

Appendix G
CWA Section 404(b)(1) Evaluation

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

Maintenance Dredging of the Murrells Inlet Federal Navigation Project

Georgetown County, South Carolina

The U.S. Army Corps of Engineers, Charleston District (USACE) is proposing to maintain the Murrells Inlet Federal Navigation Channel located in Georgetown County, South Carolina. This document presents the Clean Water Act Section 404(b)(1) evaluation for the discharge of dredged or fill material into the waters of the U.S. associated with the proposed excavation and placement of material to maintain the channel.

I. PROJECT DESCRIPTION

A. Location

The Murrells Inlet Federal Navigation Channel is located on the Atlantic Coast in Georgetown County, South Carolina (SC) approximately 90 miles north of Charleston, SC and 12 miles south of Myrtle Beach, SC.

B. General Description

The Inlet is a small, tidally driven estuary. The Inlet's dimensions are approximately five- and one-half nautical miles in length and one mile in width. The watershed draining into the Inlet is approximately 10,250 acres with approximately 3,108 acres considered suitable for shellfish production. Tidal range varies from 4.2 feet to 5.3 feet within the Inlet. The Inlet contains intertidal mudflats, marshes, oyster beds, tidal creeks and created canals.

The proposed work consists of periodic maintenance dredging of shoal material from the Federal Navigation Channel. Dredged material would be beneficially used at Huntington Beach State Park to protect the existing jetty and at beach placement areas along either Huntington Beach State Park and/or Garden City Beach.

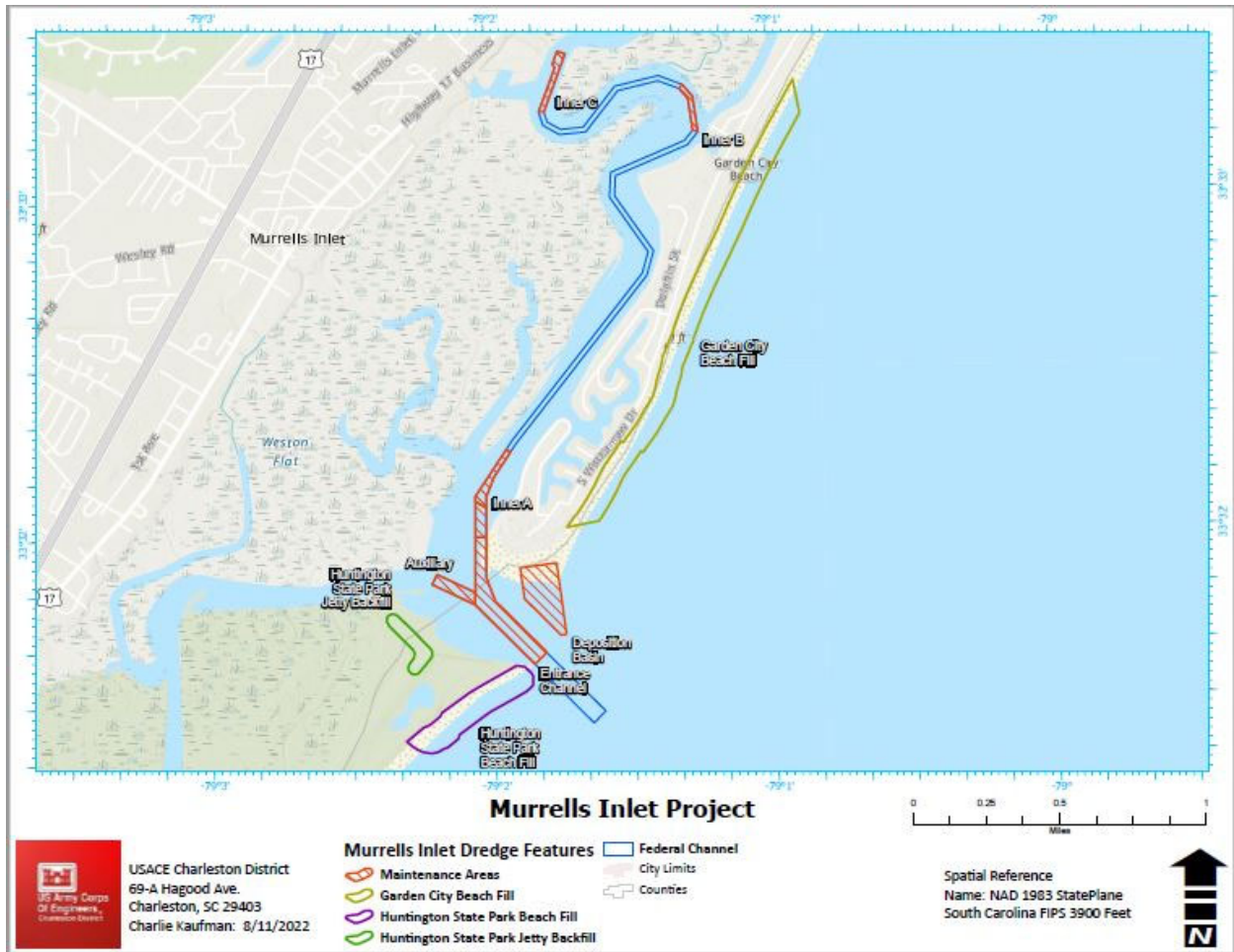


Figure 1. Murrells Inlet Maintenance and Placement Areas

C. Authority and Purpose

The Murrells Inlet Federal Navigation Channel Project was authorized by the House Committee on Public Works on 10 November 1971 and the Senate Committee on Public Works on 18 November 1971, under authority of Section 201, P.L. 89-298, and 1965 Flood Control Act. Section 67 of the Water Resources Act of 1974 authorized interim maintenance to permit free and safe movement of vessels until the authorized project was completed.

The purpose of this project is to continue to provide safe navigation for existing and prospective vessel traffic by maintaining the congressionally authorized Federal navigation channel from the 12-foot contour in the open ocean to the village of Murrell’s Inlet. Shoals tend to accumulate in areas within the channel, which impact navigation. When this shoaling occurs, vessels navigate outside the Federal channel to access deeper areas.

D. Alternatives Considered

For reference, Section 404(b)(1) guidelines of the Clean Water Act require that “except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.” The 404(b)(1) guidelines consider an alternative

practicable “if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”

In accordance with the National Environmental Policy Act (NEPA) and USACE guidance, the following alternatives were reviewed: No Action Alternative and the Action Alternative.

The proposed alternative includes excavating up to 750,000 cubic yards of material from the Federal Navigation Channel. Maintenance dredging will be by means of a hydraulic cutterhead dredge that will transport the sand through a pipeline to be discharged as a slurry and placed directly on the front beach at Garden City Beach and/ Huntington Beach State Park. Material will also be placed at the terminal west end of the south jetty on Huntington Beach State. This material would be used to provide protection to the terminal end of the jetty and to restore shorebird habitat. During construction, temporary training dikes of sand will be used to contain the discharge and control the fill placement to prevent runoff into areas outside of the construction zone. The dikes will be set at an elevation of +2 Mean High Water.

E. General Description and Quantities of the Dredged or Fill Material

1) *General Characteristics of Material*

The fill material is predominantly silica sand. Only dredged material that is suitable for beach placement (90% or greater sand content) will be placed along the front beach. Sediment not suitable for beach placement would be placed at the terminal end of the south jetty located on Huntington Beach State Park.

2) *Quantity of Material*

Approximately 500,000 to 750,000 cubic yards of material may be dredged every 7-10 years; however, dredging volumes and frequency may vary due to storm induced shoaling.

3) *Source of Material*

The fill material will come from the Murrells Inlet Federal Navigation Channel.

F. Description of the Proposed Discharge Site

1) *Location and Size*

The fill material is predominantly silica sand. Only dredged material that is suitable for beach placement (90% or greater sand content) will be placed along the front beach. Sediment not suitable for beach placement would be placed at the terminal end of the south jetty located on Huntington Beach State Park.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

1) *Substrate Elevation and Slope*

Top elevation of the construction beach fill will be consistent with past nourishment projects. Construction equipment is used to push up a berm, approximately 6.5 feet NAVD88, and then the slurry is discharged behind the berm and allowed to naturally settle to the designed elevation. The resulting elevation and profile will slightly vary depending on waves, tides, current distribution and grain size.

2) *Sediment Type*

The sediment is predominantly silica sand with some sand-size shell fragments. Some sediment consists of silt, clay and silty sand, which would be placed behind the jetty and not along the front beach.

- 3) *Dredged/Fill Material Movement*
The fill material will be subject to erosion by waves with the net movement of fill material to the south.
- 4) *Physical Effects on Benthos*
Existing benthic organisms will be permanently lost in the immediate areas of construction and deposition placement; however, benthic organisms are expected to quickly rebound from the short-term impacts of material placement.

B. Water Circulation, Fluctuation and Salinity Determinations.

- 1) *Water Column*
 - (a) **Salinity.** There are no anticipated impacts expected to salinity.
 - (b) **Water Chemistry.** There are no anticipated impacts expected to water chemistry.
 - (c) **Clarity and Color.** There may be a local and temporary increase in turbidity during excavation and deposition construction activities. Water clarity is expected to improve from preconstruction conditions shortly after operations are completed.
 - (d) **Odor.** The excavation and placement are not expected to have any effects on odor in the project area.
 - (e) **Taste.** Not applicable. Water in the project area is not used as a drinking water resource.
 - (f) **Dissolved Gas Levels.** Dissolved oxygen levels will not be altered significantly by the proposed project due to high-energy wave action and associated adequate re-aeration rates. No anoxic layers of sediment would be exposed by dredging due to the low level of organic material in the dredged material.
 - (g) **Nutrients.** There are no anticipated impacts expected to nutrients.
 - (i) **Eutrophication.** High nutrient loading causes eutrophication; however since nutrient loading is not high in the study area, eutrophication is not expected.
- 2) *Current Patterns and Circulation.*
 - (a) **Current Patterns and Flow.** Currents in the project area are both tidal and longshore. Placement of the fill along beach front and behind the jetty will have no effect on the currents.
 - (b) **Velocity.** Effects on water velocity would be minimal.
 - (c) **Stratification.** No change in stratification is anticipated.
 - (d) **Hydrologic Regime.** The hydrologic regime would not be affected.
- 3) *Normal Water Level Fluctuations and Salinity Gradients*

Tides in the project area are semi-diurnal. The mean ranges of tides in the project area is approximately 4.0 feet. The project will have no adverse impact to these characteristics and would not affect salinity gradients in the area.

C. Suspended Particulate/Turbidity Determinations.

1) *Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site*

There will be a temporary increase in turbidity levels in the project area during dredging and placement activities. Turbidity will be temporary and localized, and no significant adverse effects are expected.

2) *Effects (degree and duration) on Chemical and Physical Properties of the Water Column*

- (a) **Light Penetration.** Light penetration will decrease during discharge in the immediate area where dredged material is being deposited on the beach. This effect will be temporary and will have no adverse impact on the environment.
- (b) **Dissolved Oxygen.** Dissolved oxygen levels will not be altered significantly by this project due to high-energy wave action and associated adequate re-aeration rates. No anoxic layers of sediment would be exposed by dredging due to the low level of organic material in the dredged material.
- (c) **Toxic Metals, Organics, and Pathogens.** No toxic metals, organics, or pathogens will be released by the project due to the clean nature of the dredged material.
- (e) **Aesthetics.** Aesthetic quality will be temporarily reduced during the period when work is occurring. There will be a long-term increase in aesthetic quality at beach sites once the work is completed.

(3) *Effects on Biota*

- (a) **Primary Production & Photosynthesis.** Primary production is not a recognized, significant phenomenon in the surf zone, where a temporary increased level of suspended particulates will occur. Elevated turbidity levels may have minor, adverse impacts on drifting autotrophic organisms in the immediate project area. Because of nearshore water exchange from tidal and wind generated currents, it is probably that photosynthetic organisms are continuously carried in and out of the project area. Therefore, no long-term adverse effects are expected.
- (b) **Suspension/Filter Feeders.** Dredged material resuspended into the water column may contribute to the clogging of siphons or filter-feeders. This is expected to be a temporary condition. Conditions for existing filter feeders should return to normal once construction is complete. To minimize impacts to the commercial shellfish harvesting area along Huntington Beach State Park, a temporary berm will be constructed to contain the slurry during placement activities.

(c) **Sight Feeders.** Elevated turbidity levels will have a short-term adverse impact on these organisms; however, these organisms are highly mobile and are able to migrate into more favorable areas to fulfill their nutritional requirements during the short-term.

D. Contaminant Determinations

Deposited dredged material is similar to the existing material in the surrounding areas and would not introduce, relocate, or increase contaminants in the nearshore waters.

E. Aquatic Ecosystem and Organism Determinations

1) *Effects on Plankton*

Decreased light transmission caused by suspended dredged material may have a temporary adverse effect on plankton; however, this effect is expected to be minor and temporary.

2) *Effects on Benthos*

Existing benthic organisms will be permanently lost in the immediate locations where fill is placed. Repopulation of benthic communities should occur within a year once operations have ceased because of their high fecundity and turnover rate. Species composition should be similar to that which existed prior to construction. The effects will be minor and temporary.

3) *Effects on Nekton*

Direct impacts to motile organisms would be minor because of their ability to avoid adverse conditions. Some larval fishes may be destroyed by the mechanical action of the cutterhead. Impacts would be temporary and minor and would not significantly affect the local fish stocks.

4) *Effects on Aquatic Food Web*

Reductions in primary productivity from turbidity would be temporary and localized around the immediate area of excavation and placement sites. Non-motile organisms are quickly able to repopulate affected intertidal zones; no long-term adverse impacts to higher trophic level organisms are expected. No overall adverse effect on the food web is anticipated.

5) *Effects on Special Aquatic Sites.*

(a) **Sanctuaries and Refuges.** Not applicable; there are no special aquatic sites in the study area.

(b) **Wetlands.** Estuarine wetlands exist near the project area, but period maintenance dredging activities will not directly impact these areas.

(c) **Mud Flats.** There are tidal mudflats within the project area on the backside of Huntington Beach State Park. Fill will be placed behind the jetty and impact approximately 9.8 acres of mudflats. This area is an existing placement area that has been utilized in past dredging cycles. The area will naturally restore and continue to provide habitat for shore birds.

- (d) **Vegetated Shallows.** Not applicable; there are no species of submerged aquatic vegetation in the study area.
- (e) **Coral Reefs.** Not applicable; not found in the study area.
- (f) **Riffle and Pool Complexes.** Not applicable; not found in the study area.

5) *Threatened and Endangered Species*

USACE has entered formal consultation with the U.S. Fish and Wildlife Service (USFWS) in accordance with Section 7 of the Endangered Species Act, and the project will be implemented in compliance with the USFWS issued Biological Opinion once issued. In addition, the project would be implemented in compliance with the South Atlantic Regional Biological Opinion (SARBO) issued by the National Marine Fisheries Service (NMFS). Suitable habitat is present within the project area for the following federally listed species: American wood stork, Eastern black rail, piping plover, seabeach amaranth, West Indian manatee, and all four sea turtles (green sea turtle, leatherback sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle).

It has been determined that the proposed project may affect, but is not likely to adversely affect, the American wood stork, the Eastern black rail, piping plover, Rufa red knot, and the West Indian Manatee. If the project occurs during the warmer months, standard manatee conditions for in-water construction work will be followed to ensure that any manatees in the vicinity are not harmed or harassed.

Sea turtle nesting may occur in the project area during the time dredging and beach placement occurs. If placement occurs during nesting season, a sea turtle nest monitoring and relocation program will be implemented to discover, mark and relocate these nests. Any sea turtle nests discovered within the beach placement area will be removed and relocated using the procedures outlined in the SARBO. Other measures outlined in the SARBO will be followed to protect nesting turtles and to ensure that the sand placement project will not adversely affect the quality of the beach for use for turtle nesting after completion of the project. USACE has determined that the proposed project may affect, is likely to adversely affect, the, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle. All of these listed species can be found in surrounding waterbodies and on beaches of the project area.

While there is designated Critical Habitat for piping plover within the project area. A portion of the southern tip of Garden City Beach will be converted from dry land to open water, which will result in a loss of piping plover critical habitat in this area. The fill activity within the mudflat will provide and protect piping plover habitat. However, placement of material at the terminal west end of the south jetty at Huntington Beach State Park will result in creation of additional habitat in this area that will offset the loss at Garden City Beach.

6) *Other Wildlife*

Placement of dredged material is not expected to have long-term adverse impacts on wading birds of terrestrial foraging animals. Measures to protect nesting shorebirds will be implemented if beach placement occurs during nesting season.

F. Proposed Disposal Site Determinations

- 1) *Mixing Zone Determination*
Dredged material will not cause unacceptable changes in the mixing zone specific in the Water Quality Certificate in relation to depth, current, velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents.
- 2) *Determination of Compliance with Applicable Water Quality Standards*
The project will comply with applicable state water quality standards.
- 3) *Potential Effects on Human Use Characteristics*
 - (a) **Municipal and Private Water Supply.** Not applicable; municipal drinking water is not supplied from within the study area, and USACE is not aware of any private water supplies.
 - (b) **Recreational and Commercial Fisheries.** Recreational and commercial fisheries may be temporarily impacted by the dredging of material and the placement of the material on the beach, but these effects should be minor. Deepening of the navigation channel will provide fishing vessels better access to and from Murrells Inlet, which may improve commercial fishing in the long-term.
 - (c) **Water Related Recreation.** Water related recreation will be temporarily impacted during construction; however, it will be preserved and enhanced through the maintenance of safe depths for navigation and by the beneficial use of compatible sediment along the beach.
 - (d) **Aesthetics.** A temporary decrease in aesthetics will occur with the presence of dredge and earthmoving equipment. Stabilizing eroding beach will improve the aesthetics of the beach in the long-term.
 - (e) **Parks, National and Historic Monuments, National Seashores Wilderness Areas, Research Sites, and Similar Preserves.** Huntington Beach State Park is within the project area. The park will be temporarily impacted during construction and placement of material, however, will benefit in the long-term through beach renourishment and added material to improve habitat.

- G. Determination of Secondary and Cumulative Effects on the Aquatic Ecosystem.**
The proposed discharge of material would have no adverse impacts that would result in degradation of the natural, cultural, or recreational resources of the project area. The project would have no incremental impacts that, when considered with past, present, and reasonably foreseeable future project, would result in major cumulative impairment of water resources or interfere with the productivity and water quality of the existing aquatic ecosystem.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.

- A.** No significant adaptation of the Section 404(b) guidelines were made relative to this evaluation.

- B.** There are no practicable alternatives to the proposed beneficial use placement sites that would have less adverse impact on the aquatic ecosystem.
- C.** The proposed plan described in this evaluation would not cause or contribute to violations of any known applicable state water quality standards.
- D.** The disposal of dredged material on the beach and behind the jetty will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specific by the Endangered Species Act of 1973.
- E.** The proposed project will not result in significant adverse effects on human health and welfare, recreational and commercial fishing, plankton, fish, shellfish, wildlife, special aquatic sites, or overall ecosystem diversity, productivity and stability.
- F.** The composition of the dredged material would not contribute organics or pollutants to the aquatic environment. The earthmoving equipment is not expected to operate in the water (below mean low water) to minimize the potential adverse impact of hydrocarbon release into the water. All responsible precautions will be taken to prevent hazardous materials discharge from all activity or equipment.
- G.** Appropriate steps to minimize potential adverse impacts from the proposed action will be implemented, such as berms to protect nearby shellfish grounds and construction best management practices to reduce temporary turbidity and suspended solids impacts.
- h.** On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Fill Material is specified as complying with the requirements of the Clean Water Act Section 404(b)(1) guidelines, with the inclusion of appropriate and practical conditions to minimize adverse effects on the aquatic ecosystem.

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