operating costs for 37 vessels delayed in 2004 amounted to a total of \$138,750. In addition some of the Port customers must be in berth in Vancouver by 8:00 AM for a full day of operations after it leaves Olympia. It must leave Olympia by 3:00 PM or lose a day of work in Vancouver. There were 12 vessels that fell into this category in 2004, of which 4 did not make the departure time because of tidal delays. The estimated cost of this delay for the 4 vessels is \$160,000 plus labor and other associated cost with operation of the vessel.

If this alternative were chosen, adverse economic impacts would continue to grow as the Federal navigation channel continued to shoal. Delay time for ships waiting for high tide to negotiate the navigation channel and with further shoaling would increase, with resulting impairment of cargo shipping into and out of the Port. With additional impairment of cargo shipping, ancillary impacts to the revenue and jobs supported by the marine terminal operations would likely be adversely affected.

Preferred Alternative

Based on the economic analysis performed by the Corps, this alternative would eliminate any slow down of shipping into and out of the Port based on ships that are now required to wait for high tide to safely enter and exist the Port facilities. Elimination of the delay would eliminate the costs associated with the delay.

3.12 Land Use

3.12.1 Existing Conditions

Thurston County covers approximately 714 square miles. It is mostly flat, except for areas in the south and west where hills rise to 3,000 feet above mean sea level. The area adjacent to the project site is the Port's berthing and terminal area. On the opposite side of the project area is residential development.

3.12.2 Impacts

No Action

If the Federal navigation channel became impassable to cargo ships, the Port and terminal area may be less viable as a marine terminal facility over the longer term. This could result in changes in land use of the Port Terminal properties to maintain viability. In any event, the Port peninsula would likely remain in industrial use. Under the no action alternative, land uses to the west of Budd Inlet would not be affected.

Preferred Alternative

With the preferred alternative, the Port would continue to provide marine terminal services for wood products and other break bulk cargo, thus preserving the status quo land uses in the area. The disposal operations would have no effect on land uses. Similar to the no action alternative, land uses to the west of Budd Inlet would not be affected by the preferred alternative.

3.13 Transportation and Navigation

3.13.1 Existing Conditions

Transportation in the project area consists of merchant vessels, pleasure craft, and fishing vessels. Land-based vehicular traffic associated with the merchant vessels could include tractor-trailer trucks, small trucks, and personal vehicles. Vehicular traffic associated with pleasure craft and fishing vessels would include a variety of personal vehicles. The Port is served by the Tri-City and Olympia railroad that provides service to the Burlington Northern-Santa Fe and Union Pacific mainline.

3.13.2 Impacts

No Action

This alternative could have potential impacts to transportation if the Federal navigation channel was to continue shoaling to the point where merchant vessels are not be able to access the Port facilities. There could also be additional vessel traffic (additional crews) if additional tugs were required to maneuver the merchant vessels into Port facilities if the shoaling hindered but did not completely prevent entrance. These impacts could be considered long term until shoaling prevented entrance into the Port facilities. Decreased commercial vessel traffic would likely result in decreased railroad traffic in the area.

Preferred Alternative

If this alternative were chosen there would be a potential interruption to merchant vessels while the dredging and disposal were occurring. There is also potential for some temporary interruption to pleasure craft and fishing vessels as portions of the Federal navigation channel

would be occupied by tugs and work barges during project construction. Dredging during the winter months will minimize the potential interference with most non-commercial vessel traffic due to low usage during the winter. Once the project is complete, merchant vessels, pleasure craft, and fishing vessels would have full access to Port facilities. This alternative would reduce the potential requirement for additional tugs to maneuver the merchant vessels into the berthing area. The dredge contractor will request a U.S. Coast Guard Notice to Mariners be issued in advance of the dredging to help minimize disruption to vessel traffic.

3.14 Aesthetics

3.14.1 Existing Conditions

The area near and in conjunction with the proposed project is industrial and has been since the land was created in the early 1900s. The project itself will be performed at the submarine level and is therefore not otherwise visible.

3.14.2 Impacts

No Action

There would be no impact to aesthetics if this alternative were chosen.

Preferred Alternative

This alternative would have short term impacts to the aesthetics due to presence of the dredging and disposal vessels that would be working within the project area. Once the proposed project is complete the area will return to its present condition.

3.15 Recreation

3.15.1 Existing Conditions

The primary recreation in Budd Inlet is sport fisheries and pleasure craft. There may be some opportunities for scuba diving in the vicinity, but recreational diving in the Federal navigation channel is rare.

3.15.2 Impacts

No Action

There would be no impacts to the recreation of the area unless the channel was to shoal in to the point of impassability of pleasure vessels. Since most pleasure craft can currently access most areas of Budd Inlet even outside of the maintained channel during most tidal stages, future shoaling of the channel that would inhibit recreational traffic is highly unlikely to occur in the near or long term future.

Preferred Alternative

The impacts would be temporary and represent a minor inconvenience to navigation while the area is being dredged and material is being disposed of. No other impacts would be associated to recreation.

4. CUMULATIVE IMPACTS

4.1.1 Past Actions in the Project Vicinity

From as early as 1848, construction began in the vicinity of Budd Inlet as the first landing was constructed in deep water on the west side of the Inlet. During the next few years various wharfs and additional landings were built in or near Budd Inlet. The first known dredging of the area occurred around 1885 when the dredger Umatilla dug a channel from Main Street to deep water. The U.S. Army Corp of Engineers first dredged in 1893-94 when they dredged the same channel and deposited the material under 4th Street bridge.

From 1909 to 1911, the local community decided to dredge the channel into the Port to allow larger and more ships to enter with their merchandise. The dredged material from that project was used to fill in approximately 29 blocks of land of intertidal habitat to form the Port Peninsula and provide lands to develop into an industrialized complex to handle different types of cargo. From that time forward, various types of industry built on the newly formed land mass. The industry ranged from ship building to treating utility poles and railroad ties. Table 2 shows the chronology of dredging in Budd Inlet since formation of the Port.

Table 2. Port of Olympia Dredging Chronology

▪ YEAR	▪ ACTIVITY
▪ 1909-1911	▪ Deeper channel dredged into Port and Port Peninsula developed from dredged material
▪ 1931	▪ Dredged 339,012 cy
▪ 1934	▪ Dredged 715,000 cy
▪ 1938	▪ Dredged 531,411 cy
▪ 1939	▪ Channel and turning basin completed
▪ 1948	▪ Dredged 149,457 cy, combined with Port dredging
▪ 1951	▪ A dam was constructed to form Capitol Lake at the mouth of the Deschutes River
▪ 1963	▪ Dredged 95,866 cy
▪ 1973	▪ Dredged 168,201 cy (the 1973 dredging footprint included same channel footprint now proposed for federal maintenance in 2007, except for area of minor widening).

The construction of the dam on the Deschutes River in 1951 to form Capitol Lake has reduced the rate of sedimentation in Budd Inlet, which has since resulted in a downward trend in the amount and frequency of dredging.

In the mid-twentieth century, treated wastewater began to be discharged into Budd Inlet from the Olympia Treatment Plant. Since upgrades to the Budd Inlet Treatment Plant since the 1990s, nutrient inputs to the inlet from wastewater have been somewhat reduced (see Section 3.2).

From 1957 to 1986, the Cascade Pole Company operated a wood-treating facility on property leased from the Port. Prior to that time, several other wood-treating businesses operated at the site at the northern end of the Port Peninsula. Investigations from 1986 through 1995 revealed a variety of toxic substances in soils, ground water, surface water, intertidal sediments, and marine organisms at the site. These toxic substances include polynuclear aromatic hydrocarbons (PAHs, which are key chemical constituents of creosote, a wood preserving compound), pentachlorophenol (PCP, which is another wood-preserving compound), volatile hydrocarbons, and dioxins. Since 1995, the Port has worked with the Washington Department of Ecology to remediate the contamination through removal, treatment, and isolation of affected areas.

In concert with development of the navigation channel, a variety of overwater structures have been constructed along the Port Peninsula. In more recent years, new overwater structures have incorporated innovative techniques to minimize the extent of overwater coverage. For example, in 2005, the Port rebuilt the North Point Restaurant at the former location of Genoa's Restaurant, and actually decreased overwater coverage of the structure.

4.1.2 Potential Future Actions in the Project Vicinity

The Port plans to dredge dioxin/furan contaminated sediment from Berths 2 and 3 adjacent to the turning basin at the south end of the Federal navigation project (see Appendix A). This dredging would remove approximately 40,500 cy of accumulated sediment to restore berth depths of minus 42 feet (MLLW). The work could utilize the same dredging equipment as the proposed Federal dredging and would occur immediately after the Corps work. The dredged sediments from the berths will be loaded onto specially outfitted deck barges and transferred to an upland transloading facility on the Port's dock. After a period of gravity dewatering, the sediment will be loaded into rail cars and transported for disposal to a regional Subtitle D landfill facility. Berth sediment is not designated a dangerous waste. Maintenance dredging of Berths 2 and 3 will both reestablish the acceptably deep depths to allow safe moorage of ships in the Port's shipping berths and reduce long-term environmental risks through removal and offsite disposal of dioxin-contaminated sediments present in the berths. The need for any additional long-term clean up actions in other areas of Budd Inlet is currently being evaluated by the Department of Ecology.

Given the project purpose and the nature of the area, commercial shipping activity would continue in and adjacent to the proposed work. Vessel operation has some potential to redistribute surface sediments through prop scour, the degree of which would likely be reduced if the navigation channel and berth depths are restored to safe depths.

The Port may dredge the East Bay entrance channel and marina for routine maintenance in the future. The Port will conduct all coordination for this project and provide all environmental documentation. Impacts as a result of additional pleasure boating in the area will have to be

determined. Details on the dredging amount and scope of the project are not available at this time as this project is in the preliminary planning stages.

The Corps may dredge the turning basin and bottleneck reach of the Federal navigation project in the future pending funding and agreements on handling of the contaminated sediments present in the areas. The timing and scope of this potential dredging is uncertain at this time.

The Washington State Department of General Administration is currently studying the feasibility of restoring the Deschutes River estuary, which would likely involve removal of the dam at the outlet of Capitol Lake. Removal of the dam would allow sediment that currently settles in Capitol Lake to enter Budd Inlet. The feasibility study began in 2003 and is scheduled to be completed in 2008. The primary objective of the Deschutes Estuary Feasibility Study (DEFS) is to evaluate the possibility of a restored estuary as an alternative to the management actions necessary to maintain Capitol Lake. Given the timeline and status of the feasibility study at this time, removal of the Capitol Lake dam is not a reasonably foreseeable future action and thus will not be considered for potential cumulative impacts with the proposed action.

4.1.3 Impact Analysis

The aggregate effect of the past actions has resulted in reduced ecological value of the Budd Inlet estuary through reduction in sediment, increased nutrient inputs, discharges of contaminants, physical alteration of the morphology of Budd Inlet, and general environmental degradation associated with development of the area from pristine forest to the present urbanized condition.

Considering the past actions, the proposed action, and reasonably foreseeable future actions, the cumulative effect would generally maintain the general environmental character of the area. The proposed action will not greatly alter the cumulative effects on hydrology, water quality, air quality, noise, wildlife, vegetation, cultural and Native American concerns, socioeconomics, transportation, aesthetics, and recreation. Even considering the individual benefit the proposed work would have in reducing contamination of exposed surface sediments in Budd Inlet, the cumulative effects on sediment, fish, the benthic community, and threatened and endangered species will remain substantial due to accumulated impacts of nutrient loading, contamination, and physical changes to the estuary. Future projects are expected to gradually reduce these accumulated effects through remediation of contamination, with the possibility of restoration of important ecological processes (i.e. if the Deschutes Estuary Feasibility Study results in removal of the Capitol Lake dam).

5. CONSERVATION AND MITIGATION MEASURES

5.1 Conservation Measures

As discussed in Section 3.8.2, the proposed action would include the following conservation measures:

1. The Corps will adhere to all agreed timing restrictions that are protective of migratory periods for juvenile salmonids and potential use periods for bull trout. Dredging and disposal operations would occur between October 1 and February 14.
2. Water quality monitoring will be conducted to aid in ensuring that applicable standards are not exceeded outside specified dilution zones (by Ecology's Clean Water Act Section 401 compliance determination). If exceedances occur, work will

- stop and will not re-commence until water quality meets the applicable standards and all relevant actions are taken to modify the dredging to minimize the chance of future exceedances.
3. The Corps will require that all prudent and necessary steps (based on best management practices) be taken to assure that no petroleum products, chemicals, or other toxic materials will enter the water from the dredging equipment.
 4. If a spill should occur, work will stop immediately, steps will be taken to contain the material, and the appropriate agencies will be notified.
 5. If fish are observed in distress or a fish kill occurs, work will stop immediately and appropriate agencies will be notified.

5.2 Mitigation

The U.S. Army Corps of Engineers proposes to use the clean sediments beneficially and provide advance mitigation in the form of 1.0 acres of shallow subtidal habitat for the potential future impact to 0.4 acres of shallow subtidal habitat from potential future bottleneck channel minor widening. The area the Corps intends to use as advance mitigation is within the beneficial use area shown in Figure 3. The pre-project depth in the beneficial use area varies from -11 MLLW to -15 MLLW. A bottom dump barge will be used to place the dredged material and layer the material until the depth is shallower than -10 MLLW.

The most direct effect of the creation of 1.0 acres of shallow subtidal habitat for mitigation will be the covering or smothering of approximately 8 acres of existing benthic community. However this will be a short term effect as the community will re-populate the newly created habitat rapidly after the completion of the proposed project. The timing of future dredging of the bottleneck reach of the entrance channel is uncertain. Until the actual dredging of the bottleneck reach, the disposal of material at the beneficial use site will result in addition of up to 8 acres of new shallow subtidal habitat in Budd Inlet. If the bottleneck reach is eventually dredged, the net result would still be a net gain of more than 7 acres of shallow subtidal habitat for Budd Inlet. The long term effect will be an increase in the benthic population due to the access to more suitable habitat. In addition to creating shallow subtidal habitat, the beneficial use of the clean dredged material would reduce the concentration of dioxin/furans in surface sediments at the beneficial use site from more than 20 pptr TEQ to less than 1 pptr TEQ.

6. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects from the proposed work include the temporary loss of the benthic community that currently exists within the dredging and disposal areas, short-term adverse effects on localized water quality during dredging and disposal, construction disturbance to fish and wildlife in the project vicinity and minor impacts to air quality. Although these impacts are unavoidable they are also temporary, as the benthos will recolonize affected areas, and water quality disturbance to fish and wildlife and air quality impacts will return to ambient conditions almost immediately after dredging and disposal operations have stopped.

7. COORDINATION

The following agencies and entities have been involved with the environmental coordination of the proposed project:

- U.S. Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service (NMFS)
- Washington Department of Fish and Wildlife (WDFW)
- Washington Department of Ecology
- Port of Olympia
- Squaxin Tribe
- Nisqually Tribe

The following outstanding environmental coordination items are anticipated to be included in the final EA:

- Comments and responses for the draft environmental assessment
- The 401 Water Quality Certification and Coastal Zone Consistency Determination from Washington Department of Ecology
- Concurrence of findings from NMFS
- Section 404(b)(1) Analysis

8. ENVIRONMENTAL COMPLIANCE

8.1 National Environmental Policy Act

Section 1500.1(c) and 1508.9(1) of the National Environmental Policy Act of 1969 (as amended) requires federal agencies to “provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact” on actions authorized, funded, or carried out by the federal government to insure such actions adequately address “environmental consequences, and take actions that protect, restore, and enhance the environment”. This assessment evaluates environmental consequences from the proposed dredging and disposal for maintenance and minor widening of the entrance channel bend at the Olympia Federal navigation project.

8.2 Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. In November 2005, the Corps submitted a biological evaluation to the U.S. Fish and Wildlife Service and National Marine Fisheries Service for their concurrence with the Corps’ determination that the proposed project is not likely to adversely affect Chinook salmon, bull trout, and bald eagles and would have no effect determination on humpback whale, marbled murrelet, Steller sea lion, Southern Resident killer whales, and leatherback turtle. A concurrence letter was received from the U.S. Fish and Wildlife Service on May 15, 2006, with a finding that the project is not likely to adversely affect bull trout, bald eagles and marbled murrelet. Since the submittal of the original biological evaluation in November 2005, Puget Sound steelhead have been listed as threatened, Southern Resident killer whales have been listed as endangered, and critical habitat has been designated for killer whales. Considering the current status of these species, the Corps believes that the proposed work is not likely to adversely affect Puget Sound steelhead, Southern Resident killer whales, or killer whale critical habitat. As of the date of this EA, the Corps and NMFS

continue consultation on species on NMFS jurisdiction. The Corps will fully comply with the Endangered Species Act prior to project implementation.

8.3 Clean Water Act

A 404(b)(1) evaluation, which demonstrates compliance with the substantive requirements of the CWA, is required for work involving discharge of fill material into the waters of the United States and has been completed (Appendix C). The Corps will also obtain a Section 401 water quality certification from Washington Department of Ecology.

8.4 Coastal Zone Management Act

The Corps has evaluated the project and determined it is consistent with the Federal Coastal Zone Management Act (CZMA) of 1972 (16 USC 1456 et. seq.) and the State of Washington Shoreline Management Act of 1971 (Chapter 90.58 RCW). See Appendix D for the Corps CZMA consistency determination.

8.5 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of U.S. Fish and Wildlife Service habitat surveys evaluating the likely impacts of proposed actions, which provide the basis for recommendations for avoiding or minimizing such impacts. A Fish and Wildlife Coordination Act Report is not required for maintenance work.

8.6 National Historic Preservation Act

The National Historic Preservation Act (NHPA, 16 USC 470) requires that the effects of proposed undertakings or actions on properties (such as archaeological sites, buildings, structures, or objects) included or eligible for the National Register of Historic Places must be considered. Historic Preservation Officers for affected States and Tribes and the Advisory Council on Historic Preservation must be afforded an opportunity to comment on the undertaking, and the agency also must consult with affected Indian tribes. Dredging Guidance Letter No. 89-01 (13 March 1989) states that it is the policy of the Corps of Engineers that cultural resources surveys should not be conducted for maintenance dredging and disposal activities proposed within the boundaries of previously constructed navigation channels or previously used disposal areas. The areas of minor widening have been surveyed in accordance with NHPA.

8.7 Rivers and Harbors Act

The Rivers and Harbor Act of 1899 regulates structures or work in or affecting navigable waters of the United States including discharges of dredged or fill material into waters of the United States. Structures include without limitation, any pier, boat dock, weir, revetment, artificial islands, piling, aid to navigation or any other obstacle or obstruction. The proposed dredging and disposal operations would aid navigation by providing a navigation channel of suitable depth for the types of vessels accessing the Port. Dredging and disposal operations may temporarily obstruct navigation in the immediate vicinity of the work. Navigation impacts would cease immediately upon completion of the work. Significant adverse impacts to navigation will not occur.

8.8 Magnuson-Stevens Fishery Conservation and Management Act

In accordance with the Essential Fish Habitat (EFH) requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the Corps has determined that the proposed dredging would impact approximately 28 acres of EFH utilized by Pacific salmon, groundfish, and coastal pelagic species. The disposal operations would impact approximately 326 acres (about 8 total acres at the beneficial use site; about 318 acres at the Anderson Island open-water disposal site) of designated EFH for the same species assemblages. We have determined that the proposed action would not adversely affect EFH for federally managed fisheries in Washington waters. Potential impacts of the work will be offset since disposal operations and material effects would be in conformance with approved disposal site management standards, and dredging would be carried out in compliance with permits with conditions to protect water quality. The BE for the project provides more detailed supporting documentation on the EFH analysis.

8.9 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations. The potentially affected community does include a minority and/or low-income population. The project does not involve locating a facility that will discharge pollutants or contaminants, so no human health effects would occur. Maintenance of this navigation project would not negatively affect property values in the area, or socially stigmatize local residents or businesses in any way. The net effect of the proposed work on contaminants would be to reduce potential exposure of the environment and people to high levels of dioxin and furans. No interference with local Native American Nation's treaty rights would result from the proposed project; construction activities would be coordinated with local tribes and not physically interfere with fishing, or impact fishery resources.

Based on this rationale, the Corps has determined the overall project benefits the local economy and has determined that no disproportional impacts would occur.

9. CONCLUSION

Based on the above analysis, this project is not a major Federal action significantly affecting the quality of the human or natural environment, and therefore does not require preparation of an environmental impact statement. No other impacts from the maintenance of the Federal Navigation Channel can be directly associated with the project.

10. REFERENCES

Abbott, R.T. 1974. American Seashells: the Marine Mollusca of the Atlantic and Pacific Coasts of North America. Van Nostrand Reinhold Company, New York, NY.

Albright, R. and P.K. Borithilette. 1981. Benthic invertebrate studies in Grays Harbor, Washington. Unpublished report by the Washington Game Department to the Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Aura Nova Consultants, Brown and Caldwell, Evans-Hamilton, J.E. Edinger and Assoc., Washington Department of Ecology, and University of Washington Department of Oceanography. 1998. Budd Inlet scientific study final report. Prepared for the Lacey, Olympia, Tumwater, Thurston County Partnership (LOTT), Olympia, WA.

Barlow, J., K.A. Forney, P.S. Hill, R.L. Brownell, Jr., J.V. Carretta, D.P. DeMaster, F. Julian, M.S. Lowry, T. Ragen, and R.R. Reeves. 1997. U.S. Pacific Marine Mammal Stock Assessments: 1996. NOAA-TM-NMFS-SWFSC-248. <<http://swfsc.ucsd.edu/sars/SAR96.htm>>.

BST Associates. 2005. Port of Olympia 2004 economic impact study. Prepared for the Port of Olympia. Bothell, WA.

Corps – see U.S. Army Corps of Engineers.

Ebbesmeyer, C.C., and C.A. Coomes. 1998. Net water movement in Budd Inlet: measurements and conceptual model. Proceedings of the Puget Sound Research Conference, 12-13 March, Seattle, Washington.: Puget Sound Water Quality Action Team, Olympia, WA.

Eisner, L., C.D. Janzen, S.L. Albertson, S.A. Bell, and J.A. Newton, 1994. 1992 Budd Inlet seasonal monitoring report. Washington State Department of Ecology Environmental Investigations and Laboratory Services Program, Publication #94- 132, Olympia, WA.

Eisner, L.B. and J.A. Newton, 1997. Budd Inlet focused monitoring report for 1992- 1994. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

Environmental Protection Agency. 2007. AirData website - <http://www.epa.gov/air/data/monaqi.html?co~53067~Thurston%20Co%2C%20Washington>. Accessed 27 April 2007.

EPA – See Environmental Protection Agency.

Federal Register. 2005. Endangered and threatened wildlife and plants; designation of critical habitat for the bull trout. Vol. 70, No. 185, September 26, 2005, pp. 56212-56311.

Gearin and Jeffries. 1996. Steller sea lion research in Washington state. Unpublished report Jones and Stokes Associates, Inc., Bellevue, WA.

Giles, Suzanne L. and J.R. Cordell. 1998. Zooplankton composition and abundance in Budd Inlet Washington. 1998 Puget Sound Research Conference, Seattle, WA. On-line at www.psat.wa.gov/Publications/98_proceedings/pdfs/5c_giles.pdf

George, D.A., G. Gelfenbaum, G. Lesser, and A.W. Stevens. 2006. Deschutes estuary feasibility study: hydrodynamics and sediment transport modeling. U.S. Geological Survey, Open File Report 2006-1318.

Hart, J.L. 1973. Pacific fishes of Canada. Fisheries Research Board of Canada, Bulletin 180, Ottawa, Canada.

Integral Consulting, Inc. 2007. West Bay berths 2 and 3 interim action project, Port of Olympia, Preliminary Engineering Design Report. Prepared for the Port of Olympia, Olympia, WA.

Jeffries, S.J., P.J. Gearin, H.R. Huber, D.L. Saul, and D.A. Pruett. 2000. Atlas of seal and sea lion haulout sites in Washington. Washington Department of Fish and Wildlife, Wildlife Science Division, 600 Capitol Way North, Olympia WA.

Jones and Stokes. 2005. FY2005 Benthic analysis of the Federal navigation channel, Olympia, WA. June 9, 2005. Seattle, WA.

Jones and Stokes. 1998. Subtidal epibenthic/infaunal community and habitat evaluation, East Waterway channel deepening project, Seattle, Washington. Prepared for Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Kelly, K.M. and D. Grant. 2007. Olympia Harbor channel maintenance dredging project historic properties assessment. Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Lavelle, J.W., H.O. Mofjeld, E. Lempriere-Doggett, G.A. Cannon, D.J. Pashinski, E.D. Cokelet, L. Lytle, and S. Gill. 1988. A multiply-connected channel model of tides and tidal currents in puget sound, washington and a comparison with updated observations. NOAA Technical Memorandum ERL PMEL-84.

MarCom Working Group 30. 1997. Joint PIANC-IAPH report on approach channels – a guide for design, supplement to bulletin nr. 95. PTC2 Report.

McCauley, J.F. R.A. Parr, and D.R. Hancock. 1977. Benthic infauna and maintenance dredging, a case study. Pergamon Press, Water Research II:233-242.

Newton, J.A., S.L. Albertson, K. Van Voorhis, C. Maloy, and E. Siegel. 2002. Washington State marine water quality study from 1998-2000. Publication No. 02-03-056. Washington Department of Ecology, Olympia, Washington. On-line at www.ecy.wa.gov/pubs/0203056.pdf.

Pacific International Engineering and Pentec Environmental. 1999. Biological evaluation, East Waterway channel deepening, stage 1, Seattle Harbor, Washington. Prepared for the Seattle District, U.S. Army Corps of Engineers, Seattle, WA.

Pfeifer, B. 1991. Monitoring of 1989-1990 California sea lion control program in the Lake Washington estuary. Fishery Management Report 90-17, Washington Department of Wildlife, Mill Creek, WA.

Port of Olympia. 2006. 2007 Adopted budget executive summary. Olympia, WA. On-line at www.portolympia.com/budget2007/BUDGET%20NARRATIVE.doc

Roberts, M., B. Zalewsky, T. Swanson, L. Sullivan, K. Sinclair, and M. LeMoine. 2004. Quality assurance project plan: deschutes river, capitol lake, and budd inlet; temperature, fecal coliform bacteria, dissolved oxygen, pH, and fine sediment total maximum daily load study. Washington State Department of Ecology, Olympia WA. On-line at www.ecy.wa.gov/biblio/0403103.html.

Romberg, P., C. Homan, and D. Wilson. 1995. The Denny Way sediment cap, 1990-1992 data. King County Department of Metropolitan Services (METRO), Seattle, WA.

Strachan, G., M. McAllister, and C.J. Ralph. 1995. Marbled murrelet at-sea and foraging behavior. Pp. 247-254 in Ralph, C.J., G.L. Hunt, Jr., M.G. Raphael, and J.F. Platt (eds.), Ecology and conservation of the marbled murrelet, U.S. Forest Service Pacific Southwest Research Station General Technical Report PSW-GTR-152, Albany, CA.

Swartz, R.C., W.A. DeBen, F.A. Cole, L.C. Bentsen. 1980. Recovery of the macrobenthos at a dredge site in Yaquina Bay, Oregon. Pages 391-408 in Robert A. Baker, ed. Contaminates and Sediments, Vol. 2. Ann Arbor Science Publishers, Inc., Ann Arbor, MI.

URS Company. 1986. Southern Puget Sound water quality assessment study: comprehensive circulation and water quality study at Budd Inlet. Washington Department of Ecology, Olympia, WA. On-line at www.ecy.wa.gov/pubs/86e37.pdf.

U.S. Army Corps of Engineers. 2006. Memorandum for record, subject: supplemental determination on the suitability of dredged material tested for dioxin/furans within the Olympia Harbor Federal/Port navigation project evaluated under section 404 of the clean water act for open-water disposal at the Anderson/Ketron Island non-dispersive disposal site, and for beneficial use. Seattle District, Seattle, WA.

U.S. Fish and Wildlife Service. 24 May 1996. Final designation of critical habitat for the marbled murrelet. Federal Register 61(102): 26256.

U.S. Fish and Wildlife Service. 1999. Section 7 consultations on the marbled murrelet. Proceedings of the Biological Assessment Preparation and Review Workshop, U.S. Fish and Wildlife Service, Western Washington Office, March 1999.

U.S. Fish and Wildlife Service. 2004. Draft recovery plan for the coastal-puget sound distinct population segment of bull trout; Volume 1, Puget Sound management unit. Region 1, Portland, OR.

Washington Department of Ecology. 1997. Budd Inlet focused monitoring report for 1992, 1993, and 1994. Olympia, WA.

Washington Department of Natural Resources. 2001. The Washington State ShoreZone inventory. Nearshore Habitat Program, Olympia, WA.

Washington Department of Wildlife. 1993. Status of the Steller (Northern) sea lion (*Eumetopias jubatus*) in Washington. Unpublished Report, Washington Department of Wildlife, Olympia, WA.

Washington Department of Fish and Wildlife. 1998. Ecology of bald eagles in western Washington with an emphasis on the effects of human activity. Washington Department of Fish and Wildlife, Wildlife Research Division, Olympia, WA.

Wilson, D. and P. Romberg. 1996. The Denny Way sediment cap, 1994 data. King County Department of Natural Resources, Water Pollution Control Division. Seattle, WA.

Figures

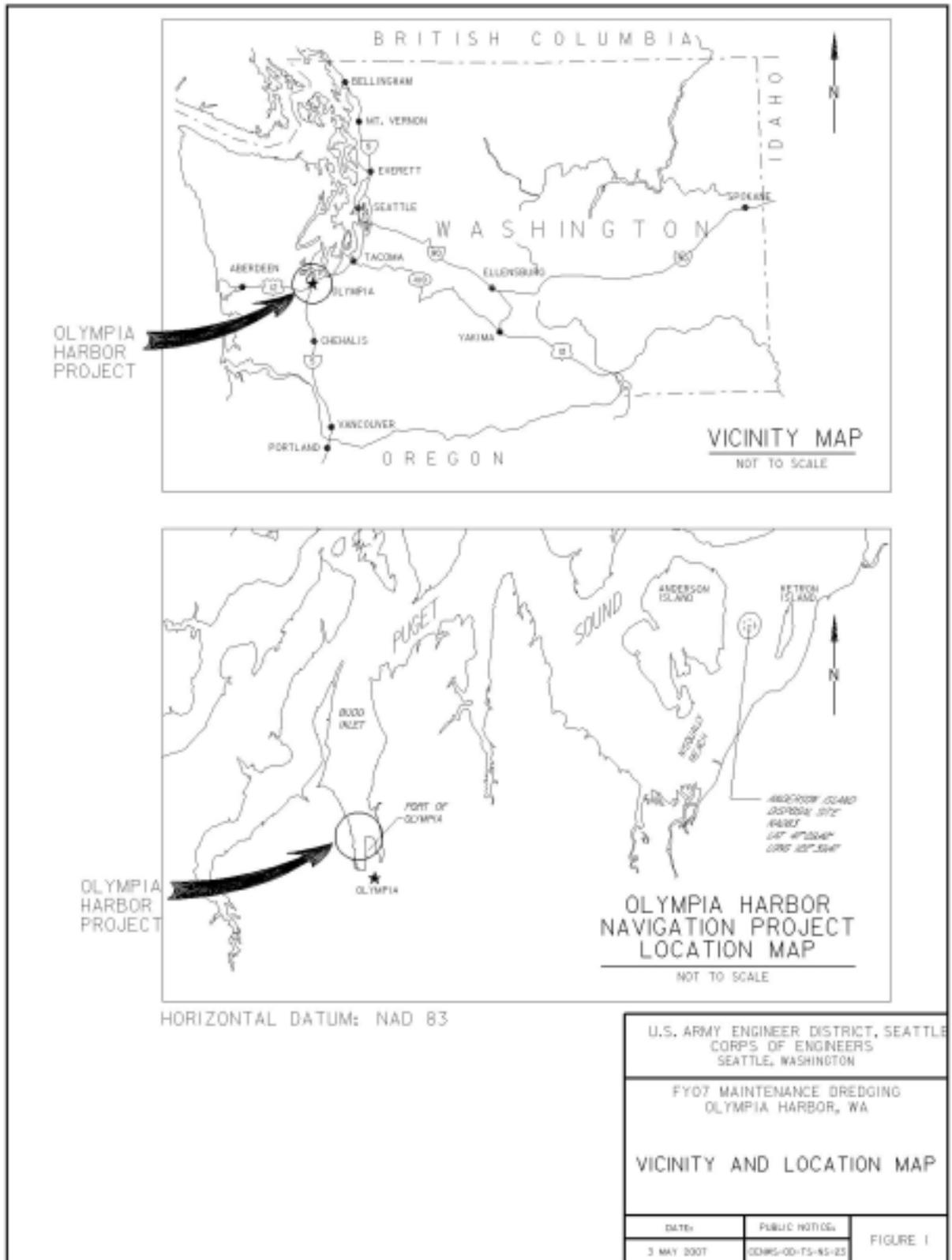


Figure 1. Location and Vicinity Map

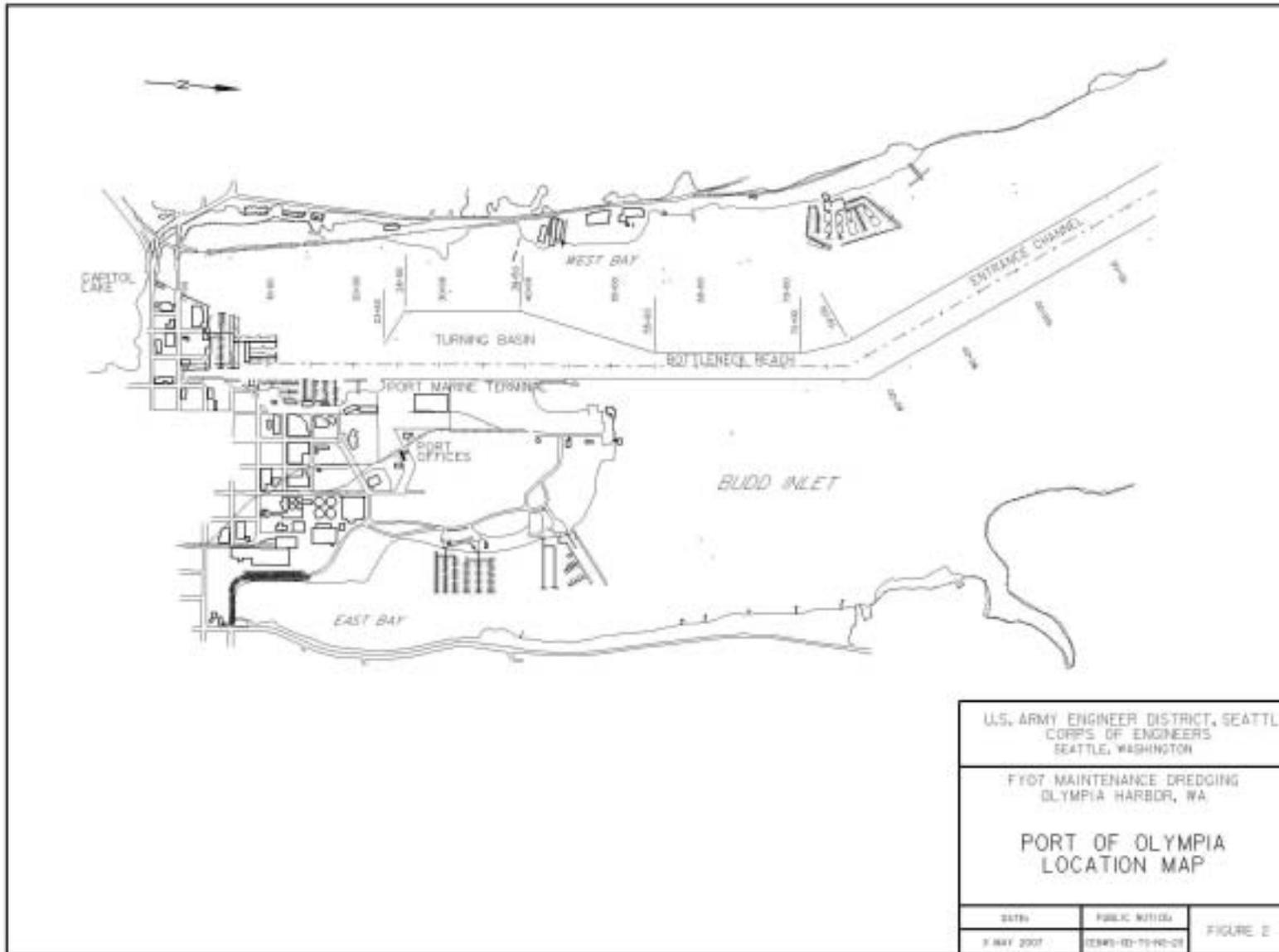


Figure 2. Map of Olympia Harbor Federal Navigation Project

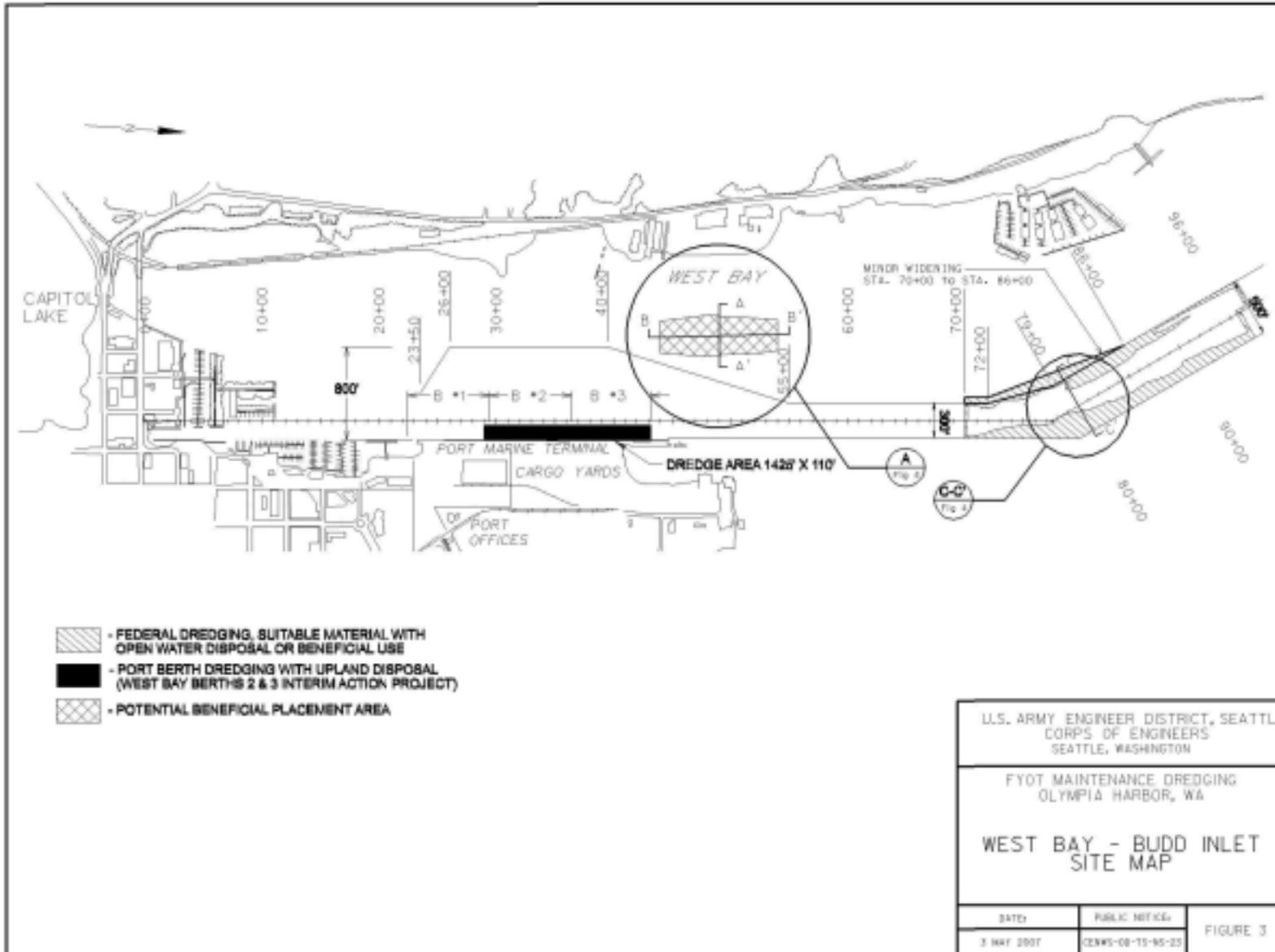


Figure 3. Proposed Federal Dredging and Beneficial Use Areas and Proposed Port Berth Dredging

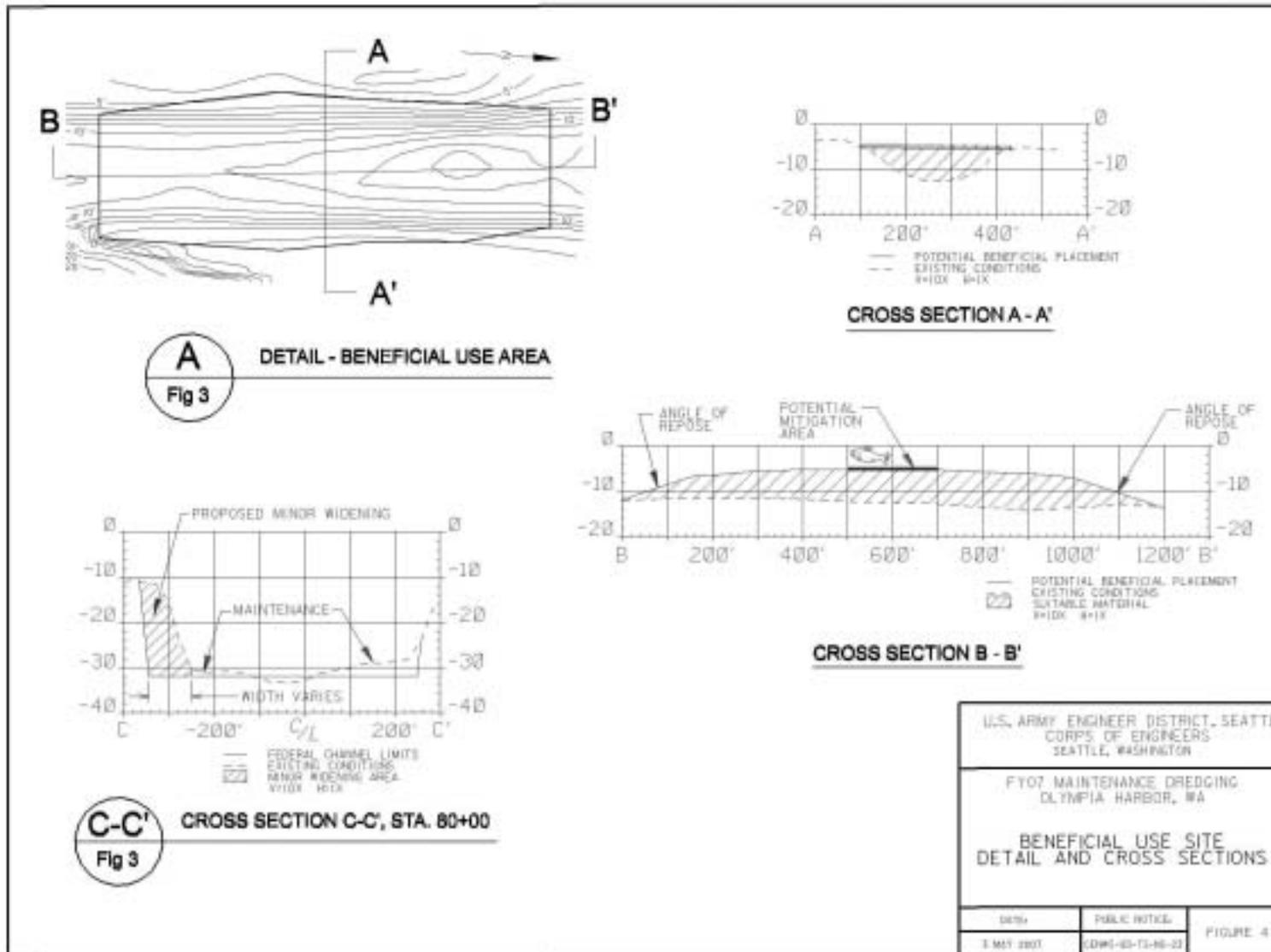


Figure 4. Detail and Cross-Section Views of Dredging and Beneficial Use Areas

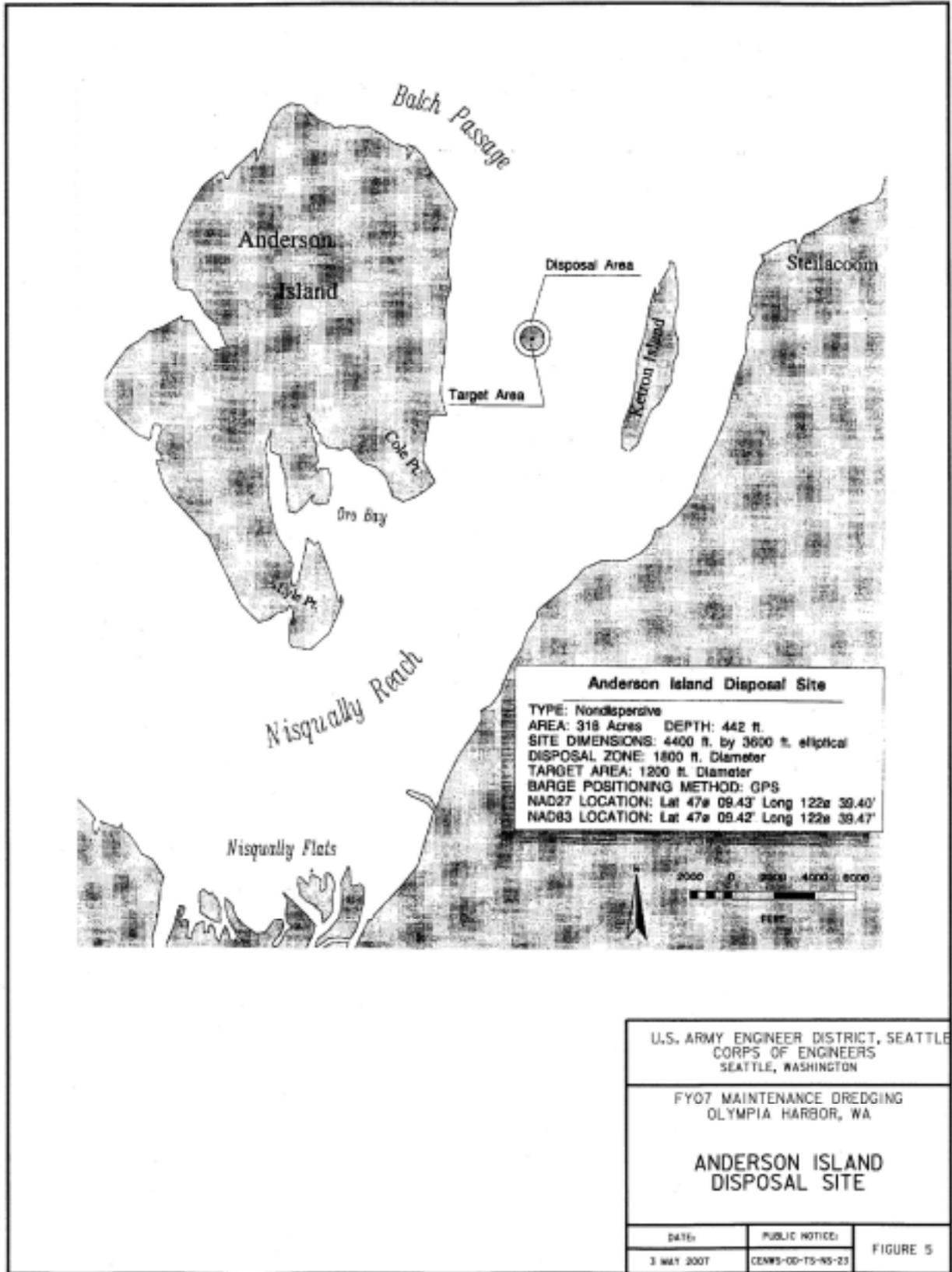


Figure 5. Location Map of Anderson Island Open Water Disposal Site

Appendices

APPENDIX A. Description of the Maintenance Dredging of West Bay Berths 2 and 3 by the Port of Olympia.

Port of Olympia has proposed to perform maintenance dredging to restore authorized navigation depths in West Bay Berths 2 and 3, located along the docking facility on the west side of the Port's Marine Terminal and adjacent to the Federal navigation channel. Sediments sloughing during berth dredging from under the Port's pier into the dredge area footprint will also be removed. The berth dredging will be undertaken in one phase, starting with the in-water work window in 2007. The proposed Port berth area to be dredged is shown on Figure 3 of the main EA document. The dredging area is approximately 1,425 feet in length and 110 feet wide located along the west side of the Port's Marine Terminal docking facility on the Port Peninsula.

The Port Marine Terminal maintained berthing areas shown in Figure A-1 have historically been maintained to minus 42 feet (MLLW) and 120 feet wide. The recent bathymetric surveys indicate reduction in water depths in these areas to as shallow as minus 33 feet (MLLW), particularly along the berth face. The berths fall within the boundaries of the authorized Federal navigation channel, but the Port's project depth for these berths exceeds the federally authorized depth minus 30 feet (MLLW, with allowable overdepth) so maintenance dredging to maintain safe depths is the responsibility of the Port of Olympia. The Port has concluded that the current berth depths are approaching unacceptably shallow depths with the potential for the inability of ships to safely moor at the marine terminal.

Characterization of berth sediment indicates the presence of elevated concentrations of dioxin/furans. Thus, the contaminated berth sediment will be disposed at an upland solid waste landfill rather than at the Anderson Island open-water disposal site. The dredging and disposal of berth sediments will occur primarily under the auspices of the Model Toxics Control Act (MTCA) through an Interim Agreed Order and exhibits thereto, namely the *West Bay Berths 2 and 3 Interim Action Preliminary Engineering Design Report*. Performance of the Port's project under a MTCA agreed order ensures that the contaminated sediment is appropriately dredged and handled under regulations designed for that purpose.

Port Marine Terminal shoal materials were tested in 1999 by the Port in accordance with the Dredged Material Evaluation and Disposal Procedures of the Puget Sound Dredged Material Management Program (DMMP). There were no chemical concentrations greater than the PSDDA Screening Level. Because of exceedances of the PSDDA bioaccumulation threshold in two samples for tributyltin concentrations in pore water, bioaccumulation testing was completed in February 2000 for those two samples. All of the proposed dredge material from the Port's project area was deemed suitable for open-water disposal at that time.

In response to concerns about potential dioxin contaminant sources within Budd Inlet, the DMMP required the Corps and Port to perform supplemental sampling and testing of the proposed dredged materials in 2005. The material was subjected to dioxin/furans testing which was not part of the initial determination. As part of their regulatory decision-making, the DMMP developed a new site-specific interpretation approach for the sampling and testing results to determine if the materials were suitable for open-water disposal. The results of the sampling and testing and the DMMP's supplemental suitability determination indicate that surface

management unit volumes of material from Berths 2 and 3 are unsuitable for unconfined-open water disposal at the Anderson Island open-water disposal site due to the presence of elevated levels of dioxin/furans.

The Port and the Washington Department of Ecology have proposed to address dredge and disposal of contaminated sediments in Berths 2 and 3 as an interim action under the state Model Toxics Control Act (MTCA). The dredged sediments from the berths will be loaded onto specially outfitted deck barges and transferred to an upland transloading facility on the Port's dock. After a period of gravity dewatering, the sediment will be loaded into rail cars and transported for disposal to a regional Subtitle D landfill facility. Berth sediment is not designated a dangerous waste. Maintenance dredging of Berths 2 and 3 will both reestablish the federally permitted depth of the Port's shipping berths and reduce long-term environmental risks through removal and offsite disposal of dioxin-contaminated sediments present in the berths. The need for any additional long-term clean up actions in other areas of Budd Inlet is currently being evaluated by the Department of Ecology.

Port of Olympia Project Alternatives Analysis

The Port considered the following alternatives in order to fulfill its project objectives:

Port Alternative 1: Dredge Berths 2 and 3 and Under-Pier Slope:

Alternative 1 would have included the dredging of Berths 2 and 3 and active removal of potentially contaminated sediments beneath the pier area adjacent to the berths. The objective would be to remove the entire mass of known contaminated sediment within Berths 2 and 3, and including accumulated sediment beneath the pier structure. The under-pier sediments have not been confirmed to be contaminated. Dredging of the berths would be accomplished with a conventional clamshell dredge. Dredging beneath the pier would require special construction methods or equipment such as a displacement dredge or hydraulic dredge due to difficulty of dredging under and around the pier and supporting pile structures.

This alternative would produce the largest volume of potentially contaminated dredged sediments. However, this alternative would be difficult to implement given the difficulty, and lack of effective methods, for removing sediments from under pier structures. Under pier dredging could also increase the potential for resuspension and redistribution of contaminated sediments during dredging. A potential advantage would be a reduction of potential for recontamination of berth sediments due to long-term sloughing of under pier sediments.

The Port concluded that the estimated order-of magnitude cost for Alternative 1 would have been approximately \$15.1 million.

Port Alternative 2: Dredge Berth 3 only and Sloughed Under-Pier Slope Sediments:

Alternative 2 would have included the dredging of Berth 3 only, and removal of potentially contaminated under-pier sediments that slough into the berth area during dredging. The objective would be to target the berth that has the largest volume of sediments needing to be removed, and the highest concentrations of dioxin-contaminated sediments. Dredging of the

berth would be accomplished with a conventional clamshell dredge. The under-pier material would be removed as it sloughed into the excavation of the berth, followed by a “clean-up” pass with the dredge following completion of the entire berth area.

This alternative would remove sediments from the berth suspected to contain the highest volume of dioxin-contaminated sediments. There is limited potential for recontamination of the dredged berths by residual under-pier sediments adjacent to Berth 2, if they continue to slough into the dredged berth area. However, contaminated sediments in the adjacent Berth 2 and potentially contaminated sediments in the Berth 2 under-pier area would remain in place, and the safe navigational draft in Berth 2 would not be restored.

The Port concluded that the estimated order-of-magnitude cost of Alternative 2 would have been approximately \$3.5 million.

Port Alternative 3: Dredge Berths 2 and 3 and Sloughed Under-Pier Slope Sediments:

This alternative would include the dredging of Berths 2 and 3 and removal of potentially contaminated under-pier sediments adjacent to both berths that slough into the berth area during dredging. Dredging of the berth would be accomplished with a conventional clamshell dredge. Similar to Alternative 2, the under-pier material would be removed as it sloughed into the excavation of the berth, followed by a “clean-up” pass with the dredge following completion of the entire berth area.

Alternative 3 would remove the known contaminated sediments within Berths 2 and 3, in addition to a significant volume of potentially contaminated materials from the under-pier areas. Similar to Alternative 2, there is limited potential for recontamination of the dredged berths by residual under-pier sediments, if they continue to slough into the dredged berth area.

The Port concluded that the estimated order-of-magnitude cost of Alternative 3 is approximately \$6.2 million.

In all alternatives, the dredged berth sediments would be loaded onto specially outfitted deck barges and transferred to an upland transloading facility on the Port’s dock. After a brief period of gravity dewatering, the sediment would be loaded into rail cars and transported for disposal to a regional Subtitle D landfill facility.

Alternative #3 has been designated as the Port’s preferred alternative. A detailed analysis of the Port berth dredging alternatives is available in the West Bay Berths 2 and 3 Preliminary Engineering Design Report, Exhibit B to the proposed MTCA interim agreed order.

Short-term water quality impacts due to dredging of the Port berths will be monitored to comply with state water quality standards. A water quality monitoring plan will be developed for the interim MTCA action and implemented during dredging. The contractor will be required to undertake specific operational controls and procedures in order to minimize sediment resuspension, generation of dredging residuals, and water quality impacts. Dredged material will be offloaded onto the Port’s marine terminal facility for a period of gravity dewatering. To minimize potential spillage, the Port will require its contractor to implement methods such as

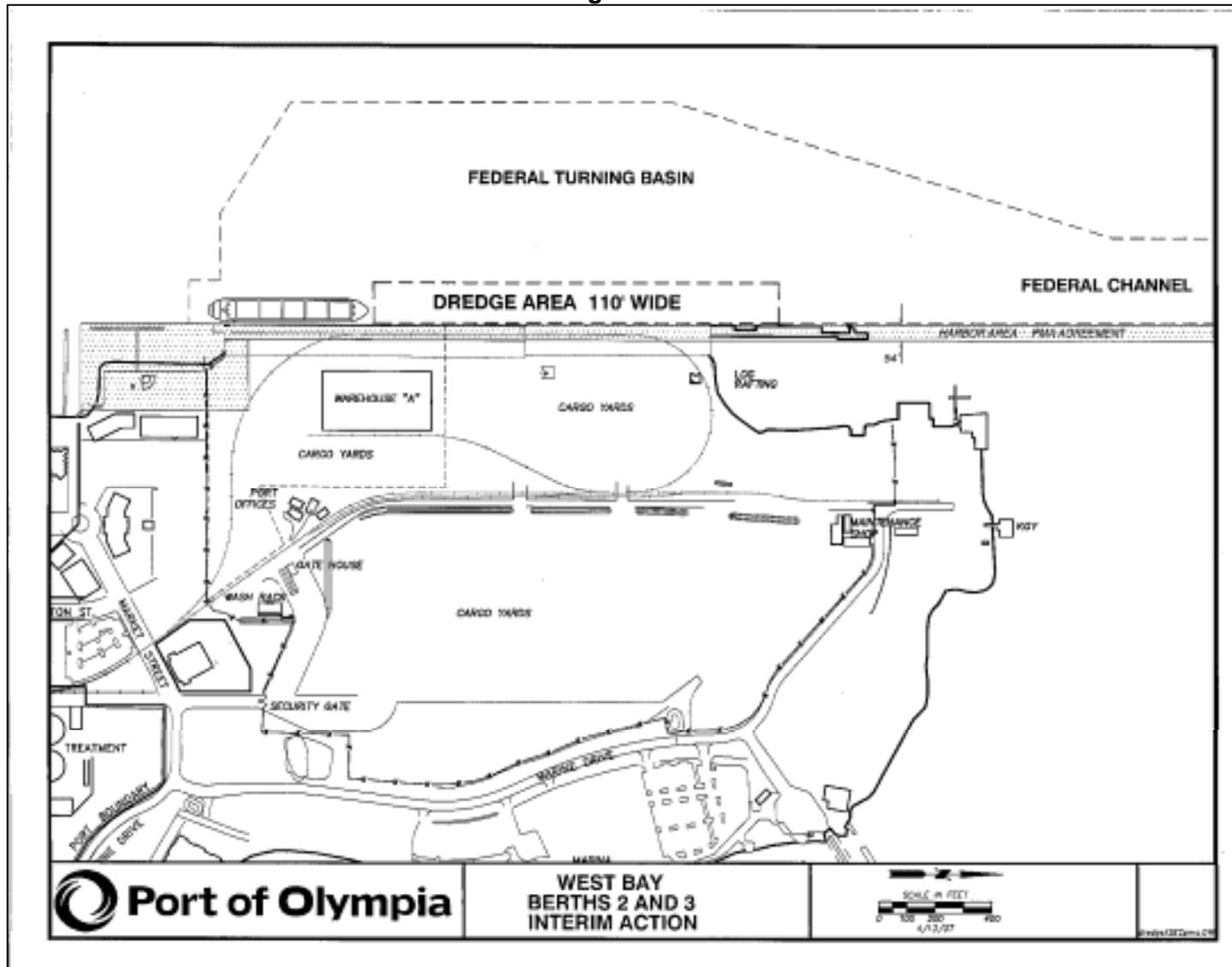
construction of a containment berm, use of a sealed rehandling bucket or similar measures. After on-site pretreatment, water collected from the upland dewatering facility will be sent to the LOTT Budd Inlet treatment facility for disposal. The on-terminal treatment system may include influent Baker tanks, sediment-removal tanks, bag filtration, carbon filtration, and storage tanks. Dewatered dredged material then will be loaded for transport and disposal at a Subtitle D landfill facility.

The Port, in coordination with the Department of Ecology, will develop and implement a post-dredging confirmational monitoring plan. The purpose of the plan will be to evaluate the potential impacts of sediments exposed by the berth dredging. The plan will include, as appropriate, visual inspection, bathymetric surveys, sediment deposition monitoring, chemical monitoring, and sediment sampling. The surface sediments exposed by the MTCA interim action dredging within Berths 2 and 3 will be sampled to determine contaminant levels in the remaining sediments, if any.. Any further actions within the berths would be evaluated as a part of the long term Budd Inlet cleanup plan being developed by the Department of Ecology.

The Port concluded that the proposed interim action will remove the highest level dioxin contaminated sediments from the Port's Marine Terminal berths, with the purpose of reducing potential environmental risks associated with dioxin in the marine environment, and to re-establish the safe navigational depths. Ecology and the Port have determined that an interim action is appropriate given that the dredging will significantly reduce the volume of highest dioxin contaminated sediments in the Marine Terminal berths while allowing the Port to maintain its shipping capacity and ability to continue terminal operations. Ecology and the Port have entered into a draft interim agreed order under MTCA. The agreed order, which describes the interim action work plan for the Marine Terminal berth dredging and associated environmental controls and mitigation measures, is being evaluated under the State Environmental Policy Act (SEPA). The Preliminary Engineering Design Report includes a description of the methods and best management practices for dredging and rehandling of the dredged material to a temporary dewatering facility on the Port peninsula in preparation for safely transporting sediments to a permanent upland disposal facility. Best management practices will include detailed post dredging monitoring and contingency plans. Agencies and interested citizens may comment separately on the SEPA determination prepared for the Department of Ecology interim agreed order during the public comment period for the agreed order.

Dredging: The Port's berth dredging is expected to take up to approximately 8 weeks. Dredging would likely occur between November 2007 and February 15, 2008. Berth sediments will be dredged with a barge-mounted clamshell bucket and placed on a deck barge with an appropriate perimeter control for bucket rehandling to an upland, temporary dewatering facility at the Port. Sediments will be dewatered and transported by rail to an upland disposal site in accordance with appropriate regulations. Dredging and handling of dredged materials will be in accordance with the MTCA agreed order and Preliminary Engineering Design Report, Army Corps of Engineers Nationwide Permit #38 requirements, and Washington Department of Ecology state water quality standards.

Figure A-1



APPENDIX B. Port of Olympia Historical Summary

The following history is a summary provided by the Port of Olympia at www.portolympia.com/community/history/hismain.htm.

The town of Olympia saw its first commercial ship arrive around 1850 loaded with wood products. In the early 20th century, Olympia boosters saw the potential for better marine trade and in 1909 a shallow marine navigation channel was dredged along the outer harbor line parallel to the west shoreline of West Bay of Budd Inlet. The shallow channel was abandoned in favor of a deep draft channel that was dredged in the present channel configuration with the dredged materials placed for creation of the Port Peninsula.

The Chamber of Commerce spearheaded a campaign to establish the Port of Olympia, which culminated with the formation of the Port District on November 7, 1922. The depression of 1929 led to decreased development and commerce in the region but, by the late 1930's, construction of new facilities had allowed the Port to rebound to the highest volume to date. Shipbuilding expanded on Port property during World War Two as cargo volumes also increased to support the war effort. After the war, wood products shipping continued, along with canned fruit and vegetables until closure of the Olympia Canning Company in 1959. In the late 1960's, raw log shipments increased as the lumber trade decreased due to closure of three plywood mills on the Port Peninsula. In the 1970's, berths were deepened to accommodate larger, deep-draft ships as logs accounted for 98 percent of the Port's cargo volume. The most recent maintenance dredging of the Federal navigation project in Olympia Harbor occurred in 1973.

Improvements in the late 1990s provided the Port with capability to service containers, with Sunmar Container Lines relocating to Olympia in 1997. Since the collapse of the Russian economy in 1998 and subsequent loss of Sunmar Container Lines, the Port has concentrated on bulk cargo for the main usage of the Port. The limited container capability is incidental but complements the Port's ability to handle break bulk cargo as some break bulk materials are shipped in containers.

In the 21st century, the Port continues to ship wood products while successfully establishing other break bulk cargoes including military supplies. Break-bulk cargo opportunities for Olympia can come from a relationship with scheduled liner service or charter cargo carriers including military charter cargo.

APPENDIX C. Section 404(b)(1) Evaluation.

Clean Water Act, Section 404(b)(1) Evaluation

**Olympia Navigation Channel/Turning Basin
Dredging and Minor Widening**

Clean Water Act

Prepared by:

**U.S. Army Corps of Engineers
Seattle District
Environmental Resources Section**

May 2007



1. Introduction

The purpose of this document is to record the U.S. Army Corps of Engineers (Corps) compliance evaluation of the Olympia Federal Navigation Dredging project pursuant to the Clean Water Act (CWA). Specifically, Section 404 of the CWA requires an evaluation of impacts for work involving discharge of fill material into the waters of the U.S., and evaluation guidance can be found in the CWA 404(b)(1) Guidelines [40 CFR §230.12(a)].

The main body of this document summarizes the information presented in Attachment A and includes relevant information from the Environmental Assessment for the project prepared pursuant to the National Environmental Policy Act (NEPA) of 1969 [42 USC §4321 et seq.]. Attachment A provides the specific Corps analysis of compliance with the CWA 404(b)(1).

2. Project Background

Olympia's Federal navigation channel within Budd Inlet requires sporadic maintenance dredging to maintain the existing authorized depths of the Federal navigation channel, turning basin, and berthing areas. The Port of Olympia (Port) formally requested the U.S. Army Corps of Engineers, Seattle District, via a meeting that occurred on April 8, 2004, and letter dated August 26, 2004, to perform authorized maintenance dredging and minor widening to promote navigational safety and free movement of deep draft commercial vessels within the Harbor.

3. Project Need

The Port has received numerous letters from pilots that guide cargo ships into the Port voicing major concerns about the navigation channel being too narrow and shallow and having to wait for high tides to provide safe access to the Port. Based upon bathymetric surveys conducted in 1998 and again in 2004, siltation is variable over these areas with greatest accumulations reducing depths to below the authorized minus 30 feet (MLLW), especially on the margins of the federal channel. The depth varies but on average is around minus 28 feet (MLLW) in the shoaled areas.

The project would widen the channel bend to address safety criteria for maneuvering and bank clearance for approach channels. Based on recent Corps guidelines for approach channels (MarCom Working Group 30, 1997), an approach channel into Budd Inlet should provide a maneuvering lane width of 2.5 times the vessel beam (2.5B). This width includes an allowance of 1.5B for a basic maneuvering lane, 0.4B for wind effects, 0.2B for minimal aids to navigation and poor visibility, and 0.4B for channel depths that can be less than 1.15 times the vessel draft. Added to this would be a bank clearance on either side of the maneuvering lane. Because this portion of the channel has steep side slopes and is cut deeply into the surrounding bottom, Corps analysis indicates that a bank clearance of 0.5B to 1.0B on each side of the maneuvering lane is warranted. When the maneuvering lane width is added to the bank clearance, the total channel width should be between 3.5B and 4.5B. For a ship beam of 100 feet, the appropriate channel width is between 350 and 450 feet. A minor widening of the channel bend is justified since the beam of vessels using the channel is approximately 100 feet. Additionally, the widening has been recommended as justified in the best professional judgment of Seattle District, this recommendation received the concurrence of the Northwestern Division, and the minor channel widening at the bend was authorized by Corps Headquarters.

The project is also necessary since the current condition of the federal channel causes delays in vessel arrivals and departures in order to work around tides. Vessel operating costs for 37 vessels delayed in 2004 amounted to a total of \$138,750. In addition, some of the Port customers must be in berth in Vancouver by 8:00 AM for a full day of operations after it leaves Olympia. It must leave Olympia by 3:00 PM or lose a day of work in Vancouver. There were 12 vessels that fell into this category in 2004 of which 4 did not make the departure time because of tidal delays. The estimated cost of this delay for the 4 vessels is \$160,000 plus labor and other associated cost with operation of the vessel. Maintenance dredging is required to allow vessels to avoid delays caused by working arrival and departure schedules around the tides.

Federal dredging to the authorized dredging depth of -30 feet Mean Lower Low Water (MLLW) with 2 feet of allowable overdepth will result in a volume of approximately 48,000 cy. The estimated minor widening areas volume is approximately 53,000 cy which represents dredging to a authorized depth of -30 feet MLLW with 2 feet of allowable overdepth. All of the proposed Federal dredged materials have been tested and are suitable for open-water disposal at the Anderson Island open-water disposal site and/or beneficial uses.

4. Project Purpose

The purpose of the proposed project is to allow timely and safe passage of ships entering and leaving the Port. Maintenance dredging of the federal channel will provide authorized navigational depths through maintenance dredging and minor widening in areas of the Federal navigation channel.

5. Proposed Action and Alternatives

The following sections describe the alternatives that were considered to meet the project purpose and need. This discussion relates specifically to Federal proposals designed to meet the project purpose and need (i.e. the proposed Federal actions that will be specifically evaluated for impacts in this evaluation).

Concurrent to the Federal dredging of navigation channel by the Corps, the Port proposes to maintenance dredge approximately 40,500 cy of material contaminated with dioxin from the Port's Marine Terminal berths 2 and 3 to restore the berths to a safe depth of minus 42 feet MLLW, with 2 feet of allowable over dredge. See Appendix A for more information on the Port's proposed berth dredging. The Port's maintenance dredging would be conducted independently of the Federal dredging. The Port's application for a Corps of Engineers authorization for this distinct project will be independently addressed under the Clean Water Act pursuant to the Corps regulatory program.

5.1 No Action

If no action is taken, ships entering and leaving the Port would continue to be required to wait for high tides in order to allow safe passage to and from the Port terminal. Significant tide delay economic impacts and safety concerns would continue and potentially increase as shoaling continues to reduce the depth of the navigational channel. Per NEPA requirements, the no action alternative will be carried forward as the baseline for evaluating potential impacts of other alternatives.

5.2 Maintenance Dredging and Minor Widening of Entrance Channel, Channel Bend, and Turning Basin

This alternative would dredge all previously dredged areas where shoaling has created areas shallower than the authorized depths. Maintenance dredging would occur in the entrance channel, the channel bend, and the west side of the turning basin. Dredging to the authorized dredging depth of -30 feet MLLW with two feet of allowable overdepth will result in a volume of approximately 234,000 cy. The estimated minor widening areas volume is approximately 163,000 cy which represents dredging to a required depth of -30 feet MLLW with 2 feet of allowable overdepth. Total dredged volume would be approximately 397,000 cy. The widening would be about 100 feet at the turning basin, 50 feet for the bottleneck reach, and between 0 and 110 feet for the channel bend (i.e. it would be a triangular footprint in the bend area).

Of the total dredged volume, approximately 220,500 cy has been approved by the regional Dredged Material Management Program (DMMP) for the State of Washington for unconfined, open water disposal or beneficial use (Corps 2006). Of the material suitable for in-water disposal, up to 60,000 cy would be placed in Budd Inlet for beneficial use and as mitigation for widening in areas that would convert shallow subtidal areas (less than minus 10 feet MLLW) to depths of minus 30 feet (MLLW); clean sediment that is not used for beneficial uses would be disposed at the Puget Sound Dredged Material Analysis (PSDDA) Anderson Island open-water disposal site. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (pptr) Toxic Equivalence (TEQ) to less than 1 pptr TEQ. About 238,000 cy is not suitable for open water disposal at the Anderson Island open-water site or beneficial uses due to elevated levels of dioxin and furans, so it would be disposed at an approved upland site.

Dredging would be accomplished by a clamshell dredge, with the dredged material deposited in bottom dump barges for transport and disposal.

The maintenance dredging would remove shoaling in the Federal navigation channel that has occurred since the last Corps dredging in 1973. The maintenance dredging would meet the purpose of allowing ships to enter and exit the Port without need to wait for high tide; the minor widening would provide a necessary safety margin to allow maneuvering room for ships navigating the channel bend. While this alternative would provide safe and timely shipping access to and from the Port Marine Terminal facilities, it will not be carried forward for detailed analysis due to the substantial logistical, technical, regulatory, and economic problems posed by upland or confined disposal of such a large quantity of dioxin contaminated sediment. Dredging in the areas of the channel currently contaminated with dioxin may become more feasible in the future if proposed non-Federal actions pursuant to the Washington Model Toxics Control Act successfully remove the sediments containing the highest levels of dioxin. Due to the presence of sediment contamination, this alternative would likely generate at least an increment of greater environmental damage than the proposed action (Section 5.3) until non-Federal actions remove other adjacent sediments with the highest levels of dioxin.

5.3 Maintenance Dredging of and Minor Widening of Channel Bend

This is the preferred alternative and the proposed Federal action.

Extensive testing of the sediment found dioxins/furans in varied areas within the boundaries of the authorized federal channel (including some portions of previously proposed minor widening) in Budd Inlet. The discovery of the extent of contaminated sediment resulted in modification of the proposed dredging to limit work to areas with clean sediments (which includes both maintenance dredging and minor widening). Under this alternative, the Corps proposes to dredge the areas that have been determined to be suitable for open-water disposal and potentially reuse a portion of them beneficially within Budd Inlet or dispose them at the Anderson Island open-water disposal site.

This alternative would perform maintenance dredge and widening of the channel bend to the authorized -30 foot depth channel with up to 2 feet of allowable overdepth. Approximately 101,000 cy of material would be removed from the Federal channel under this proposal (about 48,000 cy for maintenance dredging, about 53,000 cy for the widening). The channel bend widening would occur within a roughly triangular shape of 2.1 acres with a maximum width of 110 feet. All of the material has been approved by the DMMP for unconfined, open water disposal or beneficial use (Corps 2006). Up to 60,000 cy may be placed in Budd Inlet for beneficial use and 1.0 acres of advance mitigation for a potential future dredging phase. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (pptr) Toxic Equivalence (TEQ) to less than 1 pptr TEQ. Clean sediment that is not used for beneficial uses would be disposed at the PSSDA Anderson Island open-water disposal site.

Dredging would be accomplished by a clamshell dredge, with the dredged material deposited in bottom dump barges for transport and disposal.

The maintenance dredging would remove shoaling in the channel bend that has occurred since the last Corps dredging in 1973. The maintenance dredging would meet the purpose of allowing ships to enter and exit the Port without need to wait for high tide; the minor widening would provide a necessary safety margin to allow maneuvering room for ships navigating the channel bend.

5.4 Alternative Evaluation

The Corps rejected the no-action alternative (Section 5.1 above) because it would not meet the project purpose or address the project need. The Corps rejected the alternative involving maintenance dredging and minor widening from the channel bend through the turning basin (Section 5.2 above) since, due to the presence of contamination by dioxin and furans in the entrance channel and turning basin, the expanded dredging scope does not represent a less environmentally damaging alternative when compared to the proposed action.

6. Potentially Adverse Effects (Individually or Cumulatively) on the Aquatic Environment

a. Effects on Physical, Chemical, or Biological Characteristics of the Aquatic Ecosystem

1. Evaluate Impacts on Ecosystem Function. The minor impacts to the ecosystem will be from short-term impacts due to noise and loss of some habitat during dredging of the channel. There will be a conversion of approximately 2.1 acres of subtidal habitat at a depth of about minus 10 feet (mean lower low water or MLLW) to minus 30 feet (MLLW) depth.

However, based on the benthic analysis and the history of Budd Inlet for DO problems these impacts will be short term and are of non-significant measures. There will be some degradation of water quality from the sediment plume; however, the plume will dissipate quickly from the flow of the river on the outgoing tide. The sediment plume behavior will also be status quo for the beneficial use and mitigation site. The material that is not used for mitigation and beneficial use will be disposed of at the Anderson Island open water disposal site. The potential beneficial use of a portion of the clean material to cover sediments with high levels of dioxin and furans in surface layers will benefit overall ecosystem function in the project vicinity.

2. Evaluate Impacts on Recreational, Aesthetic and Economic Values. There will some minor temporary impacts to recreational use of Budd Inlet during the dredging operation. Timing of fisheries will be coordinated with the resource agencies and local Tribes to ensure access is available to Tribal members to their fishing areas. There will be a positive impact to the economic values as commercial navigation will no longer be delayed due to inadequate channel depths. Aesthetically the impact will be limited to the presence of the dredging equipment during construction and will return to pre-project conditions immediately once the project is complete.

3. Findings. There will be no significant adverse impacts to the aquatic ecosystem functions and values. It is expected that aquatic ecosystem functions and values will return to preconstruction conditions rapidly at the end of construction.

7. All Appropriate and Practicable Measures To Minimize Potential Harm to the Aquatic Ecosystem

a. Impact Avoidance Measures

The project has been modified to limit dredging to areas of clean sediments, thereby avoiding potential impacts from re-distribution of contaminants such as dioxin and furans.

Construction will occur during the winter when the water quality in Budd Inlet is least likely to suffer from substandard water quality due to low dissolved oxygen and elevated nutrient levels. The avoidance measures include best management practices for dredging, monitoring water quality, and placing the dredged material in the most environmentally sensitive means possible.

b. Impact Minimization Measures

The Corps will take all practicable steps during construction and monitoring of the project to minimize impacts to aquatic and terrestrial resources. Contingencies will be in place if any of the water quality protection measures fail to achieve their intended function. The minimization measures will be as follows:

1. Water quality monitoring will be conducted to aid in ensuring that applicable standards are not exceeded outside specified dilution zones (by Ecology's Clean Water Act Section 401 compliance determination). If exceedances occur, work will stop and will not re-commence until water quality meets the applicable standards and all relevant actions are taken to modify the dredging to minimize the chance of future exceedances.
2. The Corps will require that all prudent and necessary steps (based on best

- management practices) be taken to assure that no petroleum products, chemicals, or other toxic materials will enter the water from the dredging equipment.
3. If a spill should occur, work will stop immediately, steps will be taken to contain the material, and the appropriate agencies will be notified.
 4. If fish are observed in distress or a fish kill occurs, work will stop immediately and appropriate agencies will be notified.

c. Compensatory Mitigation Measures

The U.S. Army Corps of Engineers proposes to use the clean sediments beneficially and provide advance mitigation in the form of 1.0 acres of shallow subtidal habitat for the potential future impact to 0.4 acres of shallow subtidal habitat from potential future bottleneck channel minor widening. The pre-project depth in the beneficial use area varies from -11 MLLW to -15 MLLW. A bottom dump barge will be used to place the dredged material and layer the material until the depth is shallower than -10 MLLW.

The most direct effect of the creation of 1.0 acres of shallow subtidal habitat for mitigation will be the covering or smothering of approximately 8 acres of existing benthic community. However this will be a short term effect as the community will re-populate the newly created habitat rapidly after the completion of the proposed project. The timing of future dredging of the bottleneck reach of the entrance channel is uncertain. Until the actual dredging of the bottleneck reach, the disposal of material at the beneficial use site will result in addition of up to 8 acres of new shallow subtidal habitat in Budd Inlet. If the bottleneck reach is eventually dredged, the net result would still be a net gain of more than 7 acres of shallow subtidal habitat for Budd Inlet. The long term effect will be an increase in the benthic population due to the access to more suitable habitat. In addition to creating shallow subtidal habitat, the beneficial use of the clean dredged material would reduce the concentration of dioxin/furans in surface sediments at the beneficial use site from more than 20 ppb TEQ to less than 1 ppb TEQ.

d. Findings

The Corps has determined that all appropriate and practicable measures have been taken to minimize potential harm to the environment.

8. Other Factors in the Public Interest

a. Fish and Wildlife

During construction, fish would likely re-locate to other areas of Budd Inlet, with minor impacts to their fitness or survival. The preferred alternative would not disturb any forage fish spawning areas. The work would be done with a clamshell dredge, thus minimizing the likelihood of entraining fish during the dredging. Impacts to salmonid species would be minimal since the work would result in minor adverse impacts to water quality in the immediate vicinity during construction and no long-term adverse impacts to water quality. The minor widening of the channel bend would deepen approximately 2.1 acres from a depth of about minus 10 feet (MLLW) to minus 30 feet, with up to 2 feet of allowable overdredge. Both the pre- and post-dredge depths are in the subtidal range that is inhabited by similar fish species assemblages. Placement of the dredged material at the beneficial use area would

create up to 6 acres of aquatic habitat that is shallower than minus 10 feet (MLLW), thus converting an area with a current depth of about minus 12 feet to shallow subtidal habitat. This would represent a net benefit to the fish communities of Budd Inlet on the dual fronts of decreased surface contamination and increased shallow subtidal habitat.

Disturbance to water birds would occur during the dredging and placement of dredged material. However this would be short term and the species would return upon project completion. Most species would just move to an area of non-disturbance and remain within the boundary of Budd Inlet. Other mammalian species would not be affected or impacted by the project. Marine mammals would also be displaced temporally during construction of the project, but would likely remain in nearby areas outside of the area of dredging and disposal.

The Corps will fully comply with the Endangered Species Act prior to project implementation.

b. Water Quality

Dredging would occur in the winter months when flushing freshets from the Deschutes River occur most often, biological oxygen demand is low, and water temperatures are low. The disturbance of sediment and the sediment plume will be short lived and the impacts to water quality will be minor since the inner inlet flushes within one day, while the whole inlet does so every 10 days (Ebbesmeyer and Coomes 1998). Low DO levels are not expected to be an issue for dredging during the winter since the level of DO during the winter (generally greater than 9 mg/L) is sufficient to support any increased biological oxygen demand while maintaining DO levels above 5 mg/L, which is the minimum DO level for Budd Inlet pursuant to state water quality standards (WAC 173-201A-210(d) and 173-201A-612).

Disposal of the material at the open water site or the beneficial use site would result in short-term impacts to localized turbidity, DO, and other water quality indicators, but water quality is expected to quickly return to ambient background conditions. The sediments to be dredged in the Preferred Alternative are suitable for open water unconfined disposal. Accordingly, release of contaminants into the water column would not occur during the proposed work.

Water quality monitoring would be conducted to assure water quality in the project area does not violate state standards outside of the specified dilution zones for the dredging and disposal operations. The Corps will obtain Section 401 water quality certification from the Washington Department of Ecology.

c. Historical and Cultural Resources

The maintenance dredging would remove materials which have settled in since the last maintenance dredging. Based on the geologic analysis, the areas of the minor widening and the beneficial use site are considered to have low potential for pre-contact, ethno-historical, and historic period archaeology since the sediments were deposited once the area was submerged. Based on this rationale, the Corps determined that no historic properties would be affected by the proposed work. In a letter dated March 29, 2007, the Washington

Department of Archaeology and Historic Preservation concurred with the Corps determination of “no historic properties affected.”

The Squaxin Island Indian Tribe and the Nisqually Indian Tribe are the nearest federally-recognized tribes to the Budd Inlet and Olympia Harbor area. A letter soliciting knowledge and concerns for the project area was sent to these tribes on December 20, 2005. At the behest of Rhonda Foster (the Squaxin Tribal Historic Preservation Officer) a government-to-government meeting was convened on March 14, 2006. Although Ms. Foster was unable to attend, Larry Ross (tribal archaeologist) expressed concerns about the potential effect of the minor widening portion of the proposed project to intact archaeological deposits. The result of the meeting was an agreement that the sediment in the minor widening portion of the project should be evaluated for any potential to contain cultural deposits. It was further agreed that if the sediment did demonstrate potential for archaeological deposits, the minor widening area would be tested through the use of vibracore samples, especially in the area near the inundated confluence of Percival Creek and the Deschutes River. An evaluation by Corps geologists indicated that the depositional layer in question was the result of submarine sedimentation, which precluded the need for further evaluation.

d. Environmental Benefits

The project will benefit the environment if the Corps uses a portion of the dredged material to create shallow subtidal habitat while covering sediments with elevated levels of dioxin and furans in surface sediments.

9. Conclusions.

The Corps finds that this project is within the public’s interest and complies with the substantive elements of Section 404 of the Clean Water Act.

Attachment A

Clean Water Act 404(b)(1) Evaluation [40 CFR §230] Permit Application Evaluation [33 CFR §320.4]

404(b)(1) Evaluation [40 CFR §230]

Potential Impacts on Physical and Chemical Characteristics [Subpart C]:

1. Substrate [230.20]

Within the maintained portion of the navigation channel, finer grained sediments predominate (typically about 30% clay, 40% silt, 25% sand, 1% gravel). Larger grain sizes occur in the Port berthing areas (with about 25% gravel) and in the area of the minor widening at the channel bend (about 15% clay, 25% silt, 50% sand, and 5% gravel).

The Federal Navigation Project and the Port berthing areas have been tested pursuant to the Puget Sound Dredged Disposal Analysis program three times within the last two decades (Corps 2006). The most current and applicable analysis of sediment quality in the vicinity of the project comes from a 2006 evaluation of the suitability of 458,734 cy of sediment in the Federal channel and Port berthing areas for open-water disposal at the Anderson Island disposal site or for beneficial use.⁶ Previous testing in 1988 and 1999 indicated that, based on comparison to contamination by metals, hydrocarbons, phthalates, phenols, pesticides, and other potential contaminants, the majority of the material in the Federal Navigation Project and Port berthing areas was suitable for open-water disposal or beneficial uses. However, the 2006 supplemental testing included analysis of dioxins and furans⁷ and found that only 220,500 cy, which includes the material that would be dredged from the channel bend area, are suitable for disposal at the Anderson Island disposal site or beneficial uses contingent on agency approval of the specific beneficial use location and project.

The 2006 testing found that 238,234 cy of the tested material are unsuitable for open-water disposal at the Anderson Island disposal site due to contamination with dioxin and would need to be disposed at a Washington Department of Ecology-approved upland disposal site, in-water confined disposal site, or in another DMMO-approved non-dispersive open water site (i.e. not Anderson Island open-water site). The dioxin contamination is highest in the

⁶ The suitability determination reflects the consensus of the agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington. The Corps, Washington Department of Ecology, Washington Department of Natural Resources, and the Environmental Protection Agency comprise the DMMP.

⁷ As stated in Corps (2006), "The DMMP agencies acknowledge the complexity of setting interpretive guidelines for [dioxin/furans]... The DMMP agencies have developed an interim interpretive approach for [dioxin/furans] based on maintaining "background" concentrations currently existing at and in the vicinity of the Anderson-Ketron site." For the 2006 suitability determination, the Tier 1 dioxin limit for open-water disposal or beneficial uses was set at the maximum observed sediment dioxin/furan level at the Anderson Island site of 7.3 part per trillion (ppt) Toxicity Equivalence (TEQ). The Tier 2 dioxin limit compares the volume-weighted mean concentration within defined sediment units to ensure that the mean concentration of the sediment unit does not exceed the disposal site mean concentration of 3.8 ppt TEQ, which would mean that the unit is not suitable for open-water disposal or beneficial uses.

Port berthing areas. Dioxin levels in surface layers (generally shallower than 4 feet below the sediment surface) of the turning basin and the bottleneck reach of the entrance channel also exceeded thresholds for dioxins and furans. Even in the contaminated areas, dioxin/furan levels in sediment more than 4 feet below the sediment surface generally were low enough to meet criteria for open-water disposal or beneficial uses.

The weighted mean concentration of dioxin/furans for the 60,000 cy of material likely to be used for the beneficial uses project is 0.47 pptr TEQ, well below the 3.8 pptr Tier 2 limit for open-water disposal or beneficial uses. At the beneficial use site, the concentration of dioxin/furans in the top 10 centimeters of sediment was measured at between 20 and 25 pptr TEQ.

The proposed project would remove a relatively minor volume of sediment from Budd Inlet. The sediment remaining after the proposed dredging would be generally similar to that which would be removed, although areas where the channel is widened may accumulate finer grained sediments over time (leading to less sand and gravel, more silt and clay). The proposed dredging would not alter the sediment quality in the dredged areas. Re-distribution of sediment during dredging activities is expected to be minimal and very localized.

Disposal of the dredged sediment at the proposed beneficial use site would reduce the concentration of dioxin/furans in surface sediments from more than 20 pptr TEQ to less than 1 pptr TEQ. Disposal of dredged sediments at the Anderson Island open water site would result in dioxin/furan levels in the sediment no higher than pre-existing conditions at the site.

2. Suspended particulates/turbidity [230.21]

There should be no residual sediment that could be suspended at a later date; if there were suspended sediment it is expected to disperse rapidly due mainly to the available current at this site. The dredge plume that will be created while dredging and disposal should disperse rapidly; water quality monitoring of turbidity will occur during the work to ensure that the work complies with state water quality standards.

3. Water [230.22]

The U.S. Army Corps of Engineers has determined that there would be no adverse short- or long-term impacts to the water column from sediment exposure or resulting from construction of this project.

4. Current patterns and water circulation [230.23]

The work will not disrupt current patterns and water circulation at this site during or after construction.

5. Normal water fluctuations [230.24].

The work will have no effect on tidal cycles during or after construction.

6. Salinity gradients [230.25]

Natural flushing cycles of the Budd Inlet Estuary will keep the salinity gradients functioning as they are now. The work will not impact salinity gradients in Budd Inlet.

Potential Impacts on Biological Characteristics of the Aquatic Ecosystem [Subpart D]:**1. Threatened and endangered species [230.30]**

The U.S. Army Corps of Engineers has prepared a biological evaluation for this project. In a letter dated May 15, 2006, the USFWS concurred with the Corps determination that the project elements addressed in the Corps' 2005 BE are not likely to adversely affect bald eagle, bull trout, and marbled murrelet. The Corps continues to consult with NMFS on effects to species under their jurisdiction. Since the 2005 BE, southern resident killer whales have been listed as endangered and critical habitat has been designated. The Corps will fully comply with the Endangered Species Act prior to project implementation.

2. Fish, crustaceans, mollusks and other aquatic organisms in the food web [230.31]

During construction, fish would likely re-locate to other areas of Budd Inlet, with minor impacts to their fitness or survival. The work will not disturb any forage fish spawning areas. The work will be done with a clamshell dredge, thus minimizing the likelihood of entraining fish during the dredging. Impacts to salmonid species will be minimal since the work would result in minor adverse impacts to water quality in the immediate vicinity during construction and no long-term adverse impacts to water quality. The minor widening of the channel bend will deepen approximately 2.1 acres from a depth of about minus 10 feet (MLLW) to minus 30 feet, with up to 2 feet of allowable overdredge. Both the pre- and post-dredge depths are in the subtidal range that is inhabited by similar fish species assemblages. Placement of the dredged material at the beneficial use area will create up to 8 acres of aquatic habitat that is shallower than minus 10 feet (MLLW), thus converting an area with a current depth of about minus 12 feet to shallow subtidal habitat. This would represent a net benefit to the fish communities of Budd Inlet on the dual fronts of decreased surface contamination and increased shallow subtidal habitat.

3. Other wildlife [230.32]

Disturbance to water birds would occur during the dredging and placement of dredged material. However this would be short term and the species would return upon project completion. Most species would just move to an area of non-disturbance and remain within the boundary of Budd Inlet. Other mammalian species would not be affected or impacted by the project. Marine mammals would also be displaced temporarily during construction of the project, but would likely remain in nearby areas outside of the area of dredging and disposal.

Potential Impacts on Special Aquatic Sites [Subpart E]:**1. Sanctuaries and refuges [230.40]**

There are no sanctuaries or refuges within the area of the proposed project. None of the dredged material will be used in a way that could impact any of the outlying areas that may contain a sanctuary or refuge.

2. Wetlands [230.41]

There will be no impact to wetlands and none are associated with the proposed project.

3. Mud flats [230.42]

There will be no loss to mudflats because all dredging would occur in water deeper than minus 10 feet (MLLW).

4. Vegetated shallows [230.43]

There are no vegetated shallows with the project foot print. There are no known eel grass beds within Budd Inlet.

5. Coral reefs [230.44]

Not applicable.

6. Riffle and pool complexes [230.45]

Not applicable, since riffle and pool complexes are characteristics of streams.

Potential Effects on Human Use Characteristics [Subpart F]:**1. Municipal and private water supplies [230.50]**

There will be no impact to municipal or private water supplies during dredging or disposal of the proposed project.

2. Recreational and commercial fisheries [230.51]

There is potential for some temporary interruption to fishing vessels as portions of the Federal navigation channel would be occupied by tugs and work barges during project construction. Dredging during the winter months will minimize the potential interference with most non-commercial vessel traffic due to low usage during the winter. Once the project is complete fishing vessels will have full access to Port facilities.

3. Water-related recreation [230.53]

Recreational boating may experience delays or have to navigate around the dredging and disposal equipment during the project implementation.

4. Aesthetics [230.53]

During the dredging process, the actual dredging and disposal equipment will not be aesthetically pleasing but this impact will be short term and will disappear upon completion of the project. Upon completion of the project there will be no visual evidence that the project ever occurred.

5. Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves [230.54]

The Corps determined that no historic properties would be affected by the proposed work. In a letter dated March 29, 2007, the Washington Department of Archaeology and Historic Preservation concurred with the Corps determination of “no historic properties affected.”

Evaluation and Testing [Subpart G]:**1. General evaluation of dredged or fill material [230.60]**

Within the maintained portion of the navigation channel, finer grained sediments predominate (typically about 30% clay, 40% silt, 25% sand, 1% gravel). Larger grain sizes occur in the Port berthing areas (with about 25% gravel) and in the area of the minor widening at the channel bend (about 15% clay, 25% silt, 50% sand, and 5% gravel).

2. Chemical, biological, and physical evaluation and testing [230.61]

The Federal Navigation Project and the Port berthing areas have been tested pursuant to the Puget Sound Dredged Disposal Analysis program three times within the last two decades (Corps 2006). The most current and applicable analysis of sediment quality in the vicinity of the project comes from a 2006 evaluation of the suitability of 458,734 cy of sediment in the Federal channel and Port berthing areas for open-water disposal at the Anderson Island disposal site or for beneficial use. Previous testing in 1988 and 1999 indicated that, based on comparison to contamination by metals, hydrocarbons, phthalates, phenols, pesticides, and other potential contaminants, the majority of the material in the Federal Navigation Project and Port berthing areas was suitable for open-water disposal or beneficial uses. However, the 2006 supplemental testing included analysis of dioxins and furans and found that only 220,500 cy, which includes the material that would be dredged from the channel bend area, are suitable for disposal at the Anderson Island disposal site or beneficial uses contingent on agency approval of the specific beneficial use location and project.

The 2006 testing found that 238,234 cy of the tested material are unsuitable for open-water disposal at the Anderson Island disposal site due to contamination with dioxin and would need to be disposed at a Washington Department of Ecology-approved upland disposal site, in-water confined disposal site, or in another DMMO-approved non-dispersive open water site (i.e. not Anderson Island open-water site). The dioxin contamination is highest in the Port berthing areas. Dioxin levels in surface layers (generally shallower than 4 feet below the sediment surface) of the turning basin and the bottleneck reach of the entrance channel also exceeded thresholds for dioxins and furans. Even in the contaminated areas, dioxin/furan levels in sediment more than 4 feet below the sediment surface generally were low enough to meet criteria for open-water disposal or beneficial uses.

The weighted mean concentration of dioxin/furans for the 60,000 cy of material likely to be used for the beneficial uses project is 0.47 ppb TEQ, well below the 3.8 ppb Tier 2 limit for open-water disposal or beneficial uses. At the beneficial use site, the concentration of dioxin/furans in the top 10 centimeters of sediment was measured at between 20 and 25 ppb TEQ.

Actions to Minimize Adverse Effects [Subpart H]:**1. Actions concerning the location of the discharge [230.70]**

The Corps is working collaboratively with all the resource agencies and local Tribes to minimize adverse effects from the disposal operations by utilizing some combination of the DMMO-approved open-water disposal site at Anderson Island and a beneficial use disposal

site in Budd Inlet.

2. Actions concerning the material to be discharged [230.71]

All appropriate chemical and biological testing has been applied to the sediment proposed to be dredged. The proposed dredged material is suitable for open water disposal at the Anderson Island disposal site or beneficial use.

3. Actions controlling the material after discharge [230.72]

No actions should be required, unless the material is used beneficially and there is a monitoring requirement to determine the effectiveness of the placement of dredged material.

4. Actions affecting the method of dispersion [230.73]

At present the only method that is approved for this proposed project is to use a bottom dump barge to dispose of the dredged material.

5. Actions related to technology [230.74]

No specific advanced technologies will be used to perform this proposed dredging project.

6. Actions affecting plant and animal populations [230.75]

The Corps has coordinated construction activities with local Native American Tribes and state and federal resource agencies to ensure that minimal impacts to fishery and wildlife resources will occur. To avoid adverse impacts to fish, the project will take place during the winter when the project area has fewer fish and dredging is unlikely to result in poor water quality conditions. There are no eelgrass beds in the area so there will be no impact to plants. A potential positive impact would be to utilize the dredged material beneficially within Budd Inlet to enhance habitat.

7. Actions affecting human use [230.76]

The dredging and disposal are not expected to adversely affect human uses of the area. During the dredging process humans may experience minor inconveniences using Budd Inlet to accommodate the temporary presence of the dredging equipment.

8. Other actions [230.77]

Best management practices will be used to ensure that no unnecessary damage to the environment occurs during construction.

General Policies for Evaluating Permit Applications [33 CFR §320.4]

1. Public Interest Review [320.4(a)]

The Corps finds this proposed dredging action to be in compliance with the 404(b)(1) guidelines and not contrary to public interest.

2. Effects on wetlands [320.4(b)]

No impacts to wetlands will occur.

3. Fish and wildlife [320.4(c)]

The Corps has extensively coordinated with state and federal resource agencies and other interested members of the public on this action to avoid and minimize impacts on fish and wildlife.

4. Water quality [320.4(d)]

The Corps will conduct water quality monitoring to assure that water quality in the project area does not violate state standards outside of the specified dilution zones for the dredging and disposal operations. The Corps will obtain a Section 401 water quality certification from the Washington Department of Ecology prior to construction.

5. Historic, cultural, scenic, and recreational values [320.4(e)]

In a letter dated March 29, 2007, the Washington Department of Archaeology and Historic Preservation concurred with the Corps determination of “no historic properties affected” by the proposed work.

6. Effects on limits of the Territorial Sea [320.4(f)]

Not applicable, since the project will not occur in coastal waters.

7. Consideration of property ownership [320.4(g)]

All rights-of-entry have been obtained.

8. Activities affecting coastal zones [320.4(h)]

The Corps has determined that the work complies with the Coastal Zone Management Act (CZMA) and will obtain a CZMA Consistency Determination from the Washington Department of Ecology prior to construction.

9. Activities in marine sanctuaries [320.4(i)]

Not applicable, since the area is not a marine sanctuary.

10. Other federal, state, or local requirements [320.4(j)]

The Corps will fully comply with the Endangered Species Act prior to project implementation.

11. Safety of impoundment structures [320.(k)]

Not applicable, since an impoundment structure is not being built.

12. Water supply and conservation [320.4(m)]

Not applicable.

13. Energy conservation and development [320.4(n)]

Not applicable.

14. Navigation [320.4(o)]

Navigation will experience temporary and minor inconveniences during the actual dredging process. Upon completion of the proposed project, the navigation of the channel will be substantially safer.

15. Environmental benefits [320.4(p)]

If approved by the relevant resources agencies, a portion of the dredged material will be used to benefit the environmental health of Budd Inlet by placing the material in areas that are void of quality benthic habitat.

16. Economics [320.4(q)]

Completion of the project will eliminate any slow down of shipping into and out of the Port based on ships that are now required to wait for high tide to safely enter and exist the Port facilities. Elimination of the delay would eliminate the costs associated with the delay.

17. Mitigation [320.4(r)].

To address the potential future loss of 0.4 of an acre of shallow subtidal habitat for potential future channel widening, the Corps proposes advance mitigation in the form of creation of 1.0 acres of shallow subtidal habitat in Budd Inlet

APPENDIX D. Coastal Zone Management Act Consistency Determination.

CENWS-PM-PL-ER

May 9, 2007

**COASTAL ZONE MANAGEMENT ACT
CONSISTENCY DETERMINATION**

Olympia Federal Navigation Channel
City of Olympia, Thurston County, Washington

1. Introduction. The proposed Federal action applicable to this consistency determination is the maintenance dredging of the Federal navigation and minor widening of the channel bend. This determination of consistency with the Washington Coastal Zone Management Act is based on review of applicable sections of the State of Washington Shoreline Management Program and policies and standards of the adopted Thurston County (Washington) Shoreline Management Master Program.

2. State Of Washington Shoreline Management Program. Primary responsibility for implementation of the State of Washington Shoreline Management Act of 1971 has been assigned to local governments. The applicable local government office responsible for Thurston County Shoreline Master Program as defined in RCW 90.58 and in Thurston County in 1976 is the Thurston County Planning Council. Further authority is based on WAC 173-14.

3. Thurston County Shoreline Master Program. Thurston County has prepared a Shoreline Management Master Program, adopted 1976 and updated on May 15, 1990, as required by the Shoreline Management Act. The Master Program of the CZM and Thurston County, as amended, guides permit review for all relevant shoreline activities and in water work activities.

Corps of Engineers consistency determination is indicated in bold Italics.

SECTION THREE – POLICIES AND REGULATIONS FOR USE ACTIVITIES***VI. Dredging******A. Scope and Definition***

Dredging means the removal of sand, soil, gravel, or vegetative materials by any means from the bottom of a stream, river, lake, bay, estuary or channel. Dredging includes the anchoring of dredges, placement of floating draglines, diking and bulkheading for the purpose of minimizing runoff and seepage from dredge spoils disposal, and the process of discharging spoils into either aquatic or land sites. Dredging does not include mining for commercial purposes.

B. Policies

1. Dredging should be conducted in such a manner as to minimize damage to natural systems in both the area to be dredged and the area for deposit of dredged materials. All Federal dredging will occur within the deep-draft navigation channel project with the exception of the minor widening at the channel bend entrance. All of the dredged material has been approved by the Puget Sound Dredged Material Management Program (DMMP) for unconfined, open water disposal or beneficial use (Corps 2006). For beneficial uses, the Corps may place up to 60,000 cy in Budd Inlet as advance mitigation

for a potential future dredging phase; clean sediment that is not used for beneficial uses would be disposed at the Puget Sound Dredged Disposal Analysis (PSDDA) program Anderson Island open-water disposal site. The actual volume placed at the beneficial use site will vary depending on regulatory approvals and potential consolidation and settlement. Other potential beneficial use placement sites may also be considered subject to all required permits. Contractor-furnished beneficial use placement sites have been used successfully on maintenance dredging projects in the past.

2. Dredging of bottom material for the single purpose of obtaining fill material should be discouraged.
The purpose of the proposed dredging is to remove shoaling and to do minor widening to allow safer passage of vessels into and out of the port (i.e. not to obtain fill material).
3. Deposition of dredged material in water areas should be allowed for habitat improvement, to correct problems of material distribution adversely affecting aquatic populations, or when a site has been approved by the Interagency Open Water Disposal Site Evaluation Committee (WAC 332-30-166).

If a portion of the dredged material is placed at the proposed beneficial use site, the disposal would create approximately 8 acres of shallow subtidal habitat. Potential additional beneficial use placement is considered in the maintenance contract under contractor-furnished disposal sites.

C. General Regulations

1. All applications for Substantial Development Permits which include dredging shall supply a dredging plan which includes the following information:
 - a. Location and quantity of material to be removed.
 - b. Method of removal.
 - c. Location of spoil disposal sites and measures which will be taken to protect the environment around them.
 - d. Plans for the protection and restoration of the wetland environment during and after dredging operations.

The public notice and Environmental Assessment for the project show the proposed location of the dredging and disposal, the quantity of material that would be removed, the method of removal (clamshell dredge), and conservation measures. No wetlands would be affected by the proposed action since all work will occur in subtidal areas well offshore of the Puget Sound shoreline.

2. Toxic dredge spoil deposits on land shall not be placed on sites from which toxic leachates could reach shorelines and/or associated wetlands.

The project will not generate toxic dredge spoils; no land disposal sites will be utilized.

3. The Administrator and/or the legislative body may require that dredge disposal sites on land be completely enclosed by dikes designed to allow sediments to settle before dredge discharge water leaves the diked area. Such dikes must be protected from erosion.

All disposal for the proposed work will occur in-water, so upland disposal conditions are not relevant.

4. No permit shall be issued for dredging unless it has been shown that the material to be dredged will not exceed the Environmental Protection Agency and/or Department of Ecology criteria for toxic sediments.

All dredged material has been tested by the DMMP and determined to be suitable for either open water disposal at the Anderson Island site or beneficial use. Contaminants are not present in the dredged material above thresholds defined by the DMMP.

5. Dredging for the sole purpose of obtaining landfill material is prohibited.
The purpose of the dredging is to provide adequate depths for safe navigation of vessels.
6. Permits for dredging shall be granted only if the project proposed is consistent with the zoning and/or the land use designation of the jurisdiction in which the operation would be located.

This project area is not zoned since it is in the water in the central portion of Budd Inlet.

7. Dredge materials shall not be deposited in water unless:
 - a. The operation improves habitat; or
 - b. The site is approved by the Interagency Open Water Disposal Site Evaluation Committee (WAC 330-30-166).
 - c. The disposal of spoils will increase public recreational benefits.

The disposal of the dredged material at the beneficial use site would improve aquatic habitat. All dredge material has met relevant criteria and been determined to be suitable for in-water disposal. Disposal will likely benefit recreation indirectly since the proposed beneficial use site would have lower contaminant levels in surface sediment if the project moves forward. Over time, lower contaminant levels will likely benefit the Budd Inlet ecosystem, which would be expected to indirectly benefit recreational fishing by providing opportunities to catch more and healthier fish.

D. Environmental Designations and Regulations

1. Urban, Suburban, Rural and Conservancy Environments. The following dredging activities are allowed:
 - a. Dredging to deepen navigational channels
 - b. Dredging to improve water quality
 - c. Dredging to bury public utilities
 - d. Dredging to increase recreation benefits

- e. Dredging to maintain water flow
- f. Dredging which is required to allow an activity permitted by this Master Program.

Waters in Budd Inlet south of a line due west from Priest Point, which include the project area, are classified as "Urban Environment." The proposed project meets criteria (a).

2. Natural and Natural-Aquatic Environments. Dredging is prohibited in the Natural Environment except as an emergency measure. Dredging is allowed in the Natural-Aquatic Environment for the same purposes as the Conservancy Environment and for deep water disposal of dredge spoils.

The project is not located in an area classified as Natural or Natural-Aquatic Environment.

Based on the above evaluation, it is determined that the proposed dredging complies with the policies, general conditions, and activities as specified in the Thurston County Shoreline Management Master Program adopted May 15, 1990. The proposed action is considered to be consistent to the maximum extent practicable with the State of Washington Shoreline Management Program and policies and standards of the Thurston County Shoreline Management Master Program.

APPENDIX E. Draft Finding of No Significant Impact.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

CENWS-PM-PL-ER

Olympia Harbor Maintenance Dredging and Minor Widening
Olympia, Thurston County, Washington

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1. **Background.** Olympia's Federal navigation channel within Budd Inlet requires sporadic maintenance dredging to maintain the existing authorized depths of the Federal navigation channel, turning basin, and berthing areas (the last maintenance dredging occurred in 1973). The Port of Olympia (Port) formally requested the U.S. Army Corps of Engineers, Seattle District, via a meeting that occurred on April 8, 2004, and letter dated August 26, 2004, to perform authorized maintenance dredging and minor widening to promote navigational safety and free movement of deep draft commercial vessels within the Harbor.
2. **Project Location.** The Federal navigation project in Budd Inlet is located generally north of the city of Olympia, Thurston County, Washington and provides shipping access to and from Olympia into Puget Sound and beyond. The dredged material would be disposed either at (1) the non-dispersive Anderson Island open-water disposal site located at latitude 47° 9.42 minutes north, longitude 122°, 39.47 minutes west, or (2) a beneficial use site located in Budd Inlet southwest of the channel bend.
3. **Proposed Action.** The Corps proposes to dredge the areas that have been determined to be suitable for open-water disposal and potentially reuse a portion of them beneficially within Budd Inlet or dispose them at the Anderson Island open-water disposal site.

The proposed work would perform maintenance dredging and widening of the channel bend to the authorized minus 30 foot depth channel with up to 2 feet of allowable overdepth. Approximately 101,000 cy of material would be removed from the Federal channel under this proposal (about 48,000 cy for maintenance dredging, about 53,000 cy for the widening). The channel bend widening would occur within a roughly triangular shape of 2.1 acres with a maximum width of 110 feet. All of the material has been approved by the DMMP as suitable for unconfined, open water disposal or beneficial use (Corps 2006). Up to 60,000 cy may be placed in Budd Inlet for beneficial use and 1.0 acres of advance mitigation for a potential future dredging phase. Disposal of clean dredged material at the beneficial use site would reduce surface concentrations of dioxin and furans from 20 to 25 parts per trillion (pptr) Toxic Equivalence (TEQ) to less than 1 pptr TEQ. Clean sediment that is not used for beneficial uses would be disposed at the PSDDA Anderson Island open-water disposal site.

Dredging would be accomplished by a clamshell dredge, with the dredged material deposited in bottom dump barges for transport and disposal.

The maintenance dredging would remove shoaling in the channel bend that has occurred since the last Corps dredging in 1973. The maintenance dredging would meet the purpose of allowing ships to enter and exit the Port without need to wait for high tide; the minor widening would provide a necessary safety margin to allow maneuvering room for ships navigating the channel bend.

The Corps will implement conservation measures to minimize the environmental impacts of the work.

The potential effects of proposed action are evaluated in the draft environmental assessment that accompanies this draft Finding of No Significant Impact. The draft EA and FONSI will be available online under Olympia Harbor Maintenance Dredging and Minor Widening at http://www.nws.usace.army.mil/ers/doc_table.cfm. After a 30-day comment period, comments will be addressed in the course of preparing a final EA and FONSI.

- 4. Summary of Impacts.** A draft environmental assessment (EA) has been prepared pursuant to the National Environmental Policy Act (NEPA) for the proposed action. The draft EA describes the environmental consequences of the proposed project, which are briefly summarized below.

The proposed work will have short-term impacts to water quality in Budd Inlet, but effects will be minimal since work will take place in the winter when freshets occur most often, biological oxygen demand is low, and water temperatures are low. Disposal of the material at the open water site or the beneficial use site would result in short-term impacts to water quality. Water quality monitoring would be conducted to assure that water quality in the project area does not violate state standards outside of the specified dilution zones for the dredging and disposal operations.

The sediment remaining after the proposed dredging would be generally similar to that which would be removed, although areas where the channel is widened may accumulate finer grained sediments over time (leading to less sand and gravel, more silt and clay). The proposed dredging would not alter the sediment quality in the dredged areas. Disposal of the dredged sediment at the proposed beneficial use site would reduce the concentration of dioxin/furans in surface sediments. Disposal of dredged sediments at the Anderson Island open water site would maintain or decrease contaminant levels at the site.

The work would temporarily add to the pollution in the air from the use of dredging vessels and tugs to move the barges for disposal. Dredging during the winter would help ensure that the added sources of pollutants do not cause degradation in air quality as measured by the air quality index. Any increase in noise associated with the dredging vessels and tugs would be short term and short lived.

During construction, fish would likely re-locate to other areas of Budd Inlet, with minor impacts to their fitness or survival. The preferred alternative would not disturb any forage fish spawning areas. The work would be done with a clamshell dredge, thus minimizing the likelihood of entraining fish during the dredging. Impacts to salmonid species would be minimal since the work would result in minor adverse impacts to water quality in the

immediate vicinity during construction and no long-term adverse impacts to water quality. Placement of the dredged material at the beneficial use area would represent a net benefit to the fish communities of Budd Inlet on the dual fronts of decreased surface contamination and increased shallow subtidal habitat.

Disturbance to the benthic community in the dredged area (both in the channel and in the areas of minor widening) and disposal areas would be minor and temporary. Re-colonization by some species will occur immediately following the dredging activity and the subtidal benthic community is expected to recover completely within 1 to 3 years following dredging. Adjacent undisturbed habitat will provide a continuing source of organisms to colonize the newly disturbed areas. Given the small size of the benthic disturbance in relation to the benthic resources in the vicinity of the dredging and disposal sites, impacts to fish are expected to be minimal.

Birds and marine mammals would be displaced temporarily during construction of the project, but would likely remain in nearby areas outside of the area of dredging and disposal.

The Corps determined that no historic properties would be affected by the proposed work. In a letter dated March 29, 2007, the Washington Department of Archaeology and Historic Preservation concurred with the Corps determination of “no historic properties affected.”

The proposed work would eliminate current slow downs of shipping into and out of the Port facilities associated with waiting for higher tides. Elimination of the delay would eliminate the costs associated with the delay. The proposed project will preserve the status quo land uses in the area.

There is potential for some temporary interruption to vessel navigation as portions of the Federal navigation channel would be occupied by tugs and work barges during project construction. Dredging during the winter months will minimize the potential interference with most non-commercial vessel traffic due to low usage during the winter. Once the project is complete, merchant vessels, pleasure craft, and fishing vessels would have full access to Port facilities.

The aggregate effect of the past actions has resulted in reduced ecological value of the Budd Inlet estuary. Considering the past actions, the proposed action, and reasonably foreseeable future actions, the cumulative effect would generally maintain the general environmental character of the area. The proposed action will not greatly alter the cumulative effects on the environment.

A concurrence letter was received from the U.S. Fish and Wildlife Service on May 15, 2006, with the Corps' finding that the project is not likely to adversely affect bull trout, bald eagles and marbled murrelet. Since the submittal of the original biological evaluation in November 2005, Puget Sound steelhead have been listed as threatened, Southern Resident killer whales have been listed as endangered, and critical habitat has been designated for killer whales. Considering the current status of these species, the Corps believes that the proposed work is not likely to adversely affect these species or whale critical habitat. As of the date of this

EA, the Corps and NMFS continue consultation on species on NMFS jurisdiction. The Corps will fully comply with the Endangered Species Act prior to project implementation.

- 5. Finding.** Based on the analysis detailed in the EA and summarized above, this project is not a major Federal action significantly affecting the quality of the human environment and, therefore, does not require preparation of an environmental impact statement.

Date

MICHAEL MCCORMICK
Colonel, Corps of Engineers
District Engineer