



**DRAFT**  
**ENVIRONMENTAL ASSESSMENT**  
**FEDERAL MOBILE HARBOR OPERATIONS & MAINTENANCE**  
**MOBILE COUNTY, ALABAMA**

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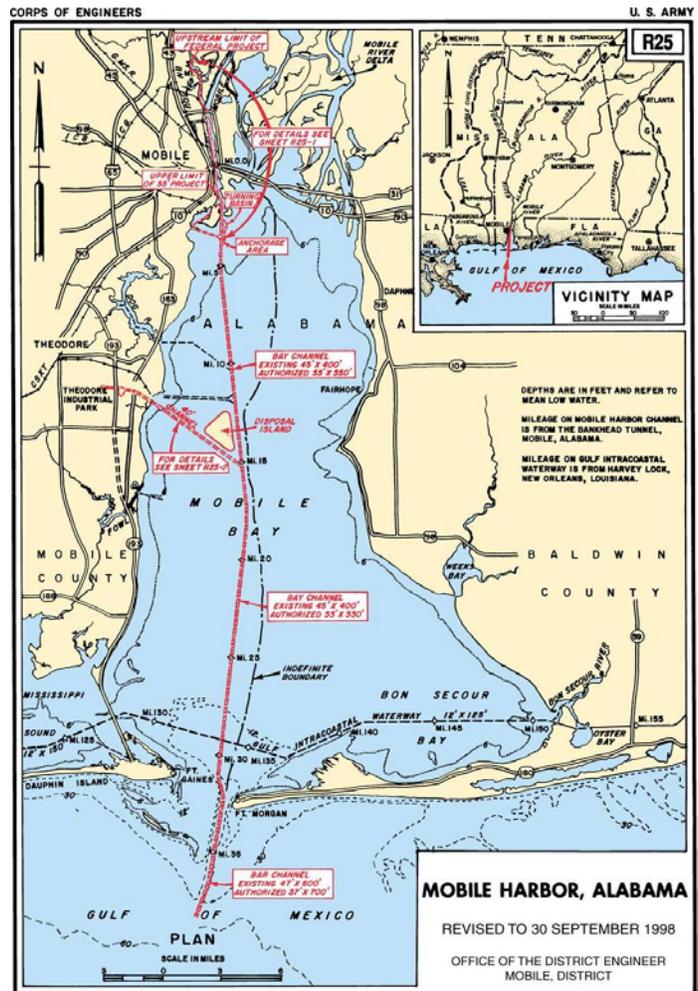
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# DRAFT

## ENVIRONMENTAL ASSESSMENT MOBILE HARBOR OPERATIONS & MAINTENANCE MOBILE COUNTY, ALABAMA

**1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION.** The proposed dredging operations and placement activities are required to continually provide for safe navigation and maintain the Mobile Harbor channels to the federally authorized dimensions. The action is a result of normal rates of shoaling and a need exists to maintain full commercial shipping capacity for the Port of Mobile (see Figure 1).

This Environmental Assessment (EA) was prepared in accordance with Engineer Regulation (ER) 200-2-2, *Procedures for Implementing the National Environmental Policy Act (NEPA)* and the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 Code of Federal Regulations (CFR) Pts. 1500-1508). The objective of the EA is to determine the magnitude of the environmental impacts of the proposed action. If such impacts are relatively minor, a Finding of No Significant Impact (FONSI) will be issued and the Mobile District, U.S. Army Corps of Engineers may proceed with the action. If the environmental impacts are significant according to CEQ's criteria (40 CFR Pt. 1508.27), an Environmental Impact Statement (EIS) or a supplement to the existing 1980 Final EIS would be prepared before a decision is reached to implement the proposed action.



**Figure 1: Vicinity Map of Mobile Harbor Project Area**

**2.0. AUTHORIZED AND EXISTING PROJECT.** The navigation channel dredging in Mobile Bay and Mobile River began in 1826 with enactment of the River and Harbor Act of 1826. Over subsequent years, the Federal project at Mobile River and Mobile Bay was expanded to include adjoining channels within the bay. Section 104 of the River and Harbor Act of 1954 (House Document 74, 83<sup>rd</sup> Congress,

First Session, as amended, and previous acts) authorized a 40-foot channel. Improvements to the existing Federal project were authorized in the Water Resources Development Act of 1986 (PL 99 – 662, Ninety-ninth Congress, Second Session), which was approved 17 November 1986, and amended by Section 302 of the Water Resources Development Act of 1996.

The authorized Mobile Harbor Navigation Project includes the following:

- a. A 57' x 700' channel from the Gulf of Mexico for approximately eight (8) miles to Mobile Bay;
- b. A 55' x 550' channel from the mouth of the Mobile Bay for a distance of approximately 29 miles to near the mouth of Mobile River, including a passing lane two (2) miles long and 625' wide at mid-bay;
- c. A 55' x 750' x 4,000' anchorage area just south of McDuffie Island;
- d. A 55' x 1500' x 1,500' turning basin opposite McDuffie Island;
- e. A 40' deep channel with the width varying from 700', near the Mobile River mouth, to 500', near the Cochrane Bridge (U.S. Highway 98), a distance of approximately four (4) miles;
- f. A 40' x 800' – 1,000' x 2,500' turning basin opposite the Alabama State docks between river miles 1.0 to 1.5; and
- g. A 40' x 1000' x 1,600' turning basin just south of the Cochrane Bridge.

The authorized dimensions of all segments of the Mobile Harbor Project have not been constructed. A summary of both the authorized and the existing maintained dimensions are listed in Table 1. The maintained dimensions of the bay channel are 45' by 400' and the outer bar channel is 47' by 600'. Each of these areas is maintained to a depth that is 10' less than the authorized depth. Several additional features of the authorized project have not been constructed at this time. The anchorage areas that would be located south of the mouth of the Mobile River have not been constructed, and the bay channel and the bar channel, have not been widened. The new turning basin opposite McDuffie Island, between Pinto Island and Little Sand Island, was constructed in 2010.

**Table 1. Authorized and Existing Dimensions for Mobile Harbor**

<b>Channel</b>	<b>Authorized Dimensions</b>	<b>Existing Dimensions</b>
<i>Outer Bar Channel (a.)</i>	57' x 700'	47' x 600'
<i>Bay Channel (b.)</i>	55' x 550'	45' x 400'
<i>Anchorage Area (c.)</i>	55' x 750' x 4,000'	<i>Not Constructed</i>
<i>Turning Basin (d.)</i>	55' x 1,500' x 1,500'	45' x 755' x 1320'
<i>River Channel (e.)</i>	40' x 500' -700'	<i>As Authorized</i>
<i>Turning Basin (f.)</i>	40' x 800' – 1,000' x 2,500'	<i>As Authorized</i>
<i>Turning Basin (g.)</i>	40' x 1,000' x 1,600'	<i>As Authorized</i>

Approval for advanced maintenance for the Federal Mobile Harbor navigation project was received from South Atlantic Division in the mid-1990s as per the Navigation Regulations ER1130-2-530, 29 November 1996. As such, the navigation channels have associated advanced maintenance to accomplish dredging in an efficient, cost-effective, and environmentally responsible manner. In addition to the federally-authorized channel dimensions providing for navigation, two (2) sediment basins in the Mobile River and three (3) sediment basins in the bay channel, have been previously authorized and approved. These sediment basins are to provide improved channel maintenance efficiency. Each of the basins are several thousand feet long and have depths ranging from four (4) feet to ten (10) feet lower than the existing navigation channel bottom. The basins decrease frequency of dredging to provide a more cost effective and reliable channel. In addition to sediment basins, an advanced widening feature is authorized for the bar channel.

**3.0 NATIONAL ENVIRONMENTAL POLICY ACT CONSIDERATION.** NEPA and Title 40 of the CFR, Parts 1500-1508 (40 CFR 1500-1508) require Federal agencies to consider the potential environmental consequences of proposed actions and alternatives. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality (amended by EO 11991), provides policy directing the Federal government to take leadership in protecting and enhancing the environment.

In accordance with the requirements of NEPA, impacts associated with navigation improvements for the Mobile Harbor navigation project were addressed in an EIS dated October 1980. In addition, a supplemental EIS dated December 13, 1985, was prepared to address impacts associated with the offshore placement (Gulf Disposal Area) of dredged material from construction of navigation improvements and channel maintenance activities, and for the designation of an offshore placement site(s). The Record of Decision implementing the harbor improvements was signed January 8, 1987. The EIS, Supplemental EIS and EAs were coordinated with all applicable Federal, state and local agencies and the interested public. Impacts from the construction of the new Mobile Harbor Turning Basin were addressed in the Final Environmental Assessment (published May 2007), as well as a Public Notice (PN# FP06-MH13-10 published December 2006). A final EA was prepared to address impacts associated with the placement activities in the *Sand Island Beneficial Use Area (SIBUA)*, dated March 2007, and a Finding of No Significant Impact (FONSI) signed on March 2007. This Draft EA for the proposed action is available for review in the U.S. Army Corps of Engineers, Mobile District Office, Planning and Environmental Division or at the following website: [www.sam.usace.army.mil/Pd1.htm](http://www.sam.usace.army.mil/Pd1.htm).

**4.0 DESCRIPTION OF THE PROPOSED ACTION.** The proposed action is continued operations and maintenance of the Mobile Harbor Navigation Project. However, previously-approved, but recently constructed, components are being included in this authorization, for the first time, such as: the Mobile Harbor Turning Basin, the use of open water disposal sites for emergency disposal, and the entrance to Theodore Ship Channel where it intersects with Mobile Bay Channel.

The Mobile Harbor Project is divided into three (3) general areas: the river channel section, the bay channel section and the bar channel section. The maintenance activities include the placement of dredged material originating from the project into previously-approved disposal areas. The complete description of the proposed action is presented below, and the project features are illustrated in Figure 1.

**River Channel Section** - The proposed action in this portion of the project involves the continued maintenance dredging and placement of material from the mouth of the Mobile River to the Cochrane Bridge, a distance of about four (4) miles (see Figure 2). The River channel is dredged to a total depth of 40 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable overdepth dredging. The river channel section upper sediment basin would be maintained to its authorized and approved dimensions with eight (8) feet of advanced maintenance and an additional two (2) feet for allowable overdepth. The river channel section lower sediment basin would be maintained to its authorized and approved dimensions with four (4) feet of advanced maintenance and an additional two (2) feet for allowable overdepth.

Approximately 1.2 million cubic yards of dredged material would be removed from the main channel on an annual basis. This includes sediment collected in the sediment basins that would be periodically removed as necessary to restore their original dimensions and their sediment-trapping ability. Dredged material may be removed from the channels by dragline/clamshell, hydraulic pipeline and/or hopper dredge, and all material would be placed in previously-approved upland disposal areas (i.e., North Blakeley, ALCOA Mud Lakes, South Blakeley and North Pinto; see Figure 2) located in the upper harbor area or the Mobile-North Ocean Dredged Material Disposal Site (ODMDS). Dredging and material placement activities could occur at any time during the year, and in response to unforeseen shoaling.

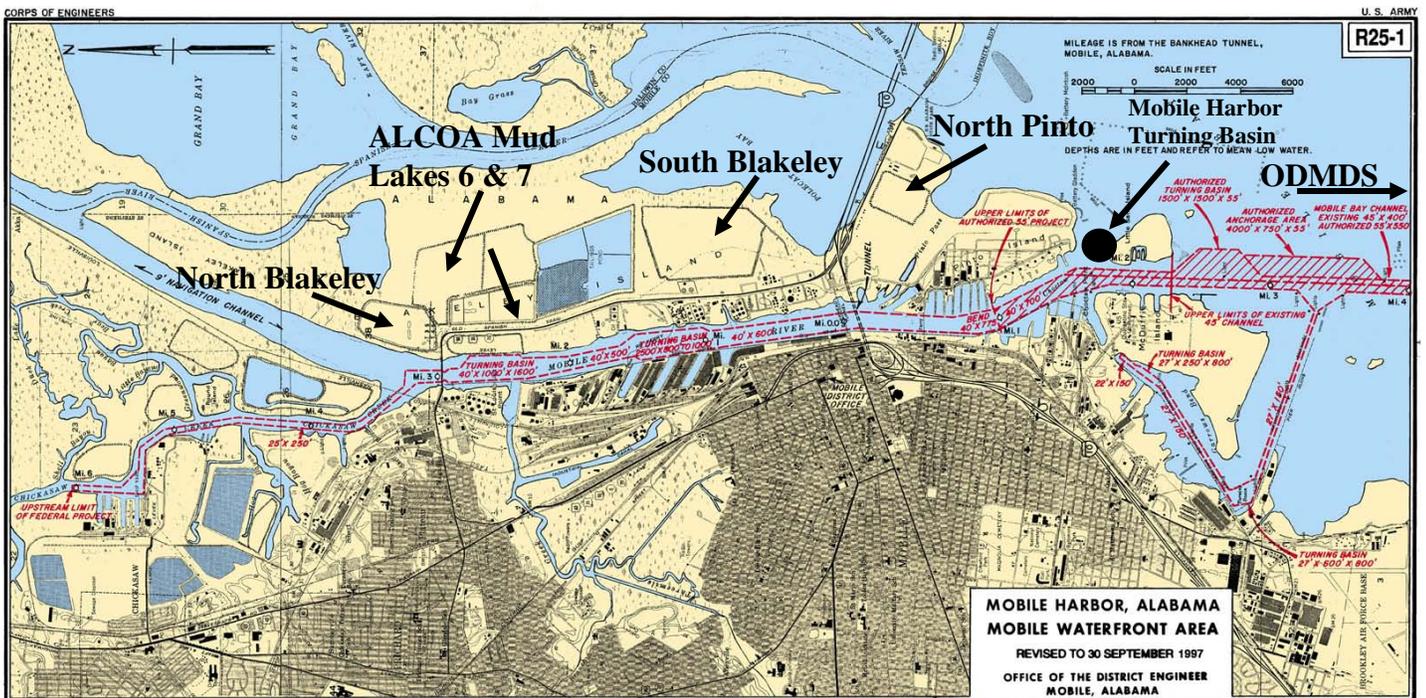


Figure 2: River Channel Section

**Bay Channel Section** – The proposed action within the bay channel section consists of the maintenance dredging of the main channel in Mobile Bay, from near the mouth of the bay to the mouth of the Mobile River, a distance of approximately 29 miles, and the tangent channels, *i.e.*, Theodore channel intersection.

The Bay channel is dredged to a total depth of 45 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable overdepth dredging. The Upper and Lower Bay sediment basins would be maintained to their authorized and approved dimensions with five (5) feet of advanced maintenance and an additional two (2) feet for allowable overdepth. This action will also include the entrance to Theodore Ship Channel where it intersects with Mobile Bay Channel for a distance of approximately 4,300' to its authorized and approved dimensions with six (6) feet of advanced maintenance and an additional two (2) feet for allowable overdepth (see Figure 3). The Mobile Harbor Upper Bay turning basin would be maintained to its authorized and approved dimensions with four (4) feet of advanced maintenance and an additional two (2) feet for allowable overdepth.

The main navigation channel in the bay typically requires the annual removal of about 4.3 million cubic yards of material to maintain the channel dimensions. The maintenance of the navigation channels and sediment basins may be accomplished by a dragline/clamshell, hopper and/or hydraulic pipeline dredge. The primary disposal area for the bay channel is the previously-approved Mobile-North ODMDS. Dredging and material placement activities could occur at any time during the year, and in response to unforeseen shoaling.

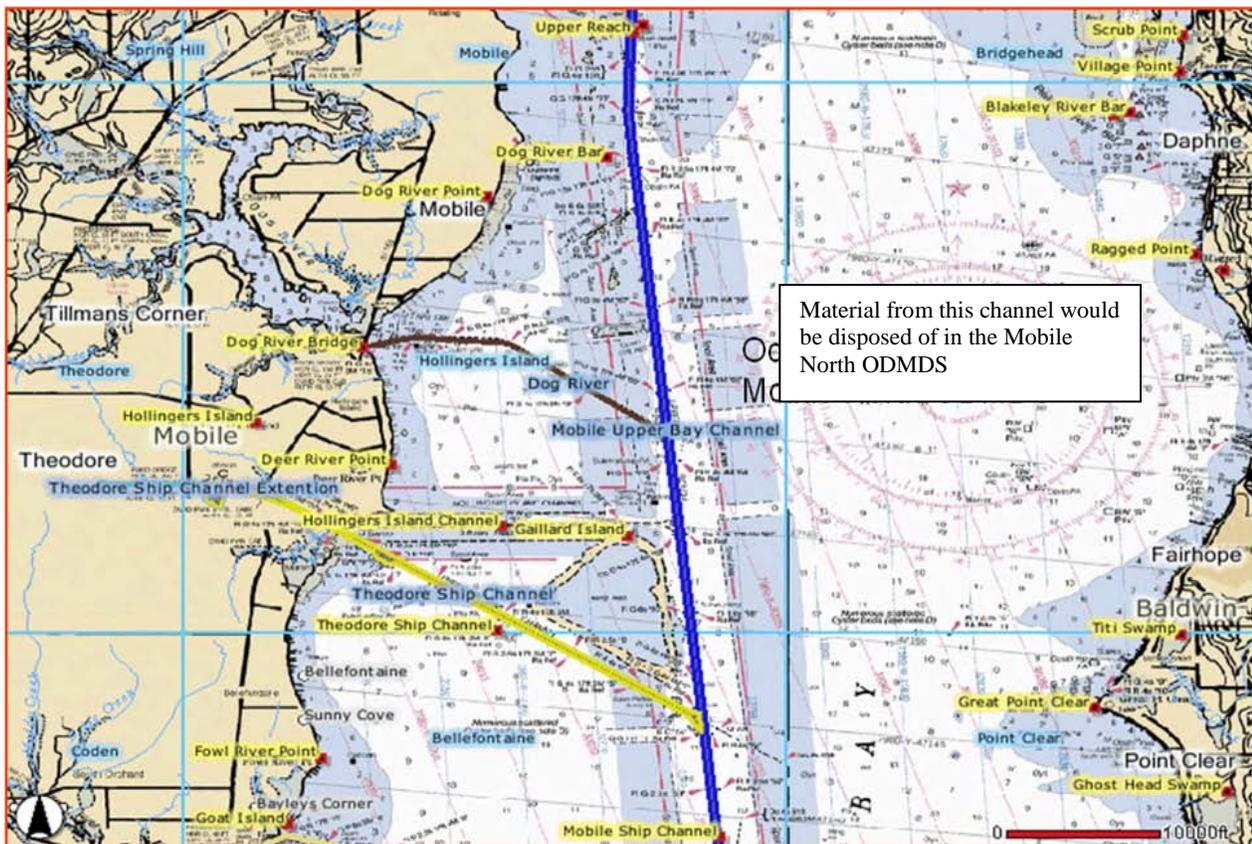


Figure 3: Upper Bay Channel Section

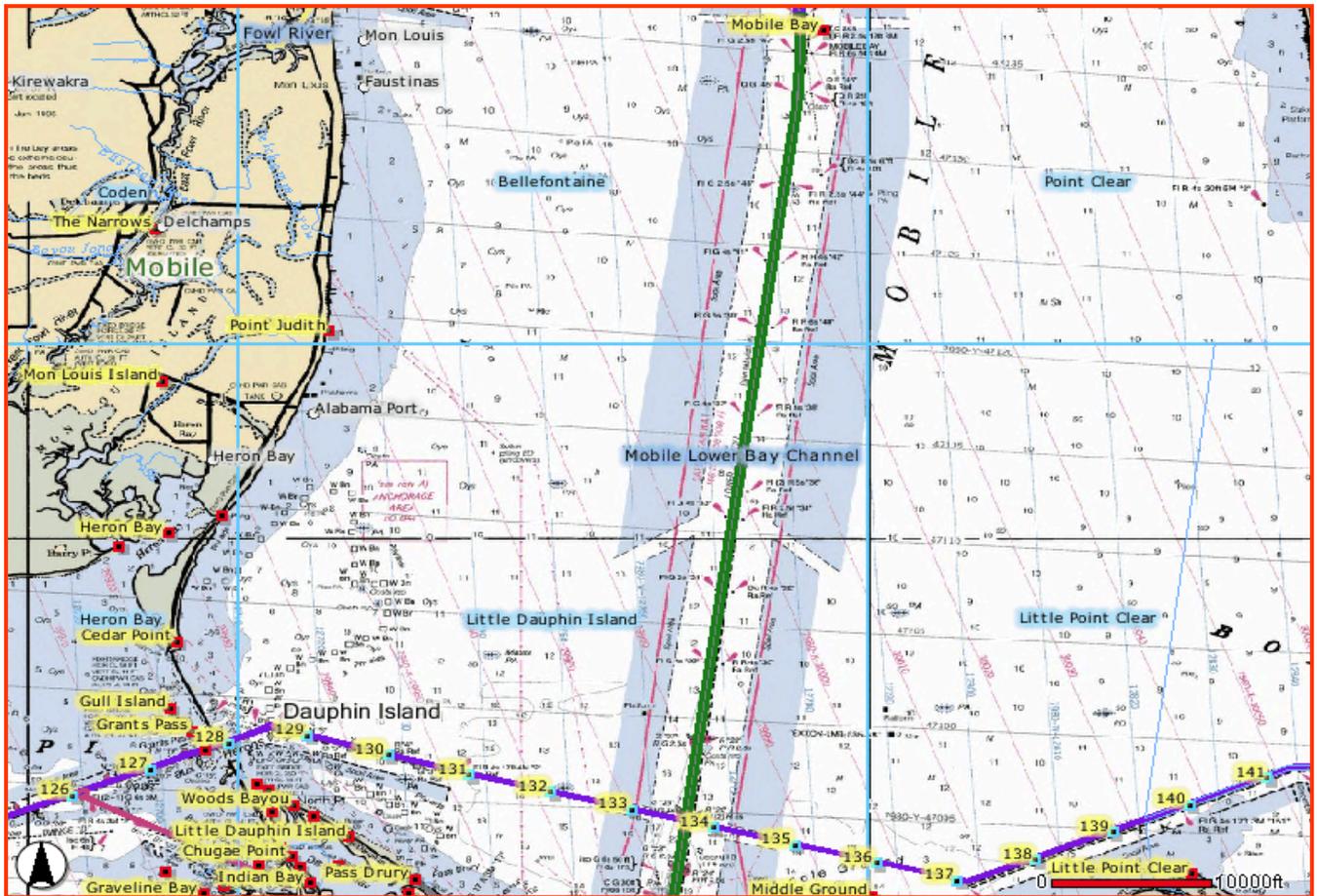


Figure 4: Lower Bay Channel Section

**Bar Channel Section** – The proposed action includes the maintenance dredging of the channel from the Gulf of Mexico to Mobile Bay, a distance of approximately eight (8) miles (see Figure 5).

The Bar channel is dredged to a total depth of 47 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable over depth dredging.

Approximately 300,000 cubic yards of material would be removed from the channel each year (average annual). The material is typically removed by a hopper or hydraulic cutterhead dredge, and placed in the SIBUA as described by Public Notice FP08-MH14-05 and illustrated in Figure 6. The primary disposal area for the bar channel is the SIBUA; however, the Mobile-North ODMDS may be utilized if it is not feasible or in the SIBUA is not available at the time of disposal.

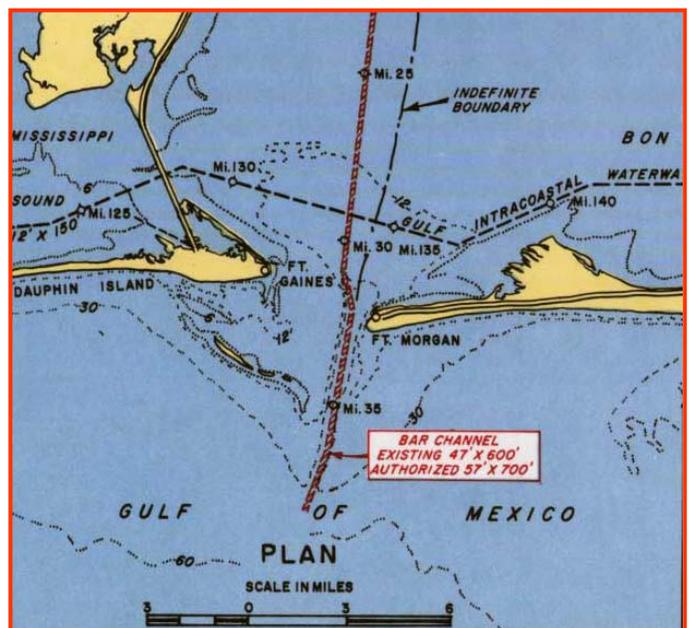


Figure 5- Bar Channel Section

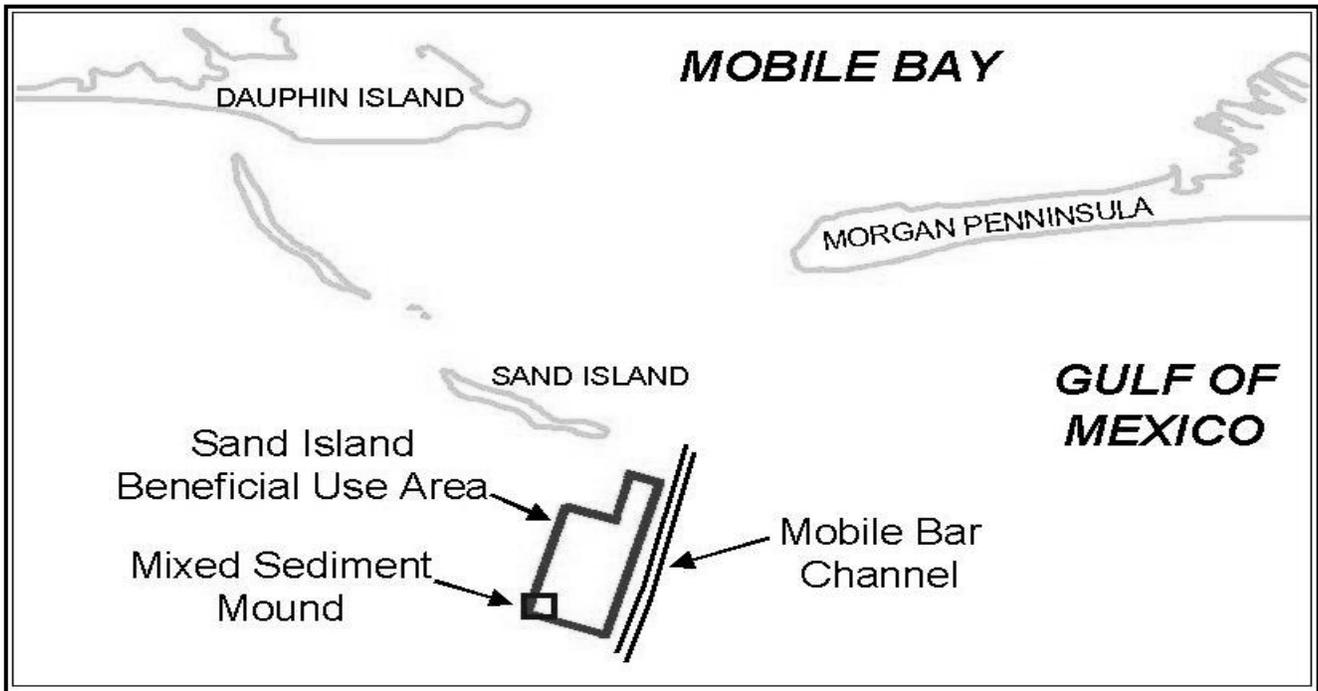


Figure 6- Location of the Mobile Bar Channel and Sand Island Beneficial Use Area (SIBUA)

**Advanced Maintenance** - It is USACE policy that dredging will be accomplished in an efficient, cost-effective, and environmentally responsible manner to improve and maintain the Nation's waterways to make them suitable for navigation and other purposes consistent with Federal laws and regulations (USACE 1996). In a guidance memorandum dated 17 January 2006, Congress specifically authorizes Federal navigation channels with a specific depth and width (and length) (USACE 2006). The authorized depth and width are generally based on maximizing net transportation savings considering the characteristics of vessels using the channel. In addition to authorized dimensions, channel reliability is considered and may result in the incorporation of advance maintenance depths into construction of the channel where such advance maintenance is justified to ensure channel reliability and least overall cost. There are inherent excavation inaccuracies in the dredging process. Excavation accuracy relates to closeness of the dredge's completed work to the design (project and/or overdepth) grade as determined by an after-dredge hydrographic survey.

Dredge excavation accuracies vary as a function of type of dredging equipment used (mechanical or hydraulic) and interaction with site-specific physical conditions (tides, currents, waves), type and thickness of sediment or rock being dredged, and channel design (water depth, side slopes, etc.). Because of these variables and the resulting excavating inaccuracies associated with the dredging activity, USACE engineering design, cost estimating, and construction contracting documents recognize that dredging below the congressionally- authorized project dimensions will occur and is necessary to ensure required depth and width as well as cost-effective operability. To balance project construction requirements against the need to limit dredging and disposal to the minimum required to achieve the designed dimensions, a paid allowable overdepth (including side slopes) is incorporated into the project dredging prism. Material removed from this allowable overdepth is paid for under the terms of the dredging contract. Material removed beyond the limits of allowable overdepth is not paid for (USACE



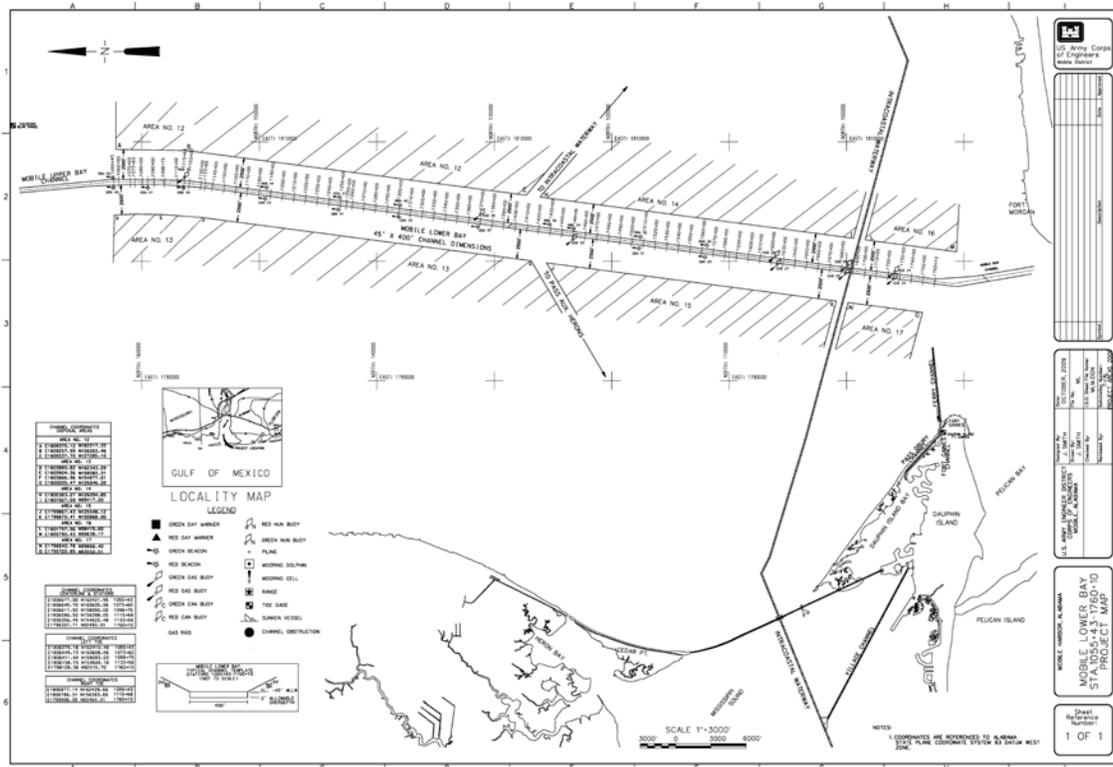


Figure 7: Mobile Harbor Open Water Disposal Areas (Upper Bay and Lower Bay)

## 5.0. ALTERNATIVES TO THE PROPOSED PROJECT.

**5.1. No Action.** The No Action alternative was considered and determined to not be a viable alternative for the proposed action. It is believed that greater negative economic and environmental impacts will result from not re-issuing certification of continual maintenance dredging and disposal activities. Discontinuing maintenance would forego economic benefits and eliminate a major United States seaport. Over 67 million commerce tons annually, (of which a large percentage are energy-related products such oil and coal), would have to be shipped by other means. The Port of Mobile is the largest break bulk forest products port in the United States, and the Alabama State Port Authority's McDuffie Terminal is the second largest coal terminal in the United States and largest import coal terminal. Project abandonment would place an economic stress upon industrial and commercial endeavors already dependent upon the project as well as eliminate a seaport important in national defense activities. A water resources oriented way-of-life initiated before the inception of this nation would also be eliminated with the abandonment of the project. Therefore, it was determined that the No-Action alternative was not a viable alternative for the proposed action.

**5.2. Proposed Action.** - The selected alternative, recertification of maintenance dredging and placement activities, is being recommended for implementation, as it would provide for safe navigation to the Federal Mobile Harbor navigation channels. The action is a result of normal rates of shoaling and a need exists to maintain full commercial shipping capacity for the Port of Mobile. This alternative will result

in minor localized impacts and proves to be the least environmentally damaging alternative. A detailed description of this proposed action is located in Section 3.0 of this EA.

## **6.0. AFFECTED ENVIRONMENT.**

**6.1 Physiography.** The East Coast Gulf Coastal Plain section lies within the Coastal Plain province of the Atlantic Plain region. Hereafter called the Coastal Plain, it is one of Alabama's five physiographic sections, each of which is recognized by its pattern of relief features and landforms that differ significantly from those of adjacent sections. The Coastal Plain section is the southernmost part of the Coastal Plain province of the Atlantic Plain Region and it is Alabama's largest physiographic section, occupying about 60 percent of the state. The section encompasses entirely or in part 40 of Alabama's 67 counties. Its northern boundary, often known as the fall line, forms a large, sweeping curve from Phoenix City, in Russell County, to the Alabama-Mississippi border west of Florence, in Lauderdale County. The Coastal Plain continues northwest into Mississippi, where it occupies most of the state, and northeast into Georgia. Although called a plain, the Coastal Plain includes a wide variety of landscapes. It is flat and relatively featureless in some areas, but elsewhere it consists of rounded and eroded hills, topographic features known as "cuestas" and "flatwoods", and the floodplains of the Alabama, Tombigbee, and Black Warrior rivers.

The Coastal Plain developed on geologically young Mesozoic to Recent (from about 140 million years ago to the present) sedimentary rocks and sediment. The geologic units, composed mainly of sediments, are described variously as gravels, sands, silts, and clays. The rocks are mainly composed of chalk, sandstone, limestone, and claystone. The beds slope gently southward at about 40 feet per mile and are progressively younger from the fall line to the coast. Locally, higher elevations are underlain by more resistant material (in some areas it is sediment, in others sedimentary rock), and the lowlands are underlain by softer material. The type of resistant material varies from one physiographic district to another.

In this distinctive landscape, the numerous "cuestas" trend roughly northwest-southeast, and each north-facing slope is steeper than the gentler south-facing slope, an indication of the dip of the underlying beds. The valleys tend to appear as distorted V shapes in profile, with a gentler northern and a steeper southern slope. The elevation difference, or relief, between the top of cuesta and the floor of the flatwoods can reach 300 feet. Major cuestas occur in the Black Prairie, Chunnenugee Hills, and Southern Red Hills districts.

**6.2 Soils.** Mobile County is in the southwestern corner of Alabama. The city of Mobile is the county seat. The county has a total area of 793,472 acres, or about 1,239.8 square miles. The county is in two major land resource areas- the Southern Coastal Plan Resource area, which includes the northern, western and central parts of the county, and the Gulf Coast Flatwoods Resource area, which includes a narrow strip along the eastern and southern boundaries.

The Southern Coastal Plan area has two general landscapes. The northern part of the area is mainly low hills with narrow to broad, gently sloping ridgetops, moderately-steep side slopes, and many narrow, well-defined drainage-ways. The southern part is mostly a series of level to gently sloping, low lying ridges that have steeper slopes along drainage-ways. The Gulf Coast Flatwoods area is mainly nearly

level, low stream terraces and swamps along the rivers on the east side of the county and broad flats with a few fairly large depressions and a few drainage-ways on the south side of the county. Petis Bois, Dauphin, and other small islands, 5 to 12 miles from the mainland, are included in the county. These islands are part of the barrier islands that encloses Mississippi Sound. Elevation in the county ranges from sea level along the coast to about 340 feet above sea level near Citronelle in the northern part of the county. Drainage in the county in the western third is by the Escatawpa River and Big Creek, which flow in a south-western direction into the State of Mississippi. The eastern part of the county is drained mostly by small streams that are part of the Mobile, Tensaw and Middle Rivers drainage system, which flows into Mobile Bay. Drainage in the southern part of the county is by the Dog River, the Fowl River, and small streams that flow into Mobile Bay and into Mississippi Sound.

The sediment of Mobile Bay consists of sand to clays with various mixtures of sand, silt, and clay covering most of the bay bottom. The Mobile Bay sediments are approximately 50 percent sand and 50 percent clay as described by the Navy (1986). The northern portion of the bay is comprised of deltaic sands, silty sand, silts and clayey silts carried in by the Mobile River. Sediments of the lower bay are primarily estuarine silty clay and clay. The western shoreline exhibits sands which grade to clayey sand, sandy clays, and clays towards the deeper parts of the bay. Oyster reefs and shell occur in isolated locations in the southern part of Mobile and Bon Secour Bays (USACE 1985). The upper portion of Mobile Harbor is predominantly silt and clay with higher concentrations of sand in the mouth of the Mobile River. The northernmost part of the harbor and Mobile River mouth, which reflects the conditions within the turning basin area is sandier due to the larger grain sizes initially deposited into the estuary by the mouth of the river while the finer silts and clays were deposited in the deeper portions of the harbor area.

Previous sampling of Mobile Harbor was conducted in 2004 by EA Engineering, Science and Technology of Sparks, Maryland, and included bulk sediment analysis, elutriate testing (Tier II), water column bioassays, whole sediment bioassays, and bioaccumulation studies (Tier III) of sediment samples proposed for maintenance dredging. The 2010 testing program was similar to the one conducted in 2004 that determined that the Mobile Bay sediment was suitable for ocean placement and the Mobile River sediment was suitable for upland placement, as described below.

In 2004, the bulk sediment, site water, and elutriate testing consisted of analyses for metals, chlorinated pesticides, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, dioxin and furan congeners, butyltins, semi-volatile organic compounds (SVOCs), ammonia, cyanide, total sulfides, acid volatile sulfide (AVS) (sediment only), simultaneously extracted metals (SEM) (sediment only), total Kjeldhal nitrogen (TKN), total organic carbon (TOC), total phosphorus, nitrate, and nitrite. The results from the project indicated that the sediment from the Mobile Bay navigation channel met the Limiting Permissible Concentration (LPC) for water quality, water column toxicity, benthic toxicity, and benthic bioaccumulation. The Mobile Bay sediments were approved for placement at the Mobile-North ODMDS.

Target analytes for the 2010 sediment testing were chosen based on the results of the 2004 sediment sampling in Mobile Harbor and consultation with USEPA-Region 4. Sediments, site water, and standard elutriates were tested for the following target constituents: metals, chlorinated pesticides, PCB congeners, SVOCs, PAHs, dioxin and furan congeners, ammonia (NH<sub>3</sub>-N), TKN, nitrate+nitrite, total phosphorus, TOC, total sulfide, cyanide, butyltins, SEM (sediment only), and AVS (sediment only).

In addition, the following physical analyses were conducted for the bulk sediment samples: grain size determination, specific gravity, and percent solids. Sediment concentrations for the 2010 Mobile Harbor samples were generally within the range of concentrations detected in the 2004 Mobile Harbor sediment samples (EA 2008). Of the 163 tested chemical constituents, 101 (62 percent) were detected in the sediments from Mobile Harbor. Concentrations of analytes detected in the sediments from Mobile Harbor were generally higher than concentrations of analytes detected at the reference site. None of the 101 chemical constituents detected in the Mobile Harbor sediments exceeded probable effects level (PEL) values. TOC concentrations in the sediments from the Mobile River and Mobile Bay Channels ranged from 0.547 to 1.91 percent. Three metals (arsenic, copper, and nickel) had concentrations exceeding threshold effects level (TEL) values by factors ranging from 1.0 to 1.8.

PAHs were generally detected at low concentrations below the laboratory reporting limit. The highest concentrations of PAHs detected were observed in sediments from the Mobile River. Total PAH concentrations [non-detects equal one half of the method detection limit (ND= $\frac{1}{2}$ MDL)] in the sediments from the Mobile River and Mobile Bay locations were all below the TEL value (1,684  $\mu\text{g}/\text{kg}$ ). Total PCB concentrations (ND= $\frac{1}{2}$ MDL) for the Mobile River and Mobile Bay sediments were also below the TEL value (21.6  $\mu\text{g}/\text{kg}$ ) at each of the sampling locations, except MH10-04 (33.1  $\mu\text{g}/\text{kg}$ ). 4,4'-DDE and gamma-BHC (lindane) were detected in Mobile River and Mobile Bay sediment samples at concentrations that exceeded the TEL value by factors ranging from 1.0 to 2.0. Dioxin and furan congeners were detected at low concentrations, and dioxin toxicity quotients (TEQs) [non-detects equal one half of the reporting limit (ND= $\frac{1}{2}$ RL)] ranged from 5.81 to 19.1 ng/kg. SVOCs were detected at low concentrations, and did not exceed the TEL values.

On April 20, 2010 *The Deepwater Horizon* exploded in the Gulf of Mexico while drilling on the Macondo oil well approximately 41 miles southeast of Louisiana. Oil spilled into the Gulf until it was capped on July 15, 2010. A sampling effort was conducted by EA on behalf of USACE-Mobile in late-November and early-December 2010 to determine if the surface sediment quality in the Mobile Harbor Federal Navigation Channels had been impacted by the oil spill. Based on results of PAH and total petroleum hydrocarbon (TPH) testing of surface sediments collected in the Mobile Lower Ship Channel, Mobile Bar Channel, USEPA-designated reference site, and the Mobile-North ODMDS in November and December 2010, there were no discernable changes observed in the sediment quality that could be attributed to the *Deepwater Horizon* Oil Spill (EA 2011). Therefore, the results of the dredged material testing provided in this Section 103 document are assumed to accurately represent the current physical, chemical, and toxicological characteristics of the maintenance sediments.

**6.3 Biological Resources.** Coastal Alabama consists of several habitats including beaches, sand dunes, coastal maritime forests, emergent wetlands, submerged aquatic vegetation, rivers, tidal creeks, tidal flats, scrub/shrub wetlands, forested wetlands, and open-water benthic habitats. These areas are home to an immensely diverse, resilient, and environmentally significant group of species, including some threatened and endangered fauna. Ecological habitats within the project site include estuarine subtidal and intertidal waterbottoms populated with diverse benthic communities. Benthic communities vary depending on the substrate bottom types present in the area. Intertidal and subtidal water bottoms vary from sand to muddy sand to mud. Subtidal bottoms consist primarily of soft mud sediments (Christmas, 1973). There are no submerged aquatic beds in the vicinity of the project area. Generally, the

submerged aquatic grasses are restricted to the northern shores of the barrier islands south of the mainland shoreline.

*6.3.1 Coastal Flora.* The vegetative communities in Coastal Alabama are diverse; however, existing land use patterns have resulted in a great deal of modification of the natural plant associations. Terrestrial uplands dominate higher ground areas that are not normally subject to riverine flooding or tidal inundation. Natural upland vegetation complexes found in the area include longleaf pine, oaks, moist pinelands, bay forests, monoculture pine, maritime strand, and beach dune associations. The most dominant upland association, longleaf pine and oaks, is well adapted to the dry, sandy sites in the coastal plain region. This association is usually found above the 10-foot contour but sometimes integrates into the moist pinelands along streams and rivers. Other dominant species occurring in the community include: southern red oak (*Quercus falcata*), laurel oak (*Q. laurifolia*), live oak (*Q. virginiana*), southern magnolia (*Magnolia grandiflora*), flowering dogwood (*Cornus florida*), persimmon (*Diospyros virginiana*), winged sumac (*Rhus copallina*), sparkleberry (*Vaccinium arboreum*), and broomsedge (*Andropogon* spp.).

Forest coverage opens up when entering sandy areas near the coast. Vegetation consists largely of slash pine (*Pinus elliottii*) with an understory of saw palmetto (*Serenoa repens*) and wax myrtle (*Myrica cerifera*). This area, known as moist pinelands, differs from longleaf pine-oaks due to its higher water table. A thin strip of moist pinelands usually divides the floodplain swamps and longleaf pine-oak forests. Sedges, grasses, and other herbaceous plants grow in the understory area. Pitcher plant bogs are very noticeable with thousands of plants occupying a relatively small area. Depression in the land combined with the high water table produce standing water, which supports dense growths of freshwater, floating and submerged, aquatic plants.

The vegetative community in brackish to saline marshes consists of plants that have adapted physiologically to higher levels of salinity. Brackish marshes are more diverse than saline marshes and are characterized by black needle rush (*Juncus roemerianus*) and saltmeadow cordgrass (*Spartina patens*). *S. Patens* is characteristic of the saline environment. A distinct zonation exists within brackish and saline marshes. Proceeding seaward from the upland, the number of species composing the community decreases until in the most saline conditions only smooth cordgrass (*S. alterniflora*) or black needle rush composed the marsh.

*6.3.2. Coastal Fauna.* Mammals found within the area include marsupials, moles and shrews, bats, armadillos, rabbits, rodents, carnivores, even-toed hoofed mammals, and dolphins. Mammals occur within all habitats of the system, using underground burrows, the soil surface, vegetative strata, the air, and the water for feeding, resting, breeding, and bearing and rearing young. Mammals, such as the bottle-nosed dolphin, marsh rabbit, cotton rat, swamp rabbit, river otter, and raccoon, are prevalent in the area. A number of whales are known to occur offshore Mississippi and Alabama.

*6.3.3 Essential Fish Habitat.* Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act 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 National Marine Fisheries Service (NMFS) has identified EFH 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, mud, sand, shell, and rock substrates, and the estuarine water column. **Table 2** provides a list of the species that NMFS manages under the federally implemented Fishery Management Plans in the vicinity of the proposed action.

<b>Table 2: Fishery Management Plans and Managed Species for the Gulf of Mexico (NMFS 2008).</b>	
<p><b>Shrimp Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>brown shrimp – <i>Farfantepenaeus aztecus</i></li> <li>pink shrimp - <i>F. duorarum</i></li> <li>royal red shrimp - <i>Pleoticus robustus</i></li> <li>white shrimp - <i>Litopenaeus setiferus</i></li> </ul> <p><b>Reef Fish Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>almaco jack – <i>Seriola rivoliana</i></li> <li>anchor tilefish - <i>Caulolatilus ntermedius</i></li> <li>banded rudderfish – <i>S. zonata</i></li> <li>blackfin snapper - <i>Lutjanus buccanella</i></li> <li>blackline tilefish - <i>Caulolatilus cyanops</i></li> <li>black grouper- <i>Mycteroperca bonaci</i></li> <li>blueline tilefish – <i>C. microps</i></li> <li>club snapper – <i>L. cyanopterus</i></li> <li>dog snapper – <i>L. jocu</i></li> <li>dwarf sand perch - <i>Diplectrum ivittatum</i></li> <li>gag grouper - <i>M. microlepis</i></li> <li>goldface tilefish – <i>C. chrysops</i></li> <li>goliath grouper - <i>Epinephelus itajara</i></li> <li>gray snapper – <i>L. griseus</i></li> <li>gray triggerfish - <i>Balistes capriscus</i></li> <li>greater amberjack – <i>S. dumerili</i></li> <li>hogfish - <i>Lachnolaimus maximus</i></li> <li>lane snapper - <i>Lutjanus synagris</i></li> <li>lesser amberjack - <i>S. fasciata</i></li> <li>mahogany snapper – <i>L. mahogoni</i></li> <li>marbled grouper – <i>E. inermis</i></li> <li>misty grouper – <i>E. mystacinus</i></li> <li>mutton snapper – <i>L. analis</i></li> <li>Nassau grouper – <i>E. striatus</i></li> <li>queen snapper - <i>Etelis oculatus</i></li> <li>red hind - <i>Epinephelus guttatus</i></li> <li>red grouper – <i>E. morio</i></li> <li>red snapper - <i>L. campechanus</i></li> <li>rock hind – <i>E. adscensionis</i></li> <li>sand perch - <i>Diplectrum formosum</i></li> <li>scamp grouper - <i>M. phenax</i></li> <li>schoolmaster – <i>L. apodus</i></li> <li>silk snapper – <i>L. vivanus</i></li> <li>snowy grouper – <i>E. niveatus</i></li> <li>speckled hind - <i>E. drummondhayi</i></li> <li>tilefish - <i>Lopholatilus chamaeleonticeps</i></li> <li>vermillion snapper - <i>Rhomboplites aurorubens</i></li> </ul>	<p><b>Stone Crab Fishery Management Plan FL</b></p> <ul style="list-style-type: none"> <li>stone crab - <i>Menippe mercenaria</i></li> <li>gulf stone crab – <i>M. adina</i></li> </ul> <p><b>Spiny Lobster Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>spiny lobster - <i>Panulirus argus</i></li> <li>slipper lobster - <i>Scyllarides nodife</i></li> </ul> <p><b>Coral and Coral Reef Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>varied coral species and coral reef communities comprised of several hundred species</li> </ul> <p><b>Coastal Migratory Pelagic Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>cobia - <i>Rachycentron canadum</i></li> <li>king mackerel – <i>Scomberomorus cavalla</i></li> <li>Spanish mackerel - <i>S. maculatus</i></li> </ul> <p><b>Red Drum Fishery Management Plan</b></p> <ul style="list-style-type: none"> <li>red drum - <i>Sciaenops ocellatus</i></li> </ul>

Warsaw grouper – *E. nigrilus*  
wenchman - *Pristipomoides aquilonaris*  
yellowedge grouper *E. lavolimbatus*  
yellowfin grouper – *M. venenosa*  
yellowmouth grouper – *M. interstitialis*  
yeloowtail snapper – *Ocyurus chrysurus*

**6.3.4 Deepwater Horizon Oil Spill Impacts.** On April 20, 2010, while working on an exploratory well approximately 50 miles offshore of Louisiana, the floating semi-submersible mobile offshore drilling unit Deepwater Horizon experienced an explosion and fire. The rig subsequently sank and oil and natural gas began leaking into the Gulf of Mexico. The total amount of oil and natural gas that has escaped into the Gulf of Mexico is yet to be finally determined. On September 19, the relief well process was successfully completed and the federal government declared the well "effectively dead". The spill has caused extensive damage to marine and wildlife habitats as well as the Gulf's fishing and tourism industries.

This spill has created uncertainty on whether future dredging operations will meet environmental compliance criteria and requirements for ocean disposal. The long term impacts of the oil spill on the northern Gulf Coast are uncertain at this time. This spill could potentially adversely impact USACE water resources projects and studies within the coastal area. Potential impacts could include factors such as changes to existing or baseline conditions, as well as changes to future-without and future with project conditions. The USACE will continue to monitor and closely coordinate with other Federal and state resource agencies and local sponsors in determining how to best address any potential problems associated with the oil spill that may adversely impact USACE water resources development projects/studies. This could include revisions to this proposed action as well as the generation of supplemental environmental analysis and documentation for specific projects/studies as warranted by changing conditions.

**6.5 Cultural Resources.** In accordance with section 106 of the National Historic Preservation Act of 1966 (as amended) and its implementing regulations at 36 CFR 800, the USACE must consider the potential effects of this project on historic properties (cultural resource sites potentially eligible for or listed on the National Register of Historic Places). Significant impacts would occur to cultural resources if potential adverse affects to historic properties could not be mitigated. There are no previously identified historic properties located within the area of potential affect (APE).

**6.6 Aesthetics.** The project area is aesthetically pleasing outside of the developed areas. The developed industrialized areas offer little in the way of aesthetics.

**6.7 Noise.** The predominant ambient sounds in the vicinity of the project are those expected with metropolitan areas, including those associated with industry, ports, and local traffic (automobiles, boats, and planes).

**6.8 Air Quality.** The project area is currently in attainment with National Ambient Air Quality Standards parameters.

**6.9 Water Quality.** The State of Alabama's water quality standards would not be significantly affected and water clarity would return to ambient conditions shortly after sediment placement at the dredge and

disposal sites. As required by the Clean Water Act, a Section 404 (b)(1) evaluation report for the removal of sediment from the previously-approved areas and placement of material in the identified disposal sites has been prepared.

**6.10 Threatened and/or Endangered Species.** Several species of threatened and endangered marine mammals, turtles, fish and birds occur in the Gulf of Mexico off the coast and in upland areas of Alabama. The National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) lists the following species in **Table 3** as either threatened and/or endangered that may potentially occur within the project area:

<b>Table 3: Federally Listed Endangered and Threatened Species in Mobile County , Alabama (USFWS and NOAA 2010)</b>
E – Red-cockaded woodpecker ( <i>Picoides borealis</i> )
E – Alabama Red Bellied Turtle ( <i>Psuedemys alabamensis</i> )
TCH – Piping plover ( <i>Charadrius melodus</i> )
E – West Indian Manatee ( <i>Trichechus manatus</i> )
T – Gopher tortoise ( <i>Gopherus polyphemus</i> )
E- Least Tern ( <i>Sterna antillarum</i> )
BGEPA – Bald eagle ( <i>Haliaeetus leucocephalus</i> )
T – Loggerhead sea turtle ( <i>Caretta caretta</i> )
E – Kemp’s ridley sea turtle ( <i>Lepidochelys kempii</i> )
T – Green sea turtle ( <i>Chelonia mydas</i> ) (P)
TCH – Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> )
E – Louisiana quillwort ( <i>Isoetes louisianensis</i> )
C – Black pine snake ( <i>Pituophis melanoleucus lodingi</i> )
T – Flatwoods salamander ( <i>Ambystoma cingulatum</i> )
T – Eastern indigo snake ( <i>Drymarchon corais couperi</i> )
E – Blue Whale ( <i>Balaenoptera musculus</i> )
E – Humpback Whale ( <i>Megaptera novaeangliae</i> )
E – Fin Whale ( <i>Balaenoptera physalus</i> )
E – Sei Whale ( <i>Balaenoptera borealis</i> )
E – Sperm Whale ( <i>Physeter macrocephalus</i> )
<u>Key to codes on list:</u> E – Endangered T – Threatened C – Candidate Species TCH – Threatened with Critical Habitat BGEPA - Bald & Golden Eagle Protection Act

The project area is host to wildlife on the State and Federal protected species list. Of particular concern in the proposed project vicinity are sea turtles, Florida manatee, and the Gulf sturgeon. Sea turtles are known to be present within the Mobile Bay and actively nest on adjacent Gulf of Mexico beaches. However, they are not known to actively use the upper reaches of the Bay or Mobile River.

The Florida manatee is a subspecies of the West Indian Manatee. Between October and April, Florida manatees concentrate in areas of warmer water. During summer months, the species may migrate as far west as the Louisiana coast on the Gulf of Mexico and may occasionally be found along the Alabama coast. Manatees inhabit both salt and fresh water of sufficient depth (about 5 feet to usually less than 18 feet). Florida manatees may be encountered in canals, rivers, estuarine habitats, saltwater bays, and on

occasion have been observed as much as 3.7 miles off the Florida Gulf coast. These manatees will consume any aquatic vegetation available to them including sometimes grazing on the shoreline vegetation. Although rare, manatee sightings have been documented in Mobile Bay and/or its tributaries for the past several years, during the period May through December.

The Gulf sturgeon is a subspecies of the Atlantic sturgeon. Subadult and adult Gulf Sturgeon spend six to nine months each year in rivers and three to six of the coolest months (September-March) in estuaries and/or the adjacent Gulf of Mexico. Gulf Sturgeon less than two years old typically reside in lower reaches of riverine habitats and estuaries throughout the year. In general, subadult and adult Gulf Sturgeon begin to migrate into rivers from the Gulf of Mexico as river temperatures increase to about 16 to 23° C (60.8 to 75.0° F). They continue to immigrate through early May, but most arrive when temperatures reach 21° C. Most Gulf Sturgeon return to estuaries or the Gulf of Mexico by mid-November to early December. Adults migrate up the river and other streams during the period of March through September to spawn. Juvenile Gulf Sturgeon use the bay primarily from September through June, although they may be found in the bay or adjacent estuaries during any month of the year. The proposed project area may be used by Gulf sturgeon for foraging during their migration periods. However, Mobile Bay is not within designated Gulf Sturgeon critical habitat.

The remaining non-marine listed species for Mobile County may possibly occur in the upland portions of the project area, but it is unlikely. Such as: the Red-Cockaded Woodpecker (*Picoides borealis*), which has specific habitat requirements, including preference for fire-maintained mature pine stands, preferably Longleaf pine (*Pinus palustris*). These pines must also suffer from a fungus called 'red heart rot', which attacks the center of the trunk, causing the inner wood, the heartwood, to become soft. The upland disposal areas do not contain this specific habitat. This is also true for the Alabama Red Bellied Turtle (*Pseudemys alabamensis*), Piping plover (*Charadrius melodus*), Gopher tortoise (*Gopherus polyphemus*), Least Tern (*Sterna antillarum*), Bald eagle (*Haliaeetus leucocephalus*), Louisiana quillwort (*Isoetes louisianensis*), Black pine snake (*Pituophis melanoleucus lodingi*), Flatwoods salamander (*Ambystoma cingulatum*), and the Eastern indigo snake (*Drymarchon corais couperi*). Their presence is possible but not likely due to their specific habitat requirements, which the project area does not contain.

The USACE, Mobile District, does not anticipate sperm, blue, fin, humpback, or sei whales would be adversely affected by the varying dredging methods (i.e. hydraulic, hopper, and/or mechanical) described by the proposed action along the entire proposed action area. The possibility of collision with the dredge is remote since these are deepwater species and the likelihood for collision would be enhanced by the highly mobile nature of these species. Given their likely absence, feeding habits, and very low likelihood of interaction, the USACE, Mobile District, does not anticipate the proposed actions identified in this EA will affect these species. As such, sperm, blue, fin, humpback, and sei whales are not considered further in this assessment.

In the unlikely event that a manatee was located in the vicinity of the nearshore project site, "Standard Manatee Construction Conditions" would be implemented. The piping plover and least tern occur along the Gulf Coast and also may occur on Sand Island or other nearby land forms. Since this project is located over water and away from any land forms, it is highly unlikely that these birds would be disrupted by the continued maintenance dredging and placement activities will have no impact on them.

Due to high bird nesting use, material to be placed in Gaillard Island would only occur in accordance with the *Migratory Bird Treaty Act* and any associated regulatory agency agreements

## **7.0 ENVIRONMENTAL IMPACTS.**

**7.1 General.** The impacts resulting from the dredging and disposal activities would be short-term and localized, including temporary benthic impacts in the shallow water areas around dredging and disposal operations, increased turbidity, suspension of bottom sediments, and minor aesthetic degradation. All reasonable efforts would be made to avoid, minimize, and restore affected natural resources to the extent practicable. It is anticipated implementation of this project would result in improved navigation.

**7.2 Soils.** Disposal operations will result in the temporary increases of suspended sediments, the loss of benthic organisms, increases in nutrients, and bathymetry changes in open water disposal sites. The increase in turbidity will reduce light penetration through the water column, thereby reducing photosynthesis, surface water temperatures, and esthetics. These conditions could potentially alter visual predator-prey relations in the immediate project vicinity. In addition, sediment adheres to fish gills, resulting in respiratory stresses, and natural movement of eggs and larvae could be potentially altered as a result of the sediment adherence. However, the salinity of water associated with the open water disposal site is high enough to promote rapid settling of finer particles. Ninety-eight percent of discharged sediments from hydraulic dredging have been observed to settle out within 200 feet of discharge points during similar operations in the project vicinity (Corps 1978).

All of these described impacts are temporary and are anticipated to return to previous conditions shortly after disposal operations. In addition, the Section 404(b)(1) Evaluation Report concluded that the proposed maintenance and dredging action will not jeopardize or adversely impact any oyster reefs, Submerged Aquatic Vegetation (SAVs), wetlands or other critical habitat.

**7.3 Biological Resources.** Benthos within the dredging and disposal areas may be destroyed. However, it is believed that affected areas are small and would rapidly recover within a couple of months back to pre-project conditions. No seagrasses or oyster beds would be disturbed. Turbidity levels would increase during some of the dredging and placement operations; however, the levels of turbidity would subside shortly after the operation is complete. No long-term adverse impacts are anticipated.

*7.3.1 Coastal Flora.* No impacts to SAVs were identified in this evaluation. The closest known SAVs are located several miles from open water placement activities associated with this project and no SAVs are located within the expected 400-foot turbidity mixing zone of channel dredging. The upland disposal area(s) proposed for the use in this project are mostly devoid of any vegetation, and are only sparsely vegetated with invasive plant species. Therefore, no coastal flora is anticipated to be adversely impacted with this operation.

*7.3.2 Coastal Fauna.* The most vulnerable organisms during this action would be benthic animals, such as polychaete worms, shrimp, and crabs. These animals may be subject to localized impacts through dredging and placement activities, especially the less motile worms. The more motile species, such as fish, would not be significantly affected as they have the ability to avoid disturbances caused by the operations. The upland disposal area(s) proposed for use in

this project are mostly barren, flat land(s). These upland disposal sites are utilized by small mammals and a variety of birds. Gaillard Island is an important site for colonial nesting seabirds and shore birds in coastal Alabama and has been the only nesting site for brown pelicans (*Pelecanus occidentalis*) in Alabama - first discovered in 1983. Bird activity is temporarily increased during the sites' use during pumping operations due to possible food items at the discharge site. Nevertheless, this is a temporary occurrence and birds would disperse to normal activities once the operations concluded. Therefore, no long-term adverse impacts are anticipated.

**7.4 Essential Fish Habitat (EFH) Assessment.** The USACE, Mobile District takes extensive steps to reduce and avoid potential impacts to EFH as well as other significant area resources. No estuarine emergent wetlands, oyster reefs, or SAVs would be adversely affected by the proposed action. Most of the motile benthic and pelagic fauna, such as crab, shrimp, and fish, should be able to avoid the disturbed area and should return shortly after the activity is completed. No long-term direct impacts to managed species of finfish or shellfish populations are anticipated. However, it is reasonable to anticipate some non-motile and motile invertebrate species will be physically affected through dredging and disposal operations. These species are expected to recover rapidly soon after the operations are complete. As detailed in Section 4.3 of this assessment, no significant long-term impacts to this resource are expected as result of this action.

Increased water column turbidity during dredging would be temporary and localized. The spatial extent of elevated turbidity is expected to be within 400 feet of the operation, with turbidity levels returning to ambient conditions within a few hours after completion of the placement activities. No change is anticipated to occur to the habitat types. Therefore, the USACE, Mobile District does not anticipate any adverse impacts to occur to EFH. The USACE, Mobile District has requested concurrence from the NMFS for the proposed actions.

**7.5 Cultural Resources.** The APE for this project is confined to previously dredged areas. The APE was the subject of multiple cultural resources assessments conducted during the 1980's (Irion 1983; Irion and Bond 1984; Mistovich and Knight 1983). The most recent cultural resources assessment was conducted in (Hall) 2007 for the recently created turning basin in Choctaw Pass and the widening of an approximate 7650 linear foot section Mobile River Navigation Channel located towards the western side of Little Sand Island. The assessments identified no historic properties within the current project APE. The result of the surveys and no effects determinations were coordinated with the Alabama State Historic Preservation Officer (SHPO). Since all proposed work is occurring in previously disturbed areas, the activity does not have the potential cause effects to historic properties. The USACE has determined that the proposed project has no potential to cause effects to historic properties as per 36 CFR 800.3(a)(1) and therefore will have no significant impact to cultural resources. By regulation, no further consultation or coordination is required under section 106.

**7.6 Aesthetics.** Aesthetics will be temporarily reduced in the immediate vicinity of the proposed project operations. These proposed actions are temporary in nature so it is anticipated that the disturbance will be minimal.

**7.7 Noise.** Noise from the dredge and other associated support equipment would be evident in the project area. While this noise would be evident to those workers on the job and any users in proximity

of the project, it would be short-term and insignificant. Normal noise levels would be achieved at the end of each workday and after completion of the job. No long-term adverse effects are anticipated.

**7.8 Air Quality.** Due to the proposed project being a continuance of existing conditions, it is not expected to add increased exhaust emissions to the immediate area during construction. The project area is currently in attainment with National Ambient Air Quality Standards parameters.

**7.9 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(s). 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. The dredged material placed in the Mobile-North ODMDS and open water disposal sites will consist primarily of sediments similar to what is currently at the site. Suspended particles are expected to settle out within a short time, with no long-term measurable effects on water quality.

Minor increases in turbidity will occur from the proposed project operations in the vicinity. Mechanical dredges typically result in higher turbidity levels, in comparison, to that of hydraulic pipeline dredges. Turbidity increases from dredging sediment from the channel will reduce light penetration through the water column, thereby reducing photosynthesis, surface water temperatures, and esthetics. These conditions could potentially alter visual predator-prey relations in the immediate project vicinity. In addition, sediment adheres to fish gills, resulting in respiratory stresses, and natural movement of eggs and larvae could be potentially altered as a result of the sediment adherence. Particulates suspended in the water column at the upland disposal site would have sufficient time to settle out before the return water enters waters of the United States. The return water is anticipated to be clear water that would not adversely impact the area. As a result of this assessment, the short duration of the operations would minimize the described adverse impacts. No measurable changes in temperature, salinity, PH, hardness, oxygen content or other chemical characteristics are expected. Thus, the Mobile District does not anticipate any adverse impacts as a result of the proposed action.

**7.10 Threatened and Endangered Species.** The USACE, Mobile District has initiated informal consultation with the U.S. Department of the Interior, USFWS Daphne, Alabama office. In accordance with Section 7 of the Endangered Species Act, coordination of such species for this area was conducted in 1985 in the EIS for Mobile Harbor, Alabama Channel Improvement. Consultation has also been initiated with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

The USACE, Mobile District has determined that five (5) species of sea turtles (loggerhead, green, hawksbill, Kemp's ridley, and leatherback), and Gulf sturgeon protected by the Endangered Species Act (ESA) can be found in or near the project area and may be affected by the project. These species will likely avoid the immediate project vicinity during dredging or placement due to noise from vessels and machinery; however these effects will be insignificant. Sea turtles and Gulf sturgeon may also be affected by dredging and disposal operations if they were to be struck by the dredge as it transits the site or by the movement of hopper dredges and hydraulic pipelines; however, due to their mobility, the chance of this occurring is discountable. This project is not located within designated critical habitat for any of the listed species.

Activities associated with the removal of materials from the Mobile Bar Channel by hopper dredge have already been analyzed in the November 2003 Regional Biological Opinion (RBO) titled “Dredging of Gulf of Mexico Navigation Channels and Sand Mining (“Borrow”) Areas Using Hopper Dredges by Corps of Engineers (COE) Galveston, New Orleans, Mobile, and Jacksonville Districts” as amended and modified on June 24, 2005, and January 7, 2009. Potential impacts on the five species of listed sea turtles and Gulf sturgeon from hopper dredging activities were assessed in the 2003 RBO. In the opinion, NMFS concluded that sea turtles and Gulf sturgeon can be adversely affected by hopper dredges and included in Incidental Take Statement (ITS), pursuant to Section 7 of the Endangered Species Act. The ITS in the 2003 RBO contains reasonable and prudent measures with implementing terms and conditions to help minimize impacts of take; therefore any sea turtle or Gulf sturgeon take resulting from future maintenance dredging in Mobile Bay will be assessed against the Annual ITS in the RBO (see Appendix B Agency Coordination for RBO).

The USACE has determined that the proposed action may affect but is not likely to adversely affect the species discussed above. The USACE anticipates concurrence from the respective jurisdictional agency.

## **8.0 CUMULATIVE EFFECTS SUMMARY.**

Cumulative impacts 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. This section analyzes the proposed actions as well as any connected, cumulative, and similar existing and potential actions occurring in the area surrounding the site. The potential adverse direct environmental and socioeconomic impacts associated with the proposed action are insignificant. In general, the proposed continued dredging and placement operations would have no significant adverse cumulative effects.

Based on the above discussion of the minor impacts, which would result from the implementation of the proposed project and due to the lack of long term adverse impacts, it is our belief that no significant cumulative impacts as a result of the continued dredging and placement operations would occur.

## **9.0 OTHER CONSIDERATIONS**

**9.1 Coastal Zone Management Act of 1972.** The USACE, Mobile District determined that the proposed action is consistent with the Alabama Coastal Management Program to the maximum extent practicable. The USACE, Mobile District will request Coastal Zone Consistency from ADEM for the proposed action.

**9.2 Clean Water Act of 1972.** No work would occur until the State has issued water quality certification for the proposed action. All State water quality standards would be met. Section 401 water quality certification will be requested from the ADEM for the proposed action.

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

**9.4 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.

**9.5 Fish and Wildlife Coordination Act of 1958, as amended.** This project was coordinated with the USFWS, and is in full compliance with the act. Concurrence from USFWS for the proposed action will be coordinated.

**9.6 E.O. 11988, Protection of Children.** The proposed action complies with Executive Order 13045, “Protection of Children from Environmental Health Risks and Safety Risks”, and does not represent disproportionately high and adverse environmental health or safety risks to children in the United States.

The proposed maintenance dredging and placement areas are located in open-water and uninhabited locations; thus, no changes in demographics, housing, or public services would occur as a result of the proposed project. With respect to the protection of children, the likelihood of disproportionate risk to children is not significant. Dredging and disposal actions do not involve activities that would pose any disproportionate environmental health risk or safety risk to children.

**9.7 E.O. 11990, Environmental Justice.** The proposed action complies with Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, and does not represent disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the United States.

The dredging and disposal activities do not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations of the surrounding community. Review and evaluation of the proposed actions have not disclosed the existence of identifiable minority or low-income communities that would be adversely impacted by the proposed project.

**10.0 COORDINATION.** The general public has been notified of the proposed action via public notice. The public notice has been electronically sent to Federal and state agencies and the interested public and included a 30-day review period. All comments on the action will be considered prior to a decision on the action. A legal notice will be published in the Mobile Register.

**11.0 CONCLUSION.** The proposed maintenance dredging and placement activities would have no significant environmental impacts on the existing environment. No mitigation actions are required for the proposed project. The implementation of the proposed action would not have a significant adverse impact on the quality of the environment and an environmental impact statement is not required.

Findings of this EA and Section 404 (b)(1) Evaluation determined no significant impacts would occur as a result of this Mobile Harbor Operations & Maintenance Project. The purpose of this EA is to determine if 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.

## **12.0. LIST OF PREPARERS.**

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## **13.0. LIST OF AGENCIES AND OTHERS CONTACTED REGARDING THE ACTION.**

U.S. Environmental Protection Agency, Region 4  
U.S. Department of the Interior, Fish and Wildlife Service  
National Oceanic and Atmospheric Administration, National Marine Fisheries Service  
Gulf of Mexico Fishery Management Council  
Alabama Department of Environmental Management  
Alabama State Historic Preservation Officer

## **14.0. REFERENCES.**

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## Appendix A

# Draft Section 404(b)(1) Evaluation Report for the Mobile Harbor Operations & Maintenance Project *Mobile County, Alabama*

### I. DESCRIPTION OF THE AUTHORIZED AND EXISTING FEDERAL PROJECT

The authorized Mobile Harbor, Alabama Navigation Project includes the following:

- a. A 57' x 700' channel from the Gulf of Mexico for approximately eight (8) miles to Mobile Bay;
- b. A 55' x 550' channel from the mouth of the Mobile Bay for a distance of approximately 29 miles to near the mouth of Mobile River, including a passing lane two (2) miles long and 625' wide at mid-bay;
- c. A 55' x 750' x 4,000' anchorage area just south of McDuffie Island;
- d. A 55' x 1500' x 1,500' turning basin opposite McDuffie Island;
- e. A 40' deep channel with the width varying from 700', near the Mobile River mouth, to 500', near the Cochrane Bridge (U.S. Highway 98), a distance of approximately four (4) miles;
- f. A 40' x 800' – 1000' x 2,500' turning basin opposite the Alabama State docks between river miles 1.0 to 1.5;
- g. A 40' x 1,000' x 1,600' turning basin just south of the Cochrane Bridge.

The authorized dimensions of all segments of the Mobile Harbor Project have not been constructed. A summary of both the authorized and the existing maintained dimensions are listed in Table 1. The maintained dimensions of the bay channel are 45' by 400' and the outer bar channel is 47' by 600'. Each of these areas is maintained to a depth that is 10' less than the authorized depth. Several additional features of the authorized project have not been constructed at this time. The anchorage areas that would be located south of the mouth of the Mobile River have not been constructed, and the bay channel and the bar channel, have not been widened. The new turning basin opposite McDuffie Island, between Pinto Island and Little Sand Island was constructed in 2010.

**Table 1. Authorized and Existing Dimensions for Mobile Harbor**

<b>Channel</b>	<b>Authorized Dimensions</b>	<b>Existing Dimensions</b>
<i>Outer Bar Channel (a.)</i>	57' x 700'	47' x 600'
<i>Bay Channel (b.)</i>	55' x 550'	45' x 400'
<i>Anchorage Area (c.)</i>	55' x 750' x 4,000'	<i>Not Constructed</i>
<i>Turning Basin (d.)</i>	55' x 1,500' x 1,500'	45' x 755' x 1,320'
<i>River Channel (e.)</i>	40' x 500'-700'	<i>As Authorized</i>
<i>Turning Basin (f.)</i>	40' x 800' – 1,000' x 2,500'	<i>As Authorized</i>
<i>Turning Basin (g.)</i>	40' x 1,000' x 1,600'	<i>As Authorized</i>

Approval for advanced maintenance for the Federal Mobile Harbor navigation project was received from South Atlantic Division in the mid-1990s as per the Navigation Regulations ER1130-2-530, 29 November 1996. As such, the navigation channels have associated advanced maintenance to accomplish dredging in an efficient, cost-effective, and environmentally responsible manner. In addition to the Federally-authorized channel dimensions providing for navigation, two (2) sediment basins in the Mobile River and three (3) sediment basins in the bay channel, have been previously authorized and approved. These sediment basins are to provide improved channel maintenance efficiency. Each of these basins are several thousand feet long and have depths ranging from 4 (four) feet to 10 (ten) feet lower than the existing navigation channel bottom. The basins decrease frequency of dredging to provide a more cost effective and reliable channel. In addition to sediment basins, an advanced widening feature is authorized for the bar channel.

## **II. DESCRIPTION OF THE PROPOSED ACTION:**

Mobile Harbor, Alabama, is located in the southwestern part of the state, at the junction of the Mobile River with the head of Mobile Bay. The port is about 28 nautical miles north of the Bay entrance from the Gulf of Mexico and 170 nautical miles east of New Orleans, Louisiana. The navigation channel dredging in Mobile Bay and Mobile River began in 1826 with enactment of the River and Harbor Act of 1826. Over subsequent years, the federal project at Mobile River and Mobile Bay was expanded to include adjoining channels within the bay. Section 104 of the River and Harbor Act of 1954 (House Document 74, 83<sup>rd</sup> Congress, First Session, as amended, and previous acts) authorized a 40-foot channel. Improvements to the existing Federal project were authorized in Water Resources Development Act of 1986 (PL 99 – 662, Ninety-ninth Congress, Second Session), which was approved 17 November 1986, and amended by Section 302 of the Water Resources Development Act of 1996.

The proposed action is the continued operations and maintenance of the Mobile Harbor Navigation Project. However, previously-approved, but recently constructed, components are being included in this authorization, for the first time, such as: the Mobile Harbor Turning Basin, the use of open water disposal sites for emergency disposal, and the entrance to Theodore Ship Channel where it intersects with Mobile Bay Channel.

The Mobile Harbor Project is divided into three (3) general areas: the river channel section, the bay channel section and the bar channel section. The maintenance activities include the placement of dredged material originating from the project into previously-approved disposal areas. The complete description of the proposed action is presented below, and the project features are illustrated in Figure 1 (see Public Notice and EA).

**River Channel Section** - The proposed action in this portion of the project involves the continued maintenance dredging and placement of material from the mouth of the Mobile River to the Cochrane Bridge, a distance of about four (4) miles (see Figure 2 in the Public Notice and EA). The River channel is dredged to a total depth of 40 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable overdepth dredging. The river channel section upper sediment basin would be maintained to its authorized and approved dimensions with eight (8) feet of advanced maintenance and an additional two (2) feet for allowable overdepth. The river channel section lower sediment basin would be maintained to its authorized and approved dimensions with four (4) feet of advanced maintenance and an additional two (2) feet for allowable overdepth.

Approximately 1.2 million cubic yards of dredged material would be removed from the main channel on an annual basis. This includes sediment collected in the sediment basins that would be periodically removed as necessary to restore their original dimensions and their sediment-trapping ability. Dredged material may be removed from the channels by dragline/clamshell, hydraulic pipeline and/or hopper dredge, and all material would be placed in previously-approved upland disposal areas (i.e., North Blakeley, ALCOA Mud Lakes, South Blakeley and North Pinto; see Figure 2) located in the upper harbor area or the Mobile-North Ocean Dredged Material Disposal Site (ODMDS). Dredging and material placement activities could occur at any time during the year, and in response to unforeseen shoaling.

**Bay Channel Section** – The proposed action within the bay channel section consists of the maintenance dredging of the main channel in Mobile Bay, from near the mouth of the bay to the mouth of the Mobile River, a distance of approximately 29 miles, and the tangent channels, *i.e.*, Theodore channel intersection.

The Bay channel is dredged to a total depth of 45 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable overdepth dredging. The Upper and Lower Bay sediment basins would be maintained to their authorized and approved dimensions with five (5) feet of advanced maintenance and an additional two (2) feet for allowable overdepth. This action will also include the entrance to Theodore Ship Channel where it intersects with Mobile Bay Channel for a distance of approximately 4,300' to its authorized and approved dimensions with six (6) feet of advanced maintenance and an additional two (2) feet for allowable overdepth (see Figure 3). The Mobile Harbor Upper Bay turning basin would be maintained to its authorized and approved dimensions with four (4) feet of advanced maintenance and an additional two (2) feet for allowable overdepth.

The main navigation channel in the bay typically requires the annual removal of about 4.3 million cubic yards of material to maintain the channel dimensions. The maintenance of the navigation channels and sediment basins may be accomplished by a dragline/clamshell, hopper and/or hydraulic pipeline dredge. The primary disposal area for the bay channel is the previously-approved Mobile-North ODMDS. Dredging and material placement activities could occur at any time during the year, and in response to unforeseen shoaling.

**Bar Channel Section** – The proposed action includes the maintenance dredging of the channel from the Gulf of Mexico to Mobile Bay, a distance of approximately eight (8) miles (see Figure 5). The Bar channel is dredged to a total depth of 47 feet plus two (2) feet of advanced maintenance and two (2) feet of allowable over depth dredging.

Approximately 300,000 cubic yards of material would be removed from the channel each year (average annual). The material is typically removed by a hopper or hydraulic cutterhead dredge, and placed in the SIBUA as described by Public Notice FP08-MH14-05 and illustrated in Figure 6. The primary disposal area for the bar channel is the SIBUA; however, the Mobile-North ODMDS may be utilized if it is not feasible or in the SIBUA is not available at the time of disposal.

**Advanced Maintenance** - It is USACE policy that dredging will be accomplished in an efficient, cost-effective, and environmentally responsible manner to improve and maintain the Nation's waterways to make them suitable for navigation and other purposes consistent with Federal laws and regulations (USACE 1996). In a guidance memorandum dated 17 January 2006, Congress specifically authorizes Federal navigation channels with a specific depth and width (and length) (USACE 2006). The authorized depth and width are generally based on maximizing net transportation savings considering the characteristics of vessels using the channel. In addition to authorized dimensions, channel reliability is considered and may result in the incorporation of advance maintenance depths into construction of the channel where such advance maintenance is justified to ensure channel reliability and least overall cost. There are inherent excavation inaccuracies in the dredging process. Excavation accuracy relates to closeness of the dredge's completed work to the design (project and/or overdepth) grade as determined by an after-dredge hydrographic survey.

Dredge excavation accuracies vary as a function of type of dredging equipment used (mechanical or hydraulic) and interaction with site-specific physical conditions (tides, currents, waves), type and thickness of sediment or rock being dredged, and channel design (water depth, side slopes, etc.). Because of these variables and the resulting excavating inaccuracies associated with the dredging activity, USACE engineering design, cost estimating, and construction contracting documents recognize that dredging below the congressionally-authorized project dimensions will occur and is necessary to ensure required depth and width as well as cost-effective operability. To balance project construction requirements against the need to limit dredging and disposal to the minimum required to achieve the designed dimensions, a paid allowable overdepth (including side slopes)

is incorporated into the project dredging prism. Material removed from this allowable overdepth is paid for under the terms of the dredging contract. Material removed beyond the limits of allowable overdepth is not paid for (USACE 2006). (ERDC Tech Note 2007)

Hydraulic pipelines, mechanical, and hopper dredges differ on the disturb sediment profile depths beyond the advanced maintenance and overdepth dredging. Up to an additional three (3) feet of sediment could be disturbed in the dredging process resulting in minor amounts of material being removed.

**Disposal Area Maintenance** – Included in the overall maintenance of the Mobile Harbor Project are activities necessary to maintain the longevity of the upland dredge material placement areas. At times, material from upland sites, *i.e.*, Blakeley Island, may be transported to Gaillard Island for dike raising/construction or other purposes. Upland disposal area restoration and material placement activities could occur at any time during the year. Material to be placed in Gaillard Island would only occur in accordance with the *Migratory Bird Treaty Act* and any associated regulatory agency agreements.

**Emergency Disposal Actions-** In the event where storm-related emergency dredging activities are required and considered critical to provide safe navigation for returning the channels to their pre-storm dimensions and restoring full shipping capacity, the USACE is proposing the use of the open bay disposal areas (and Gaillard Island disposal area). This action, using pre-established historical disposal areas, was implemented during emergency procedures resulting from Hurricane Katrina and described in Public Notice No. FP05-MH12-10 dated 21 September 2005. This emergency option is necessary when there is insufficient hopper dredge capability to meet these increased needs. Under these circumstances pipeline dredging equipment will be used for the bay channel (see Figures 3 and 4 for Upper Bay and Lower Bay Channel Sections) utilizing thin-layer open-water disposal on adjacent bay-bottoms (east and west side). Pipeline dredging operations will extend from the northern limit of the bay channel south to the mouth of Mobile Bay. These areas range in depth from about 6 to 10 feet. Placement of materials within these sites will utilize thin-layer disposal techniques and will be placed as thinly as possible not to exceed 12 inches in thickness. These areas were historically utilized, prior to 1990, for the maintenance of the bay channel (see Figure 7 in the Public Notice and EA.) The use of the open water sites would be coordinated with the applicable agencies as needed prior to usage.

**a. Authority and Purpose.** The navigation channel dredging in Mobile Bay and Mobile River began in 1826 with enactment of the River and Harbor Act of 1826. During the period 1826 to 1857, a channel 10 feet deep was dredged through the shoals in Mobile Bay up to the city of Mobile. Subsequently, further modifications to the channel were authorized and the original Federal project was enlarged by the addition of the Arlington, Garrows Bend, and Hollingers Island channels within the bay, and a channel into Chickasaw Creek from the Mobile River. Section 104 of the River and Harbor Act of 1954 authorized a 40-foot depth channel with a 400-foot width in Mobile Bay to the mouth of the Mobile River and a 40-foot depth in the Mobile River to the Cochran Bridge with the width varying from 400 to 775 feet. The Senate Public Works Committee on 16 July 1970 and the House Public Works Committee on 15 December 1970, under the provisions of Section 201 of the 1965 Flood Control Act, authorized a 40-foot by 400-foot channel, branching from the main ship channel and extending through a land cut to the Theodore Industrial Park. The Theodore Ship Channel was reauthorized in the Water Resources Development Act of 1976.

Further improvements to the existing federal project were initially authorized in the 1985 Energy and Water Resources Appropriation Act (PL 99-88, Ninety-ninth Congress, First Session). The improvements were reauthorized in Section 201 of the Water Resources Development Act of 1986 (PL 99 – 662, Ninety-ninth Congress, Second Session), which was approved 17 November 1986, and subsequently amended by Section 302 of the Water Resources Development Act of 1996. The report referenced by this authorization recommended the following improvements to the Federal project: deepening and widening the gulf entrance channel to 57 by 700

feet; deepening and widening the main ship channel to 55 by 550 feet in Mobile Bay, except for the upper 3.6 miles which require a width of 650 feet; deepening the Mobile River channel to 55 feet to a point about 1 mile below the Interstate 10 highway tunnels; and, constructing turning and anchorage basins near the upper end of the main ship channel.

The proposed dredging operations and placement activities are required to continually provide for safe navigation and maintain the Mobile Bay channels to the federally authorized dimensions. The action is a result of normal rates of shoaling and a need exists to maintain full commercial shipping capacity for the Port of Mobile.

**b. General Description of the Dredged or Fill Material.** A geotechnical investigation was conducted to determine the physical characteristics of the material contained in the proposed project area. A summary of the findings are discussed below. The sediment proposed for excavation was also sampled and tested for possible contaminants. A summary of this investigation is also summarized below.

(1) Geotechnical Investigation. In general, the maintenance sediments from both Mobile River and Mobile Bay were found to be predominantly silt + clay, ranging from 46.9 to 97.7 percent silt + clay. The grain size of sediments from the Mobile Bar Channel were variable with two locations composed of more than 90 percent sand and two locations composed of roughly 50 % sand and 50 % silt+clay.

(2) Sediment Contaminant Analyses. The sampling results of recent studies (March 2010) of the sediment chemical analyses indicate that within the upper 10-foot layer, a few metals (arsenic, copper, and nickel) and pesticides were present at detectable levels but did not exceed critical thresholds. Each of the tested metals was detected in at least one of the sediments from Mobile River and Mobile Bay. However, none of the detected metal concentrations exceeded the PEL (Probable Effects Level) values.

The physical and chemical characteristics of sediment samples from the Mobile Harbor Lower Ship Channel, Mobile Bar Channel, Mobile Reference Site, and Mobile ODMDS were sampled in late 2010 to assess whether or not sediments were impacted by the *Deepwater Horizon* Oil Spill. Concentrations of detected analytes in sediment samples from the Mobile Harbor project were compared to sediment quality guidelines (SQGs) for marine sediments, where applicable, to assess the sediment quality (MacDonald 1994; Long et al. 1995; MacDonald et al. 1996).

Results from the post-oil spill sampling effort were compared to results from a previous investigation conducted in March 2010 (EA 2010) and to the site-designation report for the Mobile ODMDS conducted in October 2009 (ANAMAR 2010) to determine if there were any discernable changes to the sediment quality in the Mobile Harbor Ship Channels and Mobile ODMDS that could potentially be attributed to the *Deepwater Horizon* oil spill.

When compared to the PAH concentrations from March 2010, the results from the November/December 2010 study indicate that there was no discernable change in the PAH concentrations in the Mobile Harbor Lower Ship Channel in the last year. Similarly, the total PAH concentrations (ND=½RL) detected at the Mobile ODMDS (121, 295, and 535 ug/kg) (ANAMAR 2010) were slightly higher than concentrations detected in this study, and still well below the TEL value. Likewise, individual PAH concentrations and total PAH (ND=½MDL) concentrations at the reference site do not indicate a change in sediment quality, between March and December 2010. Although the PAH concentrations at the Mobile Bar Channels and ODMDS cannot be compared to data from March 2010 (not sampled), based on their location relative to the Gulf of Mexico, low PAH concentrations in November/December 2010, and the comparative data from the Mobile Harbor Lower Ship Channel and reference site, results indicate that observed concentrations are most likely similar to background concentrations in the area. Based on results of PAH and TPH testing of surface sediments collected in the Mobile Lower Ship Channel, Mobile Bar Channel, USEPA-designated reference site, and Mobile ODMDS in November and December 2010, there are no discernable changes in the sediment quality that are attributable to the *Deepwater Horizon* Oil Spill.

**c. General Description of the Discharge Sites.**

(1) Location. Mobile Harbor, Mobile, Alabama. Maps illustrating the location of the existing channels and disposal areas are presented in the Public Notice and the Environmental Assessment.

(2) Type of Habitat. Previously-approved upland disposal areas (i.e., North Blakeley, ALCOA Mud Lakes, South Blakeley and North Pinto) located in the upper harbor area and the Gaillard Island disposal area are existing upland and confined disposal sites that are approved to accept materials that contain sand and fine-grained sediments. The Mobile North ODMDS is a previously approved ocean disposal site and is approved to accept material from this project. The previously-approved open water disposal sites designated for emergency use will impact approximately 3,750 acres of bay bottoms predominantly composed of mud flats. These areas were historically utilized, prior to 1990, for the maintenance of the bay channel. The material will be moved in a 'step-down' fashion so that the areas used are in the more expansive portions of the bay. The SIBUA is part of the ebb tidal shoal associated with the mouth of Mobile Bay. This sediment is characterized as predominantly fine to medium quartz sand. This zone is a very dynamic environment that changes drastically as a function of currents and wave conditions. The direction of the littoral transport in this location is from east to west. Due to the dynamic nature of this environment, the benthic community generally consists of opportunistic invertebrates. The constantly shifting sediments do not allow aquatic vegetation to become rooted or attached to the unconsolidated sandy substrate.

(4) Timing and Duration of Discharge. Discharge could occur at any time in the year at any disposal location. This proposed action is merely a recertification of an authorized action.

**d. Disposal Method.** Placement of materials in the approved upland disposal sites (North Blakeley, ALCOA Mud Lakes, South Blakeley and North Pinto) will be accomplished by hydraulic dredge with a pipeline or hopper. Also, placement of materials in the Gaillard Island sites will be accomplished by hydraulic pipeline. It is expected that some support equipment such as bull dozers, marsh buggies, etc. may be necessary to redistribute the sediment within these sites. Sediment placed in the SIBUA and ODMDS will likely be accomplished using a hopper dredge or scowl. For the open water disposal sites, the use of pipeline dredging equipment is proposed for the bay channel utilizing thin layer open-water disposal on adjacent bay-bottoms. Emergency pipeline dredging operations will extend from the northern limit of the bay channel south to the mouth of Mobile Bay.

**III. FACTUAL DETERMINATIONS.**

**a. Physical Substrate Determinations.**

(1) Substrate elevation and slope. The substrate placed in the approved upland disposal sites, as well as the ODMDS, will be confined within the disposal areas. The elevation of the approved upland disposal sites ranges from 21.0 feet to 46 feet. The intent of the SIBUA is to keep sandy materials in the littoral system. The materials placed will be redistributed by local currents and waves to a more natural configuration consistent with the ebb tidal shoal.

Studies of open water disposal in Mobile Bay by Nichols, 1978, show that the disposal initially raised the bed approximately 30 cm and increased the average bed slope from 1:3000 to 1:2000. After disposal the mud consolidates, bulk density increases and slopes decrease. Between disposal operations the disposal area bathymetry returns to broad swells and troughs with maximum relief of two (2) feet representing topography modified by waves and tidal currents. Very little long-term mounding has resulted from the disposal of maintenance material in the bay. Significant mounding has occurred in the Upper Mobile Bay as a result of

disposal of new work material from channel deepening in the 1960's. Continued disposal of maintenance material in the upper bay has not added to that mounding.

(2) Sediment type. Approximately 5.5 million cubic yards of dredged material would be removed from the river, bay and bar channel(s) on an annual basis. Additionally, sediment collected in the sediment basins would be periodically removed as necessary to restore their original dimensions and their sediment-trapping ability. In general, the maintenance sediments from both Mobile River and Mobile Bay were found to be predominantly silt + clay, ranging from 46.9 to 97.7 percent silt + clay. The grain size of sediments from the Mobile Bar Channel were variable with two locations composed of more than 90 percent sand and two locations composed of roughly 50 % sand and 50 % silt+clay.

(3) Dredged/fill material movement. The dredged material placed in the approved upland disposal area sites will be confined. The intent of the SIBUA is to keep sandy materials in the littoral system. The materials placed will be redistributed by local currents and waves to a more natural configuration consistent with the ebb tidal shoal. The salinity of water associated with Mobile-North ODMDS is high enough to promote rapid settling of finer particles. Current velocities range from about 8 inches per second (in/s) to 16 in/s at the Mobile-North ODMDS. The directions of the currents measured during tide conditions moved towards the east while flood tide conditions moved to the north-northwest.

Brett (1975) found dredged material in core samples as far as 5,000 feet from the bay channel and concluded that the material is either capable of moving that far during the discharge activity or it is being moved along the bottom by natural wave action or by the action of marine vessel sin the ship channel. Brett's findings indicated little difference between the dredged material and normal bay bottom sediments, except that the dredged material contains considerable water when it is deposited because of its greater porosity and looser packing. It was concluded that the dredged material probably stabilizes in at least nine (9) months and then becomes difficult to re-suspend. Nichols (1978) indicates that dredged material is found as far as 4,000 feet from the point of discharge. During implementation of the interim step-down plan quantities of material placed in open water near the Theodore Ship Channel would double. Long-term distribution of the sediments would be expected to be similar to existing conditions.

(4) Physical effects on benthos. Within the open-water disposal sites, SIBUA and the ODMDS some benthic organisms would be destroyed by the proposed action; however, due to the constant movement of material by currents, benthic organism diversity and abundance would appear to be low. Research conducted by the U.S. Army Corps of Engineers, Engineer Research and Development Center (ERDC) under the Dredged Material Research Program (DMRP) suggests that the benthic community is adapted to a wide range of naturally occurring environmental changes and that no significant or long-term changes in community structure or function are expected.

Approximately 20,000 acres of bay bottom are affected by the disposal of dredged material parallel to the bay channel. Bottom organisms include polychaete worms, crabs, shrimp, mollusks and echinoderms. Non-motile species are directly covered by the dredged material, engulfed by mud flow or covered by heavy siltation within 1,200 feet of the dredge discharge. Recovery of these species occurs between the 24-month dredging cycle for each particular area. Some species recover quickly by migrating through the dredged material, while others are destroyed and recruitment occurs from adjacent non-disturbed areas. Most species recover within nine (9) months.

(5) Other effects. No other significant effects due to movement of the physical substrate are noted.

(6) Actions taken to minimize impacts. No actions, which would further reduce impacts due to the placement of the dredged material are deemed necessary.

#### **b. Water Circulation/Fluctuation, and Salinity Determination.**

(1) Water

(a) Salinity. No significant effects.

(b) Water chemistry. The sampling results of recent studies (2010) of the elutriate analyses indicate little to no effects on water chemistry for the proposed action.

(c) Clarity. Water clarity may locally be decreased slightly during the proposed placement of dredged material, but this would not be significant.

(d) Color. No effects.

(e) Odor. No effects.

(f) Taste. No effects.

(g) Dissolved gases. No effects.

(h) Nutrients. No effects.

(i) Eutrophication. No effects.

(2) Current Patterns and Circulation

(a) Current patterns and flow. Changes in water circulation and flow due to placement of sand in the SIBUA, open water and ODMDS are not expected to occur. Natural currents and flow will occur during tidal, wave, and storm activities.

(b) Velocity. No significant effects.

(c) Stratification. No effects.

(d) Hydrologic effects. No significant effects.

(3) Normal Water Level Fluctuations. No effects.

(4) Salinity Gradients. No significant effects.

(5) Actions That Will Be Taken To Minimize Impacts. No other actions that would minimize impacts on water circulation/fluctuation and salinity are deemed necessary.

**c. Suspended Particulate/Turbidity Determinations.**

(1) Expected changes in suspended particulate and turbidity levels in the vicinity of the disposal site. Suspended particulate and turbidity levels are expected to undergo minor increases during dredging and placement activities, however, suspended sediment of this type will quickly fall out of the water column and return to normal conditions. No significant effects would occur as a result of these increases.

(2) Effects on the chemical and physical properties of the water column.

(a) Light penetration. Increased turbidity levels in the project area as a result of the placement of dredged material would reduce the penetration of light into the water column only slightly and would be a minor short-term impact.

(b) Dissolved oxygen. No effects.

(c) Toxic metals and organics. No significant effects.

(d) Pathogens. No effects.

(e) Aesthetics. The placement of dredged material would likely decrease the aesthetic qualities of the project area for a short period of time during and shortly after placement. The disposal areas equilibrate and rapidly return to normal upon exposure to the wave climate.

(f) Others as appropriate. None appropriate.

(3) Effects on biota.

(a) Primary production, photosynthesis. No significant effects.

(b) Suspension/filter feeders. Some local increases in suspended particulates may be encountered during the dredging and disposal actions, but these increases would not cause significant impacts to these organisms unless they are directly covered with sediment. If directly covered with dredged material, it is expected that some organisms will be destroyed. Rapid recruitment of these organisms will promote a rapid recovery to normal populations. Overall, the impact to these organisms is expected to be minor and insignificant.

(c) Sight feeders. Sight feeders would avoid impacted areas and return when conditions are suitable. However, it is difficult to relate the presence or absence of sight feeders in an area to the placement of dredged material. Sight feeders, particularly fishes, may vary in abundance as a result of temperature changes, salinity changes, seasonal changes, dissolved oxygen level changes, as well as other variables. No significant impacts are expected to occur on sight feeders.

(4) Actions taken to minimize impacts. No further actions are deemed appropriate.

**d. Contaminant Determination. No significant effects.** The sampling results of recent studies (March 2010) of the sediment chemical analyses indicate that within the upper 10-foot layer, a few metals (arsenic, copper, and nickel) and pesticides were present at detectable levels but did not exceed critical thresholds. Also, based on results of PAH and TPH testing of surface sediments collected in the Mobile Lower Ship Channel, Mobile Bar Channel, USEPA-designated reference site, and Mobile ODMDS in November and December 2010, there are no discernable changes in the sediment quality that are attributable to the Deepwater Horizon Oil Spill.

**e. Aquatic Ecosystem and Organism Determinations.**

(1) Effects on plankton. No effects.

(2) Effects on benthos. Benthic organisms would be destroyed by the deposition of dredged material below the waterline in the placement area, but no significant effects are expected on the benthic community as a result of the proposed action.

(3) Effects on nekton. No effects.

- (4) Effects on aquatic food web. No effects.
- (5) Effects on special aquatic sites.
  - (a) Sanctuaries and refuges. Not applicable
  - (b) Wetlands. Not applicable
  - (c) Mud flats. Not applicable.
  - (d) Vegetated shallows. Not applicable.
  - (e) Coral reefs. Not applicable.
  - (f) Riffle and pool complexes. Not applicable.

(6) Threatened and endangered species. The project area is host to wildlife on the State and Federal protected species list. Of particular concern in the proposed project vicinity are sea turtles, Florida manatee, and the Gulf sturgeon. Sea turtles are known to be present within the Mobile Bay and actively nest on adjacent Gulf of Mexico beaches. However, they are not known to actively use the upper reaches of the Bay or Mobile River.

The USACE, Mobile District has determined that five (5) species of sea turtles (loggerhead, green, hawksbill, Kemp's ridley, and leatherback), and Gulf sturgeon protected by the Endangered Species Act (ESA) can be found in or near the project area and may be affected by the project. These species will likely avoid the immediate project vicinity during dredging or placement due to noise from vessels and machinery; however these effects will be insignificant. Sea turtles and Gulf sturgeon may also be affected by dredging and disposal operations if they were to be struck by the dredge as it transits the site or by the movement of hopper dredges and hydraulic pipelines; however, due to their mobility, the chance of this occurring is discountable. This project is not located within designated critical habitat for any of the listed species.

Activities associated with the removal of materials from the Mobile Bar Channel by hopper dredge have already been analyzed in the November 2003 Regional Biological Opinion (RBO) titled "Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by Corps of Engineers (COE) Galveston, New Orleans, Mobile, and Jacksonville Districts" as amended and modified on June 24, 2005, and January 7, 2009. Potential impacts on the five species of listed sea turtles and Gulf sturgeon from hopper dredging activities were assessed in the 2003 RBO. In the opinion, NMFS concluded that sea turtles and Gulf sturgeon can be adversely affected by hopper dredges and included in Incidental Take Statement (ITS), pursuant to Section 7 of Endangered Species Act. The ITS in the 2003 RBO contains reasonable and prudent measures with implementing terms and conditions to help minimize impacts of take; therefore any sea turtle or Gulf sturgeon take resulting from future maintenance dredging in Mobile Bay will be assessed against the Annual ITS in the RBO.

The Florida manatee is a subspecies of the West Indian Manatee. Between October and April, Florida manatees concentrate in areas of warmer water. During summer months, the species may migrate as far west as the Louisiana coast on the Gulf of Mexico and may occasionally be found along the Alabama coast. Manatees inhabit both salt and fresh water of sufficient depth (about 5 feet to usually less than 18 feet). Florida manatees may be encountered in canals, rivers, estuarine habitats, saltwater bays, and on occasion have been observed as much as 3.7 miles off the Florida Gulf coast. These manatees will consume any aquatic vegetation available to them including sometimes grazing on the shoreline vegetation. Although rare, manatee sightings have been documented in Mobile Bay and/or its tributaries for the past several years, during the period May through December. In the unlikely event that a manatee was located in the vicinity of the nearshore project site, "Standard Manatee Construction Conditions" would be implemented.

The Gulf sturgeon is a subspecies of the Atlantic sturgeon. Subadult and adult Gulf Sturgeon spend six to nine months each year in rivers and three to six of the coolest months (September-March) in estuaries and/or the adjacent Gulf of Mexico. Gulf Sturgeon less than two years old typically reside in lower reaches of riverine habitats and estuaries throughout the year. In general, subadult and adult Gulf Sturgeon begin to migrate into rivers from the Gulf of Mexico as river temperatures increase to about 16 to 23° C (60.8 to 75.0° F). They continue to immigrate through early May, but most arrive when temperatures reach 21° C. Most Gulf Sturgeon return to estuaries or the Gulf of Mexico by mid-November to early December. Adults migrate up the river and other streams during the period of March through September to spawn. Juvenile Gulf Sturgeon use the bay primarily from September through June, although they may be found in the bay or adjacent estuaries during any month of the year. The proposed project area may be used by Gulf sturgeon for foraging during their migration periods. However, Mobile Bay is not within designated Gulf Sturgeon critical habitat.

The remaining non-marine listed species for Mobile County may possibly occur in the upland portions of the project area, but it is unlikely. Such as: the Red-Cockaded Woodpecker (*Picoides borealis*), which has specific habitat requirements, including preference for fire-maintained mature pine stands, preferably Longleaf pine (*Pinus palustris*). These pines must also suffer from a fungus called 'red heart rot', which attacks the center of the trunk, causing the inner wood, the heartwood, to become soft. The upland disposal areas do not contain this specific habitat. This is also true for the Alabama Red Bellied Turtle (*Pseudemys alabamensis*), Piping plover (*Charadrius melodus*), Gopher tortoise (*Gopherus polyphemus*), Least Tern (*Sterna antillarum*), Bald eagle (*Haliaeetus leucocephalus*), Louisiana quillwort (*Isoetes louisianensis*), Black pine snake (*Pituophis melanoleucus lodingi*), Flatwoods salamander (*Ambystoma cingulatum*), and the Eastern indigo snake (*Drymarchon corais couperi*). Their presence is possible but not likely due to their specific habitat requirements, which the project area does not contain.

The USACE, Mobile District, does not anticipate sperm, blue, fin, humpback, or sei whales would be adversely affected by the varying dredging methods (i.e. hydraulic, hopper, and/or mechanical) described by the proposed action along the entire proposed action area. The possibility of collision with the dredge is remote since these are deepwater species and the likelihood for collision would be enhanced by the highly mobile nature of these species. Given their likely absence, feeding habits, and very low likelihood of interaction, the USACE, Mobile District, does not anticipate the proposed actions identified in this EA will affect these species. As such, sperm, blue, fin, humpback, and sei whales are not considered further in this assessment.

The piping plover and least tern occur along the Gulf Coast and also may occur on Sand Island or other nearby land forms. Since this project is located over water and away from any land forms, it is highly unlikely that these birds would be disrupted by the continued maintenance dredging and placement activities will have no impact on them. Due to high bird nesting use, material to be placed in Gaillard Island would only occur in accordance with the *Migratory Bird Treaty Act* and any associated regulatory agency agreements

The USACE has determined that the proposed action may affect but is not likely to adversely affect the species discussed above. The USACE anticipates concurrence from the respective jurisdictional agency.

(7) Other wildlife. No significant effects.

(8) Actions to minimize impacts. No other actions to minimize impacts on the aquatic ecosystem are deemed appropriate.

#### **f. Proposed Disposal Site Determination.**

(1) Mixing zone determinations. The Alabama Department of Environmental Management (ADEM) delineates mixing zones on a case-by-case basis. Any requirements placed on the project would be followed to the maximum extent practicable.

(2) Determination of compliance with applicable water quality standards. Preliminary finding show that

action would be in compliance to the maximum extent practicable, with all applicable water quality standards.

(3) Potential effects on human use characteristics.

(a) Municipal and private water supply. No effects.

(b) Recreational and commercial fisheries. No effects.

(c) Water-related recreation. No effects.

(d) Esthetics. No significant effects.

(e) Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves. Not applicable.

**g. Determination of Cumulative Effects on the Aquatic Ecosystem.** No significant cumulative effects on the aquatic ecosystem would occur as a result of the proposed action.

**h. Determination of Secondary Effects on the Aquatic Ecosystem.** No significant effects.

**III. FINDING OF COMPLIANCE.**

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

**b. Alternatives.** The proposed action discussed in this EA and Section 404(b)1 only encompasses the recertification of an ongoing maintenance project. Therefore, only 'Action' and 'No Action' alternatives have been evaluated in this assessment. It is believed that greater negative economic and environmental impacts will result from not re-issuing certification of continual maintenance dredging and disposal activities. Other Alternatives for dredging and disposal were evaluated in the 1980 EIS for Mobile Harbor Channel Improvements.

**c. Compliance with State Water quality Standards.** A Clean Water Act (CWA), Section 401 Water Quality Certification is required for the proposed action. Certification will be coordinated with ADEM for the proposed action.

**d. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act.** The action is consistent with the Alabama Coastal Program to the maximum extent practicable. Recertification of the existing project will be coordinated through and approved by the State of Alabama.

**e. Compliance with Endangered Species Act.** The proposed activity is not expected to harm federally-protected species. No critical habitats of any federally-protected species exist within the project area. Regarding potential impacts to federally-protected species, coordination with the appropriate Federal agencies will be initiated through a Public Notice and completed. Sufficient safeguards exist to protect federally-protected species which may enter into the project area.

**f. Compliance with Specific Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act.** The proposed activity would not result in any significant adverse effects on human health or welfare, including municipal or private water supplies, recreation and commercial fishing, plankton, fish, shellfish, and wildlife. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values would not occur. No wetlands would be impacted by the proposed

action.

**g. Evaluation of Extent of Degradation of the Waters of the United States.** The proposed fill plan is specified as complying with the requirements of these guidelines.

**h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem.** The proposed fill plan is specified as complying with the requirements of these guidelines.

**i. On the Basis of the Guidelines, the proposed Disposal Site for the Discharge of Dredged Material.** Specified as complying with the requirements of these guidelines.

DATE: \_\_\_\_\_

\_\_\_\_\_  
**Steven J. Roemhildt**  
**Colonel, Corps of Engineers**  
**District Commander**

**APPENDIX B**

**AGENCY COORINDATION**