

DRAFT ENVIRONMENTAL ASSESSMENT

**FISCAL YEARS 2011 THROUGH 2018 MAINTENANCE DREDGING AND
DISPOSAL**

GRAYS HARBOR AND CHEHALIS RIVER NAVIGATION PROJECT

Prepared by:



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

Abstract:

In accordance with the National Environmental Policy Act (NEPA), this Environmental Assessment (EA) evaluates the impacts of continued maintenance of the Grays Harbor and Chehalis River Navigation Channel beginning in October 2011 through October 2018. The Grays Harbor and Chehalis River Navigation Channel is located in Grays Harbor County, Washington. The navigation channel is over 23 miles long and begins in the Pacific Ocean offshore of the western entrance of Grays Harbor and terminates at Cosmopolis where the Chehalis River enters the eastern end of Grays Harbor. The Grays Harbor and Chehalis River Navigation Channel is an artificially dredged channel that was constructed by the U.S. Army Corps of Engineers (Corps). The Grays Harbor and Chehalis River Navigation Channel is important to commercial shipping and commercial fishing because it allows safe passage of deep draft ocean going vessels to reach Aberdeen, Hoquiam, and Cosmopolis. To maintain the navigation channel, the Corps must remove up to about 3.2 million cubic yards (cy) of accumulated sediment from the navigation channel every year. The recommended plan consists of maintenance dredging up to approximately 3.2 million cy annually within the approved in-water construction windows of July 16 through February 14 and April 1 through June 30. Hydraulic hopper dredges would be used in the outer (western) portion of Grays Harbor while mechanical dredges would be used for the rest of the dredge operation. Disposal of this material would occur at six disposal sites, which include three open water sites, two nearshore nourishment sites, and one direct beach nourishment site. Testing of the material to be dredged has occurred every other year and the material has always met the Dredge Material Management Program (DMMP) guidelines for open water disposal. The material would continue to be tested on a biannual cycle. The proposed project would not constitute a major Federal action significantly affecting the quality of the human environment.

This document is available online at: <http://www.nws.usace.army.mil/ecrb/envirdocs.html>

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THE OFFICIAL COMMENT PERIOD ON THIS EA ENDS ON July 30, 2011.

This document should be cited as:

Corps of Engineers, Seattle District. 2011. Draft Environmental Assessment, FY 2011 through 2018 Maintenance Dredging and Disposal, Grays Harbor and Chehalis River Navigation Project. 2011. Seattle, WA.

TABLE OF CONTENTS

1	PROPOSAL FOR FEDERAL ACTION	1
1.1	Location of the Proposed Action	1
1.2	Authority	1
1.3	Purpose and Need	2
1.4	Pertinent Documents	4
2	ALTERNATIVE ACTIONS	5
2.1	No Action	5
2.2	Dredging and Disposal	5
2.2.1	Dredging	5
2.2.2	Disposal	9
3	ISSUES FOR COMPARISON OF THE ALTERNATIVES	10
3.1	Geomorphology	10
3.2	Aquatic Vegetation	11
3.3	Invertebrates, Fish, and Wildlife	12
3.4	Threatened, and Endangered Species	14
3.5	Historic and Cultural Resources	17
3.6	Water Quality	17
3.7	Sediment Quality	19
3.8	Air Quality, Noise, and Artificial Lighting	20
3.9	Land Use and Aesthetics	21
3.10	Recreation	21
3.11	Hazardous, Toxic, and Radioactive Waste	21
3.12	Greenhouse Gas Emissions	22
3.13	Local Economy	22
3.14	Indian Treaty Rights	23
3.15	Disposal Area Environment	24
3.15.1	Point Chehalis Open Water Disposal Site	24
3.15.2	South Jetty Open Water Disposal Site	24
3.15.3	Southwest (3.9 Mile) Open Water Disposal Site	25
3.15.4	Half Moon Bay Nearshore Nourishment and Upland Direct Beach Nourishment Sites ...	25
3.15.5	South Beach Nearshore Nourishment Site	26

4	MITIGATION AND MONITORING	27
4.1	Mitigation Measures Incorporated into the Maintenance Dredging Program.....	27
4.2	Dungeness Crab Mitigation Strategy Agreement	28
4.3	Dungeness Crab Mitigation Plot Maintenance	30
4.4	Point Chehalis Revetment Extension Mitigation Agreement	30
5	COORDINATION.....	33
6	CUMULATIVE EFFECTS.....	33
6.1	Baseline Conditions for Cumulative Effects Analysis.....	33
6.2	Past, Present, and Reasonably Foreseeable Future Actions.....	33
6.2.1	Whitcomb Flats Section 111 Study.....	34
6.2.2	Grays Harbor Long Term Management Study.....	34
6.2.3	Navigation Improvement Project.....	35
6.3	Incremental Effects of the Proposed Action	35
7	ENVIRONMENTAL COMPLIANCE.....	36
7.1	National Environmental Policy Act	36
7.2	Marine Mammal Protection Act	36
7.3	Endangered Species Act.....	37
7.4	Clean Water Act.....	37
7.5	Coastal Zone Management Act.....	37
7.6	Marine Protection, Research, and Sanctuaries Act.....	38
7.7	National Historic Preservation Act	38
7.8	Magnuson-Stevens Fishery Conservation and Management Act	38
7.9	Clean Air Act.....	38
7.10	Executive Order 12898, Environmental Justice.....	38
7.11	Executive Order 11988, Floodplain Management	39
8	UNAVOIDABLE ADVERSE IMPACTS.....	39
10	REFERENCES	41

TABLES AND FIGURES

Figure 1.	Location and Vicinity Map	3
Figure 2.	Grays Harbor Navigation Channel Reaches and Disposal Sites	7

Table 1. FY11 through 2018 Maintenance Dredging Program by Reach	8
Table 2. Reported dredge material disposal volumes for Grays Harbor	10
Table 3. Endangered Species Act listed species potentially occurring in the project vicinity and effect determinations	16
Table 4. Point Chehalis Revetment Extension Mitigation Agreement, Summary of Predicted vs. Actual Placement Volumes (1999-2010)	32

APPENDICES

Appendix A. Finding of No Significant Impact (FONSI)
Appendix B. Agency Approval Letters
Appendix C. 404(b)(1) Evaluation
Appendix D. Coastal Zone Consistency Determination

ACRONYMS AND ABBREVIATIONS

BE	Biological Evaluation
cfs	cubic feet per second
cy	cubic yards
Corps	U.S. Army Corps of Engineers Seattle District
CZMA	Coastal Zone Management Act
DIM	Dredge Impact Model
DMMP	Dredged Material Management Plan
DNR	Washington State Department of Natural Resources
DO	dissolved oxygen
EA	Environmental Evaluation
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EISS	Environmental Impact Statement Supplement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FY	Fiscal Years
GHDMEP	Grays Harbor Dredged Material Evaluation Procedures
LTMS	Long Term Management Study
MLLW	Mean Lower Low Water
MPRSA	Marine Protection, Research, and Sanctuaries Act
NEPA	National Environmental Policy Act
NIP	Navigation Improvement Project
NMFS	National Marine Fisheries Service
O&M	Operation and Maintenance
PBE	Programmatic Biological Evaluation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDFW	Washington Department of Fish and Wildlife

1 PROPOSAL FOR FEDERAL ACTION

The Council on Environmental Quality (CEQ) regulations, 40 CFR § 1500.1(c) and 40 CFR § 1508.9(a)(1), interpreting the National Environmental Policy Act of 1969 (as amended) require 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 ensure such actions adequately address “environmental consequences, and take actions that protect, restore, and enhance the environment.” This Environmental Assessment (EA) evaluates the environmental effects of proposed maintenance of the Grays Harbor and Chehalis River Navigation Channel.

The Grays Harbor and Chehalis River Navigation Channel is located in Grays Harbor, on the southwest coast of Washington State. There are several rivers that flow into Grays Harbor, including the Chehalis River, the Humptulips River, and the Wynoochee River. These rivers and the adjacent Pacific Ocean deposit millions of cubic yards of sediment annually into Grays Harbor resulting in an embayment with considerable dynamic shoaling.

The communities of Aberdeen, Hoquiam, and Cosmopolis (combined – the Port of Grays Harbor) are all located near the mouth of the Chehalis River at the eastern end of Grays Harbor. Congress initially authorized construction of a navigation channel from the Pacific Ocean to the lower reaches of the Chehalis River in 1896. The navigation channel is used by deep draft ocean going vessels to safely reach and leave the Port of Grays Harbor. The Corps proposes to conduct maintenance dredging of the Grays Harbor and Chehalis River Navigation Channel between the Pacific Ocean and its eastern terminus beginning in October 2011 through October 2018. Up to about 3.2 million cubic yards (cy) of dredge material may be dredged and disposed of in up to six disposal sites. The 3.2 million cubic yards is the average volume dredged over the past 10 years, plus one standard deviation. The average plus one standard deviation number was used to allow for larger than average volumes if conditions warranted. The proposed action would be conducted to minimize impacts to the environment, the Endangered Species Act listed species and their critical habitat, and would include mitigation for loss of Dungeness crab.

Over the course of the project period of FY 2011 – FY 2018, this document would be reevaluated and supplemented as appropriate if the project changes, if determinations of sediment suitability for disposal deviate from the expected conditions, if there are changes in listed species, or if other significant changes occur that trigger a reanalysis of environmental effects.

1.1 Location of the Proposed Action

The Grays Harbor navigation channel provides shipping access between the Pacific Ocean and Cosmopolis on the Chehalis River, Grays Harbor County, Washington (T17N, R10 W, Sections 9, 10, 11, 12, 13 and T17N R9W Sections 8, 9, and 10). Please see Figure 1. Grays Harbor County is located on the coast in southwest Washington. The western entrance to Grays Harbor is approximately 50 nautical miles north of the entrance to the Columbia River.

1.2 Authority

The original Grays Harbor navigation channel was authorized by Congress in the Rivers and Harbors Act of 1896. The Grays Harbor and Chehalis River Navigation Project and regular Department of the Army maintenance dredging were authorized by the Rivers and Harbors Act

of 1935, and modified in 1945 and 1954. Based on an updated economic evaluation, a February 1989 General Design Memorandum modified the navigation channel by reducing the dredging depths to those presently maintained. In 1990, widening and deepening of the navigation channel began as part of the Grays Harbor Navigation Improvement Project, which was authorized by Section 202 of the Water Resources Development Act of 1986 (Public Law 99-662) in November 1986. Copies of authorizing documents are on file at the Seattle District Corps Office.

1.3 Purpose and Need

The purpose of the project is to maintain congressionally authorized project depths, as subsequently modified through the 1989 General Design Memorandum, in order to provide safe navigation and wide turning areas for large ships while they traverse Grays Harbor from the Pacific Ocean to the Port of Grays Harbor industrial port area. This project is needed because without annual maintenance dredging, shoaling would lead to a shallower channel that would fail to provide the legislatively authorized and implemented navigation channel depths, thus reducing the ability of large ocean-going vessels to enter and leave the Port of Grays Harbor safely. The maintenance dredging is important to the local economy because operations at the Port of Grays Harbor provide directly and indirectly hundreds of local jobs. The local economy in the area is historically tied to forest products that are shipped to domestic and international markets. More recently, the Port of Grays Harbor has improved rail access and terminal facilities for grain exports and other bulk cargo.

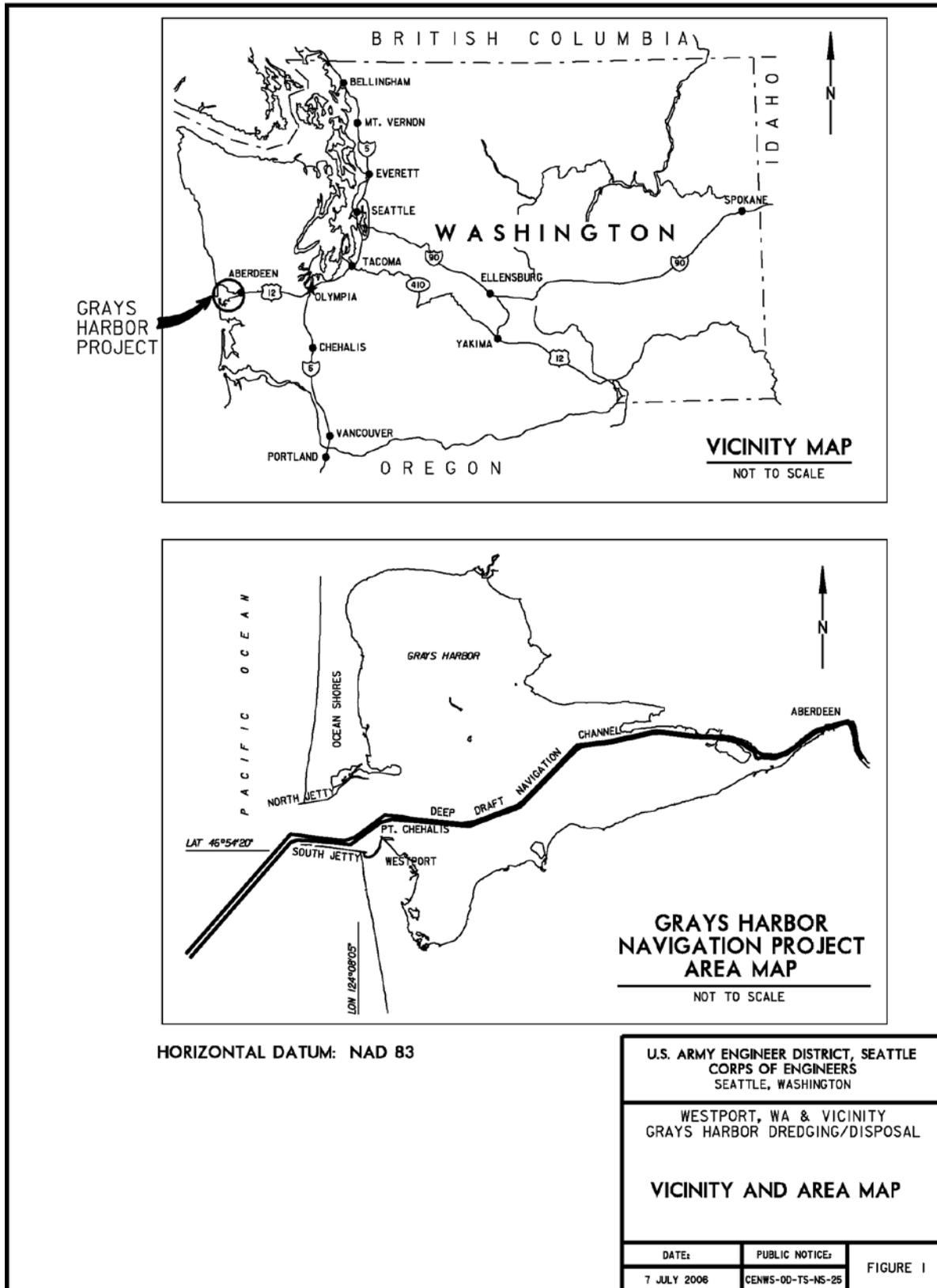


Figure 1. Location and Vicinity Map

1.4 Pertinent Documents

Since the proposed action is one for which previous environmental impact statements (EISs) and environmental assessments (EAs) have been prepared, this EA is tiered from the parent documents in accordance with 40 CFR 1502.20. As a result, this EA does not repeat evaluations presented in previous NEPA documents but rather incorporates discussions from previous NEPA documents by reference and concentrates on new issues specific to these subsequent actions.

The Grays Harbor and Chehalis River Navigation Project consists of the Federal navigation channel, the North Jetty, the South Jetty, and the Point Chehalis revetment. Historical information on these structures, as well as descriptions of recent modifications and maintenance work, has been described in several Corps documents. The following documents are incorporated here by reference:

- Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement (EIS), dated June 1975
- Long Range Maintenance Dredging Program for the Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement Supplement (EISS) No. 2, dated October 1980
- Grays Harbor, Chehalis and Hoquiam Rivers, Washington Channel Improvements for Navigation Interim Feasibility Report and Final EIS, dated September 1982
- Grays Harbor, Washington, Navigation Improvement Project Final EISS, dated February 1989
- Grays Harbor, Washington, Navigation Improvement Project Operations and Maintenance Final Environmental Assessment, 1989 Sediment Collection and Testing Program, dated February 1990
- Dredged Material Evaluation Procedures and Disposal Site Manual, dated June 1995
- Revised Crab Mitigation Strategy Agreement Evaluation Report and Environmental Assessment, dated September 1998
- Point Chehalis Revetment Extension and Half Moon Bay Inter-Agency Mitigation Agreement, dated October 1998
- Fiscal Years 2001-2006 Maintenance Dredging and Disposal, Grays Harbor and Chehalis River Navigation Project Final Environmental Assessment, dated April 2001
- South Jetty Breach Fill Final Environmental Assessment, dated April 2002
- South Jetty Breach Fill Maintenance Final Environmental Assessment, dated February 2004
- South Jetty Breach Fill Maintenance Final Supplemental Environmental Assessment, dated December 2004
- South Jetty Breach Fill Maintenance Final Supplement to the Final Supplemental Environmental Assessment, dated November 2005
- Fiscal Year 2006 Maintenance Dredging and Disposal, Grays Harbor and Chehalis River Navigation Project Final Supplemental Environmental Assessment, dated December 2005
- Grays Harbor Crab Mitigation Program Oyster Spat Placement Environmental Assessment and Biological Evaluation, dated March 2006
- Fiscal Year 2007-2011 Maintenance Dredging and Disposal, Grays Harbor and Chehalis River Navigation Project Final Environmental Assessment, dated October 2006

Copies of these documents are on file at the Seattle District Corps office.

2 ALTERNATIVE ACTIONS

2.1 No Action

Under this alternative the Corps would not dredge the Grays Harbor and Chehalis River Federal navigation channel. This alternative would result in no effects to the aquatic environment; however, any problems for marine traffic caused by present shoaling would worsen as sediments accumulate. The Grays Harbor and Chehalis River navigation channel would continue to accumulate sediments which would reduce the depths of the channel to less than the authorized and implemented depths, greatly restricting use by large ocean going vessels. This would have a significant negative effect on the local maritime economy. The no action alternative does not meet the project purpose and need. Nevertheless, the no-action alternative is carried forward for the sole purpose of comparative evaluation against the preferred alternative.

2.2 Dredging and Disposal

2.2.1 Dredging

Care has been taken during formulation of the proposed project to reduce dredging amounts to the least possible. The quantity of material proposed to be dredged annually from the Federal navigation channel beginning in FY11 through 2018 is the minimum amount necessary to accomplish the purpose and need. This alternative affects the aquatic and local terrestrial environments, but simultaneously minimizes dredging effects to these environments through minimizing the amount of time the dredges are in operation and the amount of substrate disturbed. Additionally, this alternative is more costly than the no action alternative; however, the major benefit of this alternative is that it meets the purpose and need as stated above (Section 1.3).

The Grays Harbor Navigation Channel has been divided into nine discrete reaches based upon physical characteristics and dredging requirements. Please see Figure 2 for the locations of these reaches, and Table 1 for a summary of volumes that would be dredged, channel dimensions, and timing information specific to individual reaches. With the exception of two periods, February 15 through March 31 and July 1 through July 15, dredging can be conducted from April through June and again from July 16 to February 14 somewhere in the Grays Harbor and Chehalis River Navigation Channel during each year. The outer Grays Harbor channel segments would be dredged sometime during the period April 1 through June 30 using hydraulic dredges. The actual dredging time is about one month.

The five “inner harbor” reaches - South Aberdeen, Cow Point, Hoquiam, North Channel, and Inner Crossover would be dredged using contractor mechanical dredges. Two turning basins within the inner harbor, the Elliott Slough Turning Basin in the South Aberdeen Reach, and the Cow Point Turning Basin in Cow Point Reach, would be dredged as well. Typically, this dredging operation lasts about five to six months. Dredging would occur during late summer and early winter months (July 16 and February 14), due to the need to remove shoals resulting from high river flows and the need to avoid dredging during salmonid migrations in the spring and early summer. Up to approximately 1.8 million cy would be dredged annually from the inner harbor reaches and turning basins. The average annual volume dredged over the past decade has been 1.373 million cy.

The four “outer harbor” reaches—Outer Crossover, South, Entrance/Point Chehalis, and Bar Channel—would be dredged in the spring with hydraulic (or hopper) dredges. Hopper dredges are better suited for use in the more exposed outer harbor because mechanical (clamshell) equipment requires two barges rafted together, and this can be hazardous in choppy seas. The Government hopper dredges *Essaysons* and *Yaquina* have annual assignments to Grays Harbor to perform outer harbor maintenance dredging. During years when pump-off capabilities are required for disposal at Half Moon Bay, the upland direct beach nourishment site, a contractor hopper dredge is used for a portion of the outer harbor work. Dredging occurs during the spring, due to favorable weather/wave conditions and to reduce impacts to the Dungeness crab fishery. Up to approximately 1.4 million cy would be dredged annually from the outer harbor reaches. The average annual volume dredged over the past decade has been 987, 000 cy.

Figure 2 shows a typical channel cross section. The side slopes of the navigation channel vary throughout the Harbor. Slopes progressively steepen toward the mouth of the Chehalis River, since finer substrates are more cohesive and can therefore maintain a steeper slope. Representative slopes range from 1V:3H in the South Aberdeen, Cow Point, and Hoquiam reaches, to 1V:5H in the North, Crossover, and inner portion of the South Reach channels, to 1V:10H in the outer portion of South Reach, Entrance, and Bar reaches.

The typical channel cross section in Figure 2 illustrates the total dredging prism, which includes the authorized and implemented project depth and the allowable over depth.. The authorized channel dimensions are the depth and width of the navigation channel authorized by Congress to be constructed and maintained by the Corps, as eventually implemented through the Corps’ General Design Memorandum for the Grays Harbor Navigation Improvement Project of February 1989. Advance maintenance is dredging to a specified depth and/or width beyond the authorized channel dimensions in critical and fast-shoaling areas and typically occurs during each annual dredge cycle. Advance maintenance would allow the Corps to avoid frequent re-dredging, and would ensure the reliability and least overall cost of maintaining projects to authorized and implemented dimensions. Since there is inherent imprecision in a typical maintenance dredging process, the Corps would allow for an overdepth tolerance of two feet for most of the Grays Harbor channel.

The volumes that would be removed are presented in Table 1 and include both advance maintenance and allowable overdepth quantities. These volume estimates are based upon several years of actual volumes removed from the Grays Harbor channel during maintenance dredging plus a standard deviation to account for variation between years. Thus the volumes in table 1 are the maximum expected to be dredged in any given year, but the actual volume dredged would likely be less. The depths presented in Table 1 are authorized and implemented depths, which do not include the additional depth required for advanced maintenance and allowable overdepth.

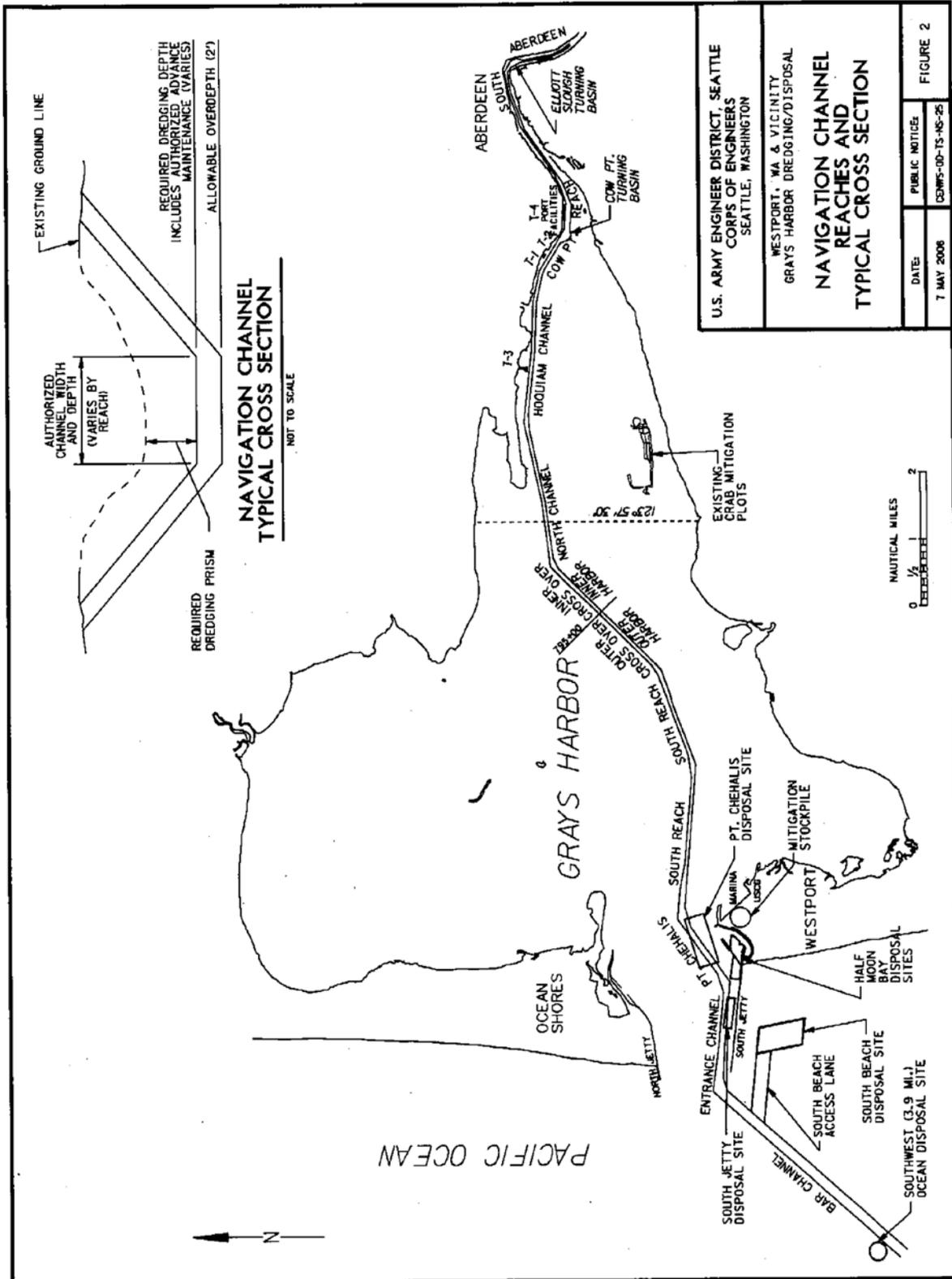


Figure 2. Grays Harbor Navigation Channel Reaches and Disposal Sites

Table 1. FY11 through FY 18 maintenance dredging program by reach³

Reach	Volume (cubic yards)	Sediment Type	Dredge Type	Channel Dimensions ¹	Disposal Area(s)	Work Closures	Work Scheduled
S. Aberdeen	~55,000 Semi decadal	sandy silt	clamshell	-32' MLLW 200-300' wide	South Jetty or Point Chehalis ²	15 Feb to 15 July	16 July to 14 Feb
Elliott Slough Turning Basin	~60,000 biennially	sandy silt	clamshell	-32' MLLW 350-550' wide	South Jetty or Point Chehalis ²	15 Feb to 15 July	16 July to 14 Feb
Cow Point	~750,000 annually	sandy silt	clamshell	-36' MLLW 350-550' wide	South Jetty or Point Chehalis ²	15 Feb to 15 July	16 July to 14 Feb
Cow Point Turning Basin	~215,000 annually	sandy silt	clamshell	-36' MLLW 350-950' wide	South Jetty or Point Chehalis ²	15 Feb to 15 July	16 July to 14 Feb
Hoquiam	~150,000 annually	sandy silt	clamshell	-36' MLLW 350' wide	South Jetty or Point Chehalis ²	15 Feb to 15 July	16 July to 14 Feb
North Channel	~175,000 annually	silty sand	clamshell	-36' MLLW 350' wide	Point Chehalis	Feb 15 to July 31	August to 14 Feb
Inner Crossover	~375,000 annually	silty sand	clamshell	-36' MLLW 350-450' wide	Point Chehalis	Feb 15 to July 31	August to 14 Feb
Outer Crossover	~235,000 annually	silty sand	hopper	-36' MLLW 350' wide	Point Chehalis	June 1 to March 31	April and May
South Reach	~190,000 annually	sand	hopper	-36' MLLW 350-450' wide	Point Chehalis or Half Moon Bay	July 1 to March 31	April to June
Entrance/ Point Chehalis	~685,000 annually	sand	hopper	-40' to -46' MLLW 600-900' wide	South Jetty, or Half Moon Bay or Point Chehalis	June 1 to March 31	April and May
Bar Channel	~260,000	sand	hopper	-46' MLLW 900' wide	South Beach or South Jetty or 3.9 Mile ocean site	June 1 to March 31	April and May

¹ Depths shown are authorized depths and do not include 2' advanced maintenance or 2' overdepth tolerance. Exceptions: South Aberdeen Reach has 0' advance maintenance and 1' overdepth tolerance. Elliott Slough Turning Basin has 3' advance maintenance for half of the channel (inside bend). Widths shown are those of the channel bottom, and do not include extra width at channel bends.

² Adverse weather/wave relief site.

³ Volumes are averages, plus one standard deviation, computed on the last 10 years dredging records, thus the actual volumes dredged may be less than those in the table.

2.2.2 Disposal

Disposal of dredged material would occur only at approved, designated disposal sites. Two Washington Department of Natural Resources (DNR) public, multi-user, unconfined open water dredged material disposal sites are located directly adjacent to the navigation channel. The Point Chehalis and South Jetty sites are located on state-owned aquatic lands, and are managed by DNR. One Environmental Protection Agency (EPA) designated ocean disposal site, Southwest (also called 3.9 Mile), is located adjacent to the Bar Channel. In addition, material that would be dredged from the sandy outer reaches of the channel would be periodically used for both direct upland beach and nearshore nourishment at Half Moon Bay, and nearshore nourishment at South Beach. See Figure 2 for the location of these sites.

The channel sediments have been tested and approved for unconfined open water disposal under the guidelines of the DMMP administered by the Corps, EPA, Washington Department of Ecology (Ecology), and DNR. Additional sampling and analysis of inner harbor sediments occurs on a regular basis, as specified in the June 1995 Dredged Material Evaluation Procedures and Disposal Site Management Manual for Grays Harbor and Willapa Bay. All sediment samples have met DMMP requirements for unconfined open water disposal through the latest testing period.

Materials dredged from the inner harbor reaches are primarily fine grain suspended/bedload material from tributary streams and rivers. Inner harbor material would be disposed of at the South Jetty site, and at the Point Chehalis site during adverse weather/wave conditions or if the South Jetty site is full. Materials dredged from the outer harbor reaches are marine sands deposited by tidal action and silty sand/sandy silt redistributed within the estuary by wind and wave action. Some outer harbor material would be disposed of at three “beneficial use” sites, including the Half Moon Bay nearshore nourishment site, upland Half Moon Bay direct beach nourishment site, and the South Beach nearshore nourishment site. The 3.9 mile disposal site has not been used since the channel deepening project in 1990. To use this site EPA would need to reclassify it as a valid disposal site. Thus the 3.9 mile site will likely not be used.

The determination of which disposal site would be used during the course of maintenance dredging would be based on these factors:

Outer and inner harbor criteria

- the source of the dredged material, the depth of each aquatic disposal site and the amount of material present in the Half Moon Bay direct upland beach nourishment site, as surveyed annually, all sites;
- weather and wave conditions at the time of disposal, all sites;

Outer harbor criteria

- presence of commercial crab pots in a disposal site and/or access lane (South Beach); and
- results of pre-disposal Dungeness crab surveys, Half Moon Bay and South Beach.

Dredged material would be transported to disposal sites by either a bottom dump hopper dredge or by a tugboat and bottom-dump (or split-hull) barge. These vessels generally have the ability to transport between 800 and 6,000 cy of material each trip. The number of barge discharges per day is typically three to five, but this number varies depending on the extent of the dredging activity occurring at the time. The volumes of dredge material by disposal site is summarized in Table 2.

Table 2. Reported dredge material disposal volumes for Grays Harbor

Year	Point Chehalis	South Jetty	Half Moon Bay	South Beach	Upland Disposal Site	Reported Total
2000	956700	1200248	0	0	0	2156948
2001	667943	358873	0	0	0	1026816
2002	942310	475199	378441	75219	135700	1871169
2003	355139	824694	329107	125388	0	1634328
2004	957186	1166089	289652	262176	0	2675103
2005	1054086	740970	102194	217909	0	2115159
2006	1277837	196833	126892	55170	0	1656732
2007	599254	389127	140406	0	0	1128787
2008	1288726	707080	171352	0	0	2167158
2009	1223159	21088	144975	214502	0	1603724
2010	977282	91720	91720	118182	0	1278904
Adjusted Average Annual (2000-2010)	1224000	733000	210000	127000	16000	2310000

A hydraulic pipeline would be used for disposal of outer harbor materials at the upland Half Moon Bay direct beach nourishment site. A contractor hopper dredge full of sand would dock at an existing rock dock at Firecracker Point, where a crane barge outfitted with an injection pump and jet would add water to the sediment in the hopper dredge bin. The hopper dredge would offload the resulting slurry of sand and water to a hydraulic booster pump on the crane barge. The booster would pump the slurry to an onshore pipeline for the across-town transport of material in a temporary plastic pipeline 1.7 miles long. The temporary pipeline was installed in 1994 and buried along the road that generally follows the shoreside roads between Firecracker point and Half Moon Bay. The slurry of sand and water would be discharged to the area in front of the buried revetment. A sand berm/perimeter dike would separate the discharge area from Half Moon Bay. The slurry of water and sand would temporarily pond in the disposal site, and water would be conveyed via effluent pipe into Grays Harbor at the exposed rock revetment near Groin A. The sandy dredged material would quickly dewater and a dozer at the point of discharge would grade the sand uniformly over the disposal area.

3 ISSUES FOR COMPARISON OF THE ALTERNATIVES

This section provides information on issues relevant to the decision process for selecting the preferred alternative. Factors for selecting the recommended alternative include finding the alternative that would be the most cost effective, least environmentally damaging, and meets the purpose and need of the project.

3.1 Geomorphology

The Federal navigation channel begins in the lower portion of the Chehalis River as it enters Grays Harbor and exits into the adjacent Pacific Ocean. The Chehalis River originates in the Black Hills and lowlands east of Interstate Highway 5 near Centralia, the Chehalis River does

not have a glacial source of water. The Chehalis River generally flows westerly through conifer forests and open farmlands. The Chehalis River is the major contributor of sediment to the inner portions of the Grays Harbor and less so to outer Grays Harbor. The majority of material in outer Grays Harbor is marine derived and distributed by waves and tidal currents. In fact, so much sediment reaches Grays Harbor that up to 3.2 million cy of material must be removed from the navigation channel annually to keep it open for commercial deep draft vessels.

The Federal navigation channel is a series of straightened and deepened sections within Grays Harbor and the adjacent Pacific Ocean. Grays Harbor is a large shallow dynamic estuary located on the southwest coast of Washington. The majority (over 80%) of Grays Harbor is less than 20 feet deep (MLLW) and the Grays Harbor and Chehalis River Navigation Channel is the deepest portion of Grays Harbor east of the entrance from the Pacific Ocean. In excess of 50 percent of Grays Harbor has a depth of about zero feet MLLW. There are two natural channels, one from the north, somewhat diffuse, with occasional depths slightly in excess of 20 feet MLLW, and one to the South, well defined, also with some depths slightly in excess of 20 feet MLLW. The landform to the west and southwest of Grays Harbor is predominantly flat terrain with low hills. Thus Grays Harbor is exposed to the predominant southwesterly winds, which along with the ocean waves, supply the energy that causes movement of shoals. The dynamic movement makes prediction of where shoals would occur difficult if not impossible.

Alternative 1 - No-Action Alternative

This Alternative would allow the geomorphology of Grays Harbor to return to pre-navigation channel conditions, which would result in the navigation channel becoming unusable. This Alternative would not meet the project purpose and need.

Alternative 2 - Dredging and Disposal

This Alternative would have no effect on the character and grain size distribution provided by the adjacent Pacific Ocean and the rivers that drain into Grays Harbor. Based on historic sediment characterization the Corps has determined that the dredged material is suitable for deposition in open water disposal sites, beach nourishment sites and upland. Beach nourishment would compensate for erosion in those areas where wave action erodes beaches. In-water disposal contributes to the maintenance of the natural sediment transport system. This Alternative would maintain the historical geomorphology of the sediment transport system. Material is disposed of in locations to maximize beneficial use to mitigate for erosion in high erosion places such as Half Moon Bay. The dredge material is used to mitigate the effects of large waves and tidal currents that propagate through the inlet. Therefore, this alternative will not have a significant effect on geomorphology.

3.2 Aquatic Vegetation

There is some aquatic vegetation in Grays Harbor, especially eelgrass (*Zostera marina*); however, the abundance of eelgrass has been decreasing in recent years. In addition, the movement of shoals results in eelgrass displacement as substrate is alternately created and destroyed. There is some emergent vegetation along the shoreline, but much of the shoreline is occupied by commercial enterprises and private homes. Shoreline aquatic vegetation is discouraged by property owners. There are a few areas where aquatic vegetation is encouraged, but these areas are generally small and separated from each other.

Alternative 1 - No-Action Alternative

No effects are anticipated as a result of this Alternative.

Alternative 2 - Dredging and Disposal

This Alternative would have minimal to no effect on aquatic vegetation within Grays Harbor because the dredging is conducted in the deepest portions of Grays Harbor away from aquatic vegetation and at depths where vegetation generally cannot grow, and because disposal would be in locations where aquatic vegetation does not occur. The locations of existing disposal sites were chosen in areas with minimum to no vegetation. The lack of vegetation is primarily due to the high energy environments and turbidity at the disposal sites. For example, Half Moon Bay is shallow enough for eelgrass, but wave action, currents and turbidity appear to preclude eelgrass. The other in-water disposal sites are too deep and turbid for eelgrass. The upland disposal site is located in an area of sand dunes without vegetation, although there is some dune grass that self established on the disposed sand. But this dune grass is native and re-establishes after each disposal event.

3.3 Invertebrates, Fish, and Wildlife

Grays Harbor has been affected by development, especially the Federal navigation channel, but most of the aquatic area has remained pristine. The minimal development of the aquatic area has allowed the continuation of significant crab and salmonid fisheries. Several Corps studies and monitoring have been conducted on the biological resources of Grays Harbor; these studies include the following:

- a multi-year bull trout sampling effort in the lower Chehalis River to confirm that USFWS work windows are protective of this threatened species (R2 Resource Consultants 2006);
- surveys of fish utilization of Half Moon Bay (R2 Resource Consultants 2005);
- benthic invertebrate sampling in Half Moon Bay and South Beach, and an analysis of stomach contents of fish obtained as part of the Half Moon Bay fish surveys (SAIC 2005);
- monitoring of dune grass plantings on the South Jetty breach fill (Corps 2005);
- a literature review and development of a study design for shorebird use assessments in the vicinity of the South Jetty (Raedeke Associates 2005);
- an assessment of shorebird use of terrestrial habitats adjacent to Half Moon Bay (Corps 2006); and
- sand lance spawning surveys in Half Moon Bay (Molenaar 2005).

Electronic copies of these reports are available on the Seattle District web site http://www.nws.usace.army.mil/PublicMenu/Doc_list.cfm?sitename=ECRB&pagename=MONITORING

The purpose of recent sampling efforts in Half Moon Bay was to begin defining existing environmental conditions, specifically nearshore fish and benthic invertebrate assemblages, for the Grays Harbor Long Term Management Study. The R2 Resources (2005) fish survey work indicates that fish and crab assemblages along the Half Moon Bay shoreline are diverse and numerous throughout the summer months. From late June through August, juvenile Chinook salmon and juvenile and adult surf smelt were the most numerous and consistent inhabitants of the Bay. Species diversity and overall fish density was greater during the summer months than during the spring months, as compared to previous beach seine work (R2 Resources 1999).

The SAIC (2005) benthic survey work indicated that the highest abundance and number of invertebrate taxa occurred at the subtidal sample stations (-4, -8, and -12' MLLW). The -12' stations were located within the Half Moon Bay nearshore nourishment disposal site, and the June samples were taken less than two months after disposal of almost 290,000 cy of dredged material in the site. A shift in dominant taxa at the -12' stations was noted in the June samples as compared to the samples taken the previous January. The June samples were dominated by the polychaete *Saccocirrus sp.*, while the January samples were dominated by Nemertean (proboscis worms). *Saccocirrus sp.* was not found in the January samples, but Nemerteans were present in June as subdominant species. In January and June samples, juvenile organisms dominated and a small number of adult organisms were found. These data support conclusions made in previous NEPA documents that areas disturbed by navigation maintenance activities recolonize quickly.

SAIC (2005) analyzed the stomach contents of fish captured as part of the R2 Resources (2006) seining effort. Species collected for stomach content analysis included Chinook salmon, surf smelt (*Hypomesus pretiosus pretiosus*), sand lance (*Ammodytes hexapterus*), American shad (*Alosa sapidissima*), shiner perch (*Cymatogaster aggregate*), English sole (*Parophrys vetulus*), speckled sanddab (*Citharichthys stigmaeus*), and sand sole (*Psettichthys melanostictus*). With the exception of the flatfish, there was little overlap between the stomach contents of fish captured in Half Moon Bay and benthic organisms present there. English sole appeared to be feeding on benthic polychaetes derived from mid to lower tidal elevations in Half Moon Bay. A discussion on what the results of these sampling efforts describe regarding food web relationships and the effects of sand placement in upper intertidal areas of Half Moon Bay can be found in the 2004 South Jetty Breach Fill Maintenance Final Supplemental EA (Corps 2004). In summary, the project area shoreline and bay are characterized by a high rate of natural disturbance, due to exposure to strong wind and wave action, and large volumes of sediments eroded and deposited in the area. Nevertheless, the bay and shoreline provides usable habitat for fish, benthic invertebrates, and shorebirds. Limited benthic production occurs sporadically, depending on location and tidal elevations, especially at lower intertidal zones. Bottom fish, and probably forage fish, feed on invertebrates present in the project area. However juvenile Chinook salmon are consuming primarily pelagic species as they prepare for their ocean life history. Some dune grass may have been present in the area and was subject to damage due to sand placement activities but it was replanted as necessary in the subsequent spring season. Between December 2004 and April 2005, Washington Department of Fish and Wildlife (WDFW) fishery biologists conducted twice monthly sand lance spawning surveys along the Half Moon Bay shoreline. No eggs were found, and WDFW concluded that the study area was not suitable spawning habitat because wave energy was too great (Molenaar 2005).

Alternative 1 - No-Action Alternative

This Alternative would be the least disruptive to the invertebrates, fish and wildlife of Grays Harbor. This Alternative would allow the aquatic ecosystem to reach a climax condition; however this Alternative would not meet the project purpose and need.

Alternative 2 - Dredging and Disposal

This Alternative would disrupt the infaunal community in the Grays Harbor and Chehalis River Navigation Channel during each dredge event never allowing the infaunal community to reach a climax condition. Larger mobile organisms, such as fish, would generally be able to avoid the dredge except for some forage fish that might be entrained in the hopper dredge. Dungeness

crab would be entrained by the hopper dredge; to compensate for this loss, the Corps would place oyster shell, or another substrate, to improve the survival of juvenile Dungeness crab. Because of the avoidance of the dredge by mobile organisms, recolonization by invertebrates, and the mitigation for crab losses, this alternative will not have significant effects to these species.

3.4 Threatened, and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Several species listed as either threatened or endangered are potentially found in Grays Harbor (Table 2).

Changes in ESA designations and the National Marine Fisheries Service (NMFS) current understanding of the nearshore distribution of listed Columbia River Chinook and chum salmon have occurred since preparation of the last EA in 2006. The bald eagle (*Haliaeetus leucocephalus*) was de-listed and two additional species occurring in and near Grays Harbor were listed. The Southern Resident killer whale (*Orcinus orca*) was listed as endangered, and the Southern green sturgeon (*Acipenser medirostris*) was listed as threatened and critical habitat designated for both species. Based on length data of juvenile salmon collected in Grays Harbor, NMFS assumes Lower Columbia River Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River Chinook salmon and Columbia River chum salmon (*O. keta*) juveniles may use nearshore areas of Grays Harbor.

The Corps prepared a PBE to evaluate the impacts of the proposed actions on species and habitats protected under the ESA. The Corps submitted the PBE and initiated consultation with the U.S. Fish and Wildlife Service and the NMFS (combined, the Services) in May 2011. The Corps' effect determinations are summarized in Table 2 and are either "may affect not likely to adversely affect" or "no effect." The primary basis for the "may affect, not likely to adversely affect" determinations (see table 2) is because the dredging and disposal is conducted at times and locations when and where ESA listed species will likely not occur, or in the case of most of the "no effect" determinations the species and/or critical habitat occurs in the adjacent ocean environment, but generally not in Grays Harbor.

The 1999 listing of bull trout as a threatened species altered the dredging schedule for the lower Chehalis River. The dredging closure period protective of migrating juvenile salmon was extended, from April through June and again from February 15 to July 15 (see table 1). The U.S. Fish and Wildlife Service (USFWS) requested that the Corps undertake a literature review and three-year sampling effort of the affected reaches to establish patterns of bull trout use. The purpose of this effort was to substantiate the then new USFWS work window for bull trout in order to ensure the new window was fully protective of this species. Fish biologists from R2 Resources sampled 12 sites in 2001, 2002, 2003, and 2004 (R2 Resources 2006). Acoustic tags were implanted in the bull trout captured in 2004, so additional data was collected in 2005. The results of the literature review and sampling effort indicate that bull trout are present in the lower Chehalis River beginning in mid- to late-February and continuing through mid-July. The tagged fish appeared to display a preference for the mainstem reach of the Chehalis River between the Elliott Slough Turning Basin and Cow Point Reach. No tagged fish were detected at a fixed receiver station in Half Moon Bay. The USFWS work window appears to correspond with the portion of the year when bull trout are least likely to be present in the inner harbor dredging area.

This information confirms that by dredging during the window designated by USFWS, the Corps avoids likely adverse effects to bull trout.

Alternative 1 - No-Action Alternative

This Alternative would be the least disruptive to ESA listed species and their designated critical habitat in Grays Harbor. This Alternative would allow the aquatic ecosystem to reach a climax condition and thus likely provide additional resources for ESA listed species; however this Alternative would not meet the purpose and need for the project.

Alternative 2 - Dredging and Disposal

This Alternative would disrupt the infaunal community in the Grays Harbor and Chehalis River Navigation Channel never allowing this community to reach a climax condition. The ESA-listed species most likely affected by this condition would be green sturgeon because they are bottom feeders eating clams and other organism on and in the substrate. However the amount of benthic habitat disrupted by the dredging and disposal is small compared to the entire benthic community of Grays Harbor. There will remain adequate benthic forage opportunity for green sturgeon. Further, the disposal sites are located in areas of high energy where sediment is eroding and probably do not allow a climax benthic community to exist since the substrate is constantly eroding and recolonization occurring. Sediment placement in these locations would likely cause minimal changes in the benthic community. As a result there would be a non-significant effect on green sturgeon. Other ESA-listed species such as juvenile salmonids are generally found in shallow nearshore waters away from the dredge and disposal activities and would not be affected by the project as long as the dredging is conducted during the work windows. The temporary increases in disturbance during dredging are expected to be insignificant and are not expected to significantly degrade existing conditions within the action area or to have adverse effects on ESA listed species as long as the dredging is conducted during authorized work windows. The ESA baseline environmental conditions in Grays Harbor include the navigation channel as dredged and the disposal sites as used. Therefore from the perspective of the ESA, dredging of the navigation channel would not change the baseline conditions.

Table 3. Endangered Species Act listed species potentially occurring in the project vicinity and effect determinations

SPECIES	LISTING STATUS	EFFECT DETERMINATION	CRITICAL HABITAT DETERMINATION
Coastal/Puget Sound Bull Trout <i>Salvelinus confluentus</i>	threatened	not likely to adversely effect	not likely to adversely effect
Lower Columbia River Chinook Salmon <i>Onchorhynchus tshawytscha</i>	threatened	not likely to adversely effect	-
Upper Willamette River Chinook Salmon <i>Onchorhynchus tshawytscha</i>	threatened	not likely to adversely effect	-
Columbia River Chum Salmon <i>Onchorhynchus keta</i>	threatened	not likely to adversely effect	-
Western Snowy Plover <i>Charadrius alexandrius nivosus</i>	threatened	not likely to adversely effect	not likely to adversely effect
Brown Pelican <i>Pelecanus occidentalis californicus</i>	endangered	not likely to adversely effect	—
Marbled Murrelet <i>Brachyramphus marmoratus</i>	threatened	not likely to adversely effect	no effect
Southern Green Sturgeon <i>Acipenser medirostris</i>	threatened	not likely to adversely effect	not likely to adversely effect
Eastern Stock Steller Sea Lion <i>Eumetopias jubatus</i>	threatened	not likely to adversely effect	no effect
Southern Resident Killer Whale <i>Orcinus orca</i>	endangered	not likely to adversely effect	no effect
Humpback Whale <i>Megaptera novaeangliae</i>	endangered	not likely to adversely effect	—
Blue Whale <i>Balaenoptera musculus</i>	endangered	no effect	—
Fin Whale <i>Balaenoptera physalus</i>	endangered	no effect	—
Sei Whale <i>Balaenoptera borealis</i>	endangered	no effect	—
Sperm Whale <i>Physeter macrocephalus</i>	endangered	no effect	—
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	endangered	no effect	no effect
Loggerhead Sea Turtle <i>Caretta caretta</i>	threatened	no effect	no effect
Mexican Nesting Green Sea Turtle <i>Chelonia mydas</i>	endangered	no effect	no effect
Mexican Nesting Olive Ridley Sea Turtle <i>Lepidochelys olivacea</i>	endangered	no effect	no effect

3.5 Historic and Cultural Resources

A review of the Washington State Department of Archaeology and Historic Preservation (DAHP) online database WISSARD indicates that there is no National Register –eligible cultural resources located neither within the project area or disposal areas of the dredged material. The WISSARD search did reveal that there are several archaeological sites located within the vicinity of the project area along the north shoreline of the Hoquiam Channel reach of the proposed dredging. These sites will not be affected by the proposed dredging. The Corps has conducted several studies within the proposed dredged area and disposal areas to determine if cultural resources are present. A literature search was made to determine the presence of potential shipwrecks at the mouth of Grays Harbor in the vicinity of the proposed dredged material disposal sites. This search did not identify any known ships within the proposed ocean disposal areas. No known shipwrecks are present within the area of the Federal navigation channel. The M. S. SIERRA, a National Register property, is located adjacent to the channel but would not be affected by dredging. A side-scan sonar search of all project impact areas was undertaken in the fall of 1988 to identify significant sunken historic properties. No vessels were found in the project areas. The State Historic Preservation Officer was notified and has concurred that no historic sunken vessels would be affected by maintenance dredging. Sediment cores taken from harbor dredge sites were examined for prehistoric cultural material, but none was found.

Dredging Guidance Letter No. 89-01 (March 13, 1989) states that it is the policy of the Corps 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. Accordingly, no new cultural resources surveys were conducted for this project. The proposed maintenance dredging does not change the configuration or location of the authorized navigation channel in any fashion.

Alternative 1 - No-Action Alternative

No effects are anticipated as a result of this Alternative, although this Alternative would not meet the project objective.

Alternative 2 - Dredging and Disposal

This Alternative would likely have no effect on historic and cultural resources since none are known to exist in the project area.

3.6 Water Quality

Ecology sets water quality standards based on water use and the water quality criteria for designated uses. The waters of Grays Harbor are designated as category 1. The exceptions are two locations classified as category 2 and one location classified as category 5. The parameters in question are ammonia-N, temperature, copper (inner harbor) and fecal coliform. Most of Grays Harbor water is clean with little contamination, although there is some contamination especially in the lower Chehalis River near Cosmopolis.

Lack of large vegetation (trees and large shrubs) in the riparian zone likely contributes to increases in water temperatures. The possible amount of shoreline vegetation that could provide shade for temperature control is minimal compared to the total surface area of Grays Harbor.

Alternative 1 - No-Action Alternative

No effects are anticipated as a result of this Alternative, but this Alternative would not meet the project purpose and need. Since there would be no dredging there would be no effects generally associated with dredging. Examples include resuspension of sediment and reductions in dissolved oxygen (DO).

Alternative 2 - Dredging and Disposal

This Alternative would have minor effects to water quality in the vicinity of the active dredge operations and in the disposal areas. Sediments dredged from beneath the substrate surface could have some incompletely decomposed organic material that would consume DO when it would be exposed to the water column during dredging and disposal. In addition, there would be some resuspension of sediment into the water column during dredging and disposal; the resuspension of sediment would decrease with distance from the Chehalis River because the fine grain content of the sediment decreases with distance from the Chehalis River.

There would be short-term re-suspension of sediments into the water column during the dredge operations. State Water Quality Standards allow for a 600 foot dilution zone downcurrent of the dredge operation such that suspended sediment in the water column would return to background conditions within the 600 foot dilution zone. Most mobile organisms would avoid the area of increased suspended sediment, although fish that enter the area of increase are unlikely to be harmed. Historical testing indicates that release of contaminants to the water column would be insignificant and any contaminated sediment that did get into the water column would quickly settle out within the legally defined dilution zone. Therefore suspended sediment impacts would be minor and not expected to degrade the overall water quality conditions in Grays Harbor or the action area. Dissolved oxygen tends to decline in the vicinity of dredging operations when the suspension of anoxic sediments creates high chemical oxygen demand. Temporary decreases in DO associated with increased suspended sediments are possible in the immediate dredging plume area, especially the inner channel reaches where the amount of fines is greatest. During dredging operations, DO in the Federal navigation channel is not expected to reach low levels because flushing from river and the adjacent ocean flow into the bay will keep the water oxygenated. If river flows fall below 1000 cubic feet per second (cfs), then DO would be monitored in the inner navigation channel reaches. If DO levels drop below 4mg/L dredging would cease for a short period, then resume with monitoring. Further, it is unlikely that the sediments to be dredged are strongly anoxic because the bulk of the sediment is expected to have a low percentage of fine materials. Short-term (only during dredge operation) effects of decreases in DO could include avoidance of the dredging area by mobile aquatic organisms and reduced foraging opportunity during and immediately after dredging as fish avoid areas of depressed DO. Given the amount of flushing, tidal exchange with the adjacent Pacific Ocean, and fetch, it is unlikely water quality would be degraded sufficiently to cause biological problems as a result of dredging.

During disposal there would be a minor depression of DO in the immediate vicinity of the disposal site associated with exposure of low DO sediment to oxygenated water as the material falls through the water column. There would also be a minor amount of material that is resuspended, but since most of the water has drained out of the dredged material prior to release from the bottom dump barge, the dumped material generally descends to the bottom as a coherent mass minimizing resuspension. In addition one of the reasons for choosing the South Jetty and Point Chehalis aquatic disposal sites was their erosion (dispersal) characteristics as

most of the disposal material is dispersed away from the disposal site in the lower layers of the water column. Since this dispersal is a natural occurrence there would be little or no increase in effects to water quality. Disposal at the upland site involves creating a berm, made of dredge material, around the site. The dredge material is pumped into the enclosed disposal site which allows time for most of the suspended sediment to settle out before the water drains back into Grays Harbor minimizing effects to water quality.

3.7 Sediment Quality

Sediments to be removed from the Federal navigation channel have been tested and approved for open water disposal under the DMMP guidelines administered by the Corps, EPA, Ecology, and DNR. The requirements for determining the suitability of dredged material from the Federal navigation channel for unconfined, open-water disposal are documented in the 1995 Dredged Material Evaluation Procedures and Disposal Site Management Manual, Grays Harbor and Willapa Bay, Washington (the GHDMEP).

The Grays Harbor Navigation channel is low-ranked, meaning few or no sources of chemicals appear to contribute to channel sediments. This conclusion is based on data that show no or low levels of chemicals of concern and no significant toxic responses in biological tests.

The GHDMEP specifies a six-year “frequency” guideline during which sampling and testing of the entire channel must be completed. Alternating portions of the navigation channel (Inner Crossover to Hoquiam, and Cow Point to South Aberdeen Reaches) are characterized every third year. Coarse-grained sands found at the Bar, Entrance, and South Reaches meet no-test guidelines for high-energy areas under the Marine Protection, Research, and Sanctuaries Act (MPRSA). The total dredging prism (including the authorized project depth, advance maintenance depth, and the overdraft depth) is characterized.

Multiple rounds of sampling and sediment characterization have occurred since preparation of the last EA. Typically one-third of the inner harbor channel would be sampled every two years (the inner harbor channel segments are Crossover, North Channel, Hoquiam, Cow Point, and South Aberdeen). Thus there was testing every other year including 2010. The next round of sampling is scheduled for 2012 and will include all inner harbor channel reaches. The suitability testing is good for six years. All sampling since 1991 and subsequent testing supported the finding that proposed dredged material is suitable for open-water disposal (DMMP 2010). A suitability determination documenting this characterization is expected before the end of the 2012 calendar year.

Since the GHDMEP standards are designed to be protective of organisms that come into contact with sediments, concentrations and bioavailability of contaminants in sediments suspended during dredging and disposal are expected to be below levels that may cause harm to juvenile or adult salmonids.

Alternative 1 - No-Action Alternative

No effects to this parameter are anticipated as a result of this Alternative; however this Alternative would not meet the project purpose and need.

Alternative 2 - Dredging and Disposal

This Alternative would have a similar outcome to the no action Alternative, that is little or no effect on sediment quality because the dredge operation does not have any component that would

change the nature of sediments found in Grays Harbor. This is because the Corps conclusion of no significant effects is based sediment testing since 1991 where all sediment tested met open water disposal criteria. Based on these results the Corps expects future test results to continue supporting open water disposal. However, if negative test results were obtained in future sediment testing the Corps would reopen the EA and its conclusion and reevaluate the finding of no significant impact (FONSI).

3.8 Air Quality, Noise, and Artificial Lighting

The ambient air quality in Grays Harbor is generally good with few sources of pollution. Those sources are primarily local automobiles, local fishing vessels, a local pulp mill, and ocean going commercial cargo vessels. These sources of air pollution are minor compared to the size of the entire area. To the north and east are logging and lumber mill operations that produce air pollution, but this and other air pollution generated in the area is moved out of the area by the prevailing winds from the southwest. Noise and artificial lighting are minimal and are associated primarily with the populated cities of Westport, Aberdeen, Hoquiam, and Cosmopolis. Other sources of noise and artificial lighting are vessel traffic, private homes, and small private and port-related operations on the shoreline in the eastern portion of Grays Harbor.

Alternative 1 - No-Action Alternative

No effects to this parameter are anticipated as a result of this alternative, but this alternative would not meet the project purpose and need.

Alternative 2 - Dredging and Disposal

The dredge and the tugs necessary to move the dredge and barges are diesel powered and thus contribute to air pollution; however, the amount of air pollution generated by the dredge operation would not be any greater than large ocean going ships that traverse the Grays Harbor and Chehalis River Navigation Channel. During the dredge operations, there would be an increase in air pollution because pollution generated by the dredge operation would be added to the vessel traffic; however, dredging has been an annual event and the 2011 through 2018 dredge operations would not increase air pollution over conditions that have prevailed during previous dredge cycles. The dredging operation would, however, result in greater air pollution compared to the no action Alternative because the dredging machinery would produce air pollution and would facilitate continued use of the navigation channel by large ocean going vessels that themselves produce air pollution. Dredging and disposal activities are scheduled to be performed between April 1 and June 30 (outer harbor channel reaches), and between July 16 and February 14 (inner harbor channel reaches). Actual dredging takes about 30 days during the spring period and about five to six months during the late summer to early winter period.

Maintenance dredging would increase noise levels above ambient levels in the vicinity of the dredge and tugs during dredge operations. Noise and activity during dredging operations could temporally disturb some animal species from the adjacent shoreline areas and from the immediate area of the working dredge, but this effect is expected to be limited in both space and time because the disturbance would affect only the immediate area around the dredge and tug and this disturbance would move with the active dredge so only a small portion of Grays Harbor would be effected at any given time.

Lights operating on the dredge would temporarily increase ambient lighting levels at night in the immediate vicinity of the dredge, but are not expected to adversely affect adjacent habitats

beyond the immediate vicinity of the dredge operation. Once the dredge operation ceases there would be no long-term effects from the noise or light of the dredge operation. Since the dredge operation moves along the Federal navigation channel, only a single location at a time would endure short-term disturbance. This alternative would slightly increase air pollution, noise, and artificial lighting; as compared with the no-action alternative, however, the effects would be minor because the scale of the project would be small at any given time relative to the size of Grays Harbor, as the dredge and barges move along the navigation channel.

3.9 Land Use and Aesthetics

The area surrounding Grays Harbor is sparsely populated except for Westport, Aberdeen, Hoquiam, and Cosmopolis. These communities are small compared to the cities in the Puget Sound Basin. Most of the surrounding territory is forested in native vegetation, which has undergone an aggressive timber harvest regime in the past 150 years.

Alternative 1 - No-Action Alternative

No effects to this parameter are anticipated as a result of this Alternative.

Alternative 2 - Dredging and Disposal

This Alternative would create a visual presence on the surface of Grays Harbor, but would likely have minimal effect on the surrounding terrestrial area. During maintenance dredging, the dredge, barges, and tugs would be visible to observers from the shore and from the water. This would constitute a change in the visual appearance of the waterway surface traffic during the time of maintenance dredging; however the addition of the dredge relative to all the large ships and commercial traffic would be an insignificant change. There would be no changes in land use in the terrestrial areas adjacent to the maintenance dredge area. No other impacts to land use and aesthetics would occur.

3.10 Recreation

Grays Harbor is used for fishing, clamming, crabbing, and some recreational boating. During annual salmon runs, fishers ply the waters, and during low tides people dig for clams.

Alternative 1 - No-Action Alternative

This Alternative would not have any effect on recreation until such time that navigation in Grays Harbor for pleasure craft became difficult due to shoaling.

Alternative 2 - Dredging and Disposal

During the time when maintenance dredging would occur, there would be minimal effects to recreation since recreational boaters and fishers would be required to avoid the immediate area of the dredge and disposal barge for safety reasons, but that area is small compared to the entire surface area of Grays Harbor. This Alternative would maintain the current usage patterns regarding recreational vessels and fishing, clamming, and crabbing opportunities; therefore, effects would be insignificant.

3.11 Hazardous, Toxic, and Radioactive Waste

There are no known hazardous, toxic, or radioactive wastes in the project area.

Alternatives 1 and 2:

No effects are anticipated as a result of the either Alternative.

3.12 Greenhouse Gas Emissions

The primary greenhouse gasses in the atmosphere are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. The characteristic these gasses have in common is that they absorb and emit radiation within the thermal infrared range, which is the fundamental cause of the “greenhouse effect”. Anthropogenic sources of greenhouse gasses have been increasing over the past 250 years, and have reached a rate of contribution that is causing climate change. The concern for Federal projects is the contribution of greenhouse gasses to the atmosphere in such large quantities as to outweigh the benefit of executing the proposed action.

Alternative 1 - No-Action Alternative

This Alternative would not contribute greenhouse gasses generated by the dredge operation, but would not meet the project purpose and need.

Alternative 2 - Dredging and Disposal

The dredge and tugs would emit carbon dioxide and water vapor (both powerful greenhouse gasses). If the need for the project is to be met then there is no practical alternative to hydrocarbon (primarily fossil fuel) powered dredge and tugs. The Grays Harbor and Chehalis River Navigation Channel has been dredged annually (or nearly so) for over one hundred years and the quantities have been similar each year; therefore the amount of greenhouse gasses released into the atmosphere during each dredge cycle will be similar to the amount released during past dredge cycles. Nevertheless the greenhouse gases released from the dredge machinery and ocean going vessels that would use the navigation channel would be greater than those released under the no action Alternative. To address this issue the Corps has designed the project to minimize the total quantity of material to be dredged each year, which thereby minimizes the total quantity of greenhouse gasses emitted during dredging. Greenhouse gasses would accumulate, especially since there is nothing proposed to mitigate for these gasses generated during the dredge operation. This Alternative would add to the total greenhouse gas atmospheric burden, but the quantity of emissions is a tiny fraction of all anthropogenic sources of greenhouse gasses and does not constitute a significant contribution of greenhouse gasses.

3.13 Local Economy

Historically, the economy of the Grays Harbor area depended on the timber industry with logging and sawmills, salmon fishing and the accompanying canneries, and shipping since locals built a spur to connect Aberdeen with the Northern Pacific Railroad. The economy has become depressed in recent decades with significant reductions in timber harvest and salmon fishing, the closure of saw mills and a pulp mill. The recent opening of a biodiesel plant created some jobs, and shipping continues to be a major sector of employment in the area. A considerable percentage of those employed in the area are dependent on navigation-related activities.

Alternative 1 - No-Action Alternative

This Alternative would cause significant harm to the local economy because large ocean going freight vessels would not be able to traverse Grays Harbor to offload and load cargo at the Port of Aberdeen. This would likely result in significant job loss in the local area, which would thereby cause negative economic effects to the broader region of southwest Washington.

Alternative 2 - Dredging and Disposal

Minor disruption to navigation traffic would occur; however, this action would keep the channel usable by deep draft vessels transiting the Federal navigation channel. Work would be

coordinated with the maritime community to allow affected parties to plan for the temporary closures. The Corps would ask the U.S. Coast Guard to issue a notice to mariners.

Overall, the maintenance dredging would benefit the economy in that normal commercial activities would continue after the maintenance dredging is completed. Water-dependent businesses can plan for the restrictions during dredge operations as long as the restrictions would not become permanent. The removal of shoaled sediments is essential to maintaining the Federal navigation channel as a deep draft vessel channel, which is necessary to most water-oriented businesses in Grays Harbor. This Alternative would have the least effect on the local economy and allow commerce to continue using the Port of Grays Harbor, saving numerous local jobs.

3.14 Indian Treaty Rights

Indian tribes that may have concerns about this project include the Quinault Indian Nation (QIN) based at Taholah, Washington, the Chehalis Indian Tribe located at Oakville, Washington, and the Shoalwater Bay Indians at Tokeland, Washington.

The concerns of greatest importance include treaty rights, especially rights to fish in the Grays Harbor area, access to plant materials used in making traditional crafts, preservation of sacred sites important in the practice of traditional Indian religion, and preservation of habitat for fish propagation. Traditional Indian usage of the Grays Harbor area has been documented in a Corps-sponsored ethnohistory of the project area (James and Martino 1986). Only the Quinault Indians have a reservation established by treaty, and they have adjudicated rights to off-reservation usual and accustomed fishing sites within Grays Harbor. The other groups have reservations established by executive order, but they do not have the same off-reservation treaty rights to take fish at usual and accustomed locations.

Consultation with the Quinault and Chehalis tribes was initiated for the channel widening project by written notification in 1986. In December 1987 and January 1988, Corps representatives met with tribal leaders of both groups to describe the project and its effects on Grays Harbor. The principal result of these meetings was the anticipated concern about project effects upon fish resources and fishing rights. The QIN inquired about possible adverse effects during the fishing season because of increased numbers of deep-draft vessels and oceangoing barges passing through Grays Harbor into the Chehalis River at that time. The Corps investigated the extent of this type of water traffic with the Port of Grays Harbor in January 1988, and determined that there would be no increase in interruption to Indian fishing in the near future since there was no anticipated increase in ship and barge movements. An additional concern was raised with regard to modification of the existing railroad bridge or moving the railroad bridge to another location and the impact this might have on the set net and drift net fishery. The bridge remains in its alignment. Other concerns that have emerged in meetings with QIN officials and fishers are possible losses to set net fishers resulting from changes in channel location and characteristics that affect fish or flotsam movement or loss of tie points. The Corps held interviews with potentially affected fishers and project plans for the channel widening were altered to prevent losses at individual grounds.

Alternative 1 - No-Action Alternative

This Alternative would likely diminish Tribal Treaty Rights by reducing fishing vessel access to some portions of Grays Harbor and reduced safety associated with navigating in Grays Harbor. There would be no effect to Dungeness crab.

Alternative 2 - Dredging and Disposal

This Alternative would continue the status quo by maintaining optimal navigation in Grays Harbor. Loss of Dungeness crab due to the use of hopper dredges would be mitigated through oyster shell placement. The Corps would also investigate other mitigation measures that would meet the same objective, but would be less costly and/or self maintaining. The no action Alternative and this Alternative would have the same effect on Indian Treaty rights. This Alternative would not change access to usual and accustomed fishing, shell fishing, or collecting areas; therefore, effects are deemed insignificant.

3.15 Disposal Area Environment

The existing conditions of the six disposal sites are described below. Each description is followed by the effects of the Alternatives on the disposal site.

3.15.1 Point Chehalis Open Water Disposal Site

The depth of this site varies between –50 to –80' mean lower low water (MLLW). It is a dispersive site subject to high wave energy and strong, predominantly westward, currents. The irregular bottom consists of fine to medium-sized sand grains of marine origin. Historically, this site has been extremely deep. Charts that predate jetty construction show depths of –100' MLLW in this area. Over 40 million cy of dredged material have been placed in this area since 1977, at an average rate of 1.7 million cy/year. Annual survey records indicate that approximately 75 percent of material disposed of at this site erodes during the dredging period, and that another 15 percent erodes during the following winter. Bathymetric surveys indicate that most of this eroded material moves seaward along the South Jetty. Disposal at this location reduces erosion near the Point Chehalis revetment and groins. The Point Chehalis site is the most heavily used disposal site in Grays Harbor.

Alternative 1 - No-Action Alternative

This Alternative would allow erosion near the Point Chehalis revetment and groins exposing the toe, and allow the natural removal of the accumulated dredge material disposed of in this site. The long term result would be the destabilization of the Point Chehalis revetment, further reducing the functionality of the navigation channel.

Alternative 2 - Dredging and Disposal

This Alternative would continue the status quo by depositing dredge material in this disposal site. The Point Chehalis revetment and groins would continue to be protected and the site would continue to accrue some dredge material. No significant change to the area, as compared with the no-action alternative, is expected.

3.15.2 South Jetty Open Water Disposal Site

The depth of this site varies between –40 to –60' MLLW. This area is subject to fast tidal currents, predominantly westward, that sweep along the jetty toe. The site is considered dispersive, with seaward erosion of disposed material generally occurring rapidly; however, in recent years some material has begun to mound in portions of the site. This accretion is being closely monitored so that disposal activities do not cause navigation concerns. The irregular bottom consists of fine to medium-sized sand grains of marine origin. Placement of dredged material at this site is necessary to prevent scour and undermining of the South Jetty's toe. This site is the preferred disposal area for inner harbor materials, although when the South Jetty site is

full or weather/wave conditions are hazardous then inner harbor materials are disposed of at the Point Chehalis site.

Alternative 1 - No-Action Alternative

The no action Alternative would mean no dredge material would be placed in this disposal site and would allow natural scour of the South Jetty's toe. This Alternative would also stop the mounding of material at this disposal site. The Corps did not expect mounding of material at this disposal site. The Corps has monitored the situation and to date there is no evidence that the mounding has negative effects.

Alternative 2 - Dredging and Disposal

In contrast to Alternative 1, this Alternative would continue the status quo by depositing dredge material in the South Jetty open water disposal site. The annual deposition of dredge material would continue to protect the South Jetty's toe, and it would continue the mounding of dredge material at this disposal site. The Corps would also continue to monitor the situation and may elect to reduce the amount of material placed in the site to allow natural erosion to reduce mounding. The Corps does not anticipate any significant effects from continued disposal at this site.

3.15.3 Southwest (3.9 Mile) Open Water Disposal Site

The depth of this ocean disposal site varies between -100 and -120' MLLW. This site was designated to minimize impacts to Dungeness crabs during the construction phase of the widening and deepening project. This site was only designated by the EPA as a disposal site for the widening and deepening project and has not been used since. The EPA would need to reopen the site to disposal before it could be used as a disposal site. Material disposed of at this site would be unavailable to the longshore transport system (i.e., unable to feed beaches to the north) so disposal at the South Beach nearshore nourishment site is preferred.

Alternative 1 - No-Action Alternative

This Alternative would stop any deposition of dredge material in this disposal site. There would be no effects to the disposal site as a result of this Alternative.

Alternative 2 - Dredging and Disposal

If the EPA were to reopen the 3.9 mile site it would lead to removal of material from the longshore transport system. In comparison with the no action Alternative this would cause increased erosion of the shore habitat and thus have a greater effect on the nearshore aquatic environment. Other than a reduction of material in the longshore transport system No significant environmental effects have appeared to accrue due to use of this disposal site, therefore, use of this site would likely have insignificant effects.

3.15.4 Half Moon Bay Nearshore Nourishment and Upland Direct Beach Nourishment Sites

The purpose of these two disposal sites is to maintain a stable beach profile west of the Point Chehalis revetment extension constructed in 1998-1999 and to ensure that the armor stone toe of the revetment extension is not exposed. Sandy material from the outer harbor is placed on the Point Chehalis revetment extension (direct upland nourishment) and in the bay as close to shore as possible (nearshore nourishment), in accordance with the October 1998 Point Chehalis Revetment Extension Project Inter-Agency Mitigation Agreement (see section 4.4 for additional explanation). Obtaining suitable sand through the annual maintenance dredging process, and

depositing this material through the direct beach and nearshore placement processes, are essential to compliance with the stable beach slope and revetment toe burial requirements of the mitigation agreement.

The direct upland beach nourishment site is used to help ensure compliance with the beach profile and revetment toe burial obligations of the revetment extension. Material is disposed of in the direct upland beach nourishment site when the erosive processes and borrow activities have generated sufficient capacity to accommodate disposal of an annual episode of maintenance material dredged from the outer harbor, particularly the Entrance and South Reaches. The direct beach nourishment site is located above the mean higher high water (MHHW) datum (+9 at this location), but sand from the site erodes into Half Moon Bay during storm events. Approximately 135,000 cy of material was disposed of at this site in 2002. It is expected that this disposal site would be used again during the life of this EA.

Half Moon Bay is a high energy environment subject to erosion. The nearshore nourishment site is used for dredge material disposal to place material that will be transported to the nearshore and intertidal areas off Half Moon Bay to assist in maintaining the existing beach profile waterward of the Point Chehalis revetment extension. The nearshore nourishment site is used for disposal as bathymetric conditions permit (i.e., when the bay is deep enough for the bottom dump barge to navigate). Since spring 2002, Half Moon Bay has been deep enough to allow dredge access for disposal. Approximately 2 million cy of material has been placed in this site since spring 2002.

Alternative 1 - No-Action Alternative

This Alternative would stop any deposition of dredge material in these disposal sites, and would allow the armor stone toe of the Point Chehalis revetment extension to become exposed to erosive forces and perhaps cause damage to the revetment. This Alternative would allow unchecked erosion of the Half Moon Bay beach and subsequent breaching of the area just south of the South Jetty and would be out of compliance with the October 1998 Point Chehalis Revetment Extension Project Inter-Agency Mitigation Agreement. When breaching has occurred at the revetment, this has had negative consequences for land use and recreation at Westport, therefore, this Alternative was not selected as the preferred Alternative because it would not meet the need for beach nourishment and prevention of breaching.

Alternative 2 - Dredging and Disposal

This Alternative would continue the status quo by continuing to nourish the Half Moon Bay beach and continued protection of the South Jetty revetment and would comply with the October 1998 Point Chehalis Revetment Extension Project Inter-Agency Mitigation Agreement. Effects to the environment from beach nourishment are insignificant.

3.15.5 South Beach Nearshore Nourishment Site

The purpose of disposal at this site is to slow erosion on the south side of the South Jetty. Sandy material from the Bar Channel is placed as close to shore as possible, generally between -35' to -40' MLLW. This location extends the residence time of dredged material in the littoral system while avoiding productive crabbing areas. Over 735,000 cy of material has been placed in this site since spring 2002.

Alternative 1 - No-Action Alternative

This Alternative would stop any deposition of dredge material in this disposal site and would accelerate the erosion of South Beach. South Beach is one of Westport's most popular recreation areas, so erosion may have negative effects for recreation and subsequently affect income from tourism.

Alternative 2 - Dredging and Disposal

This Alternative would continue the status quo by minimizing the erosion of South Beach and extend the residence time of dredge material in the littoral system while avoiding productive Dungeness crab areas. Maintaining South Beach is important for recreation and the local economy of Westport. Environmental effects of this alternative would be insignificant.

4 MITIGATION AND MONITORING

The combination of mitigation measures to reduce negative effects reduces the effects of this project. These measures include mitigation measures incorporated into the maintenance dredging program, and compensation for impacts to the Dungeness crab resource.

4.1 Mitigation Measures Incorporated into the Maintenance Dredging Program

During the formulation of the maintenance dredging program, care was taken to reduce environmental effects. Several effect avoidance, minimization, and compensation measures have been incorporated into the maintenance program:

- To avoid impacts to bull trout and out-migrating juvenile salmon, the Corps does not dredge the South Aberdeen Reach, Cow Point Reach, Hoquiam Reach, and turning basins between February 15 and July 15. No timing restrictions related to salmonids apply downstream of Hoquiam Reach. The estuary is wider downstream of Hoquiam Reach, so a smaller proportion of the migratory pathway is affected by sediment plumes. In addition, the relative distance between dredging activities and the shallow subtidal habitat where juvenile foraging occurs is greater.
- To reduce entrainment of fish, shrimp, and crabs, the inner harbor reaches are dredged using a clamshell dredge.
- To reduce entrainment of Dungeness crabs, no hopper dredging occurs in outer harbor reaches during periods of peak crab abundance.
- Water quality monitoring occurs during inner harbor dredging when flow of the Chehalis River drops below 1,000 cfs at Hoquiam, as reported by the U.S. Geological Survey. The Corps notifies Ecology if DO levels fall below 5 mg/L. Dredging ceases immediately if DO measurements fall below 4 mg/L.
- To avoid significant impacts to Dungeness crab and marine fishes, trawl surveys occur in the Half Moon Bay nearshore disposal site prior to any disposal activities. In accordance with WDFW guidance, disposal does not occur if crab densities exceed 750 per hectare, if 25% of the crab 100 millimeters or larger are soft, if a large increase in newly settled young-of-the-year crab is encountered, or if any species of rockfish, flatfish, or lingcod is unusually abundant.
- Disposal at the Half Moon Bay nearshore disposal site and the South Beach disposal site is coordinated with commercial crab fishermen to reduce the potential for damage to crab pots.

- Disposal at the Half Moon Bay direct beach nourishment site is restricted to 9 feet above MLLW, which is the MHHW line at this location, pursuant to the Point Chehalis Revetment Extension Mitigation Agreement.
- To compensate for the loss of Dungeness crabs to the commercial fishery, the Corps places oyster shell on intertidal mudflats in order to improve survival rates for young-of-the-year crabs. The Corps is investigating other less costly and longer-lasting methods of compensating for crab loss.

In addition, ballast management plans have been developed for the Government hopper dredges operated by the Corps, Portland District. These dredges, the *Essaysons* and *Yaquina*, have annual assignments to Grays Harbor. They use water and partial loads of sand as ballast. The management plans were written to ensure that operation of the dredges complies with Federal and State ballast management laws and regulations.

Offshore ballast water exchange is required for dredges traveling to Grays Harbor from the Columbia River, Coos Bay, San Francisco Bay, Humboldt Bay, Alaska, and Hawaii. Exchange of ballast water occurs at least 50 nautical miles off shore. Sand ballast is dredged from the ocean entrance at the departing location and disposed of at the most seaward point of the arriving project's approved ocean disposal site. For the Grays Harbor project this is the Southwest Disposal Site located 3.9 miles off shore.

Other specific mitigation measures included in these plans include:

- Two ballast tanks on *Yaquina* are filled with potable water at its yearly dry-docking. The intent is to hold this ballast all year, if possible.
- Sand ballast is carried only when sea conditions are such that not carrying it would adversely affect the handling of the vessel and endanger the crew.
- Sand ballast would consist of material that has been determined to meet all criteria for unconfined open water disposal in accordance with the provisions of the MPRSA of 1972, as amended and the Testing Manual for Evaluation of Dredged Material Proposed for Ocean Disposal (EPA Publication 503/8-91/001).
- Before departing from a disposal site for the last time, the hopper and vessel piping is flushed with at least one full load of water to ensure all remaining sediments are washed from the vessel.
- Records of ballast management are reported to the Coast Guard and Washington State, and maintained for a period of no less than 2 years.

When contractor dredges are used, contract specifications require compliance with the Washington Ballast Water Management Act (RCW 77.120) and Federal ballast water management regulations (33 CFR 151.2000 et seq.). Best management practices for ballast management and equipment cleaning prior to arrival/departure would also be reviewed during pre-construction safety meetings. Clamshell dredges consist of a tug boat and two barges, one for the clamshell derrick and the other a bottom-dump barge for storage and transport of the dredged material. Since tug boats are designed to be seaworthy without ballast, none is needed or carried. The barges are towed with no people on board, so ballast is generally not necessary.

4.2 Dungeness Crab Mitigation Strategy Agreement

Grays Harbor serves as a nursery ground for young Dungeness crabs, which eventually migrate to the Pacific Ocean and enter an important commercial fishery. Hopper dredges entrain and kill a substantial number of crabs, and may disrupt crab habitat through removal of food and benthic

debris that provide shelter for young crabs. The Corps addresses the loss of crabs attributable to the NIP authorized in 1986 through effect avoidance and resource replacement measures. As mentioned in Section 2.2.1 dredging is scheduled to occur during periods outside peaks in crab abundance, and the Corps has implemented a program to replace adult Dungeness crabs lost to the commercial fishery by increasing the survival of juvenile crabs. Shortly after construction of the wider and deeper channel in 1990, the Corps began placing oyster shell on tidal flats to enhance the survival of young Dungeness crabs following their metamorphosis from planktonic stages. Larval crab settle in the oyster shell plots, which provide cover and food, then two to three months later leave the intertidal flats for subtidal waters at a size that can survive most predation pressures.

Dungeness crab losses attributable to dredging are estimated using a Dredge Impact Model (DIM) developed by researchers at the University of Washington (Wainwright et al. 1992). The DIM predicts the number of crabs of various age classes (2+ and 0+) entrained and killed by dredges, then uses that prediction to forecast losses to the fishery and sets target production goals to mitigate for those losses. Dredge volumes, dates, and locations are entered into the model each year to develop estimates of annual crab impacts and production goals.

Dungeness crab production on the mitigation plots is estimated by entering crab density and shell cover data (obtained from field sampling each summer) into a production model developed by researchers at the University of Washington (Armstrong et al. 1995, Armstrong et al. 1987). Additional information on the sampling methodology and production model is available in the annual crab production reports available on the Seattle District web site, http://www.nws.usace.army.mil/PublicMenu/Doc_list.cfm?sitename=ECRB&pagename=MONITORING. The output of the model is the number of J4 equivalent crabs (fourth molt after settlement) that survive in the oyster shell plots over the course of one summer. This output estimated number is then compared to the annual production goal output of the DIM model in order to determine Corps compliance with crab mitigation requirements.

Mitigation requirements for NIP construction impacts were met, and the construction mitigation account was closed out in 2002. The 1998 Revised Crab Mitigation Strategy Agreement required placement of 20 hectares of shell over a two-year period in order to produce the balance of crabs needed to mitigate for construction effects. Since production rates were higher than the average rate for the two years after placement, an additional placement of 10 hectares was not required. Crab production rates were higher than the anticipated average rates because of an apparent recruitment failure of the yellow shore crab (*Hemigrapsus oregonensis*), which competes with Dungeness crab for the shell habitat (Visser et al. 2004).

The Corps continues the effort to mitigate for incremental effects of maintenance dredging. The last placement of oyster shell occurred in 2006,. The Corps also placed live oyster spat in 2006 to research the feasibility of establishing a self-sustaining source of oyster shell on the shell mitigation sites. The Corps would continue the shell mitigation or other equivalent mitigation program as long as the NIP dimensions of the navigation channel are maintained. The Corps is investigating other means of compensating for lost crab with less costly and self-perpetuating methods.

The numbers of Dungeness crab caught in the annual trawl catches were the same in 2011 and 2010, which were lower in abundance than earlier years, and below the threshold for avoiding

disposal of material at this location. Therefore, the Half Moon Bay Disposal site would be used during the 2011-2012 dredge cycle.

Another component of the 1998 Revised Crab Mitigation Strategy Agreement was to collect crab abundance data in the Bar, Entrance, and South Reaches in order to better understand seasonal abundance of crab and determine if modification of dredge schedules was needed. The trawl data collected between 1996 and 1999 indicate that during April and May (when dredging occurs), adult crab densities in South Reach were higher than previously thought. Adult densities were lower in June, so the Corps coordinated with the crab agreement signatory agencies for an extension of the dredging window for South Reach (to June 30). Since the dredging window for the other outer harbor reaches remains April through May, it is difficult to schedule dredging in South Reach during June, however, whenever dredge schedules allow, the Corps would try to delay the dredging of South Reach until June. The new density information from the trawl effort has been incorporated into the DIM, so additional adult mortality would be compensated when adult impacts cannot be reduced through a dredging delay.

The proposed dredging and shell placement is consistent with the September 1998 Revised Crab Mitigation Strategy Agreement.

4.3 Dungeness Crab Mitigation Plot Maintenance

In accordance with the 1989 Navigation Improvement Project Final EISS and the 1998 Revised Crab Mitigation Strategy Agreement, the proposed action includes placement of oyster shell on the existing Dungeness crab mitigation plots shown on Figure 2. Periodic placement of shell is required to maintain functional crab habitat, which is lost annually to shell siltation and settling.

The South Channel mitigation plots are approximately 45 acres, and new shell is placed only as overlay on these existing plots. Plot maintenance generally occurs every 3 or more years, depending on percent cover of shell within the plots and annual crab production rates. Placement occurs in the spring, prior to the settlement of larval crabs. Shell is obtained from local oyster growers, and may come from several sources depending on the quantity placed. If shell is obtained from outside Grays Harbor, the supplier would be required to have a valid shellfish transfer permit from WDFW. The WDFW permit requires the shell to be aged in an upland location to ensure that incidental transport of undesirable species would not occur.

Prior to shell placement, Corps biologists survey the plots for eelgrass (*Zostera marina*). The location of all eelgrass patches are provided to the contractor, and marked with stakes visible from the water surface at high tide to ensure that the shell placement does not occur on eelgrass beds.

Up to 15,000 cy of shell may be discharged on the plots during each placement of shell. Shell coverage rates average about 800 cy per acre. Areas targeted for placement would be determined by considering past crab production, percentage shell cover, existing tidal elevation, and percentage eelgrass cover. Placement occurs at high tide from a barge above the plots. No barge grounding occurs since shell is placed at high tide. Contractors have used a clamshell bucket or conveyor system to get the shell onto the plots. Generally, this work takes less than two weeks.

4.4 Point Chehalis Revetment Extension Mitigation Agreement

Between November 1998 and March 1999, the Point Chehalis revetment was extended 1,900 feet southward. The purpose of the project was to protect the Half Moon Bay shoreline from erosion, to protect public facilities landward of the shoreline, and to prevent tidal flooding in

Westport. The revetment was constructed considerably landward of the foredune and beach face to reduce environmental effects of the project. An artificial dune was constructed waterward of the revetment to bury the structure.

The October 1998 Point Chehalis Revetment Extension Mitigation Agreement required periodic beach nourishment waterward of the revetment to maintain a stable beach profile (approximately 1V:60H) and to ensure that the toe of the revetment extension (at elevation +4 feet MLLW) is not exposed. The Point Chehalis revetment extension mitigation agreement also required the placement of dredged material in the upland Half Moon Bay disposal site to facilitate a stable beach profile, so that re-nourishment of the upper beach can occur entirely above the MHHW contour, which is 9 feet above MLLW at this location. An anticipated schedule for these placements, based upon erosion trends at the time of the agreement, was developed as part of the Point Chehalis revetment extension mitigation agreement.

The beach and nearshore nourishment requirements of the Point Chehalis revetment extension mitigation agreement have been incorporated into the Grays Harbor maintenance dredging and disposal program. The Half Moon Bay direct beach and nearshore disposal sites correspond to the beach nourishment placement sites specified in the Point Chehalis revetment extension mitigation agreement. Table 3 summarizes the predicted and actual sand placement volumes between 1999 and 2010.

While nearshore sand placement has exceeded expected volume levels, actual direct upland beach nourishment volumes are lower than those predicted in the Point Chehalis revetment extension mitigation agreement. The direct upland beach nourishment disposal site has a limited capacity for sand because of its physical dimensions. To remain compliant with the Point Chehalis revetment extension mitigation agreement and avoid nearshore and wetland impacts, disposal cannot occur waterward of the +9' MLLW contour or on the back slope of the revetment. As a result of these physical limitations, the disposal site has a capacity of approximately 150,000 cy. Since sand is not eroding from the site as quickly as anticipated when the Point Chehalis revetment extension mitigation agreement was signed in 1998, there is not enough space to put the quantity of dredged material estimated in the placement schedule. As of 2011, there is about 50,000 cy of sand in the disposal site leaving a capacity of approximately 100,000 cy that could be disposed of in this site. This is considered the minimum volume necessary to instigate refill operations, as it is not cost-efficient to contract for dredging and transportation of volumes smaller than 100,000 cy via a specialty dredge with pump-off capabilities. The Corps expects that the direct upland beach nourishment disposal site would be used for material disposal again during the life of this EA.

Table 4. Point Chehalis Revetment Extension Mitigation Agreement, Summary of Predicted vs. Actual Placement Volumes (1999 through 2010)

DISPOSAL YEAR	DIRECT PREDICTED (CUBIC YARDS)	DIRECT ACTUAL (CUBIC YARDS)	NEARSHORE PREDICTED (CUBIC YARDS)	NEARSHORE ACTUAL (CUBIC YARDS)
1999 (1)	0	228,960	300,000	228,470
2000 (2)	0	0	250,000	0
2001 (3)	460,000	-135,000 ¹	0	0
2002 (4)	0	135,700	220,000	378,440
2003 (5)	0	0	210,000	329,100
2004 (6)	0	-52,330 ¹	0	289,650
2005 (7)	190,000	0	0	102,180
2006 (8)	0	0	180,000	126,900
2007 (9)	0	0	0	140,400
2008 (10)	160,000	0	0	171,350
2009 (11)	0	0	0	145,000
2010 (12)	0	-30,000 ¹	140,000	91,720
Total	810,000	147,330	1,300,000	2,003,210

¹ Quantities removed for South Jetty breach fill maintenance. In 2004, material was moved in February (29,550 cy) and December (22,780 cy).

Continuation of routine maintenance dredging is essential to ensure the Corps' future compliance with the two seminal objectives of the Point Chehalis revetment extension mitigation agreement. The toe of the revetment extension has remained buried and the beach slope has achieved a stable profile due to past placement of dredged material in the Half Moon Bay nearshore and direct upland beach nourishment sites. Although replenishing the 20,000 cy sand stockpile landward of the northern segment of the revetment extension has not been necessary since construction, the proposed action would provide the opportunity for replenishing that stockpile should its contents be depleted through rapid response to circumstances requiring re-burial of the revetment extension toe.

The proposed action would enable the Corps to remain compliant with beach nourishment obligations under the Point Chehalis revetment extension mitigation agreement.

5 COORDINATION

The Public Notice covering the proposed project was issued in June, 2011. Seattle District has coordinated with Federal and state agencies and tribes regarding maintenance dredging in the Duwamish River. Coordination activities would continue during this FY-2011 through 2018 maintenance-dredging years. Based on the accompanying Section 404(b)(1) evaluation (Appendix C), dredging and disposal would be in accordance with Section 404 of the CWA. All comments on this draft EA received by the deadline would be addressed in the Final EA.

Coordination was conducted with the following entities and agencies:

- The Quinault Indian Tribe
- The Chehalis Indian Tribe
- National Marine Fisheries Service
- United States Fish and Wildlife Service
- Dredged Material Management Program
 - U.S. Army Corps of Engineers
 - U.S. Environmental Protection Agency
 - Washington State Department of Ecology
 - Washington State Department of Natural Resources

6 CUMULATIVE EFFECTS

Cumulative impacts result from the “individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). The NEPA requires the evaluation of cumulative impacts to assess the overall effect of a proposed action on resources, ecosystems, or human communities in light of past, present, and reasonably foreseeable future projects. The cumulative impact analysis includes actions by Federal, non-Federal, and private entities.

6.1 Baseline Conditions for Cumulative Effects Analysis

The historic habitats of the lower Chehalis River and Grays Harbor have been altered by previous dredging, diking, filling, jetty construction, industrial discharges, and other anthropogenic activities over the past century. These activities have resulted in loss of wetland and other intertidal habitats, conversion of shallow water habitats to deeper water, erosion and migration of sand islands, and a minor reduction in water quality. By one estimate, approximately 14,579 acres or 30 percent of historic intertidal habitats have been lost (NRC 1996). Degradation of ecological function associated with these changes has affected the capacity of these habitats to support fish and wildlife populations. While historic impacts have been detrimental to the natural environment, the cumulative effects of dredging on the human environment support economic use of the area by removing hazardous areas of shoaling.

6.2 Past, Present, and Reasonably Foreseeable Future Actions

Annual maintenance dredging by the Corps is likely to continue into the foreseeable future. Some level of annual maintenance dredging has occurred every year since 1910, but no new areas have been dredged and no new disposal sites have been designated since the late 1990s. Up to 1,725 acres are disturbed by the Corps’ annual maintenance dredging, with an additional 697 acres disturbed by disposal of dredged material. This area is equivalent to approximately 12 percent of the total acreage of subtidal habitat in the Grays Harbor. Only areas previously

designated as navigation channel or disposal sites are disturbed. Dredged material disposal practices no longer contribute to the conversion of intertidal wetlands to uplands.

The Port of Grays Harbor conducts maintenance dredging of their marine terminal facilities adjacent to the Federal navigation channel, where an average of 30,000 cy (maximum of 70,000 cy) is removed annually. Impacts of and regulatory restrictions on Port dredging are similar to those of the Corps dredging program, but the scale of Port dredging activities is smaller. Other Corps studies and activities in Grays Harbor are described in Section 11 below. At this time, the outcome of these studies is too uncertain for any specific projects to be considered as reasonably foreseeable future actions and included in this analysis.

6.2.1 Whitcomb Flats Section 111 Study

The DNR leases over 2,000 acres of state-owned aquatic lands in Grays Harbor for the purpose of oyster culture. Many prime oyster lands in South Bay have been lost due to migration and erosion of Whitcomb Flats. The changes occurring at Whitcomb Flats are a result, in part, of the installation of the North and South Jetties. The jetties are causing a general deepening of the harbor inlet, as intended.

Section 111 of the Water Resources Development Act of 1968, as amended, gave the Corps the authority to study and implement projects for prevention or mitigation of shore damages attributable to Federal navigation projects. Section 111 requires involvement of a local sponsor, a state or local government agency willing to share in the cost of the project and accept responsibility for maintenance requirements.

After completion of the 2001 programmatic EA, DNR requested the Corps initiate a Section 111 study for Whitcomb Flats. Seattle District staff visited the site and met with DNR staff and other stakeholders to determine whether there is a Federal interest in pursuing a Section 111 study. In February 2010, the Corps determined that there is a Federal interest. Around the same time, DNR requested that the project be suspended until funding becomes available for their participation in further planning of the project under a feasibility cost share agreement.

6.2.2 Grays Harbor Long Term Management Study

Features of the Grays Harbor and Chehalis River Navigation Project include the navigation channel, the North and South Jetties, and the Point Chehalis revetment. The Corps' mission is to maintain all of these features in order to provide safe navigation in Grays Harbor. The Seattle District Corps is currently conducting a study, the Grays Harbor Long Term Management Study (LTMS), to identify the most cost-effective and least environmentally damaging strategy to operate and maintain the Federal project in Grays Harbor. The LTMS is evaluating the implications of the persistent loss of sediment from the Grays Harbor entrance (including North Beach and South Beach), which is expected to continue indefinitely. Without intervention, shoreline erosion near the South Jetty would eventually breach the landmass adjacent to the jetty.

Four alternatives were screened through the LTMS' Multi-Criteria Decision Analysis process. The Corps has conducted interim actions since 1993 when the area of land between the South Jetty and Half Moon Bay was breached. These interim actions involved the extension of the Point Chehalis revetment and construction of a wave diffraction mound at the eastern terminus of the South Jetty. The Corps current, interim practice – pending completion of the LTMS – is based on two pre-designed triggering criteria and includes contingent placement of sand to avert undue risk of a breach in the spit of land adjoining the South Jetty. The Corps is concluding its

environmental evaluations to support a decision document for approval. Preparation of a separate NEPA document would occur simultaneously with formulation of a recommended plan.

6.2.2.1 Contingent Interim Actions

Until the LTMS study and environmental documents are completed and any recommended components are implemented, the Corps would continue to monitor the vicinity of the South Jetty and, in order to preserve the status quo, place material in strategically selected areas of the breach fill as needed to protect against undue risk of a breach recurring in the vicinity of the South Jetty due to continued erosion. Periodic mechanical rehandling of material from the Half Moon Bay direct upland beach nourishment site may occur as part of this interim measure if survey data indicate the need for such action.

6.2.2.2 Channel Maintenance

Annual surveys of the navigation channel have shown that the center of the harbor entrance is deepening and may reach the authorized depth of the Federal navigation channel. This natural deepening may present an opportunity to realign the current channel and reduce the amount of maintenance dredging. A test dredge was completed in May 2007. This dredge removed a sand wave with the intent of promoting scour downstream to determine whether a channel re-alignment was feasible. The Corps monitored this site in the following years and determined that the sand wave reformed. The Corps determined that a realigned channel would not naturally be maintained. The Corps continues to survey the depth and study the formation of contours in this reach.

6.2.3 Navigation Improvement Project

Section 202 of the Water Resources Development Act of 1986 authorized the Grays Harbor NIP and a channel depth of 38 feet. The NIP consisted of modifications to 23.5 miles of channel. In 1991, the Corps completed the deepening of 19.7 miles of downstream channel (Bar Channel to Cow Point Reach), and the widening of the Cow Point Turning Basin to 900 feet. In 1990, the Corps completed the deepening of 3.8 miles of upstream channel (South Aberdeen Reach), and the widening of the Cow Point Turning Basin to 950 feet. This project has been completed.

The Port of Grays Harbor has requested the Corps pursue a review of the NIP to consider deepening the downstream channel (Cow Point to South Reach) to the full authorized depth of 38 feet; the Study will also evaluate the feasibility of deepening this channel segment beyond the 38-foot depth. The Corps is working in cooperation with the Port of Grays Harbor to assess the economic viability of this channel deepening. If further deepening is found to be economically feasible, then the Corps would proceed with design and environmental evaluations to prepare a decision document for approval. Preparation of a separate NEPA document would occur simultaneously with formulation of a recommended plan. This project is in an early stage and not ready to be reviewed under the NEPA process.

6.3 Incremental Effects of the Proposed Action

Compared with the no action Alternative, direct and indirect effects on the natural environment would be insignificant and are not expected to significantly increase due to the proposed maintenance dredging; rather, the proposed action would facilitate a continuation of the current type and intensity of human use of the navigation project area. Direct effects associated with the proposed action would occur only in areas previously disturbed by dredging and disposal activities. The mitigation measures implemented to ameliorate negative effects reduce the

project's contribution to cumulative effects of all actions in Grays Harbor. All dredging in Grays Harbor removes shoaled sediments that would otherwise hinder safe navigation, and contributes to shoreline protection in areas that may experience breaches. Therefore, the human environment is benefited by past, present, and future maintenance dredging actions through the safeguarding of navigation within Grays Harbor and the facilitation of commercial and recreational vessel use of Grays Harbor. In the context of past, present, and reasonably foreseeable actions, the incremental effect of the maintenance dredging program would not result in significant cumulative effects. This contrasts with the no-action Alternative where these reasonably foreseeable future actions to maintain navigation in Grays Harbor would not occur.

Though annual maintenance dredging does result in mortality and reduced habitat value for a variety of marine and estuarine species, the continuation of the Corps maintenance dredging program would not result in any new impacts to ecological function given the existing degraded condition of the navigation project area.

7 ENVIRONMENTAL COMPLIANCE

The Corps has analyzed the environmental effects of the alternatives and the following sections describe how the preferred alternative complies with all pertinent environmental laws and executive orders.

7.1 National Environmental Policy Act

In accordance with the National Environmental Policy Act, Federal agencies are required to declare the potential environmental effects of their projects and to solicit public comment. The purpose of this document is to solicit public comment and fulfill the Corps of Engineers' documentation requirements under the National Environmental Policy Act, as well as to provide a basis for informed decision making. This EA, along with the documents listed in Section 1.4, satisfy the documentation requirements of NEPA. A FONSI is provided in Appendix A.

7.2 Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972, as amended, prohibits the taking of marine mammals by citizens of the United States except under certain conditions (16 U.S.C. 1361). Several species of marine mammals can be found in Grays Harbor or the adjacent Pacific Ocean waters. The most likely occurring marine mammals are harbor seals and sea lions. Even if seals or sea lions were present while dredging was occurring, the noise and lights of the dredge and tugs could cause the seals and sea lions to avoid the area of dredging; it is likely that there would be no detrimental effects because the area impacted by the dredge operation is small compared to the entire forage range of these animals within Grays Harbor. In addition, the operating dredge is just one of thousands of vessels that use Grays Harbor each year. These vessels generate considerable underwater noise contributing to ambient sound levels. Information on underwater sound levels in Grays Harbor is lacking, therefore underwater sound levels of operating dredges measured in the lower Snohomish River were used as a substitute (Pentec, 2010, and SAIC, 2011). The ambient sound level in the lower Snohomish River is about 135 to 140 dB (re: 1 micro Pascal, root mean square (1 uPa, rms)) (SAIC and RPS/EH, 2011). Measurements of sound levels generated by dredging were as high as 177 dB 1 uPa, rms for a hydraulic dredge, and 170 dB 1 uPa, rms for a clamshell dredge (Pentec 2010, SAIC and RPS/EH, 2011). However this sound was subsumed into background within 150 meters. Grays Harbor has softer substrate than the lower Snohomish River and likely absorbs underwater sound more rapidly than

in the Snohomish River. Assuming dredging sound in Grays Harbor is subsumed into the background within 150 meters the Corps expects that marine mammals will stay away from any active dredge, and the underwater sound generated by dredging will not cause changes in behavior of marine mammals as they have probably become habituated to vessels and associated underwater sound. In addition, all known haulouts in Grays Harbor are located nearly a mile from the navigation channel. Therefore dredging in the navigation channel would have insignificant effects to marine mammals in Grays Harbor and thus the project does not require a permit under the MMPA.

7.3 Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded projects must take into consideration impacts to federally listed or proposed threatened or endangered species. Since the maintenance dredging would affect some listed species, a Section 7 consultation is required. The Corps prepared and submitted a PBE to USFWS and NMFS in May 2011. The Corps' effect determinations can be found in Section 3.4 (Table 2); no species or critical habitat is expected to be likely adversely affected. The Corps received a letter from NMFS concurring with the determinations made in the 2006 PBE on 20 September 2006. The Corps received a letter from USFWS concurring with a 2006 PBE on 20 April 2007.

7.4 Clean Water Act

The Clean Water Act requires Federal agencies to protect waters of the United States. The Act disallows the placement of dredged or fill material into waters (and excavation) unless it can be demonstrated there are no practicable alternatives to meet the need for the proposal. The Corps prepared a 404(b)(1) evaluation to document findings regarding this project pursuant to Section 404 of the Act, attached as Appendix C. The Corps has prepared and distributed for public comment a Section 404 public notice.

The Corps seeks Certification under Section 401 of the Act for discharges of dredged or fill material into the waters of the U.S. to assure compliance with state water quality standards. On July 2007, the Washington Department of Ecology issued a Water Quality Certification (Order #4895, #CENWS-OD-TS-NS-25), which will expire at the end of July 2012. The Corps will abide by the conditions of future Water Quality Certifications to ensure compliance with State water quality standards. The Corps would request a new certification of compliance with State water quality standards beginning in August of 2012 and continuing through the project period.

7.5 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, requires Federal agencies to carry out their activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program. The Corps has prepared a CZMA Consistency Determination, located at Appendix D, for the navigation channel maintenance program. This evaluation established that the proposed work complies with the policies, general conditions, and general activities specified in the approved Grays Harbor County Shoreline Management Master Plan, the City of Westport Shoreline Management Master Plan, and the Grays Harbor Estuary Management Plan. The proposed action is thus considered consistent to the maximum extent practicable with the State of

Washington Shoreline Management Program. The Consistency Determination will be submitted to the Washington Department of Ecology for concurrence.

7.6 Marine Protection, Research, and Sanctuaries Act

Section 102 of the MPRSA authorizes the EPA to promulgate ocean dumping criteria and designate recommended ocean disposal sites. The Southwest (3.9 Mile) site was designated as an ocean disposal site (currently inactive) under Section 102 of the MPRSA.

7.7 National Historic Preservation Act

The National Historic Preservation Act requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. It is the policy of the Corps that historic resource 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 [33 CFR 336.1(c)(6)]. Since the proposed dredging is confined to the removal of recently deposited sediments within the previously dredged channel width and depth boundaries, no submerged cultural resources would be affected by the project.

7.8 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires Federal agencies to consult with NMFS regarding actions that may adversely affect Essential Fish Habitat (EFH) for groundfish, coastal pelagic species, and Pacific salmon. An EFH determination was included in the PBE submitted to NMFS in May 2011 for review. In a letter dated 20 September 2006 NMFS concurred with the Corps effect determination for EFH in the 2006 PBE and concluded that the conservation measures proposed in the 2006 PBE were adequate to avoid, minimize, or otherwise offset potential adverse impacts to EFH. The project circumstances are the same for the 2011 PBE as with the 2006 PBE thus the Corps anticipates similar results from NMFS.

7.9 Clean Air Act

Section 176 of the Clean Air Act (CAA), 42 USC 7506(c), prohibits Federal agencies from approving any action that does not conform to an approved state or Federal implementation plan. Maintenance dredging and disposal activities where no new depths are required, disposal will be at an approved disposal site, and the activity would result in no emissions increase or an increase that is clearly *de minimis* are exempted from the conformity requirements[40 CFR 93.153 (c)(2)(ix)].

7.10 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 Quinault Tribe constitutes a distinct, separate community of Native Americans who rely on Treaty-reserved fish for subsistence, economic, and spiritual purposes. The Grays Harbor maintenance dredging program is not expected to result in any disproportionate adverse environmental effects or impacts on the health of tribal members, or other minority/low-income populations. No interference with treaty rights is anticipated. Tribal biologists were involved in the development of the Dungeness crab mitigation agreement, and outer harbor dredging

schedules are coordinated with the Quinault crab fishery manager annually to ensure that no conflicts with the fishery occur.

The project does not involve siting of a facility that would discharge pollutants or contaminants. Dredged material is thoroughly tested for a wide variety of contaminants prior to disposal to ensure that the material is suitable for unconfined, open-water disposal. Therefore, no human health effects would occur. Maintenance of the existing navigation project would not negatively affect property values in the area, or socially stigmatize local residents or businesses.

7.11 Executive Order 11988, Floodplain Management

Executive Order 11988 requires Federal agencies to consider how their activities may encourage future development in floodplains. No new or additional dredging would be provided that would encourage additional development.

8 UNAVOIDABLE ADVERSE IMPACTS

The primary unavoidable adverse impact would be continued disruption of the benthic community in the navigation channel and the disposal sites. Because of the annual disruptions in these locations the benthic invertebrate community would not be able to reach a climax condition, persisting primarily as an invertebrate community composed of opportunistic, short lived, organisms. Another unavoidable adverse impact would be air pollution and greenhouse gas emissions from dredge and associated machinery, and ocean going vessels that would use the navigation channel. Both air pollution and greenhouse gas emissions would be small scale.

There would be some effects to water quality in the immediate vicinity of the active dredge and during dredge material disposal. Any effects to water quality would be short lived and small scale. Therefore any effects to water quality would be insignificant. Effects to aquatic wildlife would be minimized by working during times of the year when most aquatic species (and ESA listed species) would not be in the area or in low abundance. The dredge project would not negatively affect the geomorphology of Grays Harbor and would help stabilize the revetment. Noise and light would be increased by the proposed dredging operation, but to a minor degree.

Sediment would be resuspended which would lead to increased turbidity in the vicinity of the dredge operation and at the disposal sites. However the GHDMEP standards for sediment are designed to be protective of organisms that come into contact with sediments, concentrations and bioavailability of contaminants in sediments suspended during dredging and disposal are expected to be below levels that may cause harm to juvenile or adult salmonids. Sediments to be removed from the Federal navigation channel have been tested and approved for open water disposal under the DMMP guidelines. The Grays Harbor Navigation channel is low-ranked, meaning few or no sources of chemicals appear to contribute to channel sediments. This conclusion is based on data that show no or low levels of chemicals of concern and no significant toxic responses in biological tests.

Effects to the environment, including aquatic and atmospheric, would be greater under the preferred alternative than under the no action alternative. The local terrestrial environment would not be directly affected by either alternative. The atmospheric environment would continue to be indirectly effected with the preferred alternative by maintaining large vessel access to the upper reaches of Grays Harbor thus bringing air pollution into Grays Harbor. Under the no action alternative there would be no future dredging which eventually would preclude large vessel access to the Port of Grays Harbor resulting in improved air quality.

Changes to the aquatic environment would perhaps be the most dramatic under the no-action alternative. Substrate contours in the Grays Harbor and Chehalis River Navigation Channel and the disposal sites would be allowed to undergo natural changes and fauna associated with the substrate would likely progress to a natural, climax, state. Overall this would be beneficial to the aquatic environment and any ESA listed species in the area.

However, the no action alternative would significantly affect the local economy of Grays Harbor. Exporting any material that requires shipping on large ocean-going vessels would need to be transhipped from other ports either on the Columbia River or in Puget Sound. The result would be fewer jobs for local people.

The no action alternative would be the least costly; however, as an indirect effect of the no action alternative, there would likely be dredging if not by the Corps, then by some other entity. This would likely be more disruptive to the environment and more costly because the dredging would likely occur under emergency conditions. The emergency circumstance would probably occur after large vessels could no longer use the authorized navigation channel. If this were to happen, some of the environmental protections provided under normal processes may be circumvented.

The no action alternative was rejected because it does not meet the purpose and need for the project. The preferred alternative is recommended because it would fully achieve the project purpose. The preferred alternative would have greater effect on the environment than the no action alternative, but the proposed dredge project would be the most cost effective relative to meeting the purpose and need of the proposed project, and would provide the greatest safety for ocean going vessels traversing Grays Harbor. Although the preferred Alternative would have a greater effect on the aquatic environment of Grays Harbor, work window restrictions would minimize effects to the aquatic environment. Further, the preferred Alternative uses dredge material to protect the toe of the revetment, reducing future need to repair the revetment. The no action alternative would allow the toe of the revetment to be eroded and thus allow the eventual destruction of the revetment.

9. CONCLUSION

Overall there would be general non-significant effect to the environment of Grays Harbor because off the timing of the work windows, the small scale of the operation relative to the size of Grays Harbor, the conservation measures, and the dredging methods that would be employed. The Preferred Alternative would not generate significant impacts on the quality of the human or natural environment, and the preparation of an Environmental Impact Statement is thus not required. The Corps conducts periodic sampling and analysis of the sediments to be dredged to assure suitability for unrestricted aquatic disposal, and in light of the historic record of determinations expects future test results to continue supporting open water disposal. However, if negative test results were obtained in future sediment testing the Corps would reopen the EA and its conclusion and reevaluate the finding of no significant impact (FONSI).

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APPENDIX A. 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-ER

June, 2011

FISCAL YEARS 2011 THROUGH 2018 YEARS MAINTENANCE DREDGING AND
DISPOSAL

GRAYS HARBOR AND CHEHALIS RIVER NAVIGATION PROJECT

GRAYS HARBOR COUNTY, WASHINGTON

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1. Background.

The Grays Harbor and Chehalis River Navigation Channel is dredged by the Seattle District, U.S. Army Corps of Engineers (Corps) on an annual basis to maintain a shipping channel from the Pacific Ocean to the head of navigation at Cosmopolis, Washington. Without annual maintenance dredging, shoaling would reduce the ability of ships to enter and leave safely under full load or during low tide conditions.

2. Proposed Action.

The proposed action is for annual maintenance dredging of the Grays Harbor and Chehalis River Navigation Channel, and disposal of the dredged material at three unconfined open-water dredged material disposal sites, two beneficial use disposal sites and one upland beach nourishment site. The purpose of this action is to maintain the 23.5 mile long deep draft Grays Harbor Navigation Project. Public Notice CENWS-OD-TS-NS-38 (June, 2011) indicates that up to 3,200,000 cubic yards may be dredged annually. Dredged material will be disposed of only in designated disposal areas. Two Washington Department of Natural Resources public, multi-user unconfined open water dredged material disposal sites, Pt. Chehalis and South Jetty, are located directly adjacent to the navigation channel. One Environmental Protection Agency designated

ocean disposal site, Southwest (3.9 mile) is located adjacent to the bar channel. Material dredged from the sandy outer reaches of the channel is periodically used for both direct nearshore and upland beach nourishment at Half Moon Bay, and nearshore nourishment at South Beach.

Alternatives to the proposed maintenance dredging are no action (no dredging) and dredging. The no action alternative was rejected for reasons described in the environmental documentation accompanying this Finding of No Significant Impact.

3. Summary of Impacts.

An Environmental Assessment (EA) has been prepared pursuant the National Environmental Policy Act (NEPA) for the proposed work. This document describes the environmental consequences of annual maintenance dredging, which are briefly summarized below:

Habitat in and adjacent to the Grays Harbor navigation channel will be disturbed by dredging and disposal operations. The Corps has assessed potential impacts from channel maintenance operations and determined that they will generally be highly localized in nature, short in duration, and minor scope. The Corps has coordinated with State and Federal agencies, as well as Native American Nations, to assure careful consideration of fish and wildlife resources. Known impacts of dredging and disposal operations on salmonids, Dungeness crabs, and forage fish will be reduced and/or avoided through implementation of timing restrictions, the use of clamshell dredges wherever possible, pre-disposal trawl surveys, and compensatory mitigation. Due to these measures, impacts to these economically important resources should not be significant either individually or cumulatively. No adverse impacts to threatened or endangered species are anticipated.

The Corps will abide by the conditions of the Section 401 Water Quality Certification issued by the Washington State Department of Ecology (Ecology) to ensure compliance with Washington water quality standards, in conducting activities involving the discharge of fill material into waters of the United States. To meet State Water Quality Standards, dissolved oxygen (DO) concentrations in the inner harbor will be monitored during Chehalis River low flow periods, and dredging will cease if DO levels fall below levels defined in those Standards. The proposed work complies with the policies, general conditions, and general activities specified in the Grays Harbor County Shoreline Management Master Plan, the City of Westport Shoreline Management Master Plan, and the Grays Harbor Estuary Management Plan.

All of the sediments have been tested and approved for open water disposal under the guidelines of the Dredged Material Management Program administered by the Corps, Environmental Protection Agency, Ecology, and Washington State Department of Natural Resources. Additional sediment sampling and analysis will occur on a regular basis as specified in the *Grays Harbor/Willapa Bay Dredged Material Evaluation Procedures*.

A Section 404(b)(1) Evaluation has been prepared. This evaluation indicates the proposed work, as performed in accordance with the special conditions contained in the State Water Quality Certification, complies with the requirements of Section 404 (b)(1) guidelines.

4. Finding.

Based on the analysis described above and provided in more detail in the EA, 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. The Corps conducts periodic sampling and analysis of the sediments to be dredged to assure suitability for unrestricted aquatic disposal, and in light of the historic record of determinations expects future test results to continue supporting open water disposal. However, if negative test results were obtained in future sediment testing the Corps would reopen the EA and its conclusion and reevaluate this Finding of No Significant Impact.

Date

Anthony O. Wright

Colonel, Corps of Engineers

District Engineer

APPENDIX B. AGENCY APPROVAL LETTERS

The letters will be available upon completion of consultation with agencies.

APPENDIX C. 404 (B)(1) EVALUATION

Fiscal Years 2011 through 2018 Maintenance Dredging and Disposal
Grays Harbor and Chehalis River Navigation Project
Grays Harbor County, Washington

Substantive Compliance for
Clean Water Act Section 404

**Fiscal Years 2011 through 2018 Maintenance Dredging and Disposal
Grays Harbor and Chehalis River Navigation Project
Grays Harbor County, Washington**

**Substantive Compliance for
Clean Water Act Section 404**

1. Introduction. The purpose of this document is to record the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act (CWA).

The following action is covered by this document: disposal of the dredged material at three unconfined open-water dredged material disposal sites, and three beneficial use disposal sites.

The information contained in this document reflects the findings of the project record. Specific sources of information included the following:

- a. Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement, dated June 1975
- b. Long Range Maintenance Dredging Program for the Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement Supplement No. 2, dated October 1980
- c. Grays Harbor, Chehalis and Hoquiam Rivers, Washington Channel Improvements for Navigation Interim Feasibility Report and Final Environmental Impact Statement, dated September 1982
- d. Grays Harbor, Washington, Navigation Improvement Project Final EIS Supplement, dated February 1989
- e. Grays Harbor, Washington, Navigation Improvement Project Operations and Maintenance Final Environmental Assessment, 1989 Sediment Collection and Testing Program, dated February 1990
- f. Dredged Material Evaluation Procedures and Disposal Site Manual, dated June 1995
- g. Grays Harbor and Chehalis River Navigation Project, Fiscal Years 2007-2011
- h. Maintenance Dredging and Disposal Environmental Assessment, dated July 2006
- i. Grays Harbor Navigation Project, Fiscal Years 2007-2011 Maintenance Dredging and Disposal Programmatic Biological Evaluation, dated August 2006
- j. Grays Harbor and Chehalis River Navigation Project, Fiscal Years 2011 and into Future Years Maintenance Dredging and Disposal Environmental Assessment, dated April 2011
- k. Grays Harbor Navigation Project, Fiscal Years 2011 and into Future Years Maintenance Dredging and Disposal Programmatic Biological Evaluation, dated April 2011
- l. 404(b)(1) Evaluation (see below)
- m. Public Interest Review (see below)

This document addresses the substantive compliance issues of the Clean Water Act 404(b)(1) Guidelines [40 CFR §230.12(a)] and the Regulatory Programs of the Corps of Engineers [33 CFR §320.4(a)].

2. **Project Background.** The proposed action is annual Grays Harbor Federal maintenance dredging and disposal of dredged material at the Point Chehalis, South Jetty, South Beach, Half Moon Bay, and 3.9 Mile (ocean) disposal sites. The Grays Harbor and Chehalis River navigation channel was originally authorized in 1896, and regular maintenance dredging began in 1935. Construction on the navigation improvement project occurred in 1990. The current action is maintenance of authorized depths for the 23.5-mile long channel as subsequently modified through the 1989 General Design Memorandum.
3. **Project Need.** The Grays Harbor navigation channel needs to be dredged on an annual basis to maintain a shipping channel from the Pacific Ocean to the head of navigation at Cosmopolis, Washington. Shoaling reduces the ability of ships to enter and leave safely under full load or during low tide conditions.
4. **Project Purpose.** The purpose of dredging and disposal operations at Grays Harbor is to maintain the deep draft Grays Harbor Navigation Project to facilitate the commercial shipping traffic that is important for supporting the local and regional economies.
5. **AVAILABILITY OF LESS ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVES TO MEET THE PROJECT PURPOSE. THE ALTERNATIVES EVALUATED FOR THIS PROJECT WERE AS FOLLOWS:**
 - a. *Alternative 1 (No Action).* Under this alternative there would not be any in water disposal of dredge material. The Corps would not dredge the Grays Harbor Navigation Channel. Shoaling would impede navigation from the Pacific Ocean to the head of the channel at Cosmopolis, Washington. The ability of ships to enter and leave the Port of Grays Harbor safely under full load or during low tide conditions would be restricted. A reduction in shipping of forest products to domestic and international markets would result in serious consequences to the economy of Grays Harbor County. Local companies would have to either ship limited quantities, ship only during higher tides, or ship material from a different port.
 - b. *Alternative 2 (Dredging).* Much care has been taken during the formulation of the proposed project to reduce dredging amounts to the very least and still accomplish the purpose and need of the project. This would minimize effects to the aquatic environment or the benthic community in the disposal sites and navigation channel.

Findings. The Corps rejected Alternative 1 because it was not practicable, nor would it meet the project purpose and need. While Alternative 2 would cause degradation to the aquatic benthic environment, it is the only practicable alternative that meets the purpose and need.

6. SIGNIFICANT DEGRADATION, EITHER INDIVIDUALLY OR CUMULATIVELY, TO THE AQUATIC ENVIRONMENT

- a. *Impacts on Ecosystem Function.* Habitat in and adjacent to the Grays Harbor navigation channel and disposal sites will be disturbed by dredging and disposal operations. The Corps has assessed potential effects from channel maintenance operations and determined that they will generally be localized to previously-disturbed areas, short in duration (occur where and when the dredge is operating, since the dredge moves, then any given area will sustain a short duration impact), and minor in scope. Known impacts of dredging and disposal operations on salmonids, forage fish, and Dungeness crabs (*Cancer magister*) will be reduced and/or avoided through implementation of timing restrictions, dredge type restrictions, pre-disposal trawl surveys, and compensatory mitigation. Due to these measures, impacts to these economically important resources will not be significant either individually or cumulatively. The Corps is investigating alternative Dungeness crab compensation that will be less costly and self-sustaining.
- b. *Impacts on Recreational, Aesthetic and Economic Values.* No significant adverse effects on recreation, aesthetics, or the economy are anticipated.

Findings. The Corps has determined that there would be no significant adverse impacts to aquatic ecosystem functions and values.

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

- a. *Impact Avoidance Measures.* Potential impacts of dredging and disposal operations on juvenile salmonids will be avoided through implementation of timing restrictions. No inner harbor dredging will occur during the outmigration period, March 1 through June 14. For the protection of bull trout (*Salvelinus confluentus*), a species listed as threatened under the Endangered Species Act, the Corps no longer dredges the Elliot Slough, South Aberdeen, Cow Point, and Hoquiam reaches during February 15 through July 15. This timing restriction, designated by the U.S. Fish and Wildlife Service (USFWS), is protective of bull trout foraging in the lower portion of the Chehalis River watershed (subadults and adults moving into and out of the estuary).
- b. *Impact Minimization Measures.* The number of organisms injured and killed by dredge material disposal in Grays Harbor is minimized through timing restrictions (*i.e.* conducting dredge operations during times when disposal of dredge material will have minimal effects on the aquatic ecosystem).

Dissolved oxygen (DO) levels will be temporarily reduced during dredging, generally on the order of 1 to 2 milligrams per liter (mg/l) from ambient levels. The Corps monitors DO levels as the dredges operate in the inner Harbor during low flow periods. If DO levels drop below 4 mg/l, operations are suspended until conditions improve.

Trawl surveys occur before disposal at Half Moon Bay to ensure that adverse impacts to crab and fish species are minimized. If high crab or fish densities are found, disposal would not occur in this site.

- c. *Compensatory Mitigation Measures.* Hopper dredges entrain and kill a substantial number of crabs, and may disrupt crab habitat through removal of food and benthic debris that provide shelter for young crabs. The Corps compensates for this impact by implementing measures aimed at increasing the survival of juvenile crabs in Grays Harbor, thereby replacing adult Dungeness crabs lost to the commercial fishery. This is accomplished by placing oyster shell on intertidal mud flats. Larval crabs settle in the oyster shell plots, which provide cover and food; two to three months later, juvenile crabs leave the intertidal flat for subtidal waters at a size that can survive most predation pressures.

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

8. Other Factors in the Public Interest.

- a. *Fish and Wildlife.* The Corps has coordinated with State and Federal agencies, as well as Native American Nations, to assure careful consideration of fish and wildlife resources. The Corps has prepared a Biological Evaluation in accordance with the Endangered Species Act. The Corps will assure full compliance with the Endangered Species Act prior to project implementation.
- b. *Water Quality.* The current Washington Department of Ecology Water Quality Certification (Order #CENWS-OD-TS-NS-12) is valid through July 2012. The Corps will obtain another Department of Ecology Water Quality Certification in 2012. The Corps will abide by the conditions in the new Water Quality Certificate and future Water Quality Certifications to ensure compliance with State water quality standards when conducting activities involving the discharge of dredged material into waters of the United States.
- c. *Historic and Cultural Resources.* Since the proposed dredging is confined to the removal of recently deposited sediments within the previously dredged channel width and depth boundaries, no submerged cultural resources will be affected by the project.
- d. *Activities Affecting Coastal Zones.* The Corps has determined that this maintenance work is consistent to the maximum extent practicable with the approved State of Washington Shoreline Management Program.
- e. *Environmental Benefits.* Clean, sandy material dredged from the outer reaches will be used beneficially to maintain a stable beach profile in Half Moon Bay and to minimize shoreline erosion along South Beach.
- f. *Navigation.* A minor, temporary disruption of navigation traffic may result from dredging and disposal operations. The Corps will ask the Coast Guard to issue a Notice to Mariners before dredging and disposal operations are initiated. The proposed dredging will maintain the channel for use by deep draft navigation vessels.

Findings. The Corps has determined that this project is within the public interest.

9. **Conclusions.** Based on the analyses presented in proposed project NEPA documents, as well as the following 404(b)(1) Evaluation and General Policies for the Evaluation of Permit Applications analysis, the Corps finds that this project complies with the substantive elements of Section 404 of the Clean Water Act.

404(B)(1) EVALUATION [40 CFR §230]

Potential Impacts on Physical and Chemical Characteristics (Subpart C)

1. **Substrate [230.20]** The existing surface substrate at the open water and beneficial use disposal sites consists of fine to medium sized sand grains of marine origin. Materials disposed of at the direct and nearshore nourishment sites and the 3.9 Mile site are of similar particle size and shape. Finer river-borne silts from the inner harbor are disposed of at the South Jetty and Point Chehalis disposal sites. Bathymetric surveys indicate that most of the material placed at these sites is rapidly transported seaward along the South Jetty. Most dredged material placed at these sites, as well as material disposed of at the direct beach and nearshore nourishment sites, will enter the longshore drift system.
2. **Suspended Particulate/Turbidity [230.21]** The discharge of dredged material at the open water and direct beach and nearshore nourishment disposal sites will result in a temporary increase in turbidity and suspended particulate levels in the water column, particularly in near-bottom waters. Sand and most silt sinks rapidly to the bottom, while a small percentage of finer material is expected to remain in suspension. Increases in turbidity associated with disposal operations will be minimal (confined to the areas in the immediate vicinity of the disposal sites) and of short duration (currents will disperse any suspended material within hours of disposal).
3. **Water Quality [230.22]** No significant water quality effects are anticipated. During disposal operations, a localized turbidity plume may persist for a short period during the descent of dredged material through the water column. A minor reduction in dissolved oxygen may be associated with this plume, primarily during disposal of silty inner harbor sediments. Since disposal operations consist of a series of instantaneous, discrete discharges over the dredging schedule, any water quality impacts should be short lived (hours) and localized (immediate vicinity). All of the sediments have been tested and approved for open water disposal under the guidelines of the Dredged Material Management Program (DMMP) administered by the Corps, Environmental Protection Agency (EPA), Washington Department of Ecology (Ecology), and Washington Department of Natural Resources (DNR). Additional sediment sampling and analysis will occur on a regular basis as specified in the Grays Harbor/Willapa Bay Dredged Material Evaluation Procedures.
4. **Current Patterns and Water Circulation [230.23]** The disposal of material dredged from the Grays Harbor navigation channel will not obstruct flow, change the direction or velocity of water flow/circulation, or otherwise change the dimensions of the receiving water body. Most dredged material placed at the disposal sites will enter the longshore drift system or continue seaward and be deposited in the deep water beyond the entrance bar.
5. **Normal Water Fluctuations [230.24]** The disposal of material dredged from the Grays Harbor navigation channel will not impede normal tidal fluctuations. South Jetty and

Point Chehalis are dispersive disposal sites, meaning that rapid seaward erosion of disposed material occurs. While material disposed of at the Southwest site tends to mound, this site is in sufficiently deep water (–100 and –120' MLLW) that currents and tidal flows will not be affected.

6. **Salinity Gradients [230.25]** The disposal of material dredged from the Grays Harbor navigation channel will not divert or restrict tidal flows.

Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

1. **Threatened and Endangered Species [230.30]** Pursuant to Section 7 of the Endangered Species Act, the Corps prepared a Programmatic Biological Evaluation (PBE) in 2011. To assess potential impacts of the proposed work on species protected under the Endangered Species Act. The PBE did not have an end date and the Corps would re-consult under Section 7 only if there would be significant changes to the dredge operations or changes in species listings or changes in critical habitat. The PBE concluded that Grays Harbor maintenance dredging was not likely to adversely affect the bull trout (*Salvelinus confluentus*), Western snowy plover (*Charadrius alexandrius nivosus*), brown pelican (*Pelecanus occidentalis*), marbled murrelet (*Brachyramphus marmoratus*), Southern Resident killer whale (*Orcinus orca*), Southern Green Sturgeon (*Acipenser medirostris*), Steller sea lion (*Eumetopias jubatus*), and humpback whale (*Megaptera novaeangliae*) and would have no effect on the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), Sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), and olive ridley sea turtle (*Lepidochelys olivacea*).
2. **Aquatic Food Web [230.31]** Turbidity associated with disposal operations may interfere with feeding and respiratory mechanisms of benthic, epibenthic, and planktonic invertebrates. Some sessile invertebrates in the navigation channel will suffer mortality from dredge operations. Species characteristic of these sites are opportunistic species, often small, tube-dwelling, surface-deposit feeders that exhibit patchy distribution patterns in space and time. Several studies have found that benthic infauna recolonize disposal sites quickly (several months), but that the sites may never reach mature equilibrium because of the frequent dredging. More mobile epibenthic organisms are expected to escape the immediate impact area without significant injury. The results of testing conducted in accordance with Grays Harbor/Willapa Bay Dredged Material Evaluation Procedures has demonstrated that populations of fish, crustaceans, mollusks, or other food web organisms will not be significantly affected by exposure to chemical contaminants. Potential impacts of dredging and disposal operations on salmonids, forage fish, and Dungeness crabs will be reduced and/or avoided through implementation of timing restrictions, dredge type restrictions, and pre-disposal trawl surveys. In addition, entrainment impacts to Dungeness crab are being mitigated in accordance with the interagency crab mitigation strategy agreements. The Corps is also investigating alternative compensation methods that would be less costly and self-sustaining.

3. **Wildlife [230.32]** Noise associated with disposal operations may have an effect on birds and marine mammals in the project vicinity. The impacts of any sound disturbance would likely result in displacement of animals rather than injury. Increases in turbidity associated with dredged material disposal could reduce visibility in the immediate vicinity of disposal activities, thereby reducing foraging success for any animals in the area. Any reduction in availability of food would be highly localized and would subside rapidly upon completion of the dredging and disposal operations. Disposal operations are not expected to result in a long-term reduction in the abundance and distribution of prey items. No breeding or nesting areas will be affected.

Potential Impacts to Special Aquatic Sites (Subpart E)

1. **Sanctuaries and Refuges [230.40]** The proposed project will not adversely affect any designated sanctuary or refuge area. Bowerman Basin, a wildlife refuge operated by the USFWS; two State of Washington Wildlife Recreation areas, Oyhut and Johns River; and three DNR Natural Area Preserves (NAP), Sand Island, Goose Island, North Bay, and Chehalis River Surge Plain are located in Grays Harbor but are not in close proximity to the disposal or dredging sites. No effect to these areas is expected to result from the proposed dredging and disposal operations. One DNR NAP, Whitcomb Flats, is located near the South Reach of the navigation channel. Maintenance dredging is not expected to have more than a negligible impact on this NAP.
2. **Wetlands [230.41]** Dredged material will not be discharged in wetland areas. Use of the designated disposal sites will not alter the inundation patterns of wetlands in the project vicinity.
3. **Mudflats [230.42]** Dredged material will not be discharged on mudflat areas. Use of the designated disposal sites will not alter the inundation patterns of nearby mudflats.
4. **Vegetated Shallows [230.43]** Dredged material will not be discharged onto or directly adjacent to vegetated shallows. Under some tidal and weather conditions, a disposal plume of fine sediment fractions may travel over vegetated shallows in North Bay. Such a minor increase in fine sediment is likely not measurable compared to the relative contribution of suspended sediments from the Humptulips Basin.
5. **Coral Reefs [230.44]** Not applicable.
6. **Riffle and Pool Complexes [230.45]** Not applicable.

Potential Effects on Human Use Characteristics (Subpart F)

1. **Municipal and Private Water Supplies [230.50]** Not applicable.
2. **Recreational and Commercial Fisheries [230.51]** Commercial and sport fishing grounds are located near the disposal sites. Channel maintenance work is timed to avoid fishing seasons in the dredging and disposal areas, as well as critical migration periods for salmonids. In addition, prior to disposal at Half Moon Bay, the Corps will perform trawl surveys; if Dungeness crab densities exceed levels set by WDFW, disposal will not

occur. Oysters are raised commercially on portions of Whitcomb Flats, approximately 3 miles east of the disposal areas. Annual maintenance operations are not expected to impact these oyster operations.

3. **Water-related Recreation [230.52]** Water-related recreation would be positively impacted by direct beach and nearshore disposal at Half Moon Bay. Nourishment of the Half Moon Bay beach changes the areal extent of the various elevation ranges in the bay, with an increase in the shallower profiles. Nourishment will cause waves to shoal further from the beach, providing a higher quality wave for surfers as waves will break smoother and over a longer distance. The area available for beach combing and walking will be maintained by this beneficial use disposal.
4. **Aesthetics [230.53]** Disposal operations will not change the appearance of the project area. Localized, temporary increases in noise and turbidity will occur while equipment is operating, but are not expected to be significant.
5. **Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves [230.54]** Westhaven State park is located adjacent to the Half Moon Bay and South Beach disposal sites. Disposal of clean sands at these sites will slow erosion in these areas, which is considered a beneficial effect. Bowerman Basin, a wildlife refuge operated by the USFWS and two State of Washington Wildlife Recreation areas, Oyhut and Johns River, are located in Grays Harbor but are not in close proximity to the disposal or dredging sites. No impact on these areas is expected as a result of the proposed dredging and disposal operations.

Evaluation and Testing (Subpart G)

1. **General Evaluation of Dredged or Fill Material [230.60]** The material to be dredged is predominantly sand, silty sand, and sandy silt. Coarse-grained sands found in the Bar, Entrance, and South reaches meet the no-test guidelines for high-energy areas under the Marine Protection, Research, and Sanctuaries Act. The siltier materials of the inner harbor are in closer proximity to contaminant sources, so numerous tests have been performed on these sediments over the years.
2. **Chemical, Biological, and Physical Evaluation and Testing [230.61]** The results of testing conducted in accordance with Grays Harbor/Willapa Bay Dredged Material Evaluation Procedures has demonstrated that levels of compounds of concern present in samples taken from the navigation channel were either below qualification limits or were below levels at which demonstrable effects occur. Bioassays using appropriately sensitive species (e.g., solid phase acute toxicity testing using amphipods, elutriate testing using bivalve larvae) have been conducted, and the results indicate that sediments are not significantly toxic. Two rounds of sampling and sediment characterization have occurred since preparation of the last programmatic 404(b)(1) analysis in 2006. All sampling has shown that the dredge material is suitable for open water disposal. The most recent sampling took place in December 2010, and resulted in the characterization of approximately 2.6 million cubic yards of sediment. Results supported the finding that proposed dredged material is suitable for open-water disposal.

Action to Minimize Adverse Effects (Subpart H)

1. **Actions Concerning the Location of the Discharge [230.70]** The effects of the discharge would be minimized by the choice of disposal sites. The disposal sites were used previously for dredged material discharge. The discharge will not disrupt tidal flows. With the exception of the Point Chehalis and South Jetty dispersive sites, the substrate of the disposal area is similar to that being discharged. The location and timing of the proposed discharge has been planned to minimize smothering of organisms.
2. **Actions Concerning the Material to be Discharged [230.71]** Since concentrations of chemicals of concern in the materials to be discharged are low, no treatment substances nor chemical flocculants will be added before disposal. The potency and availability of any pollutants present in the dredged material should be low.
3. **Actions Controlling the Material after Discharge [230.72]** Since the dredged materials have been approved for non-confined open water disposal by the inter-agency DMMP, no containment levees or capping is necessary.
4. **Actions Affecting the Method of Dispersion [230.73]** The disposal sites have been selected to make use of currents and circulation patterns to disperse the disposed material. At the beneficial use sites, material will be distributed widely in a thin layer to maintain natural substrate contours.
5. **Actions Related to Technology [270.74]** Appropriate machinery and methods of transport of the material for discharge will be employed. All machinery will be properly maintained and operated.
6. **Actions Affecting Plant and Animal Populations [270.75]** The timing of the proposed dredging and discharge operations will minimize the potential for adverse effects to animal populations, particularly Dungeness crab and juvenile salmonids. During certain portions of the year, pre-disposal surveys will be conducted at Half Moon Bay to ensure that significant impacts to fish and Dungeness crab are avoided.
7. **Actions Affecting Human Use [230.76]** The disposal discharge will not result in damage to aesthetically pleasing features of the aquatic landscape. The disposal discharge will not increase incompatible human activity in remote fish and wildlife areas.
8. **Other actions [230.77]** not applicable.

Application by Analogy of the General Policies for the Evaluation of Permit Applications [33 CFR §320.4]

1. **Public Interest Review [320.4(a)]** The Corps finds these actions to be in compliance with the 404(b)(1) guidelines and not contrary to the public interest.
2. **Effects on Wetlands [320.4(b)]** No wetlands will be altered by the proposed dredging and disposal operations.

3. **Fish and Wildlife [320.4(c)]** The USFWS and the National Marine Fisheries Service (NMFS) were consulted to ensure that direct or indirect loss and damage to fish and wildlife resources attributable to dredging and disposal operations will be minimized.
4. **Water Quality [320.4(d)]** The Corps will abide by the conditions of the Section 401 Water Quality Certification issued by Ecology to ensure compliance with Washington water quality standards when conducting activities involving the discharge of dredged material into waters of the United States. Dissolved oxygen concentrations in the inner harbor will be monitored during Chehalis River low flow periods, and dredging will cease if DO levels fall below levels defined by Ecology in the Water Quality Certificate.
5. **Historic, Cultural, Scenic, and Recreational Values [320.4(e)]** No wild and scenic rivers, historic properties, National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreation Areas, National Lakeshores, National Parks, National Monuments, estuarine and marine sanctuaries, or archeological resources will be adversely impacted by dredging and disposal operations.
6. **Effects on Limits of the Territorial Sea [320.4(f)]** Dredging and disposal operations will not alter the coast line nor baseline from which the territorial sea is measured for the purposes of the Submerged Lands Act and international law.
7. **Consideration of Property Ownership [320.4(g)]** Not applicable.
8. **Activities Affecting Coastal Zones [320.4(h)]** The proposed work complies with the policies, general conditions, and general activities specified in the Grays Harbor County Shoreline Management Master Plan, the City of Westport Shoreline Management Master Plan, and the Grays Harbor Estuary Management Plan.
9. **Activities in Marine Sanctuaries [320.4(i)]** Not applicable.
- 10. Other Federal, State, or Local Requirements [320.4(J)]**
 - a. *National Environmental Policy Act (NEPA)*. An Environmental Assessment (EA), tiered from past Environmental Impact Statements, has been prepared to satisfy the documentation requirements of NEPA.
 - b. *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. A Programmatic Biological Evaluation (PBE) was submitted to USFWS and NMFS on May 24, 2011. The Corps anticipates receiving letters from NMFS and USFWS concurring with the determinations made in the PBE in June, 2011.
 - c. *Clean Water Act*. The Corps must demonstrate compliance with the substantive requirements of the Clean Water Act. This document records the Corps' evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act. The

Ecology Water Quality Certificate issued on July 7, 2007 (Order #CENWS-OD-TS-NS-25, #4895) remains in effect through July 31, 2012. The Corps will request a new Water Quality Certificate in 2012 when the current Water Quality Certificate expires. The Corps will abide by the conditions of the Water Quality Certifications to ensure compliance with State water quality standards when conducting activities involving the discharge of dredged material into waters of the United States.

- d. *Coastal Zone Management Act.* The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program. The Corps has prepared a Coastal Zone Management Act Consistency Determination for the Grays Harbor navigation channel maintenance program. This evaluation established that the proposed work complies with the policies, general conditions, and general activities specified in the Grays Harbor County Shoreline Management Master Plan, the City of Westport Shoreline Management Master Plan, and the Grays Harbor Estuary Management Plan. The proposed action is thus considered consistent to the maximum extent practicable with the State of Washington Shoreline Management Program.
- e. *Marine Protection, Research, and Sanctuaries Act.* Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) authorizes EPA to promulgate ocean dumping criteria and designate recommended ocean disposal sites. The Southwest (3.9 Mile) site has been designated as an ocean disposal site under Section 102 of the MPRSA.
- f. *National Historic Preservation Act.* The National Historic Preservation Act (16 USC 470) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. It is the policy of the Corps (33 CFR 336.1[c][6]) that historic 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. Since the proposed dredging is confined to the removal of recently deposited sediments within the previously dredged channel width and depth boundaries, no submerged cultural resources will be affected by the project.
- g. *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 USFWS habitat surveys evaluating the likely impacts of proposed actions, which provide the basis for recommendations for avoiding or minimizing such impacts. However, a report is not required for maintenance work.

11. Safety of Impoundment Structures [320.4(k)] Not applicable.

12. Floodplain Management [320.4(l)] Disposal operations will not alter any floodplain areas.

13. Water Supply and Conservation [320.4(m)] Not applicable.

14. Energy Conservation and Development [320.4(n)] Not applicable.

- 15. Navigation [320.4(o)]** Disposal operations are a necessary part of maintaining the navigation channel for use by deep draft ocean going vessels.
- 16. Environmental Benefits [320.4(p)]** Clean, sandy material dredged from the outer reaches will be used beneficially to maintain a stable beach profile in Half Moon Bay and to minimize shoreline erosion along South Beach.
- 17. Economics [320.4(q)]** The economic benefits of the Grays Harbor and Chehalis River Navigation Project are important to the local community.
- 18. Mitigation [320.49(r)]** Potential impacts of dredging and disposal operations on salmonids will be avoided through implementation of timing restrictions. For the protection of bull trout and juvenile salmon, no inner harbor dredging will occur between February 15 and July 15. The number of organisms injured and killed in dredge equipment operating in Grays Harbor will be reduced through timing restrictions and the use of clamshell dredges, which entrain significantly fewer organisms than hydraulic dredges. The Corps compensates for Dungeness crab impacts by implementing measures aimed at increasing the survival of juvenile crab in Grays Harbor, thereby replacing adult Dungeness crabs lost to the commercial fishery. The Corps will monitor DO levels as the dredges operate in the inner Harbor during low flow periods. If DO levels drop below 4 mg/l, operations will be suspended until conditions improve.

APPENDIX D. COASTAL ZONE CONSISTENCY DETERMINATION

COASTAL ZONE MANAGEMENT ACT
CONSISTENCY DETERMINATION

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Fiscal Years 2011 through 2018 Maintenance Dredging and Disposal
Grays Harbor and Chehalis River Navigation Project
Grays Harbor County, Washington

1. **Introduction.** Pursuant to the Coastal Zone Management Act (CZMA), 16 USC 1451 et. Seq., Federal agencies activity are required to be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved state Coastal Zone Management (CZM) Programs. The Shoreline Management Act (SMA) of 1972 (RCW 90.58) is the core of authority of Washington's CZM Program. Primary responsibility for the implementation of the SMA is assigned to local government. The proposed action is continuation of the established Grays Harbor and Chehalis River Navigation Project maintenance dredging program. Up to 3,200,000 cubic yards of material may be removed from the Federal navigation channel during each year's maintenance dredging operation.

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 determination of this action's consistency with the Coastal Zone Management Act is based upon review of the Washington's CZMP, *Managing Washington's Coast: Washington State's Coastal Zone Management Program* (Ecology Publication 00-06-029, February 2001); the Washington Administrative Code (WAC) Shoreline Management Act Titles; and the policies and standards of the adopted Grays Harbor County Shoreline Management Master Program, City of Westport Shoreline Management Master Program, and the Grays Harbor Estuary Management Plan. Applicable sections of each plan are presented below, with the Corps' consistency indicated in ***bold italics***.

3. **Grays Harbor County Shoreline Management Master Program**

Grays Harbor County implemented the SMA through the preparation of a Shoreline Master Program (SMP), adopted on June 3, 1974 (Resolution #7419) and updated on April 5, 2002. Dredging and open-water disposal of dredged materials fall under the ambit of this plan. The applicable portions of this SMP are addressed below.

Chapter 2. Shoreline Management Policies, Activity Policies, 6. Dredging:

(a) Dredging should minimize damage to existing ecological values, natural resources and the river system of both the area to be dredged and the area for deposit of dredged materials and shall also minimize water quality degradation.

Consistent. Ongoing coordination with public agencies, Tribal Nations, and the public has resulted in annual maintenance dredging timing and methods that minimize ecological and environmental impacts.

(b). Spoil deposit sites in water areas should be identified in cooperation with the State Departments of Natural Resources (DNR) and Washington Department of Fish and Wildlife (WDFW). Depositing of dredge material in water areas should be allowed only for habitat improvements, to correct problems of material distribution affecting adversely fish and shellfish resources, or where the alternative of depositing material on land is more detrimental to shoreline resources than depositing dredge material in water areas.

Consistent. The Point Chehalis and South Jetty disposal sites are Washington Department of Natural Resources (DNR) public, multi-user unconfined open water dredged material disposal sites. Large expanses of undeveloped lands adjacent to Grays Harbor are typically a mixture of beach-dune complex and wetlands, which have important value as fish and wildlife habitat. In addition, placement of outer harbor materials in upland or wetland sites would remove sediments from the littoral cell in this already sediment-starved area. Therefore, use of such areas is considered more environmentally damaging than open water disposal.

(c). Dredging of bottom materials for the single purpose of obtaining fill material should be discouraged.

Consistent. The purpose of the proposed dredging is to maintain authorized channel depth.

(d). Ship channels, turning and moorage basins should be identified and no new such areas should be prepared or used without sufficient evidence that existing channels and basins are inadequate.

Consistent. Only existing channel and turning basin areas will be dredged. No new areas will be dredged.

(e). The use of dredge spoils for purposes other than landfill is encouraged.

Consistent. Dredged materials will not be used as landfill.

Chapter 2. Shoreline Management Policies, Natural System Policies, 3. Estuary:

(a) Because of poor flushing action in the upper harbor during summer low flows, any necessary dredging, spoiling, and filling should be scheduled during high flow seasons.

Consistent. To avoid dredging during times of the year when migrating salmonids are present in the upper harbor, dredging will sometimes occur during the low-flow summer months. To prevent significant water quality impacts, the Corps monitors DO levels as the dredges operate in the upper harbor during low flow periods. If DO levels drop below 4 mg/l, dredging operations are suspended until conditions improve.

Chapter 2. Shoreline Management Policies, Natural System Policies, 8. General:

Excavation, including dredging of channels and marinas, removal of sand or gravel for construction of roads or fills, excavation of drainage ditches and grading should be controlled to minimize removal of vegetation and cemented surface soil layers; release of sediment into water; removal of fertile soils, deepening of water where this would have adverse impacts on habitat; breaking the seal of an aquifer; change or blockage of current; smothering of underwater habitat; reduction of tidal flushing action or reduction of water depth where this would be adverse to production of desirable plant and animal life, or would stimulate undesirable forms; undesirable changes in shoreline configuration; reduction of floodwater capacity of a riverine floodplain; elimination of fertile marsh habitat or creation of navigational hazards.

Consistent. No vegetation will be removed during maintenance dredging and disposal operations, as only existing channel and disposal areas will be disturbed. Dredging and disposal operations will result in temporary, localized increases in turbidity; however, timing restrictions will minimize the potential for impacts to commercially important species. The proposed work will maintain only the existing navigation channel, so baseline habitat, current, and tidal flushing conditions will be maintained. Direct beach and nearshore nourishment disposal will not result in undesirable changes in shoreline configuration. No marsh habitat will be impacted by this maintenance work. Navigational hazards will be reduced by the proposed project.

Chapter 2. Shoreline Management Policies, Amenity Policies, 3. Archeological Areas and Historic Sites:

(a) Where possible local government should consult professional archeologists to identify areas containing potentially valuable archaeological data, and to establish procedures for salvaging the data.

Consistent. Professional archaeologists provided technical advice during the planning phases of the Grays Harbor navigation improvement project. Literature reviews and side-scan sonar investigations of channel dredging and disposal sites located no cultural resources in the project footprint.

(d). The National Historic Preservation Act of 1966 and Chapter 43.51 RCW are hereby adopted as policies of this Master Program and their administration and enforcement is encouraged.

Consistent. The Corps has determined that the proposed work complies with the National Historic Preservation Act. Since the proposed dredging is confined to the removal of recently deposited sediments within the previously dredged channel width and depth boundaries, no submerged cultural resources will be affected by the project.

Chapter 4. Shoreline Environment Designation Map, Activity Policies, 2. Channel Strip:

The Urban Strip running through the Harbor is intended to follow existing channel lines. The purpose is to allow channel dredging and maintenance.

Consistent. The navigation channel is designated as an Urban Environment area, and dredging is a permitted use (see also Chapter 20, Urban Environment Regulations).

Chapter 22. Conservancy Environment Regulations, 3. Conditional Uses:

These and other unlisted uses may be allowed subject to the provisions of Chapter 33.

Consistent. The Point Chehalis, South Jetty, and Half Moon Bay nearshore disposal sites are located within areas designated as Conservancy Environment. Dredged material disposal is not listed as an approved or conditional use in the Conservancy Environment. A Chapter 33 is not present in the 2002 plan update, or in the original 1974 plan.

4. Westport Shoreline Management Master Program

The City of Westport implemented the SMA through preparation of a SMP (Title 17- Westport Zoning Ordinance, Chapter 17.32), adopted April 28, 1998. The Half Moon Bay nearshore and direct beach disposal sites and the South Beach disposal site fall under the jurisdiction of this plan.

The beach along Half Moon Bay is designated as Urban Shoreline (Recreation and Parks use Zone). The South Beach disposal site falls with the Conservancy Shoreline Environment. Landfill, defined as replacement of shoreland areas removed by wave action or the normal erosive processes of nature, is a conditional use on an urban shoreline [17.32.050 (1)(F)]. Bankline erosion control, shoreline protective structures, and landfills are conditional uses in the Conservancy environment [17.32.050(2)(F)].

Relevant landfill guidelines [17.32.055 (8)(D)] includes:

1. Shoreline fills or cuts should be designed and located so that significant damage to existing ecological values or natural resources, or alteration of local currents will not occur, creating a hazard to adjacent life, property, and natural resources systems.

Consistent. Adverse impacts on salmonids, forage fish, and Dungeness crab associated with disposal at the Half Moon Bay site will be reduced and/or avoided through implementation of timing restrictions and pre-disposal trawl surveys. The Corps will avoid disposal at the direct upland beach and nearshore sites during times of the year when the disposal sites are extensively used by these species. Pre-disposal monitoring will be performed prior to disposal at Half Moon Bay in coordination with WDFW and if maximum allowable crab densities are reached disposal will not occur.

2. All perimeters of fills should be provided with vegetation, retaining walls, or other mechanisms for erosion prevention.

Consistent. The sands placed on the beach will be erodable by design. The erosion of this material will maintain a stable beach profile thereby maintaining fish and wildlife habitat in Half Moon Bay.

3. Fill materials should be of such quality that it will not cause problems of water quality. Shoreline areas are not to be considered for sanitary landfills or the disposal of solid waste.

Consistent. The origin of materials disposed of at the nearshore and direct upland beach nourishment sites is the outer reaches of the Federal navigation channel. Erosion of these clean sands will mimic natural erosion processes and will not degrade water quality.

4. Priority should be given to landfills for water-dependent uses and for public uses. In evaluating fill projects and in designating areas appropriate for fill, such factors as total water surface reduction, navigation restriction, impediment to water flow and circulation, reduction of water quality, and destruction of habitat should be considered.

Consistent. Direct upland beach nourishment will not degrade recreational use of Half Moon Bay nor limit public access to the beach. The purpose of beach nourishment at this site is to keep the revetment extension buried under sand cover, while maintaining a stable, gently sloping adjacent beach. Water-related activities in Half Moon Bay are not expected to be degraded as a result of direct upland beach nourishment.

Dredging is discussed in section 17.32.055 (8)(E):

2. Use of dredge spoils for protective areas and to restore areas of high erosion is appropriate. Depositing of dredge material in water areas should be allowed only for habitat improvement, to correct problems of material distribution adversely affecting fish and shellfish resources, or where the alternatives of depositing material on land is more detrimental to shoreline resources than depositing it in water areas.

Consistent. The South Beach and Half Moon Bay nearshore disposal sites are beneficial use sites intended to keep high-quality sands in the littoral system to ameliorate the effects of ongoing erosion along South Beach and in Half Moon Bay.

5. Grays Harbor Estuary Management Plan

The Grays Harbor Estuary Management Plan (GHEMP) is a coordinated regional comprehensive plan designed to guide land and water use activities in the Grays Harbor estuary and the surrounding shoreline. It was approved in January 1986 and is implemented through the Grays Harbor County Shoreline Master Program, the Master Programs of local jurisdictions, and the State Shoreline Management Act. Dredging, open water disposal, and direct/nearshore nourishment at Half Moon Bay are under jurisdiction of the GHEMP.

The Federal navigation channel, open water disposal sites, and the Half Moon Bay nearshore nourishment disposal site are located in Management Unit 44, a special unit that included all the water area not included within any other designated management unit. The management objective for the Unit 44 Planning Area is to protect areas for purposes that directly use or depend on natural systems (p. 112). Activities that occur in these areas should be compatible with natural systems in order to maintain the carrying capacity and biological productivity of the bay. Special conditions are imposed on Unit 44 to ensure that activities are carried out in a manner that does not reduce or degrade these estuarine resources.

Relevant Special Conditions are:

1. Activities in Unit 44 will be compatible with the natural system. For example, areas of significant fish and wildlife habitat will be managed to ensure continued biological productivity. Where consistent with resource capabilities, high-intensity water-dependent recreation, dredging, and other water-dependent uses will be allowed. Thus, those uses that depend on the water area (e.g., shipping and fishing) and the activities that support those uses (maintenance dredging, navigation aids, etc.) are considered appropriate to the Management Unit.

Consistent. Maintenance dredging is considered an appropriate use in this special management unit.

8. EPA-authorized in-water dredged material disposal sites are allowable in this management unit consistent with meeting all designation criteria.

Consistent. The Point Chehalis and South Jetty disposal sites are DNR public, multi-user unconfined open water dredged material disposal sites.

The Half Moon Bay direct beach nourishment disposal site is located in Management Unit 40, which is an area designated as Conservancy Managed. Unit 40 is intended for public recreational uses (p. 108).

Consistent. Direct beach nourishment will not degrade recreational use of Half Moon Bay nor limit public access to the beach. The purpose of beach nourishment at this site is to keep the revetment extension buried under sand cover, while maintaining a stable, gently sloping adjacent beach. Water related activities in Half Moon Bay are not expected to be degraded as a result of beach nourishment.

Bankline erosion control, defined as a type of fill designed to preserve the existing bankline or to protect the bankline from erosion (page 15), is an allowable use in Management Unit 40. Relevant general policies for bankline erosion control (p. 24) include:

1. Materials to be used shall be of non-erodable quality that will allow long-term stability and minimize maintenance. Some erodable materials may be used when it can be demonstrated that fish and wildlife uses will be enhanced.

Consistent. The sands placed on the beach will be erodible by design. The erosion of this material will maintain a stable beach profile thereby maintaining fish and wildlife habitat in Half Moon Bay.

2. Riprap/bank stabilization procedures shall be confined to those areas where active erosion is occurring or new development or redevelopment requires protection from maintaining the integrity of upland structures or facilities.

Consistent. Material will be placed in this area only when the protective stockpile of sandy material fronting the revetment is depleted.

3. Only clean materials may be used. Materials which could create water quality problems or which will rapidly deteriorate are not permitted.

Consistent. Only clean oceanic sands will be placed on the beach. Erosion of this material will mimic natural erosion processes and will not degrade water quality.

4. Minor modifications of the bankline may be allowed on a case-by-case basis. These alterations shall be for the purpose of stabilizing the bankline, not for the purpose of developing new upland areas.

Consistent. Sands will be placed to maintain the current shoreline configuration.

5. Under no circumstances shall bankline erosion control be initiated for the purpose of gaining developable uplands from existing water areas.

Consistent. The purpose of this work is to ensure that the armor stone toe of the Point Chehalis revetment is not exposed.

6. All projects shall be constructed in a manner to minimize turbidity in adjacent waters.

Consistent. A temporary, localized increase in turbidity will result from disposal of dredged materials at Half Moon Bay; however, disposal at this site has been designed in a manner that will reduce and/or avoid the potential for adverse effects on salmonids, forage fish, and Dungeness crabs. Implementation of timing restrictions and pre-disposal trawl surveys will

enable the Corps to avoid disposal during times of the year when Half Moon Bay is used extensively by these species.

9. The outer slope of the bankline after completion of the erosion control will not exceed a slope of 2:1.

Consistent. The purpose of nearshore and direct upland beach nourishment in Half Moon Bay is to maintain the current beach profile (approximately 60H:1V).

10. Use of vegetation for bankline stability is required where technically applicable and should be in conjunction with structural forms of erosion control. Vegetation shall be self-sustaining and soil stabilizing and compatible with natural shoreline vegetation.

Consistent. The sands placed on the beach will be erodible by design. The erosion of this material will maintain a stable beach profile thereby maintaining fish and wildlife habitat in Half Moon Bay.

7. Conclusion

Based on the preceding evaluation, the Corps has determined that the proposed project complies with the policies, general conditions, and general activities specified in the Grays Harbor County SMP, City of Westport SMP, and the Grays Harbor Estuary Management Plan. The proposed action is thus considered consistent to the maximum extent practicable with the State of Washington Shoreline Management Program.