Draft ENVIRONMENTAL ASSESSMENT

FOR

BENEFICIAL USE OF DREDGED MATERIAL ADJACENT TO DEER ISLAND, MAINTENANCE DREDGING AND PLACEMENT ACTIVITIES

EAST ACCESS, WEST APPROACH AND LATERAL CHANNELS BILOXI HARBOR FEDERAL NAVIGATION PROJECT BILOXI, ALABAMA

FEDERALLY AUTHORIZED

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ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BO	Biological Opinion
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers
CZC	Coastal Zone Consistency
DA	Disposal Area
DMR	Department of Marine Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ER	Engineering Regulation
ESA	Endangered Species Act
FONSI	Findings of No Significant Impact
GMFMC	Gulf of Mexico Fishery Management Council
GIWW	Gulf Intracoastal Waterway
ITS	Incidental Take Statement
MDEQ	Mississippi Department of Environmental Quality
Mg/l	Milligrams per liter
MHTB	Mobile Harbor Turning Basin
MLW	Mean Low Water
MLLW	Mean Lower Low Water
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NLAM	Not Likely to Adversely Modify
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODMS	Ocean Dredged Material Disposal Site
O&M	Operations and Maintenance
RBO	Regional Biological Opinion
Register	National Register of Historic Places
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Officer
TSS	Total Suspended Solids
USFWS	United States Fish and Wildlife Service
WRDA	Water Resources Development Act
WQC	Water Quality Certification

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1.0 INTRODUCTION. This Environmental Assessment (EA) presents impacts that would potentially result from the placement of dredged material for beneficial use adjacent to Deer Island from the federally authorized Biloxi Harbor navigation project – East Access, West Approach and Lateral Channels. The United States Army Corps of Engineers (USACE), Mobile District proposes to beneficially use a portion of the dredged material from the Lower Harbor section of the Federal navigation channel. Up to 1,000,000 cubic yards (cys) of maintenance material dredged from the East Access Channel could be placed in the beneficial use site located adjacent to Deer Island over a period of several years. Any additional dredged material from the East Access Channel would be placed in the designated open water disposal areas. If additional funding is available, several hundred thousand cys of dredged material from the West Approach and Lateral Channels may also be dredged and beneficially used or placed within designated open-water disposal sites. The purpose of this EA is to determine whether or not the proposed action has the potential for creating significant impacts to the environment and would thereby warrant a more detailed study on possible impacts, mitigation, and alternative courses of action.

The National Environmental Policy Act (NEPA) of 1969, as amended, excuses or excludes Federal agencies from the preparation of any formal environmental analysis with respect to actions that result in minor or no environmental effects, which are known as "categorical exclusions." An intermediate level of analysis, an EA, is prepared for an action that is not clearly categorically excluded, but does not clearly require an Environmental Impact Statement (EIS) [40 Code of Federal Regulations (CFR) §1501.3 (a) and (b)]. Based on the EA, Federal agencies either prepare an EIS, if one appears warranted, or issue a "Finding of No Significant Impact" (FONSI), which satisfies the NEPA requirement. This EA is prepared according to the USACE Engineer Regulation (ER) 200-2, Procedures for Implementing NEPA, and the Council of Environmental Quality (CEQ) Regulations (40 CFR § 1508.27) for Implementing the Procedural Provisions of NEPA (40 CFR § 1500-1508).

1.1 Location. The federally authorized Biloxi Harbor Navigation Project is located in the City of Biloxi, Harrison County, Mississippi (**Figure 1**). Biloxi, Mississippi is located approximately 45 miles west of Mobile Bay, Alabama and 77 miles east of New Orleans, Louisiana. The City of Biloxi is situated on a peninsula bounded by Mississippi Sound on the south, Biloxi Bay on the east, and Back Bay of Biloxi on the north. Biloxi Bay encompasses a surface area of approximately 150,470 acres and is located within 10 miles of the Gulf Intracoastal Waterway

(GIWW) and approximately 2 miles south of Interstate 10. Access to the Bay is provided by the Biloxi Harbor Federal Navigation Channel and is connected to the GIWW. Deer Island is located just off the shore of the City of Biloxi in the Mississippi Sound.

1.2 Description of the Entire Authorized Project. Biloxi Harbor and the surrounding bodies of water have a long history of maritime industry. The USACE, Mobile District is responsible for the operations and maintenance of the federally-authorized Biloxi Harbor navigation project. The navigation project consists of the following dimensions:

Lower Harbor:
The 10-mile East Access Channel extends northward from the GIWW east of Deer Island to the railroad bridge just north of Highway 90 crossing to the mouth of the back bay of Biloxi. The channel dimensions are 12 feet deep by 150 feet wide.

The West Access Channel is a total of 7 miles long, consisting of the 4-mile West Approach Channel west of Deer Island, which measures 10 feet deep by 150 feet wide, and the 3-mile Biloxi Lateral Channel north of Deer Island, which measures 12 feet deep by 150 feet wide and joining the East Access Channel at mile 2.5.

Upper Harbor:
The Main Back Channel extends from the railroad bridge just north of U.S. Highway 90 through the Back Bay of Biloxi to the D'Iberville Bridge (I-110), a distance of approximately 4-miles. The channel dimensions are 12 feet deep by 150 feet wide.

The Ott Bayou Channel at 12 feet deep by 150 feet wide extends from the junction of the main Back Bay Channel for a distance of 1.2-miles and terminates at a 12-foot deep by 600-foot wide turning basin located opposite of Ott Bayou.

The East Harrison County Canal at 12 feet deep by 150 feet wide extends a distance of approximately 2,100 foot long channel from the main Back Bay Channel and terminates at a turning basin fronting the northeast shore of the City of Biloxi.

Back Bay Portion:
The Back Bay Channel (remainder) at 12 feet deep by 150 feet wide extends from the D'Iberville Bridge (I-110) to the junction of Bernard Bayou and the Industrial Seaway.

The Industrial Seaway is five miles long and includes turning basins in Gulfport Lake and at the western terminus of the channel. The dimensions of the channel vary from 12 feet deep by 150 feet wide from the Back Bay channel to the turning basin in Gulfport Lake and 12 feet deep by 100 feet wide from that point to the western terminus.

1.3 Description of the Proposed Action. The federally authorized Biloxi Harbor navigation project was most recently certified in 2007 with Public Notice FP07-BH01-14. Due to the recent reconstruction of the southern Deer Island shoreline in 2011 authorized by Section 528 of the Water Resources Development Act of 2000, there is a unique opportunity to beneficially use dredged material adjacent to the island which will create some inter-tidal marsh and enhance the local coastal ecosystem. The USACE, Mobile District proposes to beneficially use a portion of

the dredged material from the Lower Harbor section of the Federal navigation channel. Up to 1,000,000 cys of maintenance material dredged from the East Access Channel could be placed in the beneficial use site located adjacent to Deer Island (**Figures 2, 3 & 4**). This site adjacent to Deer Island will likely be beneficially used multiple times over an extended period of time due to dredged material consolidation. It can serve as a permanent dredged material disposal site for O&M actions in Biloxi Harbor. Any additional dredged material from the East Access Channel that cannot fit into the beneficial use area would be placed in the designated open water disposal areas (**Figure 5**). If additional funding is available, several hundred thousand cys of dredged material from the West Approach and Lateral Channels (**Figure 5**) may also be dredged and used beneficially or placed within designated open-water disposal sites.

1.4 Purpose and Need for the Proposed Action. The primary objective and overall project purpose is to beneficially use dredged material in a cost effective manner and to enhance the local ecosystem on Deer Island. The Mississippi Department of Marine Resources (DMR) has been working with federal, state and private partners for nearly a decade to promote the beneficial use of dredged material for coastal land and habitat restoration. Using Deer Island as a beneficial use site meets a public need to beneficially use dredged material instead of disposing the material in open water. Deer Island is in great need of the sediment replacement due to the succession of hurricanes that have severely eroded the island. This proposed project provides a unique opportunity to restore previously eroded portions of the island, create some inter-tidal marsh and enhance the local coastal ecosystem. This is also an opportunity to beneficially use dredged material consistent with federal standards.

1.5 Authority, History, and Improvements. The USACE, Mobile District is responsible for maintaining Federal navigation channels along the Gulf of Mexico from Mississippi through the panhandle of Florida. The Biloxi Harbor Navigation Project was federally authorized by Congress through the River and Harbor Act of 1966 and Section 107 River and Harbor Act of 1960. The existing project, prior to modification authorized in 1966, was commenced in 1931 and completed in 1962. Modifications to the project authorized in 1966, were completed in Fiscal Year (FY) 1975. Modifications authorized in May 1979 by Section 107 authority for improvement of Commercial Small Craft Harbor were completed in FY 1980. The East Harrison County Canal project authorized in August 1985 was completed in FY 1986. Although, the average maintenance cycles typically occur approximately every one to three years, it is dependent upon where shoaling occurs within the channel and the available funding. **Figure 1** is a vicinity map of the Federally Authorized Biloxi Harbor Navigation Project and **Figure 4** is an aerial view of the project area.

A complete Biloxi Harbor dredging summary since the 1970s can be found in **Table 1** at the end of this report. Several million cubic yards of dredged material have been removed from and disposed of from this harbor over the past five decades. Most of the dredged material has been placed in open water disposal sites with a small percentage going to upland disposal areas, beach nourishment projects or beneficial uses areas. Federal standards state it is critical to beneficially use the majority of the future dredged material to avoid or greatly reduce open water and upland disposal options.

The USACE, Mobile District completed the EIS in February 1974 for existing navigation channels, expansion of an existing Federal channel and transfer of existing channels which were constructed and maintained by local interests into a Federal project within Biloxi Harbor, Mississippi. In addition, a Detailed Project Report/Navigation Study and EA were completed for Biloxi Bay to East Harrison County Industrial Park in March 1984. After Hurricane Katrina, the Mississippi Coastal Improvements Program (MsCIP) Comprehensive Plan and Integrated Programmatic EIS was completed for the entire coast of Mississippi in June 2009. These documents were coordinated with all applicable Federal, state and local agencies and interested public and are available for review at the USACE, Mobile District Office.

Deer Island restoration was authorized under Section 528 of the WRDA of 2000. USACE conducted its initial island restoration study under Section 528. The project was conducted under the authority of PL 84-99, Flood and Coastal Storm Emergencies (33 U.S.C.701n) (69 Stat. 186). Appropriation for construction of the project was received by PL 109-359, making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2006, and for Other Purposes (December 18, 2005). A significant amount of the island was restored during 2010 and 2011. Almost two million cubic yards of sandy dredged material was placed on Deer Island repairing the breached section of the island and the eroded southern shoreline. The breached area was filled with 1.1 million cubic yards of sand to create an 87.7 acre area reconnecting the separated sections of the island. Approximately 19,815 feet of shore line was reconstructed with 800,000 cys of dredged sandy material. Replanting of the breach area is scheduled for fall 2011.

1.6 Biloxi Bay. Biloxi Bay is a long, narrow, dog-leg shaped bay with the inner portion, known as the Back Bay, about 8 miles long and parallel to the Mississippi Sound. The remaining four-mile portion of the bay is oriented in a northwest-southeast direction and extends from the Mississippi Sound to the Back Bay. Major tributaries include Old Fort Bayou, Davis Bayou, Bernard Bayou, Biloxi River and Tchoutacabouffa River. The average depth within the project area of Biloxi Bay at mean low water is 14.3 feet. Much of this depth is contributed by a natural channel with depths up to over 25 feet; however, depths of 3 feet or less are more characteristic of the bay. The average tidal range is 1.8 feet with 150,470 wet surface acres existing at mean high water. Industrial development in the area involves the tourist industry, the seafood industry, the casino industry and medium and light manufacturing. The manufacturing industry is primarily concentrated along the Industrial Canal at the terminus of the project. The Canal has become a gathering point for a group of businesses involved in composites and shipbuilding and repair. The Canal is the home of Gulf Ship, LLC, Northrop Grumman Shipbuilding Gulf Coast, Seemann Composites, Southern Recycling, LLC, Trinity Yatchs, LLC and Warren Paving, Inc. These businesses are involved in boat repair, rock gravel, asphalt, gravel and shipbuilding. The Canal offers waterway frontage and quick access to Interstate 10 and four lane U.S. highways, the Mississippi State Port at Gulfport and Gulfport-Biloxi International Airport.

2.0 ALTERNATIVES. Three alternatives were considered for this project. These alternatives are:

1. No Action / No dredging of the authorized channel.
2. Dredging with 100% open water disposal.

3. Dredging with disposal in both open water and beneficial use areas.

2.1 No Action. NEPA defines a “no action” as the continuation of existing conditions in the affected environment without the implementation, or in the absence of the proposed action. Inclusion of the “no action” alternative is prescribed by the CEQ regulations as the benchmark against which Federal actions are to be evaluated.

The implementation of the “no action” alternative would result in discontinuing project maintenance dredging to its authorized depths of -12 feet Mean Lower Low Water (MLLW) plus 2 feet of advanced maintenance and 2 feet of paid allowable over depth. This alternative would result in a waterway that would eventually fill with sediments and become unsafe and non-navigable for commercial and recreational boats. Shoaling would develop at various times and places and the channel would eventually be closed to boaters. This would forego the benefits of the waterway by eliminating a key link connecting the coastal Mississippi inland waterway to the Mississippi Sound and the Gulf of Mexico. Project abandonment would place an economic stress on the commercial and recreational investments already dependent on the project. Therefore, the "no action" alternative was deemed unacceptable and not considered further.

2.2 Dredging with 100% open water disposal. This alternative would dredge the channels to their authorized depth and place 100% of the dredged material into the open water disposal areas associated with each channel. Maintenance dredging would occur to authorized depths of -12 feet MLLW plus 2 feet of advanced maintenance and 2 feet of paid allowable over depth. This alternative would ensure that the waterway would remain safe and navigable for commercial and recreational boats. The waterway would remain a key link connecting the coastal Mississippi inland waterway to the Mississippi Sound and the Gulf of Mexico. This alternative was most recently certified in 2007 with Public Notice FP07-BH01-14.

2.3 Dredging with disposal in both open water and beneficial use site. This alternative would place the majority of dredged material from the navigation channel into the beneficial use area adjacent to Deer Island. Once the area was at capacity, the remaining material would be placed in the open water disposal areas. Maintenance dredging would occur to authorized depths of -12 feet MLLW plus 2 feet of advanced maintenance and 2 feet of paid allowable over depth. This alternative would ensure that the waterway would remain safe and navigable for commercial and recreational boats. The waterway would remain a key link connecting the coastal Mississippi inland waterway to the Mississippi Sound and the Gulf of Mexico.

Placing the dredged material in the beneficial use area on Deer Island is the preferred alternative and considered the most viable option. Most of the dredged material from the channel can be placed in the beneficial use area and have a long term benefit to the island. The material will add structural stability to the island, create an inter-tidal marsh, replace lost sediment, and help reduce the amount of erosion on the island. Placing the dredged material at any other beneficial use site on Deer Island or any other area in the vicinity of the project site is not feasible due to the lack of available containment cells.

3.0 AFFECTED ENVIRONMENT

3.1 Fish and Wildlife Resources

*Oyster Reefs***.** Oyster reefs of commercial importance are subtidal and form aggregates that cover thousands of acres throughout the Mississippi Sound. The oysters inhabit shallow estuarine waters during all life stages. The Mississippi Department of Marine Resources (MDMR) manages 17 natural oyster reefs. The areal extent of oyster reefs in Mississippi is estimated at approximately 10,000 to 12,000 acres, of which approximately 7,400 acres are located in western Mississippi Sound. Approximately 97 percent of the commercially harvested oysters in Mississippi come from the reefs in western Mississippi Sound, primarily from Pas Marianne, Telegraph, and Pass Christian reefs (MDMR 2009). Oyster reefs are particularly productive biological areas. The animals and plants, which are associated with the oyster reef community, are varied and numerous and include algae, sponges, hydroids, polychaetes, other mollusks, barnacles, bryozoans, tunicates, and a number of species of fish. Note: Many of the oyster reefs located in Mississippi were destroyed or severely damaged by Hurricane Katrina and Rita in 2005. The states are currently investing a significant amount of resources to rebuild them. The oyster and fishing reefs in Biloxi Bay have been undergoing reconstruction for the past five years since Hurricane Katrina. Some of these reefs are within several hundred feet of the proposed project site. See **Figure 6** for a location of the oyster and fishing reefs in the vicinity of the project.

Submerged Aquatic Vegetation. Mississippi Sound encompasses an area of 4,792 km^2 and contains 12,140 ha of submerged aquatic vegetation (SAV) (USEPA 1999). Seagrass represents the primary component of SAV. Approximately 810 ha of seagrass beds have been identified along coastal Mississippi (MDFWP, 2005). Seven species of seagrass can be found in the Gulf of Mexico. Mississippi coastal waters contain three submergent bed types: barrier island seagrass, widgeon grass, and American wildcelery beds. Widgeon grass beds occur in shallow, moderate turbidity waters that are low in salinity. These beds occur in bays along bayous, and in mudflats and barrier island ponds. Size and distribution of widgeon grass beds have varied over time due to damage from hurricanes (MDFWP, 2005). SAVs serve as a vital nursery area for fish and shellfish, such as shrimp and crabs and as food for a variety of waterfowl.

Wetlands. Tidal marshes are located along the bay shorelines and the shoreline of the Mississippi Sound coast line. These marshes are typically bordered along the waters edge by a strip of salt marsh grass, *Spartina alterniflora*, with scattered stands of *S. cynosuroides, S. patens, Distichilis spicata,* and *Phragmites communis*. The majority of the marsh inside of this strip is composed of *Juncus roemerianus* (Swingle, 1971). Tidal marsh is most extensive in the Pascagoula and Pearl River area. They are also found in narrow fringes along bays, isolated bayous and along marsh islands in the sound. Wetlands and tidal marshes are rich in wildlife resources and provide nesting grounds and important stopovers for waterfowl and migratory birds, as well as spawning areas and valuable habitats for commercial and recreational fish.

Sediments. The sediments along the Federal channel consist of sand to clays with various mixtures of sand, silt, and clay located throughout the channel. Sediments found along this portion of the channel in the Mississippi Sound are primarily composed of a mix of estuarine

silty clay. Sediments are an important material affecting the physical, chemical and biological conditions for the environment. The natural sand and mud bottoms of the Mississippi Sound support a benthic infaunal population that contributes directly to the complex estuarine food web and provides important forage, spawning, and nursery areas for a variety of commercially and recreationally important fish and invertebrate species.

3.2 Terrestrial Wildlife. Animals inhabiting the open-waters within terrestrial habitats in the vicinity of the project include reptiles (alligators, turtles and snakes), small mammals (muskrat, nutria, and bats) and birds (Gulls, terns, sandpipers, plovers, stilts, skimmers, oystercatchers herons, egrets and ibises).

3.3 Benthos, Motile Invertebrates, and Fishes. The benthic community in the Mississippi Sound was classified by Vittor and Associates in a study of the Mississippi Sound and selected sites in the Gulf of Mexico (Vittor, 1982). A total of 437 taxa were collected at densities ranging from 1,097 to 35,537 individuals per square meter from the Mississippi Sound. Generally, densities increase from fall through the spring months since most of the dominant species exhibit a late winter to early spring peak in production. These species, though sometimes low to moderate in abundance, occur in a wide range of environmental conditions. They are usually the most successful at early colonization and thus tend to strongly dominate the sediment subsequent to disturbances such as dredging activities. These species include polychaetes *Mediomastus spp*., *Paraprionospio pinnata*, *Myriochele oculata*, polychaete worm *Owenia fusiformi*, *Lumbrineris app.*,*Sigambra tentaculata*, the *Linopherus-Paraphinome* complex, and *Magelona cf. phyllisa*e. The *phoronid, Phoronis ap*. and the *cumacean Oxyurostylis* also fit this category. *M. oculata* and *O. fusiformis* are predominate species in the Mississippi Sound. The numerically dominant species collected during the study were polychaete worm *M. californiensis* and *P. pinnata*.

The Mississippi Department of Environmental Quality (MDEQ) conducted yearly benthic invertebrate surveys in Mississippi Sound from 2000 through 2004. The results of these surveys identified 260 species (8,071 individuals) from 18 major classes (12 phyla) of marine benthic invertebrates taken in the areas close to the GIWW (MDEQ, 2006).

The fish community present in the vicinity of the navigation project represents a wide array of species from both near-shore and off-shore taxa. The majority of the fish species present are estuarine-dependent for part of their lifecycle. Typically, these species spawn in the Gulf of Mexico and the larvae are carried inshore to estuaries to mature (Corps, 1989). These small, immature forms (ichthyoplankton) are susceptible to flow regimes changes around the barrier islands where the surrounding grassbeds provide nursery grounds.

The major fisheries of the area include Gulf menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalus*), and Atlantic croaker (*Micropogonial undulates*) (Corps 1989). All of these species are commercially important and the estuaries within the vicinity of the project site play a key role in their lifecycle and survival. Christmas and Waller (1973) reported 138 species of finfish taken from Mississippi Sound. The most abundant species was the bay anchovy (*Anchoa mitchilli*) which serve an important forage fish for many other fish species. The channel does not provide the only habitat necessary to maintain the existing population levels of the bay anchovy.

Other areas in the Gulf of Mexico also provide the required habitat needed to maintain successful bay anchovy populations.

The most commercially important shellfish found in the area include the brown and white shrimp, blue crab, and American oyster (Swingle, 1971 and Swingle and Bland, 1974). Marine shrimp is by far the most popular seafood in the United States. There are many species of shrimp found in the Gulf of Mexico; however, only those of the family *Penaeidae* are large enough to be considered seafood. Brown shrimp (*Penaeus aztecus*), white shrimp (*P. setiferus*) and pink shrimp (*P. duorarum*) make up the bulk of Mississippi shrimp landings.

The life cycles of brown, white and pink shrimp are similar. They spend part of their life in estuaries, bays and the Gulf of Mexico. Spawning occurs in the Gulf of Mexico. One female shrimp releases 100,000 to 1,000,000 eggs that hatch within 24 hours. The postlarvae shrimp develop through several larval stages as they are carried shoreward by winds and currents. Postlarvae drift or migrate to nursery areas within shallow bays, tidal creeks, and marshes where food and protection necessary for growth and survival are available. There they acquire color and become bottom dwellers. If conditions are favorable in nursery areas, the young shrimp grow rapidly and soon move to the deeper water of the bays. When shrimp reach juvenile and subadult stages (3-5 inches long) they usually migrate from the bays to the Gulf of Mexico where they mature and complete their life cycles. Most shrimp will spend the rest of their life in the Gulf.

3.4 Essential Fish Habitat. Congress defines Essential Fish Habitat (EFH) as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The Gulf of Mexico Fishery Management Council (GMFMC) and National Marine Fisheries Service (NMFS) have identified EFHs for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine areas, such as estuarine emergent wetlands, seagrass beds, algal flats, and mud, sand, shell, and rock substrates. In addition, marine areas, such as the water column, vegetated and non-vegetated bottoms, artificial and coral reefs, geologic features and continental shelf features have also been identified. The habitat within the vicinity of the project consists of estuarine waters; shell, sand, silt and clay substrates; estuarine emergent wetlands; seagrass beds; oyster reefs and artificial fishing reefs. Within the project area EFH has been designated for managed species of red drum, reef fish, coastal migratory pelagics, shrimp, stone crab, and highly migratory species.

The following describes the preferred habitat, life history stages, and relative abundance of each EFH managed species likely to occur within the project area based on information provided by GMFMC (1998, 2004 and 2005) and Fishbase (2007).

Red Drum: Red drum occupy a variety of habitats, ranging from depths of 130 feet offshore to very shallow estuarine waters. Spawning occurs in the Gulf near the mouths of bays and inlets in the fall and winter months. Eggs hatch mainly in the Gulf, and larvae are transported into the estuary where they mature before moving back to the Gulf to spawn. Adult red drum use estuaries but tend to spend most of their time offshore as they age. They are found over a variety of substrates, including sand, mud, and oyster reefs, and can tolerate a wide range of salinities

(GMFMC, 1998). Juvenile red drum are most abundant around marshes, preferring quiet, shallow, protected waters with muddy or grassy bottoms (Simmons and Breuer, 1962). Sub-adult and adult red drum prefer shallow bay bottoms and oyster reef substrates (Miles, 1950). Within coastal Mississippi, adult and juvenile red drums are common year-round.

Estuaries are also important to the prey species of red drum. This is essential to larvae, juvenile, and early adult red drum since they spend all of their time in the estuary. Larval red drum feed mainly on shrimp, mysids, and amphipods, while juveniles feed on more fish and crabs (Peters and McMichael, 1988). Adult red drum feed mainly on shrimp, blue crab, striped mullet, and pinfish.

Brown Shrimp: Brown shrimp eggs are demersal and occur offshore. The larvae occur offshore and begin to migrate to estuaries as postlarvae. Postlarvae migrate through passes on flood tides at night mainly from February to April with a minor peak in the fall. In estuaries, brown shrimp postlarvae and juveniles are associated with shallow vegetated habitats but also are found in over silty sand and non-vegetated mud bottoms. The density of late postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water and oyster reefs; in unvegetated areas, muddy substrates seem to be preferred. Juveniles and sub-adults of brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Sub-adults migrate from estuaries at night on ebb tide of the new and full moons. Adult brown shrimp occur in neritic Gulf waters (i.e., marine waters extending from mean low tide to the edge of the continental shelf) and are associated with silt, muddy sand, and sandy substrates (GMFMC, 1998). Brown shrimp are common to highly abundant throughout coastal Mississippi year-round.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton, epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae in addition to algae and detritus (Pattillo et al., 1997).

White Shrimp: White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. Their eggs are demersal and larval stages planktonic, both occurring in nearshore marine waters. Postlarvae migrate through passes mainly from May to November with peaks in June and September. Migration is in the upper 7 feet of the water column at night and at middepths during the day. Postlarval white shrimp become benthic once they reach the estuary, where they seek shallow water with muddy-sand bottoms high in organic detritus or rich marsh where they develop into juveniles. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edges and SAVs, followed by marsh ponds and channels, inner marsh, and oyster reefs. White shrimp juveniles prefer salinities of less than 10 parts per thousand and can be found in tidal rivers and tributaries. As juveniles mature, they move to coastal areas where they mature and spawn. Adult white shrimp move from estuaries to coastal areas, where they are demersal and inhabit soft mud or silt bottoms (GMFMC, 1998). White shrimp are common to abundant throughout coastal Mississippi year-round.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton,

epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae but also on algae and detritus (Pattillo et al., 1997).

Gray snapper: Gray snapper are demersal mid-water dwellers inhabiting marine, estuarine, and riverine habitats. Gray snapper prefer SAV beds, mangroves, and coral reefs over rocky, sandy and muddy bottoms. Spawning occurs offshore from June to August around artificial structures and shoals. Eggs are pelagic and larvae are planktonic, both occurring in offshore shelf waters and near coral reefs. Postlarvae migrate into the estuaries and are most abundant over shoalgrass and manatee grass beds. Juveniles seem to prefer turtlegrass beds, SAV meadows, marl bottoms, and mangrove roots within estuaries, bayous, channels, SAV beds, marshes, mangrove swamps, ponds and freshwater creeks (GMFMC, 1998). Juvenile gray snapper are common in coastal Mississippi August to January.

This species is classified as an opportunistic carnivore at all life stages (Pattillo et al., 1997). In the estuary, juvenile gray snapper feed on shrimp, larval fish, amphipods, and copepods. At offshore reefs, adults feed primarily on fish and secondarily on crustaceans; larger gray snapper will eat proportionately more fish (GMFMC, 1998).

Spanish mackerel: Spanish mackerel are pelagic, occurring at depths to 250 feet throughout the coastal zone of the Gulf of Mexico. Adults are usually found along coastal areas, extending out to the edge of the continental shelf; however, they also display seasonal migrations and will inhabit high salinity estuarine areas at times. The occurrence of adults in Gulf estuaries is infrequent and rare. Spawning occurs in offshore waters during May through October. Nursery areas are in estuaries and coastal waters year-round. Larvae are most often found offshore from depths of 30 to 275 feet. Juveniles are found offshore, in the surf area, and sometimes in estuarine habitats. Juveniles prefer marine salinities and are not considered estuarine-dependent. The substrate preference of juveniles is clean sand; the preferences of other life stages are unknown (GMFMC, 1998). Juvenile Spanish Mackerel are common in the Mississippi Sound February to October.

Estuaries are important habitats for most of the major prey species of Spanish mackerel. They feed throughout the water column on a variety of fishes, especially herrings. Squid, shrimp, and other crustaceans are also eaten. Most of their prey species are estuarine-dependent, spending all or a portion of their lifecycle in estuarine habitat.

Sharks species: The Mississippi Sound and adjacent waters have been identified as important nursery areas for nine sharks, primarily Atlantic sharpnose, blacktip, finetooth, and bull sharks. Less prevalent species are the spinner, blacknose, sandbar, bonnethead, and scalloped hammerhead.

Typically sharks migrate inshore in the early spring around March and April, remain inshore during the summer months and then migrate offshore during the late fall around October. Most shark species in the Mississippi waters give birth during late spring and early summer, with young sharks spending just a few months of their life's in shallow coastal waters.

Most shark species are abundant around barrier islands, with adult sharks commonly located south of the barrier islands (Carlson *et al*, 2003).

The four most common inshore shark species feed primarily on fish including: menhaden, spot, croaker, speckled trout, and hardhead catfish. In addition, researchers have found crabs in the stomachs of bonnethead shark and stingrays and smaller sharks in the stomachs of blacktip and bull sharks.

Atlantic Sharpnose shark. Common in bays and estuaries often entering rivers. Also found in offshore waters at depths of about 1,500 feet, generally less than 329 feet. Feeds mainly on small bony fishes, including wrasses, but also marine snails, squid and shrimp.

Blacktip shark. An inshore and offshore shark found on or adjacent to continental and insular shelves. Often off river mouths and estuaries, muddy bays, mangrove swamps, lagoons, and coral reef drop-offs. Bottom associated or pelagic. Young are common along beaches. Blacktip sharks have been captured in high turbidity areas and over bottom types dominated by mud/silt/clay (Carlson et.al, 2003). Active hunter in mid-water. Feeds mainly on pelagic and benthic fishes, also small sharks and rays, cephalopods and crustaceans.

Finetooth shark. Commonly found close inshore. Finetooth sharks have been captured in high turbidity areas and over bottom types dominated by mud/silt/clay (Carlson *et al*., 2003). Forms large schools. Feeds on small bony fishes and cephalopods.

Bull shark. Bull sharks are coastal and freshwater sharks inhabiting shallow waters especially in bays, estuaries, rivers, and lakes. Readily penetrates far up rivers and hypersaline bays. Capable of covering great distances (up to 180 kilometers in 24 hours), moving between fresh and brackish water at random. Adults are often found near estuaries and freshwater inflows to the sea. Young enter rivers and may be found hundreds of kilometers from the sea. Bull sharks feed on bony fishes, other sharks, rays, mantis shrimps, crabs, squid, sea snails, sea urchins, mammalian carrion, sea turtles, and occasionally garbage.

The species managed by the Gulf of Mexico Fishery Management Council are listed in **Table 2.**

Table 2: Fishery Management Plans and Managed Species for the Gulf of Mexico (NMFS 2010).
Shrimp Fishery Management Plan brown shrimp - *Farfantepenaeus aztecus* pink shrimp - *F. duorarum* royal red shrimp - *Pleoticus robustus* white shrimp - *Litopenaeus setiferus* Red Drum Fishery Management Plan red drum - *Sciaenops ocellatus* Reef Fish Fishery Management Plan almaco jack – *Seriola rivoliana* anchor tilefish - *Caulolatilus intermedius* banded rudderfish – *S. zonata*

blackfin snapper - *Lutjanus buccanella*
blackline tilefish - *Caulolatilus cyanops*
black grouper- *Mycteroperca bonaci*
blueline tilefish – *C. microps*
cubera snapper – *L. cyanopterus*
dog snapper – *L. jocu*
dwarf sand perch - *Diplectrum bivittatum*
gag grouper - *M. microlepis*
goldface tilefish – *C. chrysops*
goliath grouper - *Epinephelus itajara*
gray snapper – *L. griseus*
gray triggerfish - *Balistes capriscus*
greater amberjack – *S. dumerili*
hogfish - *Lachnolaimus maximus*
lane snapper - *Lutjanus synagris*
lesser amberjack - *S. fasciata*
mahogany snapper – *L. mahogoni*
marbled grouper – *E. inermis*
misty grouper – *E. mystacinus*
mutton snapper – *L. analis*
Nassau grouper – *E. striatus*
queen snapper - *Etelis oculatus*
red hind - *Epinephelus guttatus*
red grouper – *E. morio*
red snapper - *L. campechanus*
sand perch - *Diplectrum formosum*
scamp grouper - *M. phenax*
schoolmaster – *L. apodus*
silk snapper – *L. vivanus*
snowy grouper – *E. niveatus*
speckled hind - *E. drummondhayi*
tilefish - *Lopholatilus chamaeleonticeps*
vermilion snapper - *Rhomboplites aurorubens*
Warsaw grouper – *E. nigritus*
wenchman - *Pristipomoides aquilonaris*
yellowedge grouper *E .lavolimbatus*
yellowfin grouper – *M. venenosa*
yellowmouth grouper – *M. interstitialis*
yellowtail snapper - *Ocyurus chrysurus*

Stone Crab Fishery Management Plan FL
stone crab - *Menippe mercenaria*
gulf stone crab – *M. adina*

Spiny Lobster Fishery Management Plan
spiny lobster - *Panulirus argus*
slipper lobster - *Scyllarides nodife*

Coral and Coral Reef Fishery Management Plan
varied coral species and coral reef communities comprised of several hundred species

Coastal Migratory Pelagic Fishery Management Plan
cobia - *Rachycentron canadum*
king mackerel – *Scomberomorus cavalla*
Spanish mackerel - *S. maculatus*

Species in the Fishery but Not in the Mgt Unit
cero – *Scomberomorus regalis*
little tuny – *Euthynnus alletteratus*
dolphin – *Coryphaena hippurus*
bluefish – *Pomatomus saltatrix (Gulf of Mexico only)*

Table 3: Species Managed in the Gulf of Mexico under Federally Implemented Fishery Management Plans (NMFS 2010).

Tuna
albacore – *Thunnus alalunga*
Atlantic bigeye – *T. obesus*
Atlantic bluefin – *T. thynnus*
Atlantic yellowfin – *T. albacares*
skipjack –*Katsuwonus pelamis*

Swordfish
swordfish – *Xiphias gladius*

Billfish
blue marlin – *Makaira nigricans*
sailfish – *Istiophorus platypterus*
white marlin – *T. albidus*
longbill spearfish – *Tetrapturus pfluegeri*

Large Coastal Sharks
basking shark – *Cetorhinus maximus*
great hammerhead – *Sphyrna mokarran*
scalloped hammerhead – *S. lewini*
smooth hammerhead – *S. zygaena*
white shark – *Carcharodon carcharias*
nurse shark – *Ginglymostoma cirratum*
bignose shark – *Carcharhinus altimus*
blacktip shark – *C. limbatus*
bull shark – *C. leucas*
Caribbean reef shark – C. perezi
dusky shark – *C. obscurus*
Galapagos shark – *C. galapagensis*
lemon shark – *Negaprion brevirostris*
narrowtooth shark – *C. brachyurus*
night shark – *C. signatus*
sandbar shark – *C. plumbeus*
silky shark – *C. falciformis*
spinner shark – *C. brevipinna*
tiger shark – *Galeocerdo cuvieri*
tiger shark – *Galeocerdo cuvieri*
bigeye sand tiger – *Odontaspis noronhai*
sand tiger shark – *O. taurus*
whale shark – *Rhinocodon typus*

Small Coastal Sharks
Atlantic angle shark – *Suatina dumerili*
bonnethead shark – *Sphyrna tiburo*
Atlantic sharpnose – *R. terraenovae*
blacknose shark – *C. acrontus*
Caribbean sharpnose shark – *R. porosus*
finerooth shark – *C. isodon*
smalltail shark – *C. porosus*

Pelagic Sharks
bigeye sixgill shark – *Hexanchus vitulus*
sevengill shark – *Heptranchias perlo*
sixgill shark – *H. griseus*
longfin mako shark – *Isurus paucus*
porbeagle shark – *Lamna nasus*
shortfin mako shark – *I oxyrinchus*
blue shark – *Prionace glauca*
oceanic whitetip shark – *C. longimanu*
bigeye thresher shark – *Alopias superciliosus*
common thresher shark – *A. vulpinus*

3.5 Threatened and Endangered Species. Several species of threatened and endangered marine mammals, turtles, fish and birds occur in the Gulf of Mexico off the coast of Mississippi. The National Oceanic and Atmospheric Administration (NOAA) lists the following species in **Table 4** as either threatened and/or endangered that may potentially occur within the project area:

Table 4: Threatened and Endangered Species (NOAA 2010)

LISTED SPECIES	SCIENTIFIC NAME	STATUS	DATE LISTED
Marine Mammals			
Blue Whale	*Balaenoptera musculus*	Endangered	12/2/1970
Finback Whale	*Balaenoptera physalus*	Endangered	12/2/1970
Humpback Whale	*Megaaptera novaengliae*	Endangered	12/2/1970
Sei Whale	*Balaenoptera borealis*	Endangered	12/2/1970
Sperm Whale	*Physeter macrocephalus*	Endangered	12/2/1970
North Atlantic Right Whale	*Eubalaena glacialis*	Endangered	12/2/1970
West Indian Manatee	*Trichechus manatus*	Endangered	3/11/1967
Turtles			
Green Sea Turtle	*Chelonia mydas*	Threatened	7/28/1978
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	6/2/1970
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered	12/2/1970
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	6/2/1970
Loggerhead Sea Turtle	*Caretta caretta*	Threatened	7/28/1978
Fish			
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	Threatened	9/30/1991

The U.S. Fish and Wildlife Service (USFWS) lists the following species in **Table 5** as either threatened and/or endangered that may occur within Coastal Harrison and Jackson County, Mississippi.

Table 5: Federally Listed Threatened and Endangered Species in Harrison and Jackson County, MS (USFWS 2010)
T – Louisiana black bear (*Ursus a. luteolus*)
E – West Indian manatee (*Trichechus manatus*)
* – Bald Eagle (*Haliaeetus leucocephalus*)
T – Piping plover (*Charadrius melodus*)
T – Gopher tortoise (*Gopherus polyphemus*)
T – Loggerhead sea turtle (*Caretta caretta*)
E – Kemp's ridley sea turtle (*Lepidochelys* kempi)
T – Green sea turtle (*Chelonia mydas*)
TCH – Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E – Louisiana quillwort (*Isoetes louisianensis*)
C – Black pine snake (*Pituophis melanoleucus ssp. Lodingi*)
E – Red-cockaded woodpecker (*Picoides borealis*)
E – Mississippi gopher frog (*Rana capito sevosa*)
E – Alabama red bellied turtle (*Psuedemys alabamensis*)
T – Eastern indigo snake (*Pituophis melanoleuscus*)

T – Yellow-blotched map turtle (*Graptemys flavimaculata*)
Key to codes on list: * – Bald Eagle is now delisted but their nest trees are protected by federal law. E – Endangered C – Candidate Species T – Threatened TCH – Listed with Critical Habitat

Note: Detailed species accounts and status are contained in the Corps, Mobile District's Federally Authorized GIWW Navigation Project – Operation and Maintenance Louisiana, Mississippi, Alabama and Florida Biological Assessment (BA) dated March 22, 2007.

3.6 Water Quality. Water quality within Mississippi Sound is influenced by several factors, including the discharge of freshwater from rivers, seasonal climate changes, and variations in tide and currents. The primary driver of water quality is the rivers that feed into the Sound. Freshwater inputs from 172,160 acres of watersheds provide nutrients and sediments that serve to maintain productivity both in the Sound and in the extensive salt marsh habitats bordering the estuaries of the Sound. The salt marsh habitats act to regulate the discharge of nutrients to coastal waters and serve as a sink for pollutants. Suspended sediments enter the Sound from freshwater sources, but are hydraulically restricted due to the barrier islands. The barrier islands, combined with the Sound's shallow depth and mixing from wind, tides and currents, promote re-suspension of sediments. These suspended sediments give Mississippi Sound a characteristic brownish color (MDEQ, 2006b).

Dynamic features such as the Loop Current, eddies, and river plumes create variations in temperature, salinity, and water density. Temperature and Salinity strongly influence chemical, biological, and ecological patterns and processes. Differences in water density affect vertical ocean currents and may also concentrate buoyant material such as detritus and plankton. Greatest stratification in the water column occurs in summer. There is a general trend for increasing salinity with depth. This results from the combination of denser water from outside the Sound moving along the channel toward shore and less dense freshwater overrunning at the surface (Thompson, 1999).

3.7 Hazardous Material. The Corps is obligated under Engineer Regulation 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste contamination in the vicinity of the proposed action. Statewide the Mississippi Department of Environmental Quality oversees the assessment and remediation of both abandoned and responsible party sites where hazardous and toxic substances have been released to the environment. No known hazardous materials are present within the project area or immediate vicinity.

3.8 Air Quality. Existing air quality in coastal Mississippi counties were assessed in terms of types of sources contributing to emissions that are regulated by National Ambient Air Quality Standards (NAAQS). NAAQS have been developed for oxides of nitrogen, hydrocarbons, particulate matter, carbon monoxide, sulfur dioxide, lead, volatile organic compounds and other

hazardous air pollutants. Sources of air pollution in the project area are mainly from non point sources such as boat motors and vehicular traffic emissions. No major sources of air pollution were found within the vicinity of the project area. The coastal counties in the vicinity of the project are all in attainment for all NAAQS (Environmental Protection Agency, 2008).

3.9 Esthetics. The coastal region of Mississippi in the vicinity of the project is aesthetically pleasing. The surrounding lands include national, state and county parks, in addition to several urbanized coastal areas.

3.10 Noise. Noise levels in the area are typical of recreational, boating, and fishing activities. Noise levels fluctuate with the highest levels usually occurring during the spring and summer months due to increased recreational activities. Marine shipping activities also produce underwater shipping noise, typically low—frequency sound in the range of 20-500 hertz. Shipping to the ports of Mississippi includes approximately 8,000 to 9,000 foreign cargo vessel trips per year, and shipping traffic throughout the GIWW exceeds 700,000 vessels per year. Low-frequency sound travels farther underwater that high-frequency sound, so underwater shipping noise from traffic in the channel extends beyond the immediate vicinity of the channel (CH2MHILL, 2007).

3.11 Cultural Resources. Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and implementing regulations 36 CFR Part 800 requires consultation with other agencies to avoid or minimize adverse effect on historical, architectural, archaeological, and cultural resource. In order to ensure compliance, the National Register of Historic Places (Register) has been consulted and no properties listed on, being nominated to or that have been determined eligible for the Register are located in the vicinity of the proposed work. Since the area has been previously dredged, the potential for submerged cultural resources is low. The Biloxi Harbor Federal Navigation Channel was authorized by Congress and completed more than 30 years ago. The existing channel and disposal areas were constructed and operated prior to the enactment of the NHPA. In 1974, the Corps, Mobile District, analyzed and considered the effect that continued use and maintenance of the waterway may have on historic properties as per regulations within 36 Code of Federal Regulation (CFR) 800, in order to ensure compliance with NHPA. This analysis was conducted as part of the aforementioned EIS from 1974. No cultural resources were found within the dredged material disposal areas or channel areas. No sites listed on the Register were located within the project area. A public notice has been sent to the MS SHPO office.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.1 Fish and Wildlife Resources.

Oyster Reefs. No significant adverse impacts to oyster reefs from the continued operation and maintenance and placement efforts in Biloxi Bay, Mississippi were identified in this evaluation. The closest oyster reefs are located within a few hundred feet from some of the proposed dredging operations and beneficial use/open water placement activities, however, care will be taken to avoid and protect these areas from any adverse impacts. No dredged material will be

placed near any oyster or fish reefs. See **Figure 6** for a location of the oyster and fishing reefs in the vicinity of the proposed project.

Submerged Aquatic Vegetation. No significant impacts to the SAVs were identified in this evaluation. The closest known SAVs are located several thousand feet from open water placement and beneficial use areas associated with this project and no SAVs are located within the expected placement of beneficial use material.

Wetlands. No impacts to wetlands are expected from the continued maintenance and placement efforts in Biloxi Bay. There are no upland dredged material management areas on this portion of the channel and the project is too far away from shore to impact any mainland coastal marshlands.

Sediments. The sediment quality and texture of the channel dredged material are expected to be homogenous to that existing in the dredged material management areas, due to their close proximity to the channel and the fact that these areas have historically received dredged material from the adjacent channels. Placement of a large quantity of fine-grained sediment in the open water disposal areas and the beneficial use site will temporarily have an adverse impact to EFH and other estuarine resources. However, over a ten-year period it is not expected to have any long-term adverse impacts.

In addition, a Section 404(b)(1) Analysis Report will be conducted on the proposed maintenance and dredging action and beneficial use. It will examine any impacts to oyster reefs, SAVs, wetlands or other critical habitat and included as an Enclosure before this EA is finalized.

4.2 Terrestrial Wildlife. As a result of this evaluation, no adverse impacts to the terrestrial wildlife located in the vicinity of project were identified. The proposed work would create disturbance to species utilizing the terrestrial habitats within on-shore equipment staging areas. This would mainly involve short-term disturbance from equipment, vehicles and personnel movements for the duration of work. However, these species are mobile and would generally avoid the area during use.

4.3 Benthos, Motile Invertebrates, and Fishes. There would be temporary disruption of the aquatic community caused by the maintenance dredging/beneficial use and open water placement. Non-motile benthic fauna within the area would be destroyed by dredging and open water placement operations, but should repopulate upon project 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.

The materials that will be dredged from the project area are homogenous with those that will remain in the channel and, therefore, no alteration of habitat composition is occurring. If sediment type is not changed as a result of project activities, recolonization can be expected with the similar species returning to the disturbed areas (Stickney, 1984). The area will remain a shallow-water (defined as depths shallower than 46 feet) neritic zone that can support sub-littoral benthic biota. Because similar habitat, in terms of both sediment composition and depth, will be

present pre- and post-dredging, it is concluded that the benthic biota in the channel will have the ability to recover and re-colonize.

Rates of benthic community recovery observed after dredged material placement ranged from a few months to several years. The relatively species-poor benthic assemblages associated with low salinity estuarine sediments can recover in periods of time ranging from a few months to approximately one year (Leathem et al., 1973; McCauley et al., 1976 and 1977; Van Dolah et al. 1979 and 1984; Clarke and MillerWay, 1992), while the more diverse communities of high salinity estuarine sediments may require a year or longer (e.g. Jones, 1986; Ray and Clarke, 1999).

Open water placement activities would utilize thin layer disposal methods (< 12 inches) where practicable and feasible to minimize impacts by allowing populations of small, shallow-burrowing infauna with characteristically high reproductive rates and wide dispersal capabilities to recover quickly. Deposition of relatively thin layers of dredged material (<10 centimeter, 4 inches) can minimize impacts by allowing many populations of small, shallow-burrowing infauna with characteristically high reproductive rates and wide dispersal capabilities to recover quickly. Deposits greater than 20-30 cm (8-12 in) generally eliminate all but the largest and most vigorous burrowers (Maurer et al., 1978). The sediment quality and texture of the channel dredged material are expected to be homogenous to that existing in the disposal areas, due to their close proximity to the channel and the fact that these areas have historically received dredged material from the adjacent reaches of the channel. Placement of material similar to the ambient sediments (e.g., sand on sand or mud on mud) has been shown to produce less severe, long-term impacts (Maurer et al. 1978, 1986).

Temporary loss of benthic invertebrate populations would occur within the project footprint of the channel and open water disposal areas. These areas combined comprise less than 0.1% of estuarine water bottom of the state within the Mississippi Sound. It should also be noted that dredging and disposal along the entire channel length in the bay would not occur within the same dredging cycle (year). Given this and the fact that the average dredging cycle of any one location is usually 3 years or greater; sufficient time for an area to recover is expected.

Several studies of turbidity from total suspended solids (TSS) associated with dredging operations have concluded that dredging had no substantial effects on nekton (Ritchie, 1970; Stickney, 1972; Wright, 1978); however, other studies have shown that elevated TSS levels and prolonged exposure can suffocate and reduce growth rates of adult and juvenile nekton and reduce viability of eggs (Moore, 1977; Stern and Stickle, 1978). Detrimental effects are generally recognized at TSS concentrations greater than 500 milligrams per liter (mg/L) and for durations of continuous exposure ranging from several hours to a few days. Turbidities exceeding 500 mg/L have been observed around maintenance dredging and placement operations (EH&A, 1978), and such turbidities may affect some aquatic organisms near the active dredges. In a study in Corpus Christi Bay, Schubal et al. (1978) reported TSS values greater than 300 mg/L but only in a relatively small area near the bottom. They also found that TSS from maintenance dredging in Corpus Christi Bay is not greater than that from shrimping and affects the bay for much shorter time periods. In a study of the Laguna Madre, Sheridan (1999) found elevations in turbidity only over the subtidal placement material fluid mud pile. In this study they found that

even 16.5 feet from the edge of the placed material, turbidity was not statistically greater than that 1 kilometer or more away. May (1973) found that TSS was reduced by 92 percent within 100 feet of the discharge point, by 98 percent at 200 feet, and that concentrations above 100 mg/L were seldom found beyond 400 feet from the point of placement. Elevated turbidities during construction and maintenance dredging may affect some aquatic organisms near the dredging activity; however, turbidities in open-water habitats can be expected to return to near ambient conditions within a few hours after dredging ceases or moves out of a given area. Schidler (1984) reports similar TSS levels from dredging and storm events. Overall, motile organisms are mobile enough to avoid highly turbid areas (Hirsch et al., 1978). Under most conditions, fish and other motile organisms are only exposed to localized suspended-sediment plumes for short durations (minutes to hours) (Clarke and Wilber, 2000).

Due to the phased nature of the channel maintenance, the small area (percentage wise) of ecosystem that will be affected at a given point in time and the use of thin layer open water disposal methods where practicable and feasible, no significant long-term impacts to the benthos, motile invertebrates, and fishes are expected to occur as a result of the proposed action.

4.4 EFH. Dredging to maintain the channel would temporarily adversely affect the EFH in the vicinity of the proposed action. However, there is ample habitat available in the vicinity to accommodate these temporarily displaced animals and any impacts would be minor. EFH for adult and juvenile brown and white shrimp; red drum; as well as adult gray snapper, Spanish mackerel and several species of shark occurs within the vicinity of the project. No estuarine emergent wetlands, oyster reefs, or SAVs would be adversely affected by the proposed action. No mitigation would be required for the temporary disruptions to the EFH, as the fish would move out of the area during dredging activities and would be able to return to the channel area after activities cease. Dredging could cause minor, localized disruptions to seasonal shrimp distributions in the vicinity of the dredge. The loss of organisms would be negligible and could be mitigated by timing dredging operations to avoid peak migration periods. Based on the size of the Mississippi Sound, only a small fraction of this total area would likely be affected during any single routine maintenance dredging event. Initial placement operations would cover benthic organisms with dredged material. However, as detailed in Section 4.3 of this assessment, no significant long-term impact to this resource is expected as result of this action.

Notwithstanding the potential harm to some individual organisms, no significant impacts to managed species of finfish or shellfish populations are anticipated from the maintenance dredging and placement operations. A public notice and the effects determination of the EA will be forwarded to the NMFS Habitat Conservation Division (HCD) for review and comment once this draft EA is complete. The USACE, Mobile District believes that due to the phased nature of the channel maintenance and the small area (percentage wise) of ecosystem that would be affected at a given point in time no significant long-term EFH impacts are expected to occur.

4.5 Threatened and Endangered Species. There will be through consultation with the NMFS, Protected Resource Division (PRD) and the United States Fish and Wildlife Service (USFWS) to determine if the following threatened and endangered species: Gulf sturgeon; West Indian manatee; and the loggerhead, green and Kemp's ridley sea turtles may be affected by the proposed project.

To reduce the likelihood of take the USACE, Mobile District will agree to incorporate the following conditions during operations and maintenance dredging of the bay:

- Dredging will be conducted utilizing hydraulic or mechanical methods reducing the potential for entrainment of Gulf sturgeon and sea turtles associated with hopper dredges.
- During active hydraulic dredging operations the cutterhead will be located within the substrate.
- Thin layer disposal will be utilized when practicable and feasible.
- If threatened or endangered species are observed during dredging operations, the operation will be temporarily stopped until the species has left the area.
- Standard Manatee Construction Conditions will be followed during operations.

4.6 Water Quality. The dredging and disposal operations are expected to create some degree of construction-related turbidity in excess of the natural condition in the proximity of the channel and placement site. Impacts from sediment disturbance during these operations are expected to be temporary, minimal and similar to conditions experienced during past routine operation and maintenance of the channel. Suspended particles are expected to settle out within a short time frame (hours), with no long-term measurable effects on water quality. No measurable changes in temperature, salinity, PH, hardness, oxygen content or other chemical characteristics are expected. The Corps, Mobile District will request water quality certification from MDEQ.

4.7 Hazardous Materials. No hazardous materials are known to exist in the project area. The contractor would be responsible for proper storage and disposal of any hazardous materials, such as oils and fuels used during the dredging and disposal operation.

4.8 Air Quality. The proposed action would have no significant long-term affect on air quality. Air quality in the immediate vicinity of the construction equipment would be slightly affected for a short period of time by the fuel combustion and resulting engine exhausts. The exhaust emissions are considered insignificant in light of prevailing breezes and when compared to the existing exhaust fumes from other vessels using the project area. Any air quality impacts would be temporary and negligible.

4.9 Esthetics. Only temporary degradation to the aesthetic environment would occur as a result of the proposed action. Impacts would primarily occur as a result of the physical presence of heavy equipment. Some minor increases in turbidity may be noted in the immediate vicinity during dredging operations, but these increases would be minor and short term in nature.

4.10 Noise. Noise impacts from project equipment are expected to increase in the vicinity during maintenance dredging work. These impacts would be short term and restricted to the immediate vicinity of the activity and only for a few days. Sensitive noise receptors (a residential area and

school) are located several miles from the proposed action. Mechanical dredging produces between 58 and 70dB for a person located 50 feet from the operation. Hopper dredging ships produce an average of 82 dB. Underwater noise levels range from 160 to 180 dB. The noise is not at levels known to cause any injury, temporary or permanent, to marine life, and would not remain in any single location for longer that a few days (CH2MHILL, 2007).

Past maintenance dredging operations within the bay and other areas have occurred at depths and durations similar to those of the proposed action. Marine species in the vicinity of the channel and elsewhere in the Sound have coexisted with ongoing maintenance dredging operations. Therefore, any noise impacts from the proposed action would be temporary and minor. No long-term increase in noise would occur in or around the project area.

4.11 Cultural Resources. Cultural resources in the Mississippi Gulf Coast area considered eligible for listing on the National Register of Historic Places include historic standing structures, submerged shipwrecks, historic cemeteries, and prehistoric and historic archaeological sites. Many of the cultural resource sites contain shell middens, which are mounds of discarded shells that offer evidence of the early use of certain shellfish (mollusks). Some of the sites are prehistoric Indian mounds. The development along the Mississippi coast has affected both archaeological sites and standing structures, including individual structures and historic districts in the project area.

In compliance with the NHPA, coordination with the Mississippi State Historic Preservation Officer (SHPO) will occur. Previous coordination indicates that no cultural resources are known to occur in the open water disposal, channel areas or beneficial use area. No sites listed on the Register are located within the project area. A copy of the Public Notice will be sent to the Mississippi State Historic Preservation Officer and the U.S. Department of the Interior, National Park Service, Atlanta, Georgia.

5.0 CUMULATIVE EFFECTS SUMMARY. Cumulative effects are those impacts on the environment that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such other actions. This section analyzes the proposed action as well as any connected, cumulative, and similar existing and potential actions occurring in the area and surrounding the site.

The USACE is required by Congress to maintain the federally authorized harbor to a depth of -12 feet MLLW plus 2 feet of advanced maintenance and 2 feet of allowable paid over depth to provide for safe navigation by commercial and recreational vessels. The location of a disposal area at or near this site is essential for future dredging events to meet this Congressional mandate. Future development of the surrounding area (on shore) would likely proceed under the “no action” or the “preferred action” plan as development in the immediate area is not specific to the proposed action but connected with existing local attractions and urbanization of the area. Those future plans could be considered through a separate NEPA process at that time. Therefore, the proposed maintenance dredging and placement of material on Deer Island and the open water disposal area is not expected to have any significant direct cumulative impacts to biological resources, water chemistry, or oceanographic resources.

6.0 OTHER CONSIDERATIONS

6.1 Coastal Zone Management Act of 1972. The USACE, Mobile District determined that the proposed action appears to be consistent with the Mississippi Coastal Management Program to the maximum extent practicable. Coordination with the Mississippi Department of Marine Resources (MDMR) for Coastal Zone Consistency (CZC) will occur before this project begins.

6.2 Clean Water Act of 1972. No work would occur until the State of Mississippi issues water quality certification for the proposed action. Coordination with the state Department of Environmental Quality will occur before this project starts.

6.3 Rivers and Harbors Act of 1899. The proposed work would not obstruct navigable waters of the United States.

6.4 Marine Mammal Protection Act of 1972, as amended. Incorporation of the safe guards used to protect threatened or endangered species during project implementation will also protect any marine mammals in the area; therefore, the project is in compliance with this Act. This project will be coordinated with the National Marine Fishery Service, and will be in full compliance with the act.

6.5 Fish and Wildlife Coordination Act of 1958, as amended. This project will be coordinated with the FWS, and will be in full compliance with the act.

6.6 E.O. 11988, Protection of Children. The proposed action complies with Executive Order (EO) 13045, "Protection of Children from Environmental Health Risks and Safety Risks", and does not represent disproportionally high and adverse environmental health or safety risks to children in the United States. The proposed site is not used disproportionally by children.

6.7 E.O. 11990, Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (February 11, 1994) requires that Federal agencies conduct their programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

The proposed project is not designed to create a benefit for any group or individual. No changes in demographics, housing, or public services would occur as a result of the proposed project. The dredging of the Federal channel and placement of the dredged material near the vicinity of Deer Island does not create disproportionately high or adverse human health risks or environmental impacts on minority or low income populations of the surrounding community. Review and evaluation of the proposed project have not disclosed the existence of identifiable minority or low income communities that would be adversely impacted by the proposed project.

7.0 COORDINATION. The general public will be notified of the proposed action via public notice in August, 2011. The public notice will be posted on the Mobile Districts web site for public documents and e-mailed to Federal and state agencies and the interested public and

included a 30-day review period. All comments on the action will considered prior to a decision on the action.

8.0 CONCLUSION. The proposed beneficial use of dredged material adjacent to Deer Island appears that it will have no significant negative environmental impacts on the existing environment. In fact, the project should benefit the island by creating additional tidal marsh, replacing lost sediment and enhancing the local coastal ecosystem. No mitigation actions are proposed for the project. The implementation of the proposed action should not have a significant adverse impact on the quality of the environment and an environmental impact statement is not required.

9.0 REFERENCES.

Clarke, D. G. and T. Miller-Way. 1992. An environmental assessment of the effects of open water disposal of maintenance dredged material on benthic resources in Mobile Bay, Alabama. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, Miscellaneous Paper D-92-1, 40 p.

Carlson J.K., D. Bethea, I. Baremore. 2003. Shark Nursery Grounds and Essential Fish Habitat Studies. Panama City, Fl. Prepared for: NOAA Fisheries, Highly Migratory Species Office.

Carlson, J.K., D. Bethea, A. Middlemiss, I. Baremore. 2004. Shark Nursery Grounds and Essential Fish Habitat Studies. Panama City, Fl. Prepared for: NOAA Fisheries, Highly Migratory Species Office.

CH2MHILL, 2007. Gulfport Harbor Navigation Channel Final EIS. June 2007.

Froese, R. and D. Pauly. Editors. 2007.FishBase. World Wide Web electronic publication. www.fishbase.org, version (10/2007).

EPA. 2008. Region 4 Air Quality. World Wide Web electronic publication. http://www.epa.gov/region4/air/naaqs/index.htm, version (1/2008)

Espey, Huston & Associates, Inc. (EH&A). 1978. The biological effects of turbidity. Prepared for Board of Trustees, Galveston Wharves and Northville Industries Corporation. EH&A Doc No.

GMFMC. 1998. Generic Amendment for Addressing Essential Fish Habitat Requirements in the Following Fishery Management Plans of the Gulf of Mexico: Shrimp Fisheries, Red Drum Fisheries, Reef Fish Fisheries, Coastal Migratory Pelagic Resources, Stone Crab Fisheries, Spiny Lobster, and Coral and Coral Reefs. Prepared by the GMFMC, October 1998.

GMFMC. 2004. Final Environmental Impact Statement for the Generic Amendment to the following fishery management plans of the Gulf of Mexico: Shrimp Fishery of the Gulf

of Mexico, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, Stone Crab Fishery of the Gulf of Mexico, Coral and Coral Reef Fishery of the Gulf of Mexico, Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic; Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council.

GMFMC 2005. Generic Amendment for Addressing Essential Fish Habitat Requirements in the Following Fishery Management Plans of the Gulf of Mexico: Shrimp Fisheries, Red Drum Fisheries, Reef Fish Fisheries, Coastal Migratory Pelagic Resources, Stone Crab Fisheries, Spiny Lobster, and Coral and Coral Reefs. Prepared by the GMFMC, March 2005.

Jones, A. 1986. The effects of dredging and spoil disposal on macrobenthos, Hawkesbury Esturary, New South Wales. Marine Pollution Bulletin 17: 17-20.

Leathem, W., P. Kinner, D. Maurer, R. Briggs and W. Treasure. 1973. Effect of spoil disposal on benthic invertebrates. Marine Pollution Bulletin 4: 122-125.

May, E. B. 1971. A survey of the oyster and shell resources of Alabama. Alabama Marine Resources Bulletin No. 4.

Maurer, D.R. Keck, J. Tinsman, W. Leatem c. Wethe, M. Hutzinger, C. Lord and T. Church. 1978. Vertical migration of benthos in simulated dredged material overburdens. Volume I. Marine Benthos. U.S. Army Corps of Engineer Waterway Experiment Station, Vicksburg, MS. Dredged Material Research Program. Technical Report No. D-78-35.

McCauley, J.E., D.R. Hancock and P.A. Parr. 1976. Maintenance dredging and four polychaetes worms. Pp. 673-683. In: Proceedings of the specialty Conference on Dredging and Its Environmental Effects, Mobile, Alabama.

McCauley, J.E., R.A. Parr and D.R. Hancock. 1977. Benthic infauna and maintenance dredging: a case study. Water Research 11: 233-242.

MDEQ (Mississippi Department of Environmental Quality). 2006a. National Coastal Assessment Data for Mississippi Sound 2004-2004.

MDEQ (Mississippi Department of Environmental Quality). 2006b. State of Mississippi Water Quality Assessment 2006, 305b report.

Miles, D.W. 1950. The life histories of the spotted seatrout (*Cynoscion nebulosus*) and redfish (*Sciaenops ocellatus*). Texas Game, Fish and Oyster Comm., Marine Lab. Ann. Rpt. (1949-1950): 66-103.

Moore, P.G. 1977. Inorganic particulate suspensions in the sea and their effects on marine animals. Ann. Rev. Oceanogr. Mar. Biol. 15:225—363.

Pattillo, M.E., T.E. Czapl, D.M. Nelson and M.E. Monaco. 1997. Distribution and Abundance of Fishes and Invertebrates in Gulf of Mexico Estuaries. Volume II: Species Life History

Summaries. ELMR Report No. 11. NOAA/NOS Strategic Environmental Assessments Division, Sliver Spring, MD 377 pp.

Peters, K.M. and R.H. McMichael. 1988. Early life history of the red drum, *Sciaenops ocellatus* (Pisces: Sciaenidae) in Tampa Bay. In: Estuaries. Vol. 10, No. 2, p. 92-107.

Ritchie, D.W. 1970. Fish. In: Gross physical and biological effects of overboard spoil disposal in upper Chesapeake Bay. L. E. Cronin (Ed.). Univ. Md., Nat. Res. Inst., Spec. Rpt. No. 3.

Sheridan, P. 1999. Temporal and spatial effects of open water dredged material disposal on habitat utilization of fishery and forage organisms in Laguna Madre, Texas. Final Report to the Laguna Madre Interagency Coordination Team. National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Simmons, E.G. and J.P. Breuer. 1962. A study of redfish (*Sciaenops ocellatus* Linnaeus) and black drum (*Pogonias cromis* Linnaeus). Pub. of the Inst. Mar. Sci., Univ. Texas. 8:184-211. Stickney, R.R. 1972. Effects of intracoastal waterway dredging on ichthyofauna and benthic macroinvertebrates. Skidaway Inst. Oceanogr., Savannah, Ga.

Swingle, H.A. 1971. Biology of Alabama estuarine areas--cooperative Gulf of Mexico estuarine inventory. Alabama.

Swingle, H.A., and D.B. Bland. 1974. A study of the fishes of the coastal watercourses of Alabama. Alabama Marine Resources Bull . 10:17

Stickney, R. R. 1984. Estuarine Ecology of the Southeastern United States and Gulf of Mexico. Texas A&M University Press, College Station.

Thompson, M.J. 1999. USGS in cooperation with MMS. Ecology of Live Bottom Habitats of the Northeastern Gulf of Mexico: A Community Profile. January 1999.

USACE, 1974. Final Environmental Statement Biloxi Harbor, Mississippi

USACE, 2007. Biological Assessment Federally Authorized Gulf Intracoastal Waterway Navigation Project. March 22, 2010.

Van Dolrah. R.F., D.R. Calder, D.M. Knott and M.S. Maclin. 1979. Effects of dredging and unconfined disposal of dredged material on macrobenthic communities in Sewee Bay, South Carolina. South Carolina Marine Resources Center Technical Report No. 39, April 1979. 54 pp.

Vittor, B.A. 1982. Benthic macroinfauna community characterization in Mississippi Sound and adjacent waters. Contract No. DACW01-80-C-0427. Report to U.S. Army Engineer Mobile Distr., Mobile, Alabama.

Vittor and Associates, Inc. 2003. Mobile Bay Submerged Aquatic Vegetation. Final Report to Mobile Bay National Estuary Program.

Wright, T.D. 1978. Aquatic dredged material disposal impacts. U.S. Army Eng. Water Experiment Station Environmental Laboratory, Vicksburg, MS. Tech Report DS- 78-1.

10.0 LIST OF AGENCIES CONSULTED.

Mississippi Department of Marine Resources
Mississippi Department of Environmental Quality
Mississippi State Historic Preservation Officer
Mississippi Department of Wildlife, Fisheries and Parks

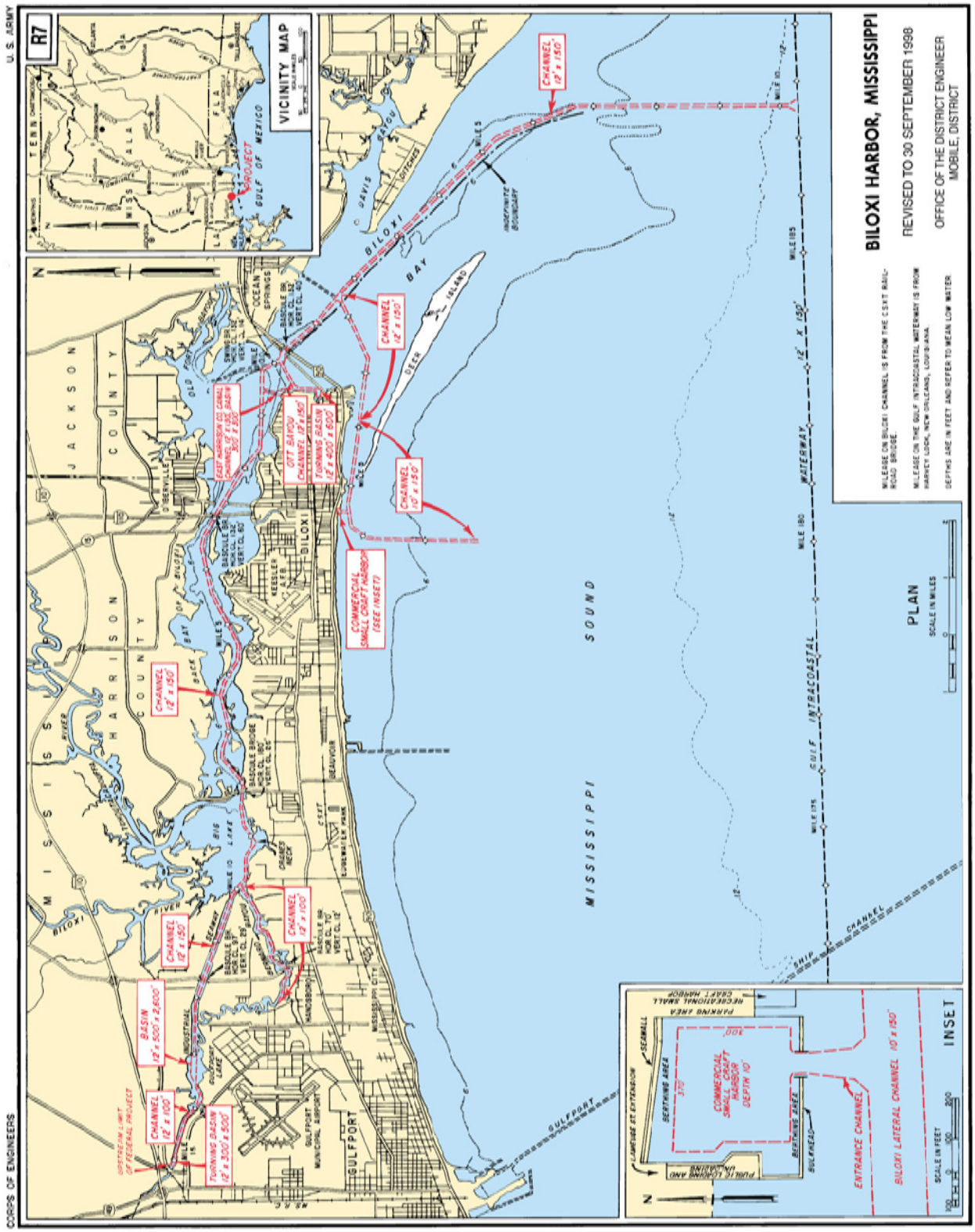
National Marine Fisheries Service
National Register of Historic Places
U.S. Army Corps of Engineers, Mobile District
U.S. Environmental Protection Agency, Region IV
U.S. Fish and Wildlife Service, Jackson, Mississippi Field Office

11.0 LIST OF PREPARERS

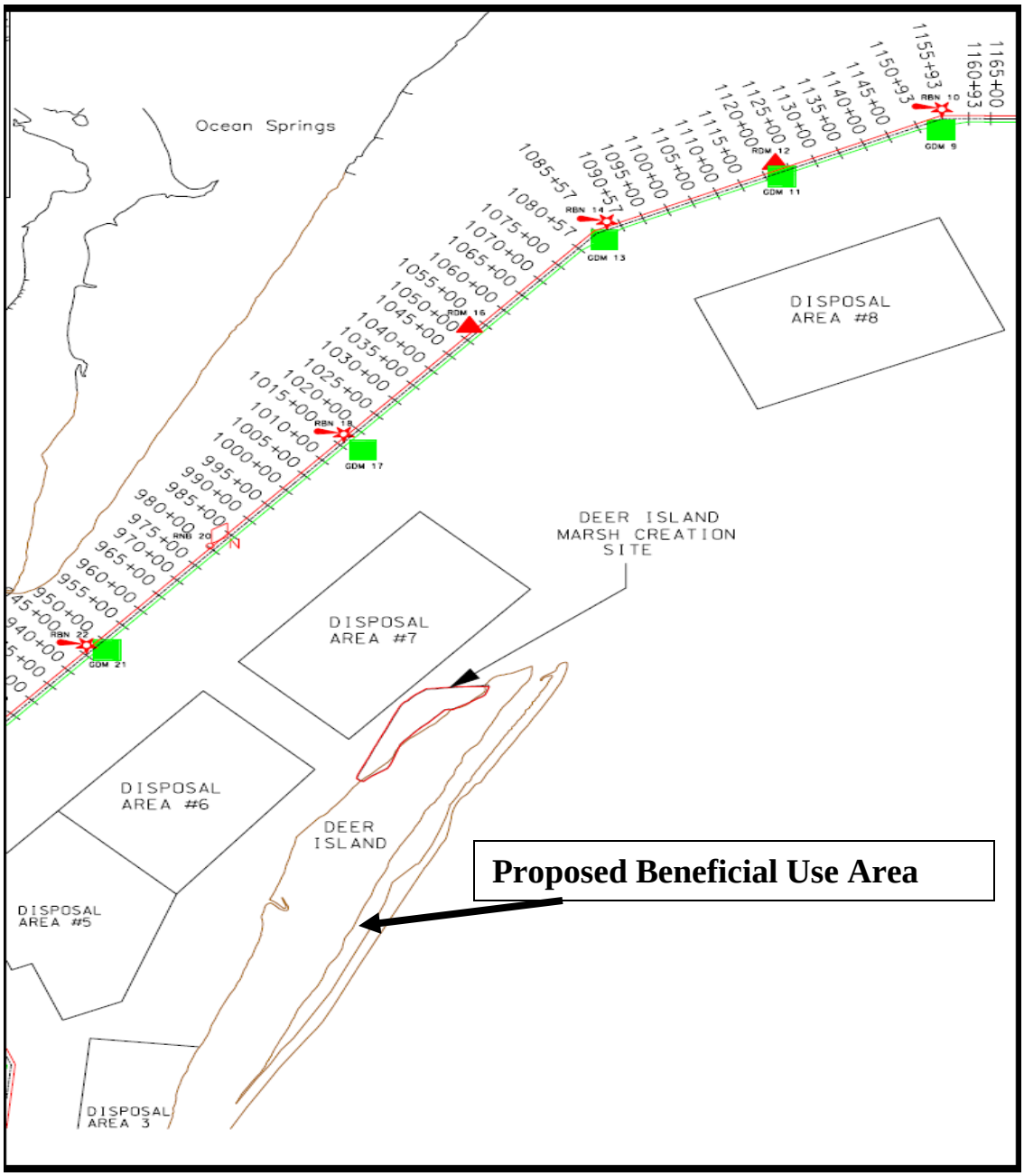
Elizabeth Godsey
Coastal Engineer
U.S. Army Corps of Engineers,
Mobile District, PD-EC
109 St. Joseph Street
Mobile, AL 36602

Mike Malsom
Biologist
U.S. Army Corps of Engineers,
Mobile District, PD-EC
109 St. Joseph Street
Mobile, AL 36602

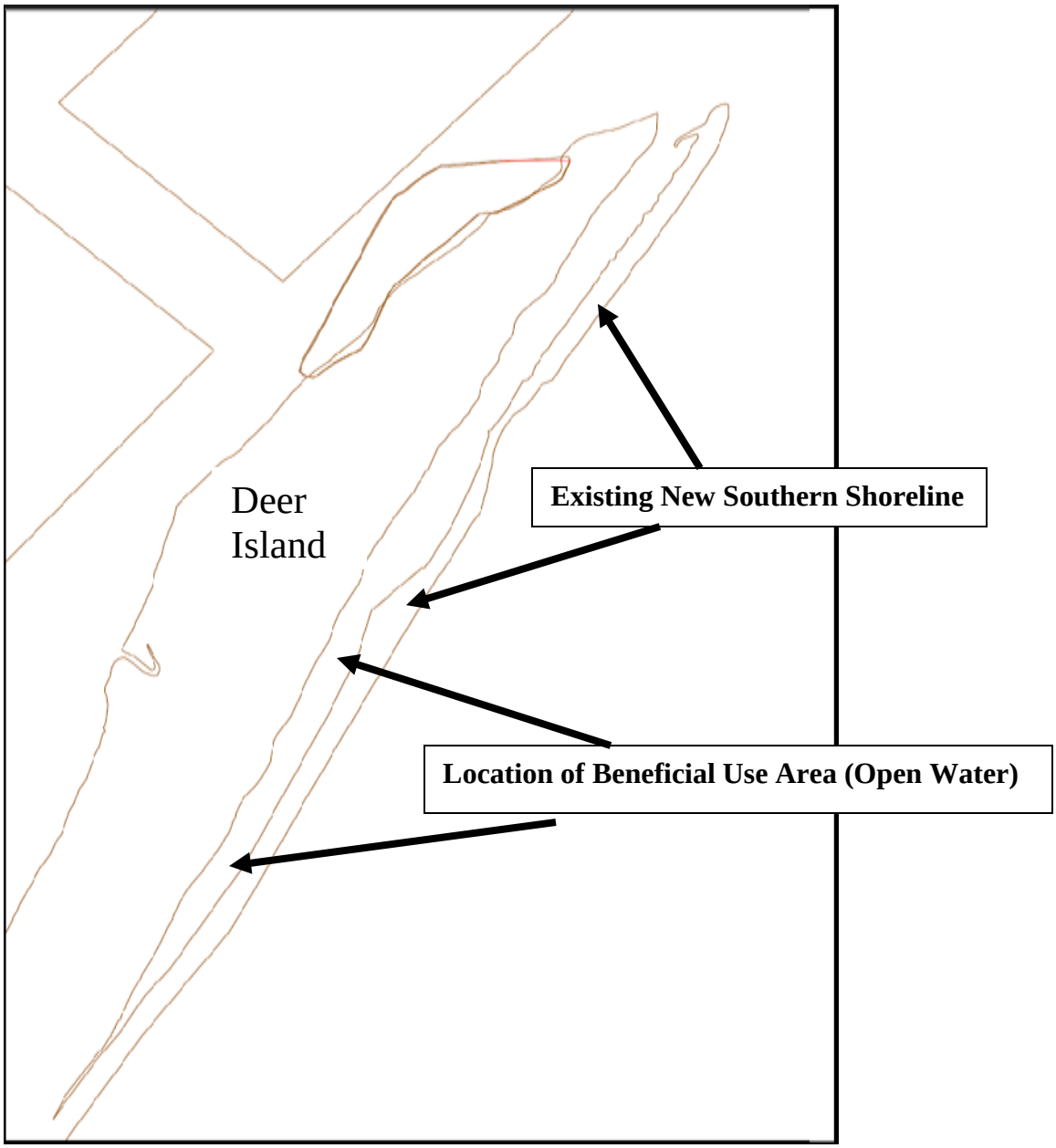
Matt Lang
Biologist
U.S. Army Corps of Engineers,
Mobile District, PD-EC
109 St. Joseph Street
Mobile, AL 36602



EA-Figure 1. Biloxi Harbor Federally Authorized Navigation Project



EA-Figure 2. Map of Proposed Deer Island Beneficial Use Area



EA-Figure 3. Enlarged Map of Deer Island Beneficial Use Area

EA-Figure 4. Aerial View of the Overall Project Area

EA-Figure 5. Map of Access Channels and Open Water Disposal Areas

EA-Figure 6. Biloxi Bay Oyster and Fishing Reef Locations near Project Site

EA-Figure 7. Aerial View of Beneficial Use Area

Table 1: Summary of Biloxi Harbor Dredging Events from 1972 to 2009

Year	Quantity in CYs	Location	Disposal Area
1972	134,301	Ott Bayou	Open Water
1972	355,311	Intersection of East Access and Lateral Channel	Open Water
1973	683,985	West Approach, Lateral Channel, Back Bay & Wolf River	Open Water
1974	246,586	West Approach	Open Water
1974-75	2,613,606	East Access Channel (New Work)	Open Water
1975	75,015	Back Bay and Cranes Neck (New Work)	Open Water
1976	169,274	West Access	Open Water
1977	1,081,250	East Access Channel and Lateral Channels	Open Water
1978	374,392	West Approach	Open Water
1978	96,471	Lateral Channel	Open Water & Upland
1979	164,217	West Access	Open Water
1979	794,088	East Access	Open Water
1980	43,253	Biloxi Small Boat Harbor	Open Water
1981	214,178	West Approach	Open Water & Beach Nourishment
1981	462,566	Lateral Channel	Open Water & Beach Nourishment
1981	1,238,510	East Access	Open Water & Beach Nourishment
1984	262,558	West Approach	Open Water
1984	258,438	Lateral Channel	Open Water
1984	847,129	East Access	Open Water
1986	294,909	Cranes Neck	DAs C & C1
1986	321,948	Ott Bayou	Open Water DA 7
1986	683,131	Industrial Canal	DAs C, C-1, C-6
1989	261,590	West Approach	Open Water DAs 2,3,4
1989	486,878	Lateral Channel	Open Water, Deer Island, DAs 3,4
1992	296,900	West Approach	Open Water DAs 1,2,3
1992	253,216	Industrial Canal	DA C-6
1994	1,189,680	Biloxi Harbor-specific area not identified	Not Identified
1994	295,607	Lateral Channel	Open Water DAs1-4
1994	666,394	West Access	Open Water DAs 1-4
1996	21,300	Industrial Canal	DA C-6
1996	103,169	West Approach	Open Water DAs 1-4
1997	277,957	West Approach	Open Water DA 2
1997	266,544	Lateral Channel	Open Water DA 6
1997	1,066,383	East Access	Open Water DAs 6-10
1998	117,514	Industrial Canal	DA C-6

Table 1 Continued: Summary of Biloxi Harbor Dredging Events from 1972 to 2009

1999	235,843	West Access	Open Water DAs 1-3
1999	528,803	East Access	Open Water
2003	279,000	Lateral Channel	Deer Island
2003	164,330	Lateral Channel	Open Water DAs 6,7
2003	66,982	Industrial Canal	DA C-6
2005	399,713	West Approach-before Katrina	Open Water
2005	482,221	East Access-before Katrina	Open Water
2005	229,256	East Access-before Katrina	Open WaterDAs9,10
2006	21,861	Ott Bayou	Open Water DA 6
2006	318,035	Lateral Channel	Open Water DA6
2006	70,600	Industrial Canal	DA C-6
2006	274,335	East Access	Open Water DAs 6-10
2008-09	766,800	East Access	Open Water
2009	114,300	East Access	Open Water

Note: DA = Disposal Area. C, C-1 and C-6 are local upland disposal areas.

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF

CESAM-PD-EC **August 5, 2011**
PUBLIC NOTICE NO. FP11-BH01-05

JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS
AND
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY,
OFFICE OF POLLUTION CONTROL
AND
MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
FOR
BENEFICIAL USE OF DREDGED MATERIAL ON DEER ISLAND,
MAINTENANCE DREDGING AND PLACEMENT ACTIVITIES

BILOXI HARBOR NAVIGATION PROJECT

A FEDERALLY AUTHORIZED PROJECT

15 DAY REVIEW

Interested persons are hereby notified that the U.S. Army Corps of Engineers (Corps), Mobile District proposes to beneficially use dredged material from the Biloxi Harbor federally authorized navigation project and place the material adjacent to Deer Island, Harrison County, Mississippi.

This Public Notice is issued in accordance with the rules and regulations published in the Federal Register on April 26, 1988. These regulations provide for the review of the dredging programs for federally authorized projects. These laws are applicable whenever dredged or fill material may enter navigable waters. The recipient of this notice is requested specifically to review the proposed action as it may impact water quality, relative to the requirements of Section 404(b)(1) of the Clean Water Act. We also request comments on any other potential impacts.

WATERWAY AND LOCATION: Biloxi Harbor, Harrison County, Mississippi.

DESCRIPTION OF THE AUTHORIZED PROJECT: The existing Biloxi Harbor, Mississippi navigation project (**Figure 1**) consists of the following channel segments:

EA-Enclosure 1

CESAM-PD-EC **August 5, 2011**
PUBLIC NOTICE NO. FP11-BH01-05

Lower Harbor:

The 10-mile East Access Channel extends northward from the Gulf Intracoastal Waterway (GIWW) east of Deer Island to the railroad bridge just north of Highway 90 crossing to the mouth of the back bay of Biloxi. The channel dimensions are 12 feet deep by 150 feet wide.

The West Access Channel is a total of 7 miles long, consisting of the 4-mile West Approach Channel west of Deer Island, which measures 10 feet deep by 150 feet wide, and the 3-mile Biloxi Lateral Channel north of Deer Island, which measures 12 feet deep by 150 feet wide and joining the East Access Channel at mile 2.5.

Upper Harbor:

The Main Back Channel extends from the railroad bridge just north of U.S. Highway 90 through the Back Bay of Biloxi to the D'Iberville Bridge (I-110), a distance of approximately 4-miles. The channel dimensions are 12 feet deep by 150 feet wide.

The Ott Bayou Channel at 12 feet deep by 150 feet wide extends from the junction of the main Back Bay Channel for a distance of 1.2-miles and terminates at a 12-foot deep by 600-foot wide turning basin located opposite of Ott Bayou.

The East Harrison County Canal at 12 feet deep by 150 feet wide extends a distance of approximately 2,100 foot long channel from the main Back Bay Channel and terminates at a turning basin fronting the northeast shore of the City of Biloxi.

Back Bay Portion:

The Back Bay Channel (remainder) at 12 feet deep by 150 feet wide extends from the D'Iberville Bridge (I-110) to the junction of Bernard Bayou and the Industrial Seaway.

The Industrial Seaway is five miles long and includes turning basins in Gulfport Lake and at the western terminus of the channel. The dimensions of the channel vary from 12 feet deep by 150 feet wide from the Back Bay channel to the turning basin in Gulfport Lake and 12 feet deep by 100 feet wide from that point to the western terminus.

The restoration of Deer Island was authorized under Section 528 of the Water Resources Development Act (WRDA) of 2000.

DESCRIPTION OF THE PROPOSED ACTION: The federally authorized Biloxi Harbor navigation project was most recently certified in 2007 with Public Notice FP07-BH01-14. Due to the recent reconstruction of the southern Deer Island shoreline in 2011 under Section 528 of the Water Resources Development Act of 2000, there is a unique opportunity to beneficially use dredged material on the island which will create some inter-tidal marsh and enhance the local coastal ecosystem. The purpose of this public notice is to include a beneficial use placement site adjacent to Deer Island to accommodate channel maintenance material from the Biloxi Harbor Federal navigation project. The Corps, Mobile District proposes to beneficially use a portion of

the dredged material from the Lower Harbor section of the Federal navigation channel. Up to 500,000 cubic yards (cys) of maintenance material dredged from the East Access Channel could be placed in the beneficial use site located adjacent to Deer Island (**Figures 2, 3 & 4**). This site adjacent to Deer Island will likely be beneficially used multiple times over an extended period of time due to dredged material consolidation. Any additional dredged material from the East Access Channel would be placed in the designated open water disposal areas (**Figure 5**). If additional funding is available, several hundred thousand cys of dredged material from the West Approach and Lateral Channels (**Figure 5**) may also be dredged and beneficially used or placed within designated open-water disposal sites.

WATER QUALITY CERTIFICATION: Pursuant to the Clean Water Act, state water quality certification is required for the proposed action described above. Water quality certification will be requested from the Mississippi Department of Environmental Quality, Office of Pollution Control (MDEQ-OPC). Upon completion of the required 15-day comment period, a decision relative to water quality certification will be made by MDEQ-OPC.

COASTAL ZONE CONSISTENCY: Pursuant to the Coastal Zone Management Act, the proposed action is consistent with the Mississippi Coastal Program to the maximum extent practicable. Concurrence with this determination will be requested from the Mississippi Department of Marine Resources (MDMR). Upon completion of the required 15-day comment period, a decision relative to coastal zone consistency will be made by MDMR.

USE BY OTHERS: The proposed action is not expected to create significant impacts on land and water use plans in the vicinity. Use of the waters in the vicinity of the project area includes fishing and recreational boating.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) CONSIDERATIONS: In accordance with the requirements of NEPA, an Environmental Impact Statement (EIS) for the entire Biloxi Harbor Navigation Project was filed with the President's Council on Environmental Quality on May 30, 1974. The EIS was coordinated with all applicable Federal, state and local agencies and the interested public. Previous Environmental Assessments (EAs) have been prepared to address potential impacts associated with modifications to the maintenance dredging and placement plan for the Biloxi Harbor navigation project. A Finding of No Significant Impact (FONSI), EA, and Section 404(b)(1) Evaluation were prepared to address impacts resulting from dredging and placement activities for the entire Biloxi Harbor Federal Navigation Project and the Deer Island Section 204 Ecosystem Restoration Project in 2002. The Biloxi Harbor navigation project was re-certified in 2007 and is currently certified until August 2012. These documents are on file and are available for review at the Corps, Mobile District Office. A draft Environmental Assessment is on the District's website at http://www.sam/usace.army.mil for public review.

SECTION 404 (B)(1) EVALUATION REPORT: Water quality impacts associated with the proposed action have been identified in an evaluation report prepared in accordance with Public Law 92-500, Section 404 (b)(1) Guidelines promulgated by the U. S. Environmental Protection Agency under the Clean Water Act. The Draft Section 404 (b)(1) Evaluation is on the District's website at http://www.sam.usace.army.mil/pd/Pd1.htm for review. The report concludes that

only minor and short-term turbidity impacts would result from the implementation of the proposed action.

ENDANGERED/THREATENED SPECIES: Pursuant to Section 7 of the Endangered Species Act, the proposed Federal action at the Biloxi Harbor is being coordinated with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Department of Commerce, National Marine Fisheries Service (NMFS) Protected Resource Division to determine if the following threatened and endangered species: Gulf sturgeon; West Indian manatee, piping plover; and the loggerhead, green and Kemp's ridley sea turtles may be affected by the proposed project.

Critical habitat for the Gulf sturgeon within the project vicinity is identified as Unit 8 consisting of the Mississippi Sound. The primary constituent elements essential for the conservation of the Gulf sturgeon are those habitat components that support foraging, riverine spawning sites, normal flow regime, water quality, sediment quality, and safe unobstructed migratory pathways. The Mississippi Sound system provides feeding, water quality, sediment quality, and migration habitat for Gulf sturgeon. Gulf sturgeon have been identified between the barriers islands' passes potentially feeding. The project is maintained via a hydraulic pipeline dredge. Gulf sturgeon are not adversely impacted by hydraulic dredges according to past coordination with the NMFS. Furthermore, the dredges and other heavy equipment would also not adversely impact the sturgeon because we anticipate that they would temporarily avoid the project area due to the elevated noise level. Based on review of endangered and threatened species that could occur within the Biloxi Harbor navigation project area, the Corps, Mobile District has determined that the proposed action would not adversely impact any listed species or their critical habitat. Concurrences from these agencies are anticipated.

CULTURAL RESOURCES CONSIDERATION: The National Register of Historic Places has been consulted during past certification efforts and no properties listed on, being nominated to or determined eligible for the National Register are located in the project vicinity. There are no reported historic shipwrecks in the vicinity of the Biloxi Harbor navigation project. No impacts to cultural resources are anticipated. Based on the history of the project, agency concurrence with our no effect determination is anticipated. Copies of this notice are being sent to the Mississippi State Historic Preservation Officer and the U.S. Department of Interior, National Park Service, Atlanta, Georgia.

ESSENTIAL FISH HABITAT ASSESSMENT: The Gulf of Mexico Fishery Management Council in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265) has developed management plans for the following fisheries: shrimp, red drum, reef fish, stone crab, spiny lobster, coral and coral reef and coastal migratory pelagic. Of these plans, only those pertaining to shrimp and red drum are applicable to the proposed action. The maintenance dredging and placement of the dredged material will not significantly affect coastal habitat identified as Essential Fish Habitat (EFH) in the Biloxi Harbor navigation project area. Based on the extent of this habitat in the general vicinity of the project and the small size of the project, the overall impact to fisheries resources is considered negligible. The Corps, Mobile District has determined there would be no impact to EFH as a result of this dredging project. The Gulf of Mexico Fishery Management Plans (1999) identifies EFH in the project area to be intertidal wetlands, submerged aquatic vegetation, non-vegetated bottoms, shell reefs, and the

estuarine water column. Habitat Areas of Particular Concern have not been identified for the project area.

CLEAN AIR ACT: Air quality in the vicinity of the proposed action would not be significantly affected by the proposed action. The equipment and machinery would generate some air pollution during construction activities, such as increased particulate levels from the burning of fossil fuels. However, these impacts would be minor and temporary in nature. The proposed action is in compliance with the Clean Air Act, as amended. The project area is in attainment with the National Ambient Air Quality Standards parameters. The proposed action would not affect the attainment status of the project area or the region. A State Implementation Plan conformity determination (42 United States Code 7506(c)) is not required since the project area is in attainment for all critical pollutants.

EVALUATION: The decision whether to proceed with the proposed action will be based on an evaluation of the overall public interest. That decision would reflect the national concerns for both protection and utilization of important resources. The benefits that may be expected to accrue from this proposal must be balanced against its reasonably foreseeable detriments. The decision whether to proceed and the conditions under which the activity would occur would be determined by the outcome of this general balancing process. All factors that may be relevant to the proposal would be considered. Among these are conservation, economics, esthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the public. The proposed action would proceed unless it is found to be contrary to the overall public interest. Inasmuch as the proposed work would involve the discharge of materials into navigable waters, specification of the proposed disposal sites associated with this Federal project is being made through the application of guidelines promulgated by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army. If these guidelines alone prohibit the specification of any proposed disposal site, any potential impairment of the maintenance of navigation including any economic impacts on navigation and anchorage, which would result from the failure to use this site, would also be considered.

COORDINATION: Among the agencies receiving copies of this public notice are:

Region 4, U.S. Environmental Protection Agency
U.S. Department of the Interior, Fish and Wildlife Service, Jackson, Mississippi
Regional Director, National Park Service
U.S. Department of Commerce, National Marine Fisheries Service, Panama City, Florida
U.S. Department of Commerce, National Marine Fisheries Service, St. Petersburg, Florida
Commander, Eighth Coast Guard District
Mississippi State Historic Preservation Officer
Mississippi Department of Environmental Quality, Office of Pollution Control
Mississippi Department of Marine Resources
Gulf of Mexico Fishery Management Council
U.S. Department of Agriculture, Natural Resources Conservation Service

CESAM-PD-EC **August 5, 2011**
PUBLIC NOTICE NO. FP11-BH01-05

Appropriate Federally recognized Indian Tribes

Other Federal, State, and local organizations, U.S. Senators and Representatives of the State of Mississippi are being e-mailed copies of the notice and are being asked to participate in coordinating this proposed work.

CORRESPONDENCE: Any person who has an interest that may be affected by this proposed activity may request a public hearing. Any comments or requests for a public hearing must be submitted in writing to the District Engineer within 15 days of the date on this public notice. A request for a hearing must clearly set forth the interest, which may be affected, and the manner in which the interest may be affected. Correspondence concerning this public notice should refer to Public Notice No. FP11-BH01-05 and should be directed to the Commander, U.S. Army Engineer District Mobile, P.O. Box 2288, Mobile, Alabama 36628-0001, ATTN: CESAM-PD-EC. If you require additional information, please contact Mr. Michael F. Malsom at (251) 690-2023, or by email at michael.f.malsom@usace.army.mil.

CURTIS M. FLAKES
U.S. Army Corps of Engineers
Mobile District

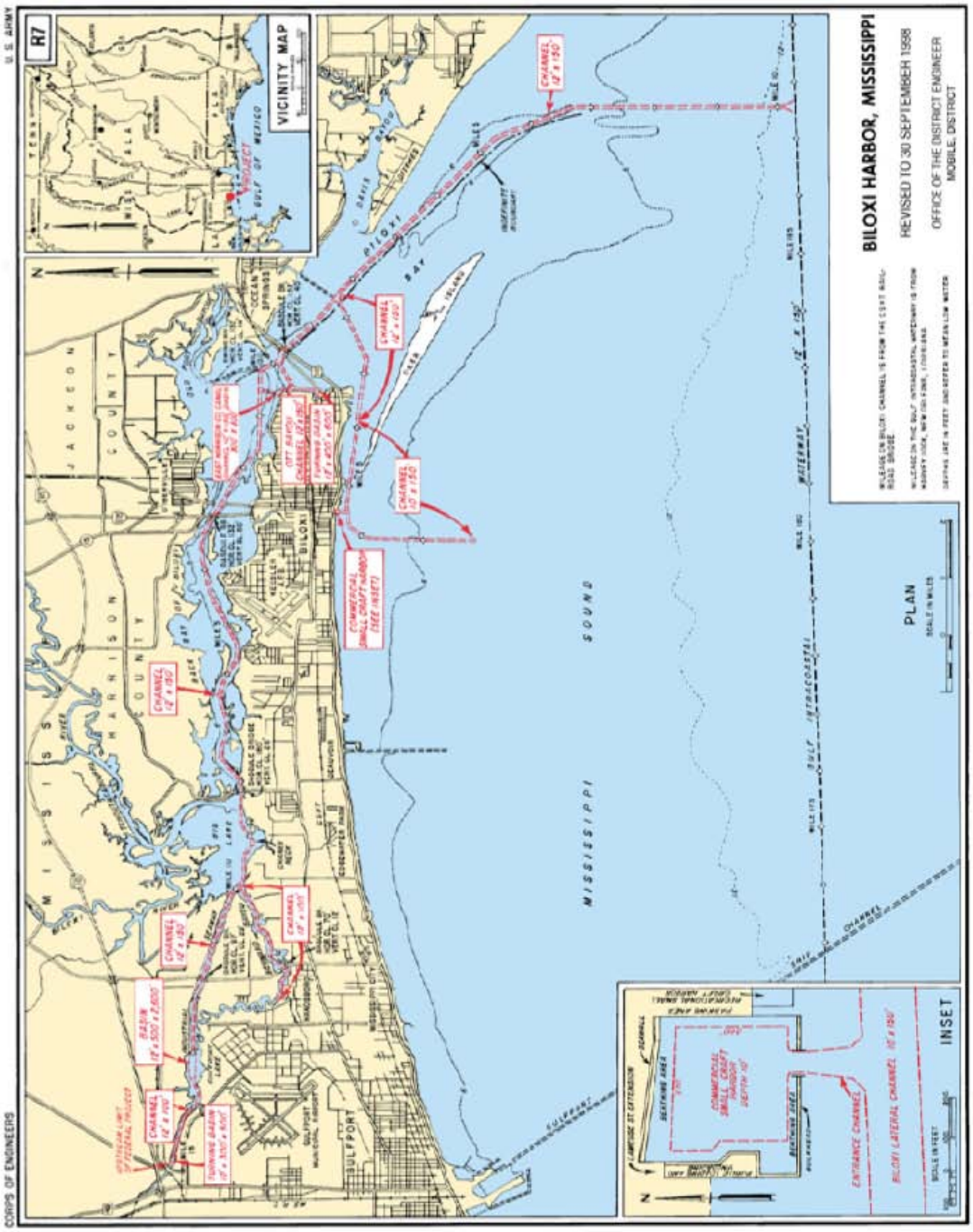


Figure 1. Biloxi Harbor Federal Navigation Project

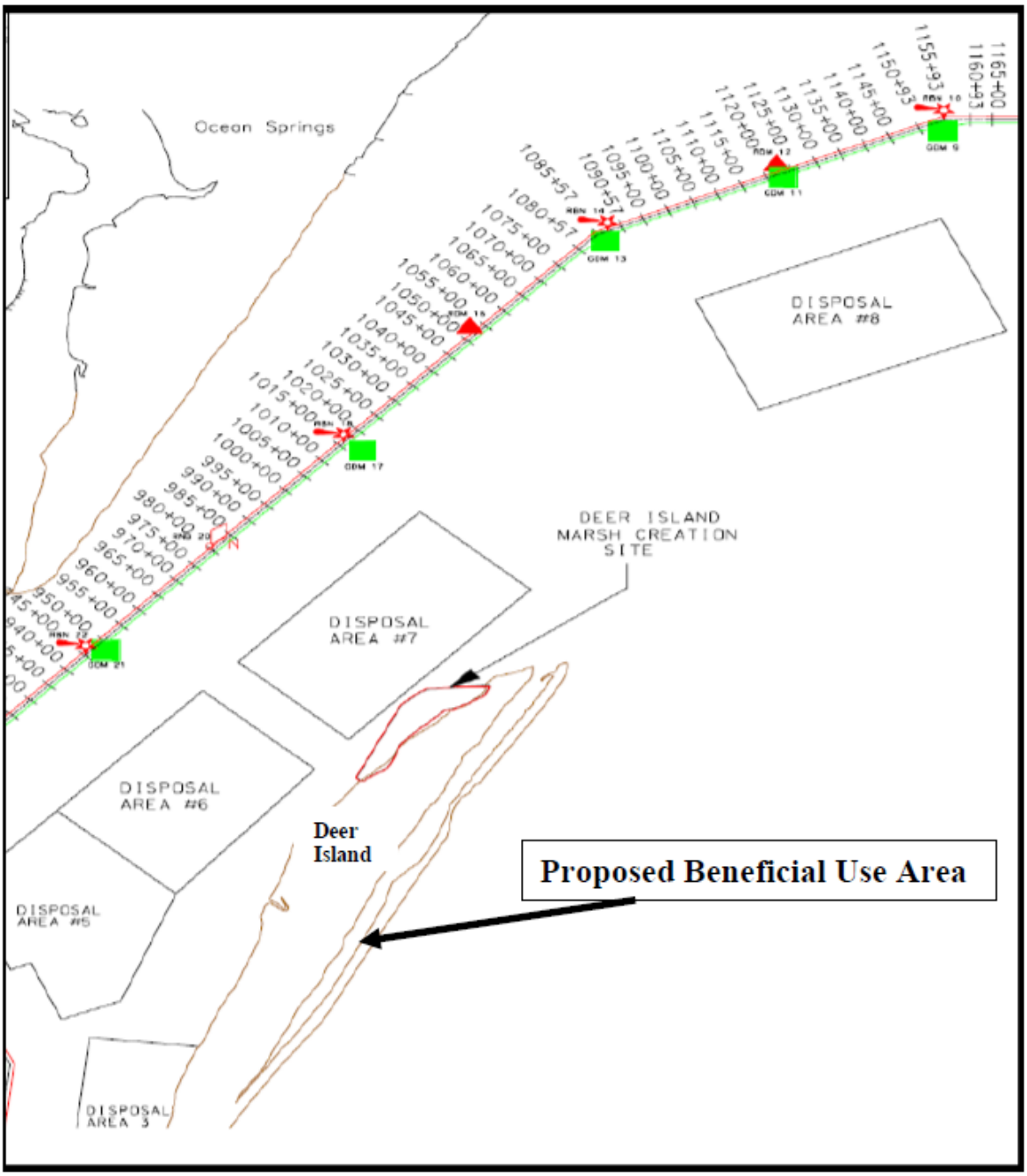


Figure 2. Map of Deer Island's Proposed Beneficial Use Area

EA-Enclosure 1

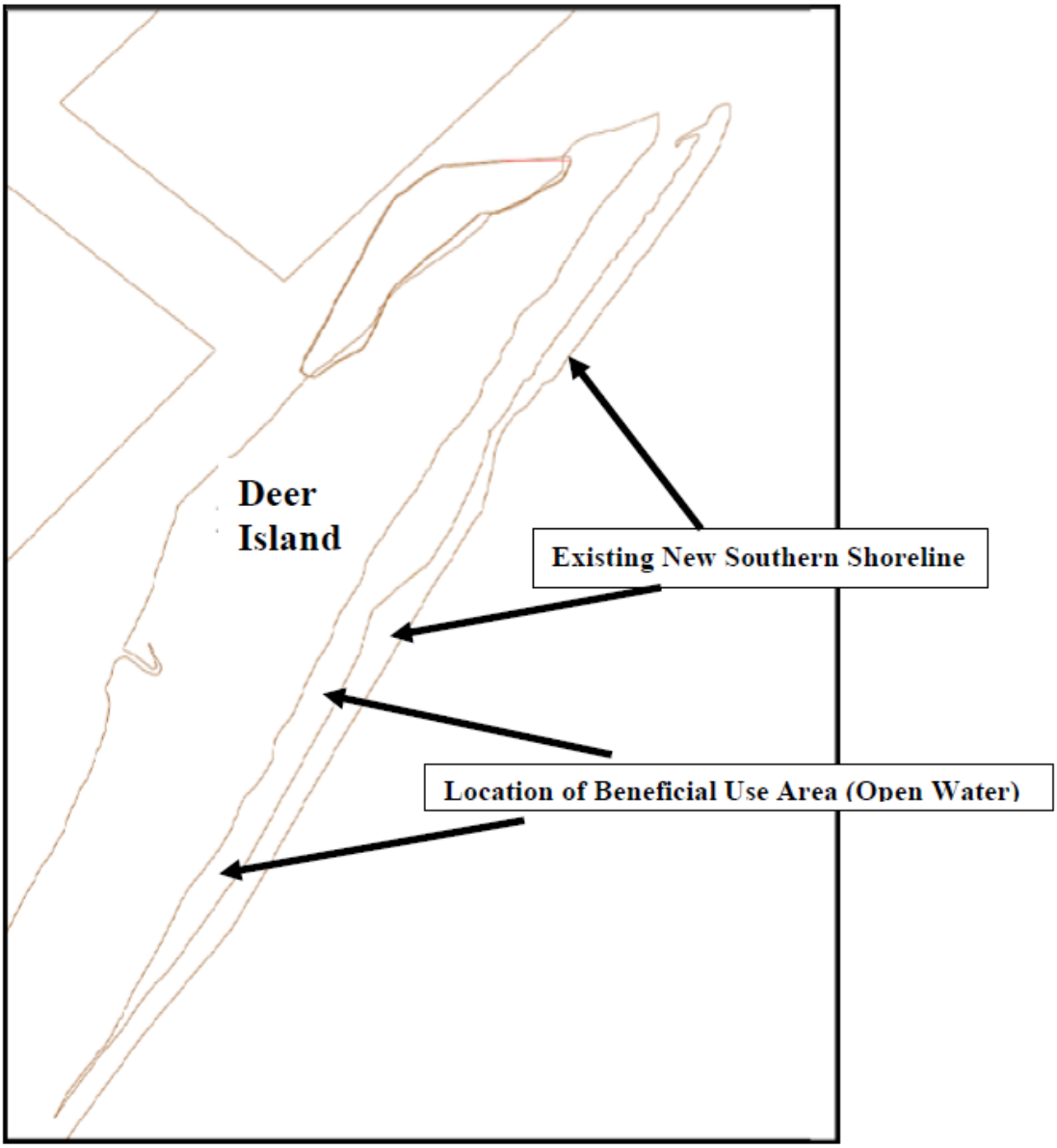


Figure 3. Enlarged Map of Proposed Deer Island Beneficial Use Area

EA-Enclosure 1

Figure 4. Aerial View of Proposed Beneficial Use Area

Figure 5. Map of Access Channels and Open Water Disposal Areas

Last Page of Draft EA