Appendix P
Section 404 (b)(1) Report

DRAFT SECTION 404(b)(1) EVALUATION REPORT
FOR
MISSISSIPPI COASTAL IMPROVEMENTS PROGRAM
COMPREHENSIVE BARRIER ISLAND RESTORATION
MISSISSIPPI SOUND
HANCOCK, HARRISON, AND JACKSON COUNTIES, MISSISSIPPI
AND
MOBILE COUNTY, ALABAMA

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I. PROJECT DESCRIPTION

a. Location. The project area includes the mainland coast of Mississippi (MS) (Hancock, Harrison, and Jackson Counties) and Alabama (AL)(Mobile County), Mississippi Sound, the MS-AL barrier islands, and the northern Gulf of Mexico to about 5 miles seaward of the barrier islands as illustrated in Figure 1-1 of the Supplemental Environmental Impact Statement (SEIS). A chain of sandy barrier islands is located about 6 to 12 miles offshore and separates Mississippi Sound from the northern Gulf of Mexico. From east to west, the islands include Dauphin Island in AL and Petit Bois, Horn, East Ship, West Ship, and Cat Islands in MS. Dauphin, Petit Bois, Horn, East Ship, and West Ship Islands are located along a littoral drift zone that moves sand westward across the islands, resulting in their elongated shapes and westward migration over time. Cat Island is isolated from the littoral drift system and has maintained a more stable position but has lost substantial land area as a result of erosion. Ship Island currently exists as two island segments, East Ship Island and West Ship Island, separated by Camille Cut. Hurricane Camille breached Ship Island in 1969, and the breach remains today as a 3.5-mile-wide shallow sandbar. All of Petit Bois, Horn, East Ship and West Ship Islands and portions of Cat Island are located within the boundaries of the Gulf Islands National Seashore (GUIS) MS units under the National Park Service (NPS) jurisdiction. GUIS includes outstanding natural, cultural, and recreational resources along the northern Gulf of Mexico coasts of MS and Florida. Petit Bois and Horn Islands also have been designated by the U.S. Congress as the Gulf Islands Wilderness.

b. Authority and Purpose. The Final Mississippi Coastal Improvements Program (MsCIP) Comprehensive Plan and Integrated Programmatic Environmental Impact Statement (EIS) dated June 2009 describe a Comprehensive Plan to support the long-term recovery of Hancock, Harrison, and Jackson Counties, MS from the devastation caused by the hurricanes of 2005 and ways to increase of resiliency of the MS coast for the future. The MsCIP Study was conducted under the authority of the Department of Defense Appropriation Act of 2006 (Public Law 109-148), dated December 30, 2005 and was completed in June 2009. The Report of the Chief of Engineers dated September 15, 2009 and the Record of Decision signed by the Assistant Secretary of the Army for Civil Works dated January 14, 2010 were submitted to Congress on January 15, 2010. The plan established improvements in the coastal

areas of MS in the interest of hurricane and storm damage reduction, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resources purposes. The barrier island restoration plan discussed in this Section 404(b)1 Evaluation Report is one component of the MsCIP Comprehensive Plan, which addresses preservation of fish and wildlife and prevention of saltwater intrusion. In addition, the plan would provide for storm wave attenuation along a portion of the mainland.

c. Tentatively Selected Plan (TSP). The Draft SEIS evaluates alternatives to accomplish the purpose and need and the potential environmental impacts and benefits associated with the final design for the TSP implementing the authorized construction action in compliance with the National Environmental Policy Act (NEPA) and applicable regulations for the restoration activities for Ship Island. The action alternatives considered include the borrow areas and the sand placement locations authorized for construction. Alternatives considered are tiered from the MsCIP Programmatic EIS (40 Code of Federal Regulations [CFR] 1508.28).

A TSP has been developed which fulfills the goals identified in the MsCIP Programmatic EIS for restoration of the MS barrier islands to sustain Mississippi Sound's productive ecological system while also providing the first line of defense, resulting in a more resilient coast. The TSP restoration areas include:

- Restoration of Ship Island, including Sand Placement in Camille Cut and Replenishment of East Ship Island
- Beach-front Placement of Sand Along Cat Island
- Management of Future Dredged Material from Pascagoula Ship Channel

1. Ship Island Restoration

The restoration of Ship Island includes the closure of Camille Cut, restoration of the shoreline of the current East Ship Island, and use of sand from five borrow sites. This restoration would be accomplished in 5 phases over an approximately 2.5-year period and is summarized below.

(a) Direct Sand Placement in Camille Cut

To restore East Ship Island and West Ship Island to a single elongated barrier island, the approximately 3.5-mile-long Camille Cut would be filled with 13.5 million cubic yards (mcy) of sand as illustrated in Figure 3-13 in the SEIS. The newly formed island segment would be constructed as a low-level dune system connecting West Ship and East Ship Islands. Under the proposed design template, the constructed Camille Cut closure would be approximately 1,100 feet wide. The fill would tie into the existing island shoreline just below the frontal dune line at an elevation of approximately +7 feet North American Vertical Datum of 1988 (NAVD88) with a 1V:12H (vertical:horizontal) slope to the mean high water line (MHWL) and an approximate 1V:20H slope below the MHWL. The fill at its western and eastern ends would tie into the existing berm along the

eastern end of West Ship Island and transition into the East Ship Island placement. The direct placement of sand to fill in Camille Cut would be a one-time event.

As sand placement in Camille Cut progresses and if funding is available, the newly created island segment would be planted with native dune vegetation, including sea oats and/or other grasses and forbs, to restore stable dune habitat. The planting would include dune grasses in groupings along all shorelines within the newly created beach.

(b) Replenishment of East Ship Island

The restoration of East Ship Island would consist of the placement of approximately 5.5 mcy of sand along the southern shoreline (Figure 3-13 in the SEIS). In addition to restoring the southern shoreline, placement of sand in this area would add material to the littoral system of Ship Island, which would support the overall replenishment of the system as identified in the sediment budget analysis and sediment transport modeling. The construction template for the restored southern shoreline would consist of an average berm crest width of approximately 1,200 feet at an elevation of +6 feet NAVD88 with a 1V:12H to 1:20 slope from the seaward edge of the berm to the toe of the fill intersection with the existing bottom (Figures 3-20 and 3-21 in the SEIS).

(c) Ship Island Restoration Borrow Areas

A total of 19.0 mcy of sand would be dredged from five borrow areas for Camille Cut closure and restoration of East Ship Island. These five borrow areas are shown in Figures 3-5, 3-6, 3-10, 3-11, and 3-12 in the SEIS. These borrow areas include: Ship Island (1.2 mcy), Petit Bois Pass–Alabama (PBS-AL) (8.5 mcy), Petit Bois Pass-Mississippi (PBP-MS) (2.0 mcy), Petit Bois Pass–Outer Continental Shelf (PBP-OCS) (4.1 mcy), and Horn Island Pass (3.2 mcy). Sand from borrow sites would be dredged with a hopper dredge or cutterhead dredge, loaded into scows, hauled to the placement vicinity, and then pumped directly onto the site. Placement of the material would be concurrent with the fill of Camille Cut. The combined Camille Cut and East Ship Island equilibrated fill would encompass approximately 1,500 acres, of which approximately 800 acres would be above the MHWL. The placement of sand would be a one-time event.

2. Cat Island Restoration

Dune and beach restoration on Cat Island, including re-vegetation, would be implemented through the direct placement of approximately 2 mcy of sand on the eastern beach fronting Cat Island (Figure 3-14 in the SEIS). The recommended design is largely based on restoring the eastern shoreface of Cat Island to 1998 conditions. The construction template would include an average dune crest width of 40 feet at an elevation of approximately +7.5 feet NAVD88. The construction berm would have an average constructed crest width of approximately 250 feet at an elevation of roughly +5 feet NAVD88 with a 1V:12H to 1V:20H slope from the seaward side of the berm to the toe of the fill. Direct placement of sand on the eastern beach would restore the island habitats, thereby enhancing the island's ability to absorb energy from westward-propagating waves. The construction profile would be expected to adjust rapidly through the erosion of the upper profile and mimic the natural nearshore profile once it reaches

equilibrium. The equilibrium design berm width averages 175–200 feet. The total equilibrated fill area encompasses approximately 305 acres.

(a) Cat Island Restoration Borrow Area

Sand used in the restoration of Cat Island would come from an approximately 282-acre sand deposit in an area about 2 miles long and 0.2-mile wide centered about 1.25 miles off the eastern shoreline of Cat Island (Figure 3-14 in the SEIS). The borrow site would be located east of the placement area and outside of the GUIS boundaries. The borrow site would be dredged to a depth of approximately 3-5 feet to minimize disruption of habitat and to minimize the effects of wave refraction over the site after excavation.

The proximity of the borrow area to the eastern shoreline of Cat Island in relatively shallow water would allow for the rapid placement of sand on the beach, likely using a hydraulic pipeline dredge. The material would be pumped directly onto the beach and reworked (shaped) by land-based equipment. Following placement, the area would be re-vegetated with native grasses. Restoration would occur over approximately 6 months.

3. Management of Littoral Placement of Future Dredged Material from Pascagoula Federal Navigation Channel

The TSP includes revisions to the dredged material placement practices within the littoral zone at Horn Island Pass portion of the Pascagoula Federal Navigation Channel. The intent of the revisions is to ensure that placement of future dredged material within the littoral zone best replicates natural sediment pathways in the system and minimizes potential adverse impacts to the surrounding area while not increasing costs to operation of the Pascagoula Federal Navigation Channel. The TSP includes placement of the suitable sandy material dredged from the Horn Island Pass portion of the Pascagoula Federal Navigation Channel further to the south and west of Disposal Area 10 (DA-10) along the shallow shoals exposed to the open Gulf waves with the greatest sand transport potential (Figure 3-16 in the SEIS). The total area for potential direct placement would encompass approximately 1,600 acres between DA-10 and the existing southern boundary of the Pascagoula Harbor littoral zone placement site, with existing depths generally between 5 and 30 feet.

d. Description of Borrow Material.

1. Ship Island Restoration Borrow Area. The borrow sources for this action will use sand dredged from five borrow areas for Camille Cut closure and restoration of East Ship Island. The borrow areas will use sand from Ship Island borrow site, PBP-AL, PBP-MS, PBP-OCS, and Horn Island Pass. Sand would be obtained from four separate borrow area sources within MS and AL including Ship Island borrow area in the Gulf of Mexico, and 2 separate borrow areas south of the western end of Dauphin Island and Petit Bois Pass in the Gulf of Mexico (East and West Petit Bois borrow areas). The Ship Island borrow area is located approximately 2 miles south of Camille Cut; and the Petit Bois borrow areas are located approximately 2 miles south of the western tip of Dauphin Island.

(a) Quantity of Material. The combined borrow areas identified for the Ship Island restoration will use 19.0 mcy of sand dredged from the following five borrow areas:

- 1.2 mcy from Ship Island borrow site
- 8.5 mcy from PBP-AL
- 2.0 mcy from PBP-MS
- 4.1 mcy from PBP-OCS
- 3.2 mcy from Horn Island Pass

(b) General Characteristics of Material.

Ship Island Borrow Area. Geotechnical investigations identified an area with 8.7 mcy of the most usable sand (D50 of 0.21 mm). This sub-area is approximately 634 acres in size. Within the sub-area, a borrow site was identified approximately 96 acres in size, an average cut depth of 8 feet deep, and containing approximately 1.2 mcy of sand. The area is located 1.5 miles south of Camille Cut and East Ship Island at a depth of approximately -28 feet NAVD (Figure 3-5 of the SEIS). The proximity of this sand deposit to Camille Cut and East Ship Island makes this borrow area highly favorable for the placement of sand at East Ship Island and West Ship Island. The size of the sand is finer than the desired size (D50 of 0.21 mm versus 0.30 mm), which would limit its potential use. Dry Munsell color is expected to range from light brownish gray to light gray with an average dry Munsell value of 7. The average percentage of fines is expected to be less than 5%.

PBP-AL Borrow Area. The initial PBP-AL location extends from Petit Bois Island in MS east to Dauphin Island in AL. Geophysical surveys indicated that large deposits of sand are present in the area south of the main pass extending 3 miles offshore (Figure 3-10 in the SEIS). Based on the results of borings, 16 mcy of suitable sand were found in two separate zones: PBP-AL West Option 1 and PBP-AL East Option 1. PBP-AL West Option 1 is roughly 587 acres in size and contains 4.3 mcy of sand (Figure 3-10 in the SEIS). PBP-AL East Option 1 is roughly 753 acres in size and contains 11.7 mcy of sand.

Both PBP-AL West Option 1 and PBP-AL East Option 1 contain high-quality sand, with a larger compatible grain size (D50 = 0.32 mm) and color ranging from light gray to white, but PBP-AL West Option 1 contains a higher percentage of shell fragments. It is in water with an average depth of roughly -31 feet NAVD88 and is 2 – 2.5 miles southwest of Dauphin Island.

PBP-MS Borrow Area. The PBP-MS borrow site is located about 1 mile southeast of the eastern tip of Petit Bois Island (Figure 3-11 in the SEIS). Sand in this location has a favorable grain size (D50 = 0.31 mm). The ambient water depths range from -25 to -32 feet. Available volume is roughly 2.0 mcy. The site consists of 175 acres with cut elevations of -33 to -48 feet NAVD88 and cut thicknesses ranging between 4 and 16 feet. The site is bounded to the north and west by the NPS limits and to the east

by a submerged cable and a pipeline. The cable is about 500 feet from the eastern limits of the proposed borrow area, the pipeline about 2,500 feet.

PBP-OCS Borrow Area. The PBP-OCS location is roughly 3.5 miles offshore near the safety fairway (Figure 3-12 in the SEIS). The sand there is an acceptable size (D50 = 0.28–0.33 mm), and the ambient water depths range from -45 to -60 feet. Estimated combined available volume is approximately 4.9 mcy. The site consists of 809 acres with cut elevations of -50 to -68 feet NAVD88 and cut thicknesses ranging between 4 and 18 feet. An obstruction is marked on the latest NOAA chart near the borrow site. The specified buffer, as indicated on the latest chart, is located off the shoal to the east roughly 150 feet from the borrow area.

Horn Island Pass Borrow Area. The Horn Island Pass borrow site lies immediately west of the Pascagoula Harbor entrance channel (Figure 3-6 in the SEIS). The sediment mounds present there were formed by past disposal of dredged material from the Pascagoula Bar Channel section of Horn Island Pass. The ambient water depths range from 27–40 feet. Estimated available volume from the borrow area is 3.2 mcy, and the D50 is 0.28 mm. The Horn Island Pass borrow areas combined are 587 acres with cut elevations of -34 to -42 feet NAVD88 and cut thicknesses ranging between 4 and 11 feet. Three obstructions near the borrow sites are marked on NOAA charts. The sites were buffered with 200 feet in addition to the specified buffer, as indicated on the latest NOAA map. In addition, two known pipelines are located to the east. A 1,000-foot buffer was maintained around the known pipelines. Excavation would consist of removing disposal mounds to surrounding depths; therefore, any potential wave focusing would likely be minimal.

2. Cat Island Restoration Borrow Area. Potential borrow sites were investigated to the east of Cat Island. Geophysical surveys indicated the availability of extensive sand deposits in this area from a 282-acre sand deposit about 2 miles long and 0.2 mile wide centered about 1.25 miles off the eastern shoreline of Cat Island.

(a) Quantity of Material. Geophysical surveys indicated the availability of extensive sand deposits in this area that could provide 2.1 mcy of sand for placement at Cat Island.

(b) General Characteristics of Material. The borrow area is roughly 282 acres in size and material is an average of 5 feet thick. Water depth over the area ranges from -12 to -14 feet NAVD88 (Figure 3-4 in the SEIS) and located just offshore near the placement area on Cat Island. The area contains the volume necessary for restoration and would be small relative to the widespread availability of sand in this area. Average grain size in the borrow area is has a D50 of 0.20 mm which is deemed suitable for the placement site. The material is predominantly light gray in color.

3. Future Dredged Material Placement from Pascagoula Federal Navigation Channel. The TSP includes placement of the suitable sandy material dredged from the Horn Island Pass part of the Pascagoula Federal Navigation Channel at the combined

DA-10 and littoral zone sites along the shallow shoals exposed to the open Gulf waves with the greatest sand transport potential. Placement of the material in this manner will enhance the littoral transport of sand from the site westward along the island chain and improve the navigational characteristics of the adjacent channel.

(a) Quantity of Material. A sediment budget analysis revealed that roughly 6.3 mcy (68,000 cy/yr) of dredged material had been removed from and placed offshore of the active littoral zone since 1917 with another 6.8 mcy (73,000 cy/yr) being placed within DA-10/Sand Island during this same period. The volume of sand placed in this area would be variable to meet the needs of future dredging of the navigation channel.

(b) General Characteristics of Material. The sediment budget analysis has indicated that the sandy material dredged from the Horn Island Pass is characteristic of the sand that composes the Mississippi barrier island chain and is suitable for placement in the combined DA-10 and littoral zone sites.

e. Description of Discharge Sites.

1. Location. The main focus of the barrier island restoration plan is focused on Ship Island which is located approximately 16 miles southeast of Gulfport, MS. The Ship Island restoration is composed of 2 parts: the rejoining of West and East Ship Islands through the closing of Camille Cut and the restoration of the southern shore of East Ship Island. Material will also be placed to restore the eastern shoreline of Cat Island.

2. Placement Sites.

(a) Camille Cut and East Ship Island. The placement sites consisting of Camille Cut and littoral area of East Ship Island are typical of the MS barrier island complex. Beach sediment sampling and analyses were conducted throughout the barrier islands in 2006 and 2009. In 2010, samples were collected along transects on West Ship Island and Horn Island to determine variability of grain size across the islands. In addition, three deeper samples were collected at West Ship Island to investigate grain size variability with depth. The samples collected were analyzed for color, angularity, grain size, and gradation. The majority of sand on the barrier island beaches consists of quartz sand light gray in color, sub-angular to rounded in shape, and had a median (D50) grain size of 0.30 to 0.51 mm. Sand distributed across the islands exhibited greater variation in D50 grain size, ranging from 0.21 to 0.48 mm. Composite samples to depths of 4 or 5 feet at West Ship Island had D50 grain size ranging from 0.27 to 0.37 mm.

(b) Cat Island Restoration Site. The recommended sand placement for Cat Island involves direct placement of 2 mcy of sand on the eastern beach of the island. The planning-level construction template includes an average dune crest width of 40 feet at an elevation of roughly +7.5 feet NAVD88. The construction berm would have an average constructed crest width of about 250 feet at an elevation of +5 feet with a 1V:12H to 1V:20H slope from the seaward side of the berm to the toe of the fill.

Direct placement of sand on the eastern beach would provide area to restore the island habitats, thereby enhancing the island's ability to absorb energy from westward-propagating waves. The sand on the barrier island beaches consists of quartz sand light gray in color, sub-angular to rounded in shape, and had a median (D50) grain size of 0.30 to 0.51 mm.

(c) Future Dredged Material Placement from Pascagoula Federal Navigation Channel - Combined DA-10 and Littoral Zone Placement Sites. The area of potential direct placement would encompass 1,600 acres between DA-10 and the southern boundary of the Pascagoula Harbor littoral zone placement site at depths of 5 to 30 feet.

3. Timing and Duration of Discharge. Timing of project construction is not known at this time but the Ship Island restoration portion is anticipated to last about 2.5 years. Restoration at Cat Island would occur over approximately 6 months. Future operations at Pascagoula Harbor would occur as needed. Construction activities would be scheduled as much as possible to coincide with environmental conditions to avoid conflicts with sea turtles, shorebirds, and other protected species and critical habitats.

f. Description of Discharge Methods. The Comprehensive Barrier Island Restoration Project at Camille Cut and East Ship Island will likely be constructed in five (5) phases using a combination of hydraulic dredges, hopper dredges, bottom dump scows, hydraulic unloaders, and mechanical equipment, such as bulldozers and trackhoes. The total construction time to execute all phases is approximately 3 years.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations.

1. Substrate Elevation and Slope. The constructed Camille Cut project area would be approximately 1,100 feet wide at an elevation of +7 feet, with a 1V:20H slope. The constructed berm will tie into West and East Ship Islands. Sand placement along East Ship Island would consist of an approximate 1,200 ft wide restored shoreline with an approximate elevation of +7 feet on a 1V:20H slope. The equilibrium design widths average approximately 800 feet for Camille Cut and 1,000 feet for East Ship Island. The combined Camille Cut and East Ship Island equilibrated fill will encompass approximately 1,500 acres of which approximately 800 acres will be above the MHWL, and 700 acres will lie below the MHWL. For Cat Island, the construction template will include an average dune crest width of 40 feet at an elevation of roughly +7.5 feet NAVD88. The construction berm will have an average constructed crest width of about 250 feet at an elevation of +5 feet with a 1V:12H to 1V:20H slope from the seaward side of the berm to the toe of the fill.

2. Sediment Type. The construction analysis for Ship and Cat Islands, examined characteristics of the material from suitable borrow sites to determine the sand suitability. The analysis focused on grain size and available volume. The analysis of mixes identified a combined D50 between 0.26 and 0.33 mm as necessary to ensure

stability of the fill for at least 30 years. The required volume of the mix was determined to be 13.5 mcy for Camille Cut and 5.5 mcy for East Ship Island to account for losses during dredging and placement. The required volume of sand for the restoration of Cat Island was determined to be 2.0 mcy. The borrow areas contain the high quality quartz sand with some shell fragments, with a relatively large grain size and color ranging from light gray to white.

3. Dredged/Fill Material Movement.

(a) Ship Island Restoration. The Camille Cut fill at its western and eastern ends would tie into the existing berm along the eastern end of West Ship Island and transition into the East Ship Island placement. Because the seaward slope of the construction profile would be steeper than the native slope, the construction profile would be expected to adjust over a 6 to 12-month period through the erosion of the upper profile with deposition near the toe of the fill until its shape, termed “equilibrium profile,” mimics the natural nearshore profile shape. The equilibrium design width would average approximately 700 feet. The tie-in points of the fill area at both ends would grade into existing contours without substantial breaks or gaps in elevation. Assuming an average water depth of about 5 feet in the existing breach, approximately 13.5 mcy of sand would be required to fill Camille Cut in this manner. The construction and equilibrium beach profiles would contain essentially equal volumes of sand; the volume eroded from the upper profile during the adjustment process would equal the volume deposited at the toe of the fill. The fill material used for the East Ship Island will consist of a approximately 5.5 mcy. In addition to restoring the southern shoreline, sand placed in that area would migrate with the littoral drift to support the overall replenishment of the system. The construction template for the restored southern shoreline would consist of an average berm crest width of roughly 1,200 feet at an elevation of +6 feet NAVD88 with a 1V:12H to 1:20 slope from the seaward edge of the berm to the toe of the fill.

The results of the analysis showed that sediment transport would increase around the island because more sand would be introduced into the system for movement. However, the effects are expected to be localized to Ship Island, and impacts to the Gulfport Navigation Channel in Ship Island Pass should be minimal under average conditions. There could be an increase in sedimentation in the navigation channel during hurricane events. The larger hurricanes considered (Katrina, Georges) resulted in a 10–30 percent increase in sedimentation in the entrance channel. The smaller hurricanes resulted in a 5–10 percent increase. Further details of the long term morphological modeling are provided in Appendix B of the SEIS.

(b) Cat Island Restoration. Direct placement of sand on the eastern beach of Cat Island would provide area to restore the island habitats, thereby enhancing the island’s ability to absorb energy from westward-propagating waves. The steeper construction profile is expected to adjust rapidly through erosion to mimic the milder natural nearshore profile once it reaches equilibrium. The equilibrium design berm width averages roughly 175–200 feet. The total equilibrated fill area encompasses roughly 305 acres.

(c) Future Dredged Material Placement from Pascagoula Federal Navigation Channel. The intent of this action is to ensure that placement of dredged material within the littoral zone best replicates natural sediment pathways in the system and minimizes potential adverse impacts to the surrounding area while not increasing costs for operation and maintenance of the Pascagoula Federal Navigation Channel. Results of the sediment transport analysis included in the SEIS indicate that placement of material in this manner will return the sand to the local littoral sediment transport system.

4. Physical Effects on Benthos. Potential impacts could occur from removal and placement activities. Dredging sediments for restoration uses would cause a direct temporary disruption to the benthic community located in borrow areas and long-term or permanent impact to benthic communities in locations selected for material placement. Both infauna and epifauna invertebrates including mollusks and crustaceans would be impacted resulting from the physical removal of sediment from the borrow areas as well as the physical placement of sediment at the placement areas.

At the borrow areas, existing benthic habitat would experience short-terms impacts from sediment removal at the sites. Open water shallow-benthic habitat at Ship Island and along the beach at Cat Island would be converted to a combination of barrier island and intertidal habitat. Given the size of open water habitat within Mississippi Sound (approximately 1,184,000 acres), this permanent loss of benthic habitat would result in a negligible impact to ecosystem function. The addition of barrier island and intertidal habitat represents a significant increase in this habitat within the barrier island system and in essence is a replacement of habitats that have been lost since Hurricane Camille in 1969. Short-term impacts could also occur from the placement of construction equipment including pipelines and anchoring spuds, and construction of temporary moorings. These areas would be expected to recover within a few months to a few years depending on the extent and duration of construction equipment impacts.

Studies summarized in the SEIS report a recovery of species abundance, diversity, and biomass, with the rate of the recovery dependent upon the habitat conditions. At the borrow sites, recovery of species abundance and diversity is more readily accomplished than recovery of biomass. The studies indicate that there is little evidence of indirect impacts on the community structure outside of the immediate dredging boundaries.

The benthic community also would experience direct impacts from placement of material. In littoral placement areas, recovery of the community could range from a few months to several years. In an evaluation of recolonization studies conducted in the eastern United States, the marine benthos was observed to experience a decrease in the number of species, densities, and biomass with a subsequent rapid recovery. Therefore, although a change in the health of populations, community structure and composition, trophic structure, or system function may occur, these impacts are temporary and typically the recovery time, in most cases, ranges from a few months to slightly more than 1 year. Impacts on the littoral benthic community would not be significant.

5. Other effects.

(a) Bathymetry. The Proposed Action would cause a permanent change in bathymetry at Ship Island, Cat Island, borrow areas, and the combined DA-10 littoral zone placement zone. Following placement actions, the combined Camille Cut and East Ship Island equilibrated fill areas would encompass approximately 1,500 acres, of which approximately 700 acres would be below the MHWL. Within Camille Cut, subaqueous bottom currently at an elevation averaging -5 feet NAVD88 between West and East Ship Islands would be converted to barrier island habitat. The restoration of the littoral sediment transport system resulting from the closing of Camille Cut could potentially result in increased sedimentation in the Ship Island Pass over a 10- to 15-year period. Increased sedimentation during hurricane events could result in 5 to 30 percent increases in sedimentation depending on the hurricane event (size, location, path, and speed), which may require some additional maintenance of the Ship Island Pass after these events. Overall, there would be long-term, beneficial, significant changes to bathymetry from the restoration of Camille Cut and East Ship Island. The closure of Camille Cut and the overall restoration of Ship Island would restore a protective barrier and reduce storm waves at the mainland.

At Cat Island, approximately 305 acres of beachfront and adjacent shallow water would be filled and converted to upland habitat. Removal of material for placement on Cat Island would cause a long-term change in bathymetry at the borrow area. Near Cat Island, bottom depth would decrease by approximately 5 feet to a depth of approximately -20 feet NAVD88 (from current average depths of -15 feet NAVD88) across an area of approximately 282 acres. The slopes of the inshore borrow area would be expected to flatten and backfill with sand over time. Therefore, bathymetric impacts would not be significant.

Removal of material from the borrow areas would result in long-term minor changes in bathymetry at the Ship Island, Horn Island Pass, PBP-MS, PBP-AL, and PBP-OCS borrow sites. Removal of material would not significantly affect island morphology, the movement of sand, or hydrological processes. The slopes of the inshore borrow areas would be expected to flatten and backfill with sand and finer-grained material over time.

The future placement of dredged material from Pascagoula Federal Navigation Channel at the combined DA-10 littoral placement area would continue to be used for disposal of material from the Pascagoula Harbor Navigation Channel. However, placement would primarily occur in different parts of the site. This continued use, focused in the south and west parts of the disposal area will maintain bathymetry that is conducive to sediment transport to the downdrift barrier islands.

(b) Coastal Habitats. Placement of dredged sandy material on the nearshore and frontal dune area of the barrier islands would result in short-term disruption to barrier island beach habitats and associated flora and fauna within the footprint of the construction areas. Although flora and fauna occupying these habitats would be lost, the various habitats would reestablish and these areas would re-colonize

and following restoration. Losses would be ongoing during the entire construction period of the project, but would be limited to the specific locations undergoing restoration at any given time. Recolonization would begin as soon as construction in a given area is completed and be ongoing during the construction period.

(c) Fish. Placement of material to create barrier island habitat and removal of material from the designated borrow areas would result in temporary disruption to the mature fish community in the vicinity of the project area. The action would result in a short-term impact to shallow foraging areas, nursery areas during construction and long-term beneficial impacts to fish habitat by enhancing shallow foraging areas, nursery areas, and SAV areas around the barrier islands in Mississippi Sound following implementation. Potential impacts to fish include:

- Adult fish could experience temporary minor (and therefore not significant) impacts from turbidity plumes and construction-related noise.
- Egg, embryonic, and larval stages of fish could be susceptible to mortality due to placement of material. However, given the amount of habitat and the sizes of fish populations in Mississippi Sound, impacts would be minor, and therefore not significant.
- Benthic habitat and shallow foraging areas/nursery areas in and near Camille Cut would be permanently lost or experience short-term alteration during construction. Foraging areas, including SAV habitat, would be enhanced north of the closed Camille Cut following restoration. Given the amount of habitat available, impacts would not be significant.

6. Actions Taken to Minimize Impacts. Since the material to be placed is naturally occurring sand similar to the substrate of the beach nourishment site, no further actions are deemed necessary.

b. Water Column Determinations

1. Salinity. The closure of Camille Cut would reduce the movement of higher salinity water into Mississippi Sound, resulting in a reduction in salinity to near pre-Hurricane Katrina conditions. Water quality modeling as discussed in the SEIS indicates that closing of Camille Cut indicate that implementation of the proposed action would result in decreases in salinity within the Sound. Following restoration of Ship Island, salinity along the north side of Ship Island (shoreward of Camille Cut) could decrease, since more saline waters from the Gulf of Mexico would no longer have direct access to that area. This would restore a profile more beneficial for estuarine health in this area. Water quality modeling results demonstrated that the proposed restoration actions would result in a reduction of salinity which indicates that the proposed restoration efforts would limit the influence of higher salinity water into the waters north of the barrier islands (i.e. the Sound). Modeling simulations indicate that implementation of the proposed action would result in salinity levels similar to pre-Katrina conditions.

2. Water Chemistry (pH, etc.). Dredging and dredged sandy material placement activities associated with the Proposed Action would result in short-term direct impacts and would not significantly degrade water quality in or near the barrier islands. Impacts would occur at specific borrow and placement locations at any given time, with the location dependant on the phase of construction and overall construction schedule. Temperature, salinity, and dissolved oxygen (DO), profiles would be affected as a result of water column mixing during sediment removal and placement activities. Profiles would return to previous conditions following completion of activities. Any impacts to profiles would be temporary and minor.

The material from the borrow areas consists primarily of fine to coarse-grained sand with less than 10 percent fines. This sand size is consistent with that for beaches of the MS barrier islands. In addition, the U.S. Army Corps of Engineers (USACE), Mobile District has routinely conducted sediment analyses on its federally authorized navigation projects, which include several within and near the MsCIP barrier island restoration effort. This material has been sampled using the protocols of the Inland and Ocean Testing manuals and found to be suitable based on physical, chemical, and biological parameters.

3. Clarity. Construction could temporarily impact localized turbidity around the dredging and placement areas. The generation of turbidity could reduce light penetration through the water column, thereby reducing photosynthesis and affecting surface water temperatures and aesthetics in the vicinity. These conditions could also alter visual predator-prey relations and result in respiratory stresses in fish. During construction, turbidity levels around the placement locations would be monitored, as appropriate, to confirm that turbidity levels outside the 750-foot mixing zone do not exceed the background turbidity levels by more than the typical state standard of 50 NTUs. Modeling of impacts indicates that exceedances of the standard outside the mixing zone could occur requiring a waiver for reasonable and temporary deviations from the turbidity standards.

4. Color. Other than the temporary color changes resulting from turbidity generated by the construction activities, no permanent changes to the color of the water is expected.

5. Odor. No effect.

6. Taste. No effect.

7. Dissolved Gas Levels. Minor changes in DO are expected, however, these changes would not be significant as discussed in the SEIS.

8. Nutrients. Concentrations of nutrients could increase locally for short periods following sediment removal and placement. However, inflow from coastal rivers and the currents and waves in Mississippi Sound would quickly dilute material in the water column and not promote nutrient concentration. Any impacts would be temporary and minor.

9. Eutrophication. No effects.

c. Water Circulation, Fluctuation, and Salinity Determinations

1. Current Patterns and Circulation.

(a) Current Patterns and Flow. Overall results of the hydrodynamic modeling found that Mississippi Sound in the vicinity of Ship Island has very limited flushing and net water transport through the system. Therefore, the effects of changes to Ship Island (either further degradation or restoration) do not have major effects on system wide circulation and should not have major effects on system wide water quality conditions.

(b) Velocity. Currents that now flow through Camille Cut would be eliminated.

2. Stratification. No significant effects.

3. Hydrologic Regime. See (a) and (b) above. No significant effects.

4. Normal Water Level Fluctuations. No effects.

5. Salinity Gradient. See b (1) above.

d. Suspended Particulate/Turbidity Determination.

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Placement Site. Construction would be expected to temporarily impact localized turbidity around placement areas. The generation of turbidity is a potential risk, since turbidity would increase as a result of these activities and could reduce light penetration through the water column, thereby reducing photosynthesis, affecting surface water temperatures and aesthetics in the vicinity. These conditions could also alter visual predator-prey relations and result in respiratory stresses in fish. Additional modeling work would occur prior to construction to identify specific Best Management Plans (BMPs) or changes to construction activities necessary to control turbidity concentrations. During construction, turbidity levels around the placement locations would be monitored, as appropriate, to confirm that turbidity levels outside the 750-foot mixing zone do not exceed the background turbidity levels by more than 50 NTUs. MS Department of Environmental Quality (MDEQ) can grant exemptions to the turbidity standards in cases of emergency to protect public health and welfare, and for environmental restoration projects. Project activities could result in reasonable and temporary deviations from the standard if reviewed and approved by MDEQ.

Sand placement near SAV areas may require site-specific BMPs to avoid temporary or permanent impact. It is not anticipated that the activities from this project would impact the turbidity of the water after the project is completed.

BMPs would be implemented to protect water quality in the vicinity of Cat Island and Ship Island during restoration activities. They could include plantings of native vegetation to stabilize new barrier island habitat areas, the use of turbidity barrier

around sensitive habitats, the inspection of equipment for leaks, and the establishment of containment areas for the storage of equipment fuels and lubricants.

2. Effects on Chemical and Physical Properties of the Water Column.

(a) Light Penetration. Slight decreases in the degree of light penetration may occur during placement activities. These impacts would be temporary in nature and restricted to the immediate area of placement.

(b) Dissolved Oxygen. Changes in DO and nutrients could also occur due to mixing and release of sediments into the water column during sediment removal and placement. DO concentrations could decrease during and immediately following dredging due to the movement of anoxic water and sediments through the water column. DO could also be affected by short-term increases in organic material and associated aerobic decomposition. Any impacts would be expected to be restricted to the immediate vicinity of the removal and placement areas. Once activities cease and disturbed material settles, DO concentrations would return to pre-disturbance levels. Any impacts would be temporary and minor. Modeling data from the evaluation of the proposed restoration indicate a minor reduction in DO would occur post construction. However, the largest reduction of DO concentration would still be well within the MSDEQ standards for DO in ocean waters.

(c) Toxic Metals and Organics. No effects.

(d) Pathogens. No effects.

(e) Aesthetics. Only temporary degradation to the aesthetic environment would occur as a result of excavation and placement operations. Impacts would primarily occur as a result of the physical presence of heavy equipment. Some minor increases in turbidity may be observed in the immediate vicinity of excavation and placement activities but these increases would be minor and short-term in nature.

3. Effects on Biota.

(a) Primary Production Photosynthesis. No long-term significant impacts is expected to occur due to the physical nature of the material to be excavated. Construction could temporarily impact localized turbidity around borrow and placement areas. The generation of turbidity is a potential risk, since turbidity would increase as a result of these activities and could reduce light penetration through the water column, thereby reducing photosynthesis, affecting surface water temperatures and aesthetics in the vicinity.

(b) Suspension/Filter Feeders. No significant effects. No oyster reefs, worm reefs, significant clam communities are known to be prominent within the vicinity of the project.

(c) Sight Feeders. No significant effects.

4. Actions Taken to Minimize Impacts (Subpart H). No further actions are

deemed appropriate.

e. Contaminant Determinations. The material to be utilized during restoration of the MS barrier islands meets the criteria set forth in 20 CFR 230.60(b). The material is characterized as clean sand which is sufficiently removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the material would not be contaminated by such pollution. In addition, the material originates in the near vicinity of the placement activity and is similar to the substrate of the placement site, and receives the same overlying waters as the placement site. Hence, no further physical, biological, or chemical testing is required pursuant to the 404(b)(1) Guidelines. However, on April 20, 2010, the floating semi-submersible mobile offshore drilling unit Deepwater Horizon experienced an explosion and fire. The rig began leaking into the Gulf of Mexico. The total amount of oil and natural gas that has escaped into the Gulf of Mexico is unknown, but is currently believed to be approximate 4.9 million barrels. The spill has been known to cause extensive damage to marine and wildlife habitats as well as the Gulf's fishing and tourism industries.

USACE conducted statistically random sediment testing on all borrow and placement areas in June 2010. Grab samples were taken and tested for total petroleum hydrocarbons (TPHs). Concentrations of TPH in more than 98 percent of the tested samples were below method/laboratory detection limits. Random samples within the sampling grid were found to contain concentrations of TPH, but there was no pattern to the presence of TPH. Based on USACE conversations with U.S. Coast Guard and the lead of the Operational Science Agency Team (OSAT3), the likelihood of the presence of oil in offshore borrow sites is low.

The presence of tar balls is not expected to result in significant impacts to any biological resources using that area or the placement area. Tar balls are composed primarily of sand mixed with degraded oil product. These features are formed when the degraded oils become entrained within the surf zone and adhere to the sand particles. The repetitive movement within the surf zone causes the oil-sand particles to coalesce into balls of various shapes and sizes. The toxicity of these materials has been tested and, due to the degraded nature of the oils, is very low.

f. Aquatic Ecosystem and Organism Determinations. No significant effects.

1. Effects on Plankton. Elevated turbidity levels and decreased light transmission caused by suspended material during dredging and placement activities could result in a temporary localized reduction in phytoplankton and zooplankton abundance as discussed in the SEIS. Turbidity and suspended solids will likely increase during dredging and placement operations. Planktonic organisms will be carried into and out of the project area via currents during and after sediment removal and placement activities. Impacts would be restricted to localized patches of plankton. Any impacts would not be considered significant. As a result, there would be no potential adverse change in the health of populations, community structure and composition, trophic structure, or system function.

2. Effects on Benthos. Temporary disruption of the aquatic community is anticipated by the excavation and placement activities. The excavation and direct placement of sands from the borrow sites would result in the mortality of some percentage of the existing benthic assemblages. Non-motile benthic fauna within the area may be destroyed by the proposed work, but should repopulate within several months after completion. Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes, are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility.

3. Effects on Nekton. Some fish within and in close proximity of the excavation and placement area would likely leave the area until condition return to be more favorable; however, it is not anticipated that all such organisms would vacate the area. It is logical to speculate that many organisms would avoid an area of disruption such as that associated with the dredging and placement of fill material. Some nektonic filter feeders may be killed as a result of being in the affected area and other organisms less capable of movement, such as larval forms, may be physically stressed by the placement of sand. Generally, most organisms would avoid the area and later return to the area. Total impacts to the nektonic community would quickly recover are not considered significant.

4. Effects on Aquatic Food Web. No significant effects.

5. Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. All of Petit Bois, Horn, East Ship, West Ship Islands, and portions of Cat Island are located within the boundaries of the GUIS MS unit under the jurisdiction of the NPS. Petit Bois and Horn Islands also have been designated by the U.S. Congress as the Gulf Islands Wilderness under the Wilderness Act. The designation affords additional significance and protection to these islands. All dredging and placement activities associated with the proposed barrier island restoration are being coordinated with the NPS and no adverse impacts are expected to occur for any of these resources.

(b) Wetlands. Placement of dredged sandy material on the barrier islands could result in temporary disruption to the unconsolidated shoreline wetlands in the vicinity of the proposed action. Such effects could cause temporary direct impacts to plant reproduction, as well as reproduction and foraging habitats for wildlife. This could create a short-term impact to both habitat and available nutrients for marine invertebrates, fishes, and wading birds. To offset the temporary disruption of shoreline wetlands on Cat and Ship Islands, closure of Camille Cut between East Ship and West Ship Islands would result in a long-term beneficial impact from the creation of about 71 acres of unconsolidated shoreline habitat. This would result in a net gain unconsolidated shoreline habitat across the project area. In addition, the restored barrier islands would serve to provide greater protection to coastal wetland habitats in MS from the intensity of storm surges and storm waves, and saltwater intrusion into freshwater systems. The net gain of unconsolidated shoreline habitat and long term benefits provided by the restoration action would offset the permanent and temporary impacts resulting from

project construction.

(c) Mud Flats. Not applicable.

(d) Vegetated Shallows. Placement of materials could damage SAV areas if placement material is placed in their vicinity. However, no SAV beds have been mapped in locations proposed for sediment removal or placement (Vittor, 2011). Placement of sand near, but not directly in the current SAV area, as part of the Proposed Action has the potential to provide a long-term benefit through an increase in the areas for colonization of SAV. Restoration of Ship Island could further enhance potential habitat for SAV in the littoral areas around Camille Cut.

Staging of construction equipment would not occur in areas of mapped SAV. However, construction activities could result in temporary disruption and negligible impacts to nearby SAV as a result of increased turbidity. Best management practices and monitoring as described in Section 5.3 would be implemented to prevent impacts to SAV.

(e) Coral Reefs. Not applicable.

(f) Riffle and Pool Complexes. Not applicable.

6. Effects on Threatened and Endangered Species. Pursuant to Section 7 of the Endangered Species Act, the proposed Federal action is being coordinated with the USFWS and the NMFS. Green, Kemp's ridley, and loggerhead sea turtles may commonly occur in the project area. Project implementation would use hydraulic, hopper and mechanical dredges, pipelines, barges, anchors, and booster pumps. Late juvenile life history stages of sea turtles are benthic feeders and without protective measures these animals could be captured or entrained by dredging equipment. The NOAA Fisheries Service issued the Gulf Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts (Gulf of Mexico Regional Biological Opinion [GRBO]) (Consultation Number F/SER/2000/01287) dated November 19, 2003, which determined that a hydraulic cutterhead dredge was not known to impact Gulf sturgeon or sea turtles. The GRBO also identified conditions to minimize the potential for impacts to protected species when using a hopper dredge. GRBO was updated in 2005 and 2007.

The Gulf sturgeon migrates through Mississippi Sound and may occur in the project area at any time. The Gulf sturgeon feeds on the bottom and could be captured or entrained by some types of dredging equipment (e.g. hopper dredges). Temporary displacement could result from the disturbance associated with dredging activities. Gulf sturgeon occur regularly in the project area, but dredging impacts would be expected to be limited to incidental contact during foraging and subsequent avoidance of active work areas. Following the completion of dredging activities, any displaced animals would be expected to resume use of the general area. Because the species tends to concentrate around the barrier islands when in the project area, it would likely be displaced from some preferred areas by placement activities. Because dredging and placement would

comply with the GRBO, only minor temporary impacts to Gulf sturgeon would be expected and the impacts would not be significant.

The project area includes two units of Gulf sturgeon critical habitat (Units 2 and 8). Because Unit 2 comprises portions of the Pascagoula River and its tributaries landward of the bay, this unit is outside of the removal and placement footprints. Unit 8 encompasses Mississippi Sound and other open water areas connected to the Sound. Unit 8 is identified as containing four of the primary constituent elements that identify critical habitat: abundant prey items, sediment quality, water quality, and migration habitat. Activities associated with placement, particularly for closing Camille Cut, would cover epibenthic crustaceans and infaunal polychaetes that serve as potential prey items for the Gulf sturgeon. The placement activities would result in a loss of a small portion of designated Gulf sturgeon critical habitat (GSCH) within the Camille Cut and East Ship placement area, and Cat Island.

The piping plover winters along the Gulf Coast and migrates north during the remainder of the year. There would be a temporary loss of some potential foraging areas around placement sites habitat at Camille Cut and East Ship Island, including designated critical habitat would be impacted. The piping plover winters along the Gulf Coast and migrates north during the remainder of the year. There would be a loss of some potential foraging areas around placement sites. Habitat at Camille Cut and East Ship Island, including designated critical habitat would be impacted during sand placement activities. Following restoration, there would be a long-term increase of new areas of potential habitat for this species. In addition, as the land mass of barrier islands and the amount of tidally exposed land increases and becomes colonized by prey items, the amount of potential foraging habitat would increase. At Cat Island critical habitat would be impacted. The fill would result in the long-term creation of an additional land above MLLW. Collectively, there would be a long-term benefit to the species through the net creation of habitat in the project area and no long-term adverse effects would be expected during sand placement activities. Following restoration, there would be a long-term increase of habitat for this species. In addition, as the land mass of barrier islands and the amount of tidally exposed land increases and becomes colonized by prey items, the amount of potential foraging habitat would increase. At Cat Island critical habitat would be impacted. The fill would result in the long-term creation of an additional land above MLLW. Collectively, there would be a long-term benefit to the species through the net creation of habitat in the project area and no long-term adverse effects would be expected.

The West Indian manatee is a transient visitor to the project area during warmer months. Dredging and placement of the sediments may cause these animals to alter their route, but would not prevent their passage across the project area. This species would likely attempt to avoid the dredging and placement areas due to noise and activity, but the West Indian manatee is a slow swimmer with poor visual acuity and may not always be able to avoid activity areas. As a precaution, standard manatee conditions would be followed during construction activities. No long-term effects from to this species would result from the dredging and placement of the material used for this

restoration effort. Effects to the manatee would not be significant.

7. Effects on Other Wildlife. No significant effect.

8. Actions to Minimize Impacts. All reasonable and prudent measures recommended by the NPS, USFWS and NMFS would be initiated during excavation and placement activities.

g. Proposed Disposal Site Determinations.

1. Mixing Zone Determination. The proposed action would comply with the zone of mixing as determined by the State of Mississippi. In the case of placement of material on the beach and a variance from the state mixing zone to cover specific climatic instances when the turbidity standard might be violated and will be incorporated into the WQC permit.

2. Determination of Compliance with Applicable Water Quality Standards. As a result of previous water quality certification (WQC) application activities, it is believed that the proposed Federal action would comply with applicable water quality standards. WQC and coastal zone consistency (CZC) with the state coastal management plan will be requested from the MDEQ and Mississippi Department of Marine Resources (MDMR) for the proposed plan.

3. Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supply. There will be no impacts to water supplies located in the region.

(b) Recreational and Commercial Fisheries. The significance criteria for commercial and recreational fishing in the project area would be a permanent localized loss of a commercial or sport species or a change in the habitat structure in the area that would lead to a change in species composition and ultimately lead to long-term changes in revenue for fisheries in Mississippi Sound. Sediment removal and placement would temporarily disrupt fish distribution and localized commercial and recreational fishing in the immediate vicinity of the activities. However, once operations were completed, the fish community would return to the area and commercial and recreational fishing activities would return to previous conditions. In addition, during the operations, fishing activities could be conducted at other locations in Mississippi Sound. Use of the placement areas would be expected to resume after work is complete. Any negative impacts to commercial and recreational fisheries from restoration activities would not be significant.

Long-term beneficial impacts to fish habitat would occur from stabilization and enhancement of the shallow water nursery and foraging habitat around the barrier islands. Furthermore, restoration of the Cat and Ship Islands would help limit saltwater intrusion into Mississippi Sound, helping to protect and maintain critical habitat for a variety of estuarine dependant species (e.g. the Eastern oyster, shrimp, blue crab,

speckled trout).

(c) Water Related Recreation. During the borrow and placement activities, recreational activities such as sunbathing, nature viewing, boating, sailing, and fishing along the barrier islands may be temporarily disrupted, limited, or altered. Potential temporary impacts may include noise, visual intrusion, and turbidity. Impacts for the lifetime of the restoration project would include the loss of fishing areas in Camille Cut between East Ship and West Ship Islands and the loss of the Camille Cut as an access point to the Gulf of Mexico.

There would be a significant long-term benefit to recreation on Ship Island from the Proposed Action. The Proposed Action would provide storm damage reduction to two historic sites on East and West Ship Islands and increase the amount of land available for fishing, wildlife observation, hiking and similar recreational activities.

(d) Aesthetics. Temporary impacts to aesthetics would occur in the immediate vicinity of the Proposed Action during sediment removal and placement activities. Many people utilize Mississippi Sound and the barrier islands within the project area and would likely be disturbed by the presence of heavy equipment and working vessels during implementation of the restoration. However, sediment dredging and placement activities would be temporary and impacts would be minor.

The barrier island restoration project is likely to provide residents and visitors with an overall more aesthetically pleasing view as activities are completed and would result in long-term improvements to visual and aesthetic resources.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. All of Petit Bois, Horn, East Ship Island, West Ship Island, and portions of Cat Island are located within the boundaries of the GUIS Mississippi unit under the jurisdiction of the NPS. Petit Bois and Horn Islands also have been designated by the U.S. Congress as the Gulf Islands Wilderness under the Wilderness Act. The designation affords additional significance and protection to these islands. All dredging and placement activities associated with the proposed barrier island restoration are being coordinated with the NPS and no adverse impacts are expected to occur for any of these resources.

(f) Other Effects. No effect.

h. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed action is not expected to have significant cumulative adverse impacts. The action would have cumulative beneficial impacts due to erosion attenuation.

i. Determination of Secondary Effects of the Aquatic Ecosystem. The proposed action is not expected to have any significant secondary adverse effects on the aquatic ecosystem.

III. FINDING OF COMPLIANCE

a. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

b. No practicable alternative exists which meet the study objectives that does not involve discharge of fill into the waters of the United States.

c. After consideration of placement site dilution and dispersion, the placement fill material along the beach and nearshore zone would not cause or contribute to, violations of any applicable State water quality standards for Class III waters.

d. As required by the CZMA, the proposed action is consistent with the Mississippi Coastal Zone Management Program to the maximum extent practicable.

e. The proposed excavation and barrier island restoration would 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 specified by the Endangered Species Act of 1973, as amended.

f. The proposed excavation and beach restoration would not result in significant adverse effects on human health and welfare, including municipal and private water supplies; recreation and commercial fishing; life stages of organisms dependent upon the aquatic ecosystem; ecosystem diversity, productivity and stability; or recreational, aesthetic or economic values.

g. Appropriate and practicable steps to minimize potential adverse impacts on the aquatic ecosystem have been included in this evaluation.

h. On the basis of the guidelines, the proposed site for placement of fill materials is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

DATE_____ _____

Jon J. Chytka
Colonel, Corps of Engineers
District Commander