FINAL ENVIRONMENTAL ASSESSMENT

CHARLESTON HARBOR ADDITIONAL ADVANCED MAINTENANCE DREDGING

CHARLESTON HARBOR, SOUTH CAROLINA

September 2009

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SUMMARY

Charleston Harbor is located along the mid-South Carolina coast and is one of the busiest ports on the east coast of the US (Figure 1). In 2005, the average annual tonnage was 25.4 million short tons of waterborne commerce and this affects an estimated 260,800 jobs across the state.

This Environmental Assessment (EA) covers dredging depths inadvertently not addressed in the 1996 Feasibility Report and EA for Charleston Harbor (Report, USACE 1996). The 1996 report indicated an authorized project depth of 45 feet (47 feet entrance channel) plus 2 feet of advanced maintenance and 2 feet of allowable overdepth for a total projected dredging depth of 49 feet. Allowable overdepth is to assure the project is constructed to the authorized depth, and advanced maintenance is conducted in high shoaling areas to enable the project to remain at the authorized depth for a longer period of time. See appendix A for more detailed definition of these terms.

The harbor was deepened to the project depth between 1999 and 2004. During this time period, portions of the several reaches were dredged 2-4 feet deeper (additional advanced maintenance) because of historically higher shoaling rates. This resulted in potential dredging depths of either 51 or 53 feet in those areas. Since this deepening, maintenance has been performed on a 12-18 month frequency including the additional advanced maintenance.

This additional advanced maintenance in the higher shoaling areas was not addressed in the 1996 Report and is the reason for this EA. The current EA discusses the entire maintenance project to provide an overall project perspective, but the focus is on the impacts of, and need for, continuing with the 2-4 feet of additional advanced maintenance.

Two dredging alternatives are discussed: No Action and the proposed project. The same dredging methods and disposal locations are proposed for both alternatives and the disposal locations have at least 20 years of remaining capacity. The no action alternative or status quo is what was discussed in the 1996 Feasibility Report (USACE 1996). As indicated above, that report covered a project depth of 45 feet plus 2 feet of advanced maintenance and 2 feet of allowable overdepth for a total potential dredging

depth of 49 feet (2 feet deeper in the entrance to allow for wave action). However because of higher shoaling rates in certain areas (Figure 2), a portion of the project would need to be dredged as frequently as twice per year to maintain the project to the authorized depth and allow efficient ship navigation. This would result in an increased annual cost of about $2,085,000 primarily due to more frequent mobilization of dredging equipment and a higher unit cost.

For the proposed project, as with the no action alternative, most of the project would be maintained to a project depth of 45 feet plus 2 feet of advanced maintenance and 2 feet of allowable overdepth. However due to higher shoaling rates, portions of the following reaches would continue to be maintained to either 45 feet plus 4 feet of advanced maintenance and 2 feet of allowable overdepth (45+4+2) or 45 feet plus 6 feet of advance maintenance and 2 feet of allowable overdepth (45+6+2): Ordnance Reach and Turning Basin, Lower Wando River, Wando Turning Basin, and Lower Town Creek Reach are all dredged 2 feet deeper (i.e. 45+4+2); and Drum Island Reach is dredged 4 feet deeper (i.e. 45+6+2). These areas with higher shoaling rates are indicated in Figure 2. However unlike the no action alternative, the additional advance maintenance will enable the project to continue to be maintained on a 12 to 18 month frequency. This would result in a decreased annual cost of about $2,085,000 compared to the no action alternative primarily due to less frequent mobilization of dredging equipment and a lower unit cost.

Because the additional advanced maintenance areas have already been dredged and have been maintained at the same time as routine maintenance events, no significant environmental impacts are expected from continued maintenance (i.e. proposed project). In addition, if the proposed project is implemented, dredges will be in the harbor less frequently and there will be an average annual savings in dredging costs of $2,085,000. Therefore the proposed project is recommended for long-term maintenance of Charleston Harbor

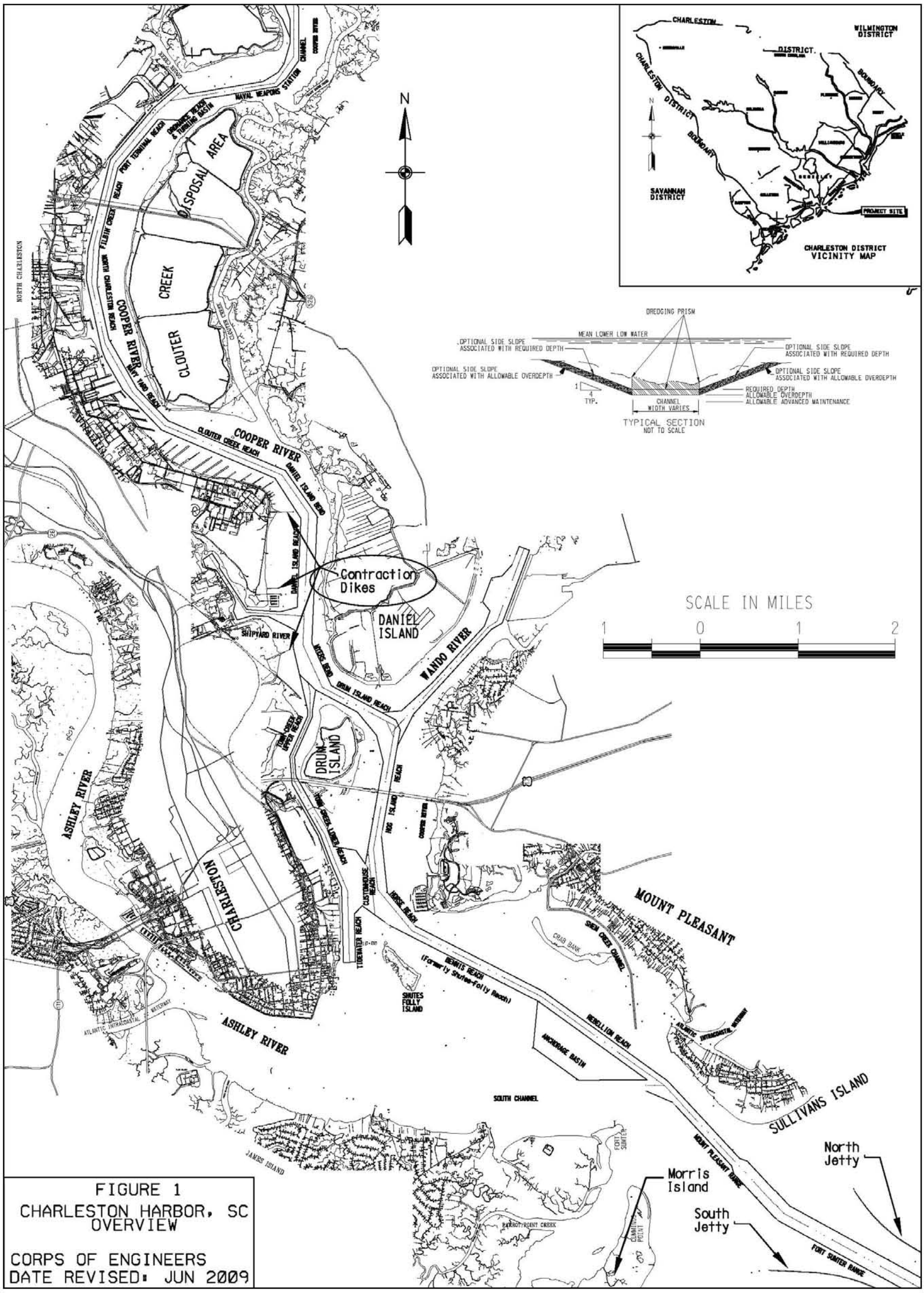
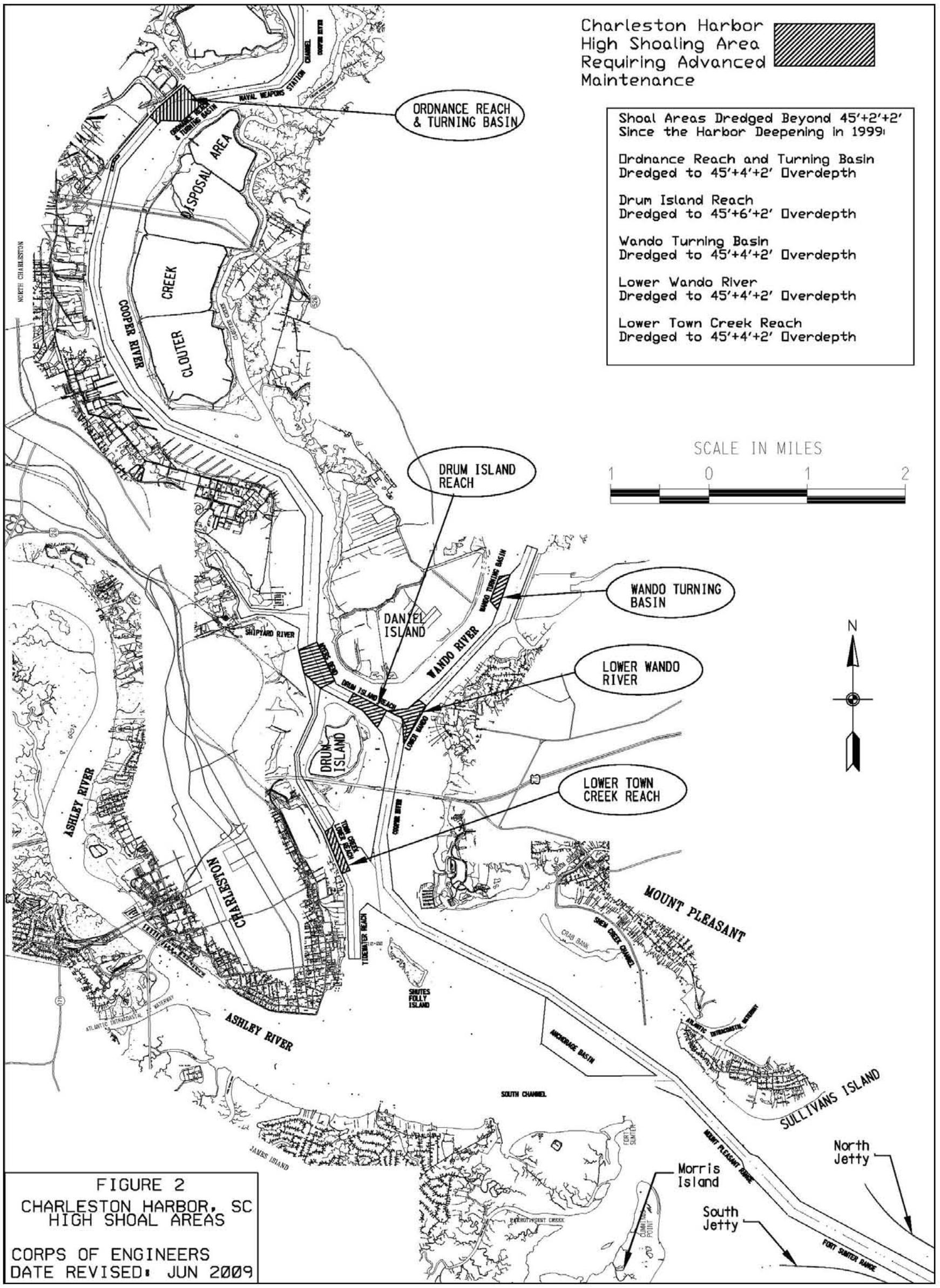


FIGURE 1
CHARLESTON HARBOR, SC
OVERVIEW

CORPS OF ENGINEERS
DATE REVISED: JUN 2009


Charleston Harbor
High Shoaling Area
Requiring Advanced
Maintenance
Shoal Areas Dredged Beyond 45'+2'+2'
Since the Harbor Deepening in 1999:
Ordnance Reach and Turning Basin
Dredged to 45'+4'+2' Overdepth
Drum Island Reach
Dredged to 45'+6'+2' Overdepth
Wando Turning Basin
Dredged to 45'+4'+2' Overdepth
Lower Wando River
Dredged to 45'+4'+2' Overdepth
Lower Town Creek Reach
Dredged to 45'+4'+2' Overdepth
SCALE IN MILES
1 0 1 2
N
ORDNANCE REACH & TURNING BASIN
DRUM ISLAND REACH
WANDO TURNING BASIN
LOWER WANDO RIVER
LOWER TOWN CREEK REACH
NAVAL WEAPONS STATION
CHANNEL
COOPER RIVER
ORDNANCE REACH & TURNING BASIN
DASPOSAL AREA
CREEK
CLOUTER
NORTH CHARLESTON
COOPER RIVER
DANIEL ISLAND
WANDO TURNING BASIN
SHIPYARD RIVER
WANDO RIVER
DRUM ISLAND REACH
LOWER WANDO
DRUM ISLAND
ASHLEY RIVER
TOWN CREEK UPPER REACH
COOPER RIVER
CHARLESTON
TIDEWATER REACH
SHUTES FOLLY ISLAND
MOUNT PLEASANT
CRAB BANK
SHEM CREEK CHANNEL
ATLANTIC INTRACOASTAL WATERWAY
ASHLEY RIVER
ANCHORAGE BASIN
SOUTH CHANNEL
SULLIVANS ISLAND
MOUNT PLEASANT RANGE
JAMES ISLAND
FORT SUMTER
CUMMINGS POINT
FORT SUMTER RANGE
North Jetty
Morris Island
South Jetty
FIGURE 2
CHARLESTON HARBOR, SC
HIGH SHOAL AREAS
CORPS OF ENGINEERS
DATE REVISED: JUN 2009

1.0 INTRODUCTION

1.1 Changes Since the 1996 Feasibility Report and Environmental Assessment

This Environmental Assessment (EA) covers dredging depths inadvertently not addressed in the 1996 Feasibility Report and EA for Charleston Harbor (USACE 1996). The 1996 report indicated an authorized project depth of 45 feet (47 feet entrance channel) plus 2 feet of allowable overdepth and 2 feet of advanced maintenance for a total projected dredging depth of 49 feet. Allowable overdepth is to assure the project is constructed to the authorized depth, and advanced maintenance is conducted in high shoaling areas to enable the project to remain at the authorized depth for a longer period of time. See appendix A for more detailed definition of these terms.

The harbor was deepened to the project depth between 1999 and 2004. During this time period, portions of several reaches were dredged 2-4 feet deeper (additional advanced maintenance) due to anticipated higher shoaling rates. This resulted in potential dredging depths of either 51 or 53 feet. Since this deepening, maintenance has been performed on a 12-18 month frequency including the additional advanced maintenance.

This additional advanced maintenance was not addressed in the 1996 Feasibility Report and EA and is the reason for this EA. The current EA discusses the entire maintenance project to provide an overall project perspective, but the focus is on the impacts of, and need for, continuing with the 2-4 feet of additional advanced maintenance. Reaches where additional advanced maintenance was performed are Ordnance Reach and Turning Basin, Lower Wando River, Wando Turning Basin, and Lower Town Creek Reach all 2 feet deeper; Myers Bend and Drum Island Reach both 4 feet deeper (Figures 1 & 2). Maintenance of these depths have continued to date except for the Myers Bend reach which only needs 2 feet of advanced maintenance similar to the rest of the navigation channel. This reduced need is due to construction of a new contraction dike and maintenance of two other contraction dikes addressed in the 1996 EA. These dikes are on the west side of the Cooper River across from Daniel Island (Figure 1). The current EA discusses the entire maintenance project, but coordination and environmental clearances are only requested for the impacts associated with the 2-4 feet of additional advanced maintenance.

1.2 Project Authority and Purpose

Resolutions adopted by the Senate on March 27, 1990 and by the House of Representatives on August 1, 1990 authorized the U.S. Army Corps of Engineers to study Charleston Harbor and determine if any modifications should be made to the existing Charleston Harbor Project, with particular emphasis on deepening and/or widening the federal navigation channel. This resulted in the 1996 feasibility report and EA to deepen the project from 40 to 45 feet (USACE 1996).

Maintenance dredging within the Charleston Harbor project is required to provide unrestricted navigation for ocean-going vessels calling upon the Port of Charleston. The project purpose is to maintain navigation at the Port of Charleston and comply with USACE regulations requiring the use of the least costly dredging and dredged material disposal alternatives consistent with sound engineering and environmental practices including meeting all federal environmental requirements, including those established under the Clean Water Act (CWA) and the Marine Protection, Research, and Sanctuaries Act (MPRSA) (see 33 CFR 335.7, 53 FR 14902).

The National Environmental Policy Act (NEPA) of 1969, as amended, requires consideration of the environmental impacts of federal actions. The purpose of this Environmental Assessment (EA) is to ensure the environmental consequences of the proposed action and alternatives are considered and that environmental and project information are available to the public. This EA has been prepared pursuant to NEPA in accordance with the Council on Environmental Quality (CEQ) regulations as contained in 40 CFR Parts 1500 to 1508, which directs federal implementation of the provisions of NEPA. An EA is a concise public document addressing an action for which a federal agency is responsible. The document briefly provides sufficient evidence and analysis for that agency to determine if it is necessary to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The United States Army Corps of Engineers, Charleston District is the lead agency for the proposed action.

1.3 Project Location and Description

The Charleston Harbor federal navigation channel is located in Charleston Harbor, South Carolina which lies approximately midway along the South Carolina coastline. It is approximately 140 statute miles southwest of the entrance to Cape Fear River, North Carolina and 75 statute miles northeast of the Savannah River, (Figure 1).

The proposed project would maintain Charleston Harbor to the dimensions described as follows: The project as constructed consisted of deepening Charleston Harbor from a previous depth of 40 feet to 45 feet (47 feet for the entrance channel) below mean low water (MLW) with two (2) feet of advance maintenance and two (2) feet of allowable overdepth in most of the harbor. However as indicated in section 1.1 above, 2 to 4 feet of additional advanced maintenance was performed in some areas. For the remainder of this EA, when a depth is indicated, 2 feet of advance maintenance and 2 feet of allowable overdepth are added unless indicated otherwise. For example if a depth of 47 feet is indicated, the actual dredging depth is potentially as deep as 51 feet.

The entrance channel was authorized to 47 feet deep and 800 feet in width from the 47-foot ocean contour to station 0+00 inside the jetties (Figures 1 & 2). The depth of the entrance channel is two feet deeper than the depth of the inner harbor channel to allow for wave action experienced in the open waters of the ocean. The channel slopes upward to 45 feet and 800 feet wide to a point adjacent to Sullivans Island where it narrows to 600 feet wide. The remainder of the navigation channel is 500 to 800 feet

wide with the following exception. The Upper Town Creek is 16 feet deep and 250 feet wide. In addition, two existing contraction dikes located on the west side of the Cooper River, across from the Daniel Island, were refurbished and one was added just to the north of the mouth of Shipyard River. The contraction dike located at Daniel Island was removed.

Maintenance of the Anchorage Basin adjacent to Rebellion Reach has been discontinued due to lack of use after closure of the Charleston Navy Base (Figure 1). The Daniel Island turning basin addressed in the 1996 report (USACE 1996) was not constructed. This basin has been reconfigured and its construction is contingent on the construction of the Marine Container Terminal at the Charleston Naval Complex (USACE 2006).

The anticipated average annual maintenance dredging needs from the federal channels are approximately 2,200,000 cubic yards. About 1,360,000 cubic yards of this total would go to the EPA designated Charleston Ocean Dredged Material Disposal Site (ODMDS) of which about 310,000 cubic yards is from the additional advanced maintenance areas. About 840,000 cubic yards of the total would go to the Clouter Creek Disposal Area of which about 330,000 cubic yards are from the additional advanced maintenance areas. These annual volumes should average the same for the foreseeable future.

A hydraulic pipeline dredge is used for maintenance dredging in the Upper Harbor of the Cooper River (from about Shipyard River upstream). This dredged material is placed in the Clouter Creek diked upland disposal area. Maintenance dredging of the Lower Reaches below Shipyard River to the entrance channel (Lower Harbor) is done by mechanical (clamshell) dredge and the material is transported via scow to the ODMDS (Figure 3). The Entrance Channel is dredged by hopper dredge and the material is transported to the ODMDS. The reaches around the ocean bar require minimal maintenance due to naturally deep water.

1.4 Need for Continued Maintenance

Charleston Harbor is ranked as the third largest container port on the East Coast of the United States. In 2005, the average annual tonnage was 25.4 million short tons of waterborne commerce. The primary exports are chemicals, paper and wood pulp. Petroleum products, coal, chemicals, cement, bauxite, non-ferrous metal products and primary iron and steel products are the major import commodities. The Charleston Customs district ranks as the nation's sixth largest in dollar value of international shipments, with cargo valued at more than $60 billion annually. International trade through the South Carolina State Port Authority (SCSPA) facilities provides thousands of good-paying jobs to South Carolinians through maritime, transportation, distribution and manufacturing companies involved in the movement of trade. The SCSPA affects an estimated 260,800 jobs across the state. All these benefits depend on continued maintenance of the harbor. See section 2.12 for more details.

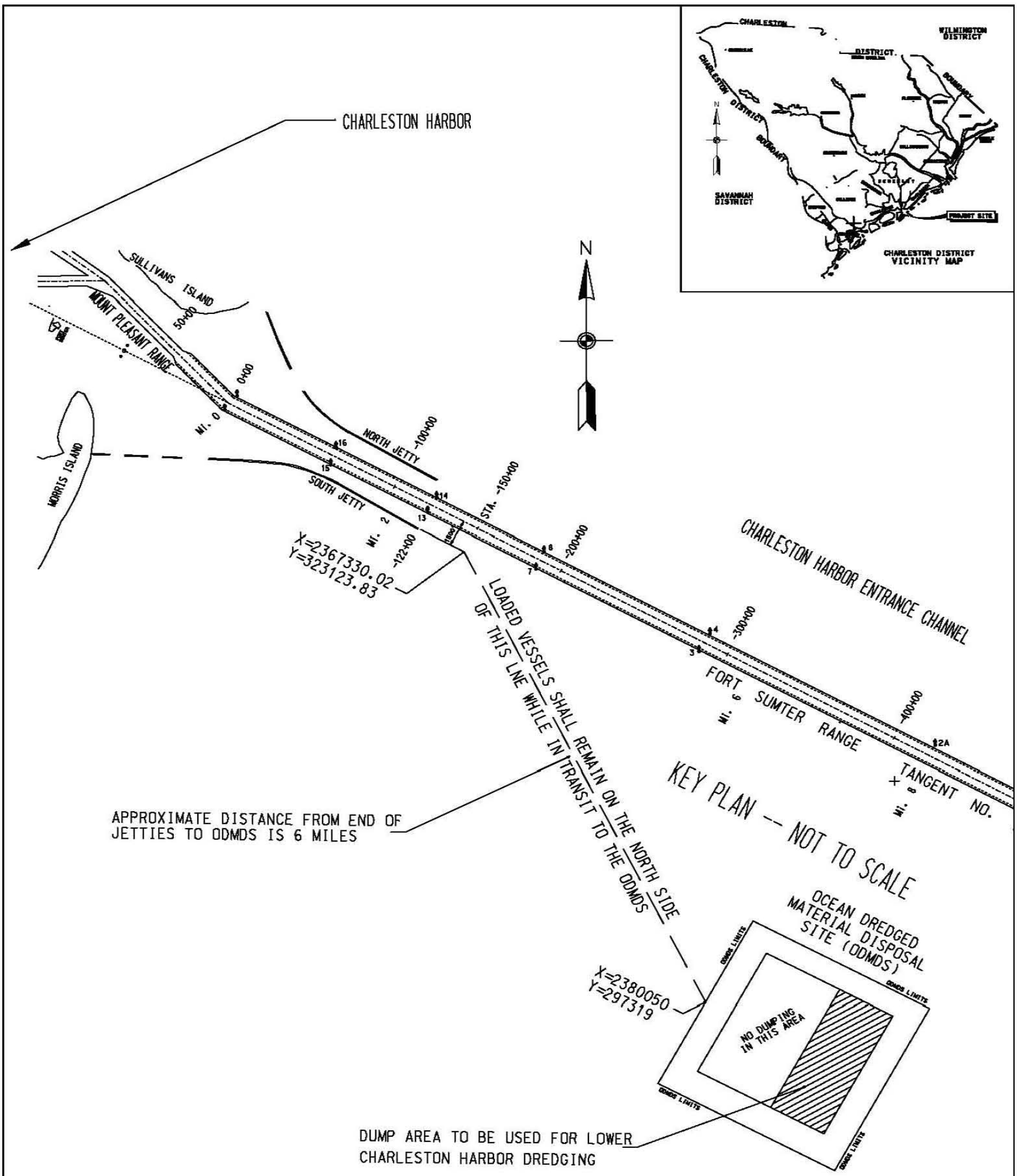


FIGURE 3
CHARLESTON HARBOR, SC
ODMDS LOCATION

CORPS OF ENGINEERS
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2.0 ENVIRONMENTAL SETTING

2.1 General Description of the Area

The harbor covers an area of approximately 14 square miles and is formed by the confluence of the Ashley, Cooper, and Wando Rivers. The City of Charleston is located to the west of the harbor, James and Morris Island to the south, Mt. Pleasant and Sullivans Island to the north and the Atlantic Ocean to the east (Figures 1 & 2). The majority of upland areas around Charleston Harbor are composed of residential, commercial, and industrial development. Docking and maintenance facilities of the harbor are concentrated along the west shore of the Cooper River extending from Battery Point of the peninsular city to the mouth of Goose Creek. Since the project will not affect terrestrial or freshwater habitats except for existing upland disposal areas, these habitats will not be assessed in detail.

The Cooper River has its origin at the confluence of its East and West Branches (locally termed "The Tee") from which it flows 32 miles southward to its outlet in Charleston Harbor. The East and West Branches of the Cooper River extend some 20 miles inland in a northward direction to their origins as small ill-defined channels in a low-lying area of Berkeley County known as Ferguson Swamp.

The Ashley River originates in the coastal plain and flows into the western part of Charleston Harbor. Areas of the river are bordered by historic plantations, but a large portion of the Ashley River Basin is now occupied by residential or commercial development.

The Wando River originates in the coastal plain and flows into the eastern part of Charleston Harbor. Portions of the lower Wando River are bordered by marsh which changes to woodland in the upper reaches of the river. Development along the Wando River has increased over the years with the completion of the interstate highway system. At present, residences and subdivisions are present along stretches of the river as are a shipyard and the State Port Authority's Wando River Terminal.

2.2 Water Quality

Water quality In Charleston Harbor is classified as SB by the South Carolina Department of Health and Environmental Control (SCDHEC 2002). The SB rating applies to tidal salt water suitable for survival and propagation of aquatic life; primary and secondary contact recreation; crabbing and fishing for market purposes and/or human consumption.

The progressive increase in the depth of the Federal navigation channel in the Cooper River over the past century has decreased the river bottom dissolved oxygen (DO) concentrations. Additionally, the freshwater flow into the Cooper River from Lake Moultrie affects vertical mixing and DO in the Lower Cooper River. The diversion of freshwater into the Cooper River beginning in the 1940s caused the river to shift from

vertically well mixed to a more stratified condition, which decreased DO concentrations along the bottom of the river and increased sedimentation and maintenance requirements in the harbor. Following rediversion of flows and reduction of the freshwater flow into the Cooper River beginning in 1985, this stratification and sedimentation was greatly reduced. SCDHEC monitoring data in the Lower Cooper River (Station MD-045 at Daniel Island Bend) show a noteworthy decreasing trend in DO concentration prior to rediversion, but no substantial trend in DO concentration when only post-rediversion data (1986-1998) were considered. (USACE 2006).

"The Charleston Harbor system is not considered to be impaired under criteria of Section 303(d) of the Clean Water Act except for an area 0.5 miles southeast from the mouth of Shem Creek. The impairment is for copper related to potential impacts on aquatic life (SCDEHC 2006). Also, available information indicates much of the system does not meet the applicable water quality standard for dissolved oxygen for significant periods of time and, therefore, is considered water quality limited for the purposes of wasteload allocation (WLA) development" (SCDHEC 2002).

Salinity concentration in the river affects the estuarine habitat in many ways. Along with tidal inundation, salinity generally determines the marsh vegetation species; it directly affects the fish, crustacean and clam populations; and it influences the DO concentrations. Salinity in the river is also of concern from a water usage perspective. Bushy Park is a freshwater reservoir located in the upper reaches of the Cooper River and used by local industry for water supply. Salinity intrusion to the estuary can cause periodic increases in chloride concentration above acceptable limits at the reservoir. These events typically occur during periods of drought, very high tides, sustained wind conditions or storm events. To counter salinity intrusion events, there are several monitoring stations in the harbor and the freshwater discharge from Lake Moultrie can be managed by increasing flow during these events to lower salinity concentrations in the Cooper River (USACE 2006).

A Section 401 Water Quality Certification was issued for disposal of dredged material associated with the project by the South Carolina Department of Health and Environmental Control (SCDHEC) on May 2, 1995. Since the dredging and disposal methods have not changed and no new disposal locations have been added, the Corps of Engineers considers the previous water quality certification to still be valid.

2.3 Benthic organisms

Dominant species in the harbor channels include mollusks, polychaetes, oligochaetes, nematodes, and amphipods (USACE 2006). Populations in the navigation channel are assumed to be not as stable and numerically abundant as nearby wetlands and mudflats due to the frequent disturbance by ongoing maintenance.

2.4 Threatened and Endangered Species

Both the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) have responsibilities under the Endangered Species Act of 1973 to

protect certain species. On June 4, 2009 both the FWS (Table 1) and NMFS (Table 2) web pages were accessed to determine which species are present in the project area (*http://www.fws.gov/charleston/docs/county_lists.htm*, and *http://sero.nmfs.noaa.gov/pr/pdf/Species%20List/South%20Carolina.pdf*).

As indicated in Section 4.5, no terrestrial or freshwater aquatic species indicated in Tables 1 and 2 would be impacted since the project action is in tidal saltwater and in a diked upland disposal area that has been used for the placement of dredged material for decades. These species would include all the birds, amphibians and plants. Section 4.5 addresses the impacts to the other species as appropriate.

2.5 Wetlands

Tidal wetlands in Charleston Harbor include emergent tidal marshes dominated by cordgrass species (*Spartina alterniflora*) and black rush (*Juncus roemerianus).* High marsh areas contain sea oxeye (*Borrichia frutescens)*, salt grass (*Distichlis spicata)* and salt meadow hay (*Spartina patens*), and scrub shrub wetlands dominated by wax myrtle (*Myrica cerifera)*, salt marsh elder (*Iva frutescens)*, and groundsel tree (*Baccharis halimifolia)*. Common reed (*Phragmites australis)* is also found along the fringe of the high marsh. However no wetlands abut the navigation channel.

2.6 Fisheries

The following is adapted from USACE (2006). A study of the Charleston Harbor by Van Dolah et al. (1990) identified many important finfish species within the lower Cooper River, including Atlantic menhaden (*Brevoortia tyrannus*), bay anchovy (*Anchoa mitchilli*), silver perch (*Bairdiella chrysoura*), weakfish (*Cynoscion regalis*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), and star drum (*Stellifer lanceolatus*) in large numbers. Summer flounder (*Paralichtys dentatus*) and southern flounder (*P. lethostigma*), two important recreational species, were caught in low numbers throughout the year. Sharks, skates and rays can all potentially be found in the project area. Schwartz (2003) reported that six species of sharks can pup their young in Carolinian waters during warm summer months: smooth dogfish, spiny dogfish, blacknose, Atlantic sharpnose, tiger, and dusky sharks.

The harbor system supports large populations of white shrimp, brown shrimp, and blue crab which are harvested both commercially and recreationally. Although none of the finfish species are commercially harvested within the estuary, many are recreationally important, such as red drum, spotted sea trout, flounder, spot, Atlantic croaker, and catfish.

Tidal creeks in the area include Clouter Creek, Beresford Creek and Shipyard Creek. Penaeid shrimp and blue crab were the most common large invertebrates in the creeks of Charleston Harbor during the reviewed studies. Dominant finfish species

Table 1. US Fish and Wildlife Service listed species in Charleston Harbor, SC.

Species	Federal Status	State Status
Mammals		
West Indian manatee		
Trichechus manatus	E	E
Birds		
Bald eagle		
Haliaeetus leucocephalus	BGEPA	BGEPA
Wood stork		
Mycteria americana	E	E
Red-cockaded woodpecker		
Picoides borealis	E	E
Piping plover		
Charadrius melodus	T	T
Reptiles		
Kemp's ridley sea turtle	E	E
Lepidochelys kempii		
Leatherback sea turtle		
Dermochelys coriacea	E	E
Loggerhead sea turtle		
Caretta caretta	T	T
Green sea turtle		
Chelonia mydas	T	T
Amphibians		
Flatwoods salamander	T	E
Ambystoma cingulatum		
Fishes		
Shortnose sturgeon		
Acipenser brevirostrum	E	E
Plants		
Sea-beach amaranth		
Amaranthus pumilus	T	T
Canby's dropwort		
Oxypolis canbyi	E	E
Pondberry		
Lindera melissifolia	E	E
American chaffseed		
Schwalbea americana	E	E

T=Threatened
E=Endangered
S/A=Similarity of Appearance to a Threatened Taxon
BGEPA=Bald and Golden Eagle Protection Act

Table 2 - National Marine Fisheries Service Listed Species in Charleston Harbor, SC Vicinity

Species Common Name	Species Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/2/70
finback whale	*Balaenoptera physalus*	Endangered	12/2/70
humpback whale	*Megaptera novaeangliae*	Endangered	12/2/70
North Atlantic right whale	*Eubalaena glacialis*	Endangered	12/2/70
sei whale	*Balaenoptera borealis*	Endangered	12/2/70
sperm whale	*Physeter macrocephalus*	Endangered	12/2/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened	7/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	6/2/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/2/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	6/2/70
loggerhead sea turtle	*Caretta caretta*	Threatened	7/28/78
Fish			
shortnose sturgeon	*Acipenser brevirostrum*	Endangered	3/11/67

included spot (*Leiostomus xanthurus*), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic croaker (*Micropogonias undulatus*), southern flounder (*Paralichthys lethostigma*), and bay anchovy (*Anchoa mitchilli*) (Wenner, 1997).

2.7 Essential Fish Habitat (EFH)

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) set forth requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other Federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of federally managed fisheries.

EFH is defined in the act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The definition for EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each Fisheries Management Plan (FMP). Table 3 lists the recognized EFHs which occur in the project area. Other habitats exist in the harbor but those listed are the only ones in or adjacent to the navigation channel.

Table 3 - Essential Fish Habitat List and Study Area Occurrence

Habitat Type	Habitat Name	Navigation Channel
Estuarine	Estuarine Emergent Wetlands	No
Estuarine	Estuarine Water Column	Yes
Estuarine	High Salinity Bays, Estuaries, and Seagrass Habitat	No
Estuarine	Tidal Freshwater (palustrine)	Yes
Estuarine	Uncolsolidated Bottom	Yes
Marine	Water Column	Yes

Table 4 lists the species for which the South Atlantic Fishery Management Council (SAFMC) manages or has developed fishery management plans that may occur in the study area. The following paragraphs discuss these species' potential to occur in EFH within the project area (adapted from USACE 2006).

Table 4 - Fishery Management Plans (FMPS) and Managed Species for the South Atlantic that May Occur in the Project Area

Common Name	Species
Shrimp	
brown shrimp	*Farfantepenaeus aztecus*
pink shrimp	*Farfantepenaeus duorarum*
rock shrimp	*Sicyonia brevirostris*
royal red shrimp	*Pleoticus robustus*
white shrimp	*Litopenaeus setiferus*
Snapper Grouper Complex	
Jack crevalle	*Caranx hippos*
gag grouper	*Mycteroperca microlepis*
black sea bass	*Centropristis striata*
mutton snapper	*Lutjanus analis*
red snapper	*Lutjanus campechanus*
lane snapper	*Lutjanus synagris*
gray snapper	*Lutjanus griseus*
yellowtail snapper	*Ocyurus chrysurus*
spadefish	*Chaetodipterus faber*
white grunt	*Haemulon plumieri*
sheepshead	*Archosargus probatocephalus*
hogfish	*Lachnolaimus maximus*
Coastal Migratory Pelagics	
king mackerel	*Scomberomorus cavalla*
Spanish Mackerel	*Scomberomorus maculatus*
cobia	*Rachycentron canadum*
Mid-Atlantic FMP species which occur in South Atlantic	
bluefish	*Pomatomus saltatrix*
summer flounder	*Paralichthys dentatus*
Federally Implemented Fishery Management Plan	
lemon shark	*Negaprion brevirostris*
bull shark	*Carcharhinus leucas*
blacknose shark	*Carcharhinus acronotus*
finetooth shark	*Aprionodon isodon*
dusky shark	*Carcharhinus obscurus*
bonnethead shark	*Sphyrna tiburo*
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*

Shrimp In the southeastern United States, the shrimp industry is based on the white shrimp (*Litopenaeus setiferus*), brown shrimp (*Farfantepenaeus aztecus*), pink shrimp (*Farfantepenaeusduorarum*), and the deeper water rock shrimp (*Sicyonia brevirostri*). The royal red shrimp (*Pleoticus robustus*) also occurs in deeper water and

sustains a limited harvest. For the above species, HAPC within the project area include estuarine and marine water columns within the inlet which includes the navigation channel. These areas are the connecting waterbodies between inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity. Essential Fish Habitat for rock shrimp and royal red shrimp occurs in deeper offshore waters. None of these offshore areas occur within the study area (USACE 2006).

Snapper Grouper Complex Ten families of fish containing 73 species are managed by the South Atlantic Fishery Management Council (SAFMC). There is variation in specific life history patterns and habitat use among the snapper grouper species complex. For specific life stages of estuarine dependent and nearshore snapper grouper species, EFH includes areas inshore of the 100-foot contour, such as the salt and brackish marshes, tidal creeks, soft sediments found in Charleston Harbor, and unconsolidated bottom occurring in the navigation channel. However, as for other species, estuarine and marine water columns are connecting waterbodies between inshore estuarine nursery areas and offshore waters used for maturation and spawning.

Coastal Migratory Pelagics King and Spanish mackerel and cobia are coastal migratory pelagic species managed by the SAFMC. EFH for these species include the inlet and, in a more general sense, any high-salinity bays which may occur in the project vicinity. Many coastal pelagic prey species are estuarine-dependant in that they spend all or a portion of their lives in estuaries. Accordingly, the coastal pelagic species, by virtue of their food source, are to some degree also dependant upon estuaries and, therefore, can be expected to be detrimentally affected if the productive capabilities of estuaries are greatly degraded.

Mid-Atlantic Species Which Occur in South Atlantic Bluefish and summer flounder are two species listed in the Mid-Atlantic Fisheries Management Plan that occur in the South Atlantic. Bluefish juveniles and adults are listed as using estuaries from North Carolina to Florida and are common in Charleston Harbor including the vicinity of the navigation channel.

Federally Implemented Fishery Management Plan The sharks listed in Table 4 are included in the Highly Migratory Species Fishery Management Plan, and are relatively common in the Charleston Harbor. EFH for these shark species include the inlet and estuarine and shallow coastal waters all of which include the navigation channel. Diadromous (freshwater and saltwater life stages) fish that use the Cooper River include the American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), blueback herring (*Alosa aestivalis*), Atlantic sturgeon (*Acipenser oxyrhynchus*) and American eel (*Anguilla rostrata*); however, federally implemented fishery management plans and/or EFH designations do not exist for these species.

2.8 Cultural Resources

European exploration of coastal South Carolina and the Charleston area began with Spanish exploration during the middle 16th century. However, permanent settlement did not begin until 1663 when King Charles II made grants to the Lords Proprietors, who fostered settlement on Albemarle Point on the west bank of the Ashley River in 1670. In 1680, the town was moved down river to Oyster Point, the present location of Charleston.

Charles Towne's economic success depended, firstly, on naval stores and then on other labor intensive agricultural products such as rice, indigo, and cotton. Slave-based plantation agriculture remained the primary economic focus of coastal South Carolina and Charleston Harbor until the end of the Civil War in 1865.

Charleston's importance as a port and political center grew rapidly, with development along the Cooper River leading the way. Despite wars, fires and hurricanes, the waterfront continued to expand, with exports growing to nearly $11 million by 1817, making Charleston second only to New York. Agricultural products remained the leading exports. But the city was not immune to economic upheavals, and by the1820s, the city was experiencing a prolonged economic slow-down as other areas of the country prospered. However, nothing heaped misery on the city like the Civil War. Seen as the cradle of the insurrection by the United States, military actions were initiated against Charleston and South Carolina as soon as appropriate forces could be mustered. But despite nearly two years of Federal shelling, the railroad and wharf installations remained operable until Confederate troops abandoned the city in mid-February of 1865. The Union Navy blockaded Charleston since it represented one of the busiest of Southern ports at the time. The Confederate States Navy attempted to break the blockade at Charleston through the use of experimental vessels, like the submarine *H.L. Hunley*, which would become the first submarine to sink an enemy vessel during wartime. Shore batteries and storms accounted for other Federal losses, including the ironclads *Weehawken* and *Keokuk* off Morris Island, and the *Patapsco* east of Mount Pleasant Range. The Federal blockade also resulted in the loss of a large number of private commercial vessels such as the side-wheel steamer *Flora* that attempted to run through the blockade.

A boost to the local and maritime economy of Charleston and South Carolina occurred in 1900, when the US Congress authorized the construction of a US Navy shipyard and repair facility. Land acquisition began in 1901 and facilities were complete by 1909 to permit the repair of a number of ships, including the US Navy tug *Potomac*, hospital ship *Solace*, and the battleship *Texas*. As World War I began and the US was drawn closer and closer to the conflict, the US Navy continued to expand its many facilities including the Charleston Navy Yard. The outbreak of World War II and the subsequent expansion of the Charleston Navy Yard proved to be the city's salvation from the ravages of the Great Depression.

In the decades following World War II, the US Navy continued to use and expand the Charleston Navy Yard. At the same time, the South Carolina State Ports Authority began to expand its facilities and capabilities in Charleston Harbor. By the 1990s, the US Navy closed the Charleston Navy Yard and its associated facilities, but the harbor became one of the busiest container ports on the east coast of the United States.

2.9 Hazardous and Toxic Waste.

The proposed project is located in the existing navigation channel where dredging occurs on a twelve to eighteen month rotation. Because of the frequent dredging activity, hazardous or toxic wastes are not expected to be encountered. Sediments dredged from the harbor have been tested most recently in 2004 for the purposes of ocean disposal (USACE 2005a). The analysis confirmed that hazardous and toxic materials are not present in the sediments above levels of concern (see below).

2.10 Sediment Analysis.

The grain size in the navigation channel for Charleston Harbor is mostly fine grain sediments (silt) with some sand in the entrance channel. To obtain Section 401 Water Quality Certification and Section 103 approval for ocean disposal of the material, sediment testing for physical, chemical, and biological parameters was conducted on maintenance material and new work material prior to the deepening that began in 1999. This included samples from or near all additional advanced maintenance areas. Sediments from Charleston Harbor were tested for Sec. 103 certification in 1994 in accordance with EPA requirements and in coordination with EPA (GEC 1994). A review of the information contained in the 1994 report showed that the sediments in the harbor were suitable for disposal at the Charleston ODMDS with the exception of one site in Shipyard Creek. This judgment was based on chemical analysis of sediments, elutriates of sediments, bioassays and studies for 17 stations within the Charleston Harbor project.

Sediments collected in 2004 near the Lower Town Creek additional advanced maintenance area and the Daniel Island Turning Basin (adjacent to the proposed Marine Container Terminal at the Charleston Naval Complex, USACE 2006) have higher levels of silt and clay than the samples collected from the rest of the harbor in the 1994 effort. However, there does not appear to be a substantive change in the chemical composition of the dredged material (USACE 2005a).

A site monitoring and management plan (SMMP) was completed for the Charleston Harbor Ocean Dredged Material Disposal Site (ODMDS) in 2005 (USACE 2005b). Monitoring of the sediments indicates that the levels of sediment contaminants within the disposal area and surrounding areas were low (Jutte 2005). EPA has concurred with ocean disposal of sediments from Charleston Harbor in the ODMDS. This concurrence is valid until November 2010.

2.11 South Carolina Coastal Management Program

South Carolina Department of Health and Environmental Control (SCDHEC) office of Ocean and Coastal Resource Management (OCRM) requires a consistency certification for proposed construction including dredging in the coastal zone. The SCDHEC provided certification that the deepening project was consistent with the Coastal Zone Management Program by letter of March 10, 1995. An amended Coastal Zone Consistency was received on February 1, 1996. Since the dredging and disposal methods have not changed and no new disposal locations have been added, the Corps of Engineers considers the previous consistency determination to still be valid.

2.12 Socioeconomics

Charleston Harbor is ranked as the third largest container port on the East Coast of the United States. In 2005, the average annual tonnage was 25.4 million short tons of waterborne commerce. The primary exports are chemicals, paper and wood pulp. Petroleum products, coal, chemicals, cement, bauxite, non-ferrous metal products and primary iron and steel products are the major import commodities. The Charleston Customs district ranks as the nation's sixth largest in dollar value of international shipments, with cargo valued at more than $60 billion annually. International trade through the South Carolina State Port Authority (SCSPA) facilities provides thousands of good-paying jobs to South Carolinians through maritime, transportation, distribution and manufacturing companies involved in the movement of trade. The SCSPA affects an estimated 260,800 jobs across the state. The vast majority of the impacts arise from port users who ship goods through the SCSPA, with the balance, 24,700 (9%) jobs, directly and indirectly attributable to port operations. In terms of jobs, such port users employ an estimated 236,100 people (91% of total jobs).

Of Charleston’s four terminals, Wando Terminal serves as the primary container facility. The other three include the North Charleston Terminal, the multi-purpose Columbus Street Terminal, and the Union Pier Terminal, which serves as Charleston’s principal roll-on/roll off (ro/ro) cargo facility with 82% of all vessel calls made by vehicles carriers and ro/ro ships.

An estimated 630,100 residents lived in Charleston (metropolitan statistical area) MSA in 2007. This represents a population increase of 14.8% from 2000. As of 2008 the civilian workforce of Charleston MSA is estimated as 320,000, a change of 19.3% from 2000. Of the 320,000, 302,080 are employed and only 17,920 are unemployed. As of 2008, the unemployment rate was 5.6%. Selected leading employers in the public sector in the Charleston metro area include US Navy C/O Naval Weapons Station (13,000), Medical University of South Carolina (10,000), Charleston Air force Base (7,300), Charleston County School District (5,400), Berkeley County School District (3,650), Dorchester School District (2,350), Charleston County (2,100), Santee Cooper (1,750), City of Charleston (1,700) and College of Charleston (1,200). The largest private sector employers include Roper St. Francis Healthcare (3,400), Piggly Wiggly

Carolina Co Inc. (2,500), Robert Bosch Corporation (2,400), Wal-Mart Supercenter (2,300), Trident Health System (2,000), Force protection Inc. (1,550), and Bi-Lo Stores (1,350).

2.13 Other Significant Resources (Section 122, P.L. 91-611)

Section 122 of P.L. 91-611 identifies other significant resources that must be considered during project development. These applicable resources, and their occurrence in the study area, are described below.

Noise Charleston Harbor has the typical noise characteristics of a busy harbor. Sources include recreational and commercial vessel traffic, dredging vessels and dock side facilities. Noise sources for vessels include cranes, whistles and various motors for propulsion. Dockside noise sources include cranes, trucks, cars, and loading and unloading equipment.

Air Quality The U.S. Environmental Protection Agency (EPA) Region 4 and the South Carolina Department of Health and Environmental Control, Bureau of Air Quality regulate air quality in South Carolina. The Clean Air Act (42 U.S.C. 7401–7671q), as amended, gives EPA the responsibility for establishing the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that set acceptable concentration levels for six criteria pollutants: fine particulate matter (PM10), very fine particulate matter (PM2.5), sulfur dioxide, carbon monoxide, nitrous oxides (NOx), ozone (O3), and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. On the basis of the severity of the pollution problem, areas that do not attain the standards are categorized as marginal, moderate, serious, severe, or extreme. Each state has the authority to adopt standards stricter than those established under the federal program; however, South Carolina accepts the federal standards (USEPA 2009).

The project is located within the jurisdiction for air quality of the South Carolina Department of Health and Environmental Control (SCDHEC), Bureau of Air Quality. The air quality in Charleston and surrounding counties, South Carolina, are designated by SCDHEC as an attainment area for all six criteria pollutants. The ambient air quality for Charles County, South Carolina has been determined to be in compliance with the National Ambient Air Quality Standards (Barnes 2009).

Esthetics, Recreation, and Public Facilities. A scenic setting is provided by the harbor and river and the numerous vessels common to these waters, including commercial and recreational boats as well as ships calling on the port. The estuarine and marine environments provide opportunities for boating and fishing, as well as an escape from the faster pace of land-based activities. Several public and private boat ramps and marinas are located in harbor (USACE 2006)

3.0 ALTERNATIVES TO THE PROPOSED ACTION

The purpose of this EA is to coordinate the need for additional advanced maintenance dredging in portions of Charleston Harbor. Two dredging depth alternatives will be addressed: No action, project addressed in the 1996 EA (USCAE 1996); and the proposed project, continuing additional advanced maintenance. Two dredged material disposal locations will be addressed in detail: the ODMDS and Clouter Creek Diked Disposal Area. Finally three dredging methods will be discussed: hopper, bucket and barge, and hydraulic pipeline.

The anticipated average annual maintenance dredging needs from the federal channels are approximately 2,200,000 cubic yards. About 1,360,000 cubic yards of this total would go to the ODMDS of which about 310,000 cubic yards is from the additional advanced maintenance areas. About 840,000 cubic yards of the total would go to the Clouter Creek Disposal Area of which about 330,000 cubic yards are from the additional advanced maintenance areas. These annual volumes should average the same for the foreseeable future.

3.1 Dredging Depths

1. No Action: the 1996 EA (USACE 1996) indicated a project depth of 45 feet plus 2 feet of allowable overdepth and 2 feet of advanced maintenance for a total potential dredging depth of 49 feet (2 feet deeper in the entrance channel to allow for wave action). However because of higher shoaling rates in certain areas (Figure 2), a portion of the project would need to be dredged as frequently as twice per year to enable the project to be maintained to the authorized depth to allow efficient ship navigation. This will result in an increased annual cost of about $2,085,000 primarily due to mobilization of dredging equipment and a higher unit cost.

2. Proposed project: As with the no action alternative, most of the project would be maintained to a project depth of 45 feet plus 2 feet of advanced maintenance and 2 feet of allowable overdepth . However, as shown in Figure 2, due to higher shoaling rates, portions of the following reaches will continue to be maintained to either 45 feet plus 4 feet of advance maintenance and 2 feet of allowable overdepth (45+4+2) or 45 feet plus 6 feet of advance maintenance and 2 feet of allowable overdepth (45+6+2).: Ordnance Reach and Turning Basin, Lower Wando River, Wando Turning Basin, and Lower Town Creek Reach all 2 feet deeper (i.e. 45+4+2); and Drum Island Reach 4 feet deeper (i.e. 45+6+2). However unlike the no action alternative, the additional advance maintenance will enable the project to be maintained on 12-18 month frequency. This will result in a decreased annual cost of about $2,085,000 compared to the no action alternative primarily due to less frequent mobilization of dredging equipment and a lower unit cost.

3.2 Disposal

The disposal alternatives for the deepening project were discussed in the 1996 feasibility report and EA (USACE 1996). The only reasonable option for the upper

harbor is disposal in the Clouter Creek upland diked disposal area and for the lower harbor the ODMDS (Figures 1, 2, & 3). Both the Clouter Creek site and the ODMDS should provide disposal capacity for harbor maintenance for over 20 years.

Morris Island, Drum Island, and Daniel Island, have been used in the past. Morris Island is not deemed to be within an economical pumping distance from any lower or upper harbor shoals due to the long distance and much of the island dike along the ocean is eroding. None of the channels near Morris Island require maintenance due to naturally deep water.

Drum Island is too small to be used for routine disposal events from dredging the navigation channel. Finally, Daniel Island is owned by the South Carolina State Ports Authority, and the Ports Authority did not renew the easement to the Government after January 1998. Most of the material that previously was placed in Daniel Island is now transported to the ODMDS. Disposal of dredged material in the ODMDS will be conducted in accordance with the 2005 Site Management and Monitoring Plan (USACE 2005b). Material from Shipyard River and Daniel Island Reach that previously was placed in Daniel Island is now pumped upstream to Clouter Creek Disposal Area. These alternatives to Daniel Island are more costly due to increased pumping and/or haul distances using dump scows, but are the only options available at this time.

3.3 Dredging Methods

Three dredging methods are feasible: hopper, bucket and barge, and hydraulic pipeline. Hopper dredges will not be used in the additional advanced maintenance areas for the reasons indicated below. Hopper dredges are only feasible in the entrance channel (where no additional advanced maintenance is proposed) because of the short distance to the ODMDS and since overflow of the hopper is allowed to achieve an economic load.

In the inner and upper harbor, a hopper dredge is not feasible due to the long haul distance to the ODMDS and over flow of hopper dredges is not allowed in the harbor. Therefore the hopper dredge would be hauling mainly water to the ODMDS. Also for anywhere a hopper dredge would be used in the harbor, no dredging is allowed outside of the December 1 to March 31 time frame due to the potential of taking seaturtles. Finally for a hopper dredge, no dredging is occurring while the dredge is in transit to the ODMDS. Therefore the longer the distance to the ODMDS, the less efficient is hopper dredging.

In the upper harbor from around Shipyard River upstream, a hydraulic pipeline dredge will be used with disposal in the Clouter Creek Disposal Area. Use of the pipeline dredge in the lower harbor is not feasible due to long pumping distances which would require the use of expensive booster pumps. Hopper and bucket and barge dredges are not used in the upper harbor due to the long haul distance to the ODMDS.

A bucket and barge operation is used in the lower harbor from around Shipyard River downstream since there are no usable upland diked disposal areas nearby. Unlike a hopper dredge, a bucket and barge operation can be essentially continuous. While a full barge is being transported to the ODMDS for disposal another barge is being loaded. A bucket and barge operation can not be used in the entrance channel because of wave action.

4.0 POTENTIAL IMPACTS OF THE PROPOSED ACTION

4.1 Summary of Potential Impacts

The additional advanced maintenance areas have already been constructed and have been maintained at the same time as routine maintenance events. Therefore, no impacts are expected with the proposed action beyond what currently occurs. However if the no action alternative is implemented, dredging in the harbor will be needed in some areas semiannually versus every 12-18 months. Therefore impacts associated with the no action alternative, even though minor, are greater than those associated with the proposed action due to increased dredging frequency. Impacts of both alternatives are summarized in Table 5.

4.2 Water Quality.

Temporary changes in turbidity at the dredging and disposal sites are expected during routine maintenance; but turbidity changes for additional advanced maintenance are anticipated to be less due to the lower frequency of dredging compared to the no action alternative. A Section 401 Water Quality Certification was issued for disposal of dredged material associated with the project by the South Carolina Department of Health and Environmental Control (SCDHEC) on May 2, 1995. Since the dredging and disposal methods have not changed and no new disposal locations have been added, the Corps of Engineers considers the previous water quality certification to still be valid.

4.2.1 Saltwater Intrusion and Sedimentation

Hydrodynamic, salinity intrusion and sedimentation models including an allowable overdepth of two feet and two feet advanced maintenance, were conducted by the Army Corps of Engineer, Waterways Experiment Station for the deepening project (USACE 1996). The numerical models were used to develop the channel velocities and water levels for the base condition and the proposed conditions in support of the ship simulation and the sedimentation study. The salinity intrusion model indicated that no significant difference was found between the previous 40 foot channel and the existing 45 foot channel. Because the channel is deeper and wider in specified areas, the sedimentation model indicated that there will be an increase in the expected sedimentation compared to the previous conditions. It is however considered a manageable increase.

Table 5 - Summary of Impacts of Alternatives				
Impacts[2]	**Alternatives**			
	No Action	**No Action Rating[1]**	**Additional Advanced Maintenance**	**Additional Advanced Maintenance Rating[1]**
Water Quality	Increased turbidity due to more frequent dredging	2	Infrequent elevated turbidity due to dredging	1
Groundwater	No anticipated impact	0	No anticipated impact	0
Benthic Organisms	Greater disturbance of benthic communities due to increased dredging frequency	3	Less frequent disturbance of benthic communities due to dredging	2
Threatened and Endangered Species	Greater potential to take listed species due to increased dredging frequency	2	Minor potential to take listed species due to dredging	1
Wetlands	No anticipated impact	0	No anticipated impact	0
Fisheries and Essential Fish Habitat	Greater potential to impact fisheries and associated habitat due to increased dredging frequency	2	Less potential to impact fisheries and associated habitat due to dredging	1
Cultural Resources	No anticipated impact	0	No anticipated impact	0
Sediments	No anticipated impact	0	No anticipated impact	0
Socioeconomics[3]	No anticipated impact	0	No anticipated impact	0
Air Quality	Greater potential to increase emissions due to increased dredging frequency	2	Minor potential to impact air quality due to dredging	1
Terrestrial and Freshwater Habitats	No anticipated impact	0	No anticipated impact	0
Cumulative Impacts	Overall greater impact due to more frequent dredging	2	Overall less impact due to less frequent dredging	1
Costs[4]	More expensive	4	Less expensive	1
Total Rating[5]		**17**		**8**

1 Alternative impacts are rated on a scale from 0 to 5. 0 is no change or impact anticipated and 5 is major change or impact anticipated.
2 Impacts are primarily related to the frequency of the dredging activity. Since the no action alternative would have a greater dredging frequency, the impacts are generally greater.
3 Maintenance of the harbor is vital to the economy of the region, state, and nation, but neither alternative will alter existing conditions.
4 Due primarily to the more frequent mobilization of dredging equipment, the average annual costs for the no action alternative is about $2.09 million more than the proposed alternative.
5 The higher total rating reflects the greater impact.

Even though the advance maintenance areas are 2-4 feet deeper than the rest of the navigation channel, they should not alter salinity patterns in the harbor because the deeper depths are discontinuous (Figure 2). No specific DO monitoring or modeling has been performed nor is proposed related to the proposed action, but no appreciable changes are anticipated due to the relatively minor increase in depth compared to existing depths. Therefore, no changes are anticipated between the no action alternative and the proposed project. If monitoring indicates a salinity issue, it can be managed as indicated in section 2.2.

Based on data collection since completion of the deepening project in 2004, shoaling is only appreciably greater than the rest of the harbor in the five areas indicated in Figure 2. These are the areas where additional advanced maintenance is proposed.

4.3 Groundwater

Correspondence from the South Carolina Department of Natural Resources dated February 6, 1995 reported that the top of the Cooper Formation lies between the approximate elevations of -10 and -60 feet mean sea level with thickness varying from 200 to 260 feet. As a result, no adverse impacts to the existing aquifers were expected as a result of deepening Charleston Harbor from 40 to 45 feet. Neither dredging alternative will change that condition.

4.4 Benthic Impact

During maintenance, all the benthic resources will be removed from the channels to be dredged, but due the rapid shoaling of similar material to what was removed, benthic organisms will begin recolonizing the disturbed areas in a short time. However, due to frequent disturbance for over 100 years, the navigation channel populations will probably not achieve the diversity and numerical abundance of an undisturbed area with similar substrate, depth, and water quality conditions. The more frequent dredging associated with the no action alternative compared to the proposed action would exacerbate this situation.

4.5 Endangered/Threatened Species

All of the species that may be impacted by the proposed action are under the jurisdiction of the National Marine Fisheries Service (NMFS) except for the West Indian manatee. Since the proposed action involves maintenance dredging only, the NMFS species fall under the NMFS 1997 southeast regional biological opinion (NMFS 1997). A new biological assessment (BA) has been prepared by the Corps of Engineers (USACE 2008) to update the 1997 BO. National Marine Fisheries Service is anticipated to release their new BO in 2010. When this document is finalized, harbor maintenance will be conducted accordingly, but until then the 1997 BO remains in effect and dredging will be conducted in accordance with it.

The West Indian manatee is under the jurisdiction of the US Fish and Wildlife Service (FWS). Informal consultation has been initiated with FWS regarding potential impacts of the proposed action on manatees. A Letter of concurrence, dated August 5th, 2009 (Appendix C), was received from the U.S. Fish and Wildlife Service concluding there will be no impacts to trust resources.

None of the terrestrial or freshwater aquatic species indicated in Tables 1 and 2 would be impacted since the proposed action is in tidal saltwater and in a diked upland disposal area that has been used for the placement of dredged material for decades. These species include all the birds, amphibians and plants.

4.5.1 NMFS Species

Whales: Blue, finback, humpback, and right whales. None of these whales occur in the lower or upper harbor so dredging will not impact them. The only impact that could occur would be collisions as the barges filled with dredged material are transported from the lower harbor to and from the ODMDS. The action is ongoing with continued maintenance of the harbor and there would not likely be an increase in barge trips per year due to the additional advance maintenance. With no additional advanced maintenance, the bucket and barge operation would be in the harbor twice a year which could increase the total number of barge trips. The slow speed (generally <10 knots) associated with barge operations is not considered a collision threat to whales.

Seaturtles: Green, hawksbill, Kemp's ridley, leatherback and loggerhead sea turtles. No beach disposal is planned as part of the proposed action; therefore, there will be no impact to nesting seaturtles. A bucket and barge dredge and hydraulic pipeline dredge are not known to frequently take seaturtles and a hopper dredge is not proposed in any of the additional advanced maintenance areas; therefore, dredging operations are not likely to impact seaturtles. Similar to the discussion for the whales, the action is ongoing with continued maintenance of the harbor and there would not likely be an increase in barge trips per year due to the additional advance maintenance. With no additional advanced maintenance, the bucket and barge operation would be in the harbor more frequently which could increase potential impacts to seaturtles compared to the proposed action.

Under the 1995 and 1997 biological opinions (NMFS 1995 & 1997), NMFS determined that cutterhead pipeline dredging may affect but is not likely to adversely affect sea turtles. In contrast to hopper dredges, pipeline dredges are relatively stationary and therefore act on only small areas at any given time. The cutterhead works most efficiently buried within thick sediment deposits and is not frequently exposed to open water when dredging. Therefore, for a turtle to be taken with a pipeline dredge, it would have to approach the cutterhead within the sediment and be caught in the suction. This type of behavior is unlikely but may be possible if the turtle is cold stunned or brumating (USACE 2008).

Clamshell dredges are the least likely to adversely affect sea turtles because they are stationary and impact very small areas at a given time. Any sea turtle injured or killed by a clamshell dredge would have to be directly beneath the bucket. The chances of such an occurrence are extremely low (USACE 2008).

Shortnose Sturgeon: Shortnose sturgeon occur within most major river systems along the Atlantic Coast of North America including the Santee/Cooper River complex and shortnose sturgeon have been documented in the systems since the late 1800's (NMFS 1998 and USACE 2008). Based on the history of incidental take data collected, both hydraulic cutterhead and mechanical dredge techniques have been documented to infrequently impact shortnose sturgeon species through entrainment of the cutterhead or capture in the clamshell bucket. Hydraulic and mechanical dredging techniques may also indirectly impact sturgeon species through (1) short-term impacts to benthic foraging and refuge habitat, (2) short-term impacts to water and sediment quality from re-suspension of sediments and subsequent increase in turbidity/siltation, and (3) disruption of spawning migratory pathways (USACE 2008).

However, since all the dredging is located outside of the spawning areas and the proposed dredging equipment has the least impact on sturgeon, the proposed action is not likely to adversely impact shortnose sturgeon. However if impacts did occur, they would be more likely with the no action alternative since dredging would occur more frequently in the harbor compared to the proposed project.

4.5.2 Fish and Wildlife Service Species

West Indian Manatee: The manatee is an occasional visitor to Charleston Harbor during warmer months. Due to low occurrence in the harbor, dredging impacts are not anticipated. However, precautions to protect manatee have been added to the dredging specifications. In summary these precautions are as follows:

> *It is the responsibility of the Contractor to take necessary precautions to avoid any contact with manatees. If manatees are sighted within 100 yards of the dredging area, all appropriate precautions shall be implemented to ensure protection of the manatee. The Contractor shall stop, alter course, or maneuver as necessary to avoid operating moving equipment any closer than 50 feet of the manatee. Operation of equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment.*

With these restrictions in place, dredging from either alternative, may affect but is not likely to adversely affect the West Indian manatee.

4.6 Wetlands

All dredging will be conducted in the existing navigation channel and disposal in active disposal sites. Therefore there will be no wetland impacts by either alternative.

4.7 Fisheries

The primary impact of dredging is to larval fish as they pass through the rivers in route to their estuarine nursery areas. The larval fish are not very mobile and those along the bottom of the navigation channel can be affected by dredging. The pipeline dredge would have the greatest impacts because it removes sediment in a watery slurry, and larvae can be entrained in this slurry. However, the amount of larvae taken is generally less than 0.1 percent of the total at any given time. This is due to the overall water volume in the harbor and since the dredge cutterhead is placed in the sediment. While any larvae entrained will be killed, it is likely that the impact to fish populations would be insignificant (Settle 2008). A bucket and barge dredge has less affect, since it mostly removes sediment and not a watery slurry.

The additional advanced maintenance areas have already been constructed and have been maintained at the same time as routine maintenance. Therefore, no additional impacts are anticipated on fishery resources with the proposed action. However the no action alternative could increase impacts due to more frequent dredging in the harbor.

4.8 Essential Fish Habitat

No changes to EFH will occur with either dredging alternative. With the preferred alternative of advanced maintenance, no additional impact should occur since the advanced maintenance areas have already been constructed, and maintenance will occur at the same time as maintenance in the rest of the harbor. For the no action alternative, the same area will be dredged but additional advanced maintenance will not occur. Therefore for this no action alternative, dredging will occur more frequently to preclude draft restrictions in the rapidly shoaling areas and have a greater potential for impacts on fishery resources. The primary impact is related to entrainment as discussed in section 4.7.

4.9 Cultural Resources.

This section is adapted from Hall 2005. Upland and underwater cultural resources studies have been conducted for a number of improvements within and adjacent to the Charleston Harbor channels and waterfront. The most relevant of these have focused upon the search for shipwrecks and related sites in the vicinity of channel and basin improvements. While the immediate footprint of previously constructed channels are normally not considered worthy of survey due to the depth of past dredging, channel shoulders and side-slopes may contain shipwreck remains. The potential for impacts by either alternative would be the same since the dredging dimensions will not exceed previous limits.

A comprehensive historic overview of areas of planned improvements was undertaken in 1994 (Watts 1995a, 1995b, 1995c). This survey included extensive map documentation, remote sensing survey, and diver investigation of discovered magnetic

anomalies. This included areas adjacent to Coulter Reach south of the US Navy Disposal Area, Daniel Island West, Daniel Island Reach, Myers Bend, Drum Island Reach, and Folly and Shutes Reaches. In addition, the location of the USS Patapsco was confirmed east of Fort Sumter. No additional cultural resources were discovered during this survey.

During 2000, a site specific survey was conducted by Panamerican Maritime under contract to the US Army Corps of Engineers Wilmington District. This survey was undertaken as a result of a dredge encountering shipwreck remains near the northern end of Tidewater Reach. This survey did not find historically significant wreckage but did reconfirm the location or disposition of removed or relocated wrecks, including Chicora, Charleston, Palmetto State, Beatrice, Patapsco, Weehaken, Housatonic, Prince of Wales, Juno, and Keokuck (Krivor and Tuttle 2000).

Given the extent of past research and the limited additional impact from maintenance of the navigation channels, no further survey is planned or needed for the current navigation project. In a letter dated August 11, 2009 (see Appendix C), the South Carolina Archives and History Center (SHPO) concurred with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

4.10 Sediment Analysis

EPA concurrence for disposal of dredged material at the Charleston ODMDS is valid until November 2010. Prior to that date, additional sediment sampling and analysis will be required in the harbor. The type of sampling and analysis will be coordinated with EPA and a new Section 103 (i.e., Section 103 of MPRSA) evaluation prepared. EPA must concur with that evaluation before ocean dumping can continue past November 2010. Both the no action and proposed alternative will be removing only maintenance material; therefore, the results of the Section 103 evaluation should be the same for each alternative.

4.11 South Carolina Coastal Management Consistency

The SCDHEC, Office of Ocean and Coastal Resource Management provided certification that the deepening project was consistent with the Coastal Zone Management Program by letter of March 10, 1995. An amended Coastal Zone Consistency was received on February 1, 1996. Since the dredging and disposal methods have not changed and no new disposal locations have been added, the Corps of Engineers considers the previous consistency determination to still be valid. Concurrence from SCDHEC was received by letter on September 17, 2009 (see Appendix C).

4.12 Socioeconomics

With continued maintenance of Charleston Harbor, no impacts are anticipated to the socioeconomic picture indicated in section 2.12 since under either maintenance alternative, commerce and recreational activities in Charleston Harbor would not be adversely impacted.

4.13 Other Significant Resources (Section 122, P.L. 91-611)

Section 122 of P.L. 91-611 identifies other significant resources that must be considered during project development. These appropriate resources, and their occurrence in the study area, are described below.

Noise. Maintenance dredging has occurred in Charleston Harbor for over 100 years. The dredging equipment is usually present in the harbor on a 12 to 18 month frequency and that would not change with the proposed action. However if the additional advanced maintenance is not performed, dredging in several areas would be required on a semiannual basis. This would result in increased noise levels but would probably not be significant in comparison to ongoing harbor activities.

Air Quality. Temporary increases in exhaust emissions from dredging equipment are expected during the construction period. The no action alternative would result in higher emissions due to more frequent occurrence of dredging in the harbor. However, a conformity determination is not required because Charleston and surrounding counties, South Carolina have been designated by the SCDHEC as an attainment area, and the direct and indirect emissions from the project fall below the prescribed deminimus levels (58 Fed. Reg. 93.153(c)(1)). This project is not anticipated to create any adverse effect on the air quality of this attainment area.

Esthetics, Recreation, and Public Facilities. A scenic setting is provided by the harbor and river and the numerous vessels common to these waters, including commercial and recreational boats as well as ships calling on the port. The estuarine environment provides opportunities for boating and fishing, as well as an escape from the faster pace of land-based activities. Several boat ramps and marinas are located in Charleston Harbor and continued maintenance will not impact these conditions.

4.14 Terrestrial Impacts

No terrestrial impacts are anticipated since the only upland activity would be disposal of dredged material in the existing Clouter Creek Disposal Area.

4.15 Section 404 of Clean Water Act of 1977

Section 404 of the Clean Water Act requires that the impacts associated with the discharge of dredged or fill material into waters of the United States be evaluated. However, there are no new issues related to the additional advanced maintenance that

were not addressed in the 1996 report and Section 404(b)(1) (P.L. 95-217) evaluation (USCAE 1996). Since no new 404 related actions are proposed, a new Section 404(b)(1) (P.L. 95-217) evaluation is not required.

During bucket and barge dredging, turbid water will be created as the bucket is pulled up through the water column and occasionally turbid water contained in the barges may spill over the side of the barge. This activity is normal and unavoidable for this dredging equipment. However since this turbidity does not occur continuously and only occurs in the wider portion of the harbor, adverse impacts to the environmental are not anticipated.

Effluent discharge from the spillways at the Clouter Creek Disposal Area will continue to concur due to pumping of dredged material into the area from a hydraulic pipeline dredge. The four cells at the Clouter Creek site range from 190 to 460 acres and are adequate in size to preclude elevated turbidity and suspended solid levels from exiting the spillway pipes.

4.16 Cumulative Impacts

Deepening of the navigation channel in Charleston Harbor has occurred periodically for well over 100 years. The last deepening was to 45 feet plus allowable overdepth and advanced maintenance (including 2-4 feet of additional advanced maintenance in several reaches) and was completed in 2004. The proposed action would continue that maintenance which has occurred on a 12-18 month frequency since then. The no action alternative would have a greater cumulative impact since dredging would occur more frequently in the harbor to maintain the project depth.

The SC State Port Authority proposes to construct a marine container terminal at the southern end of the former Charleston Navy Base along the west bank of the Cooper River across from Daniel Island. The 2006 EIS for this project contained a cumulative impact assessment which also discusses cumulative impacts of dredging (USACE 2006).

A section 905(b) report (aka reconnaissance report, USACE 2002) was prepared in 2002 investigating the need for additional deepening, but no action has been conducted since then. If additional deepening is proposed for the harbor, a new 905(b) report will need to be prepared followed by a feasibility report and EIS. These documents would fully assess impacts associated with any proposed deepening.

5.0 UNAVOIDABLE ADVERSE IMPACTS

Adverse environmental effects associated with this project are as follows:

1. Temporary increase in air emissions during the each maintenance cycle. This impact would occur less often with the proposed project.

2. Temporary increase in turbidity which would have a temporary impact on water quality at the dredging site. This impact would occur less often with the proposed project.
3. Disruption of the benthic community in the navigation channel with each maintenance event. This impact would occur less often with the proposed project.

6.0 COMPLIANCE AND COORDINATION

The project is designed to be fully compliant with all environmental requirements including NEPA, the Endangered Species Act, Sections 404 and 401 of the Clean Water Act, Coastal Zone Management Act, National Historic Preservation Act, etc. Coordination for this project was initiated with a series of telephone conversation in June and July of 2009 with agencies regarding the proposed action. The Corps of Engineers point of contact for the proposed project is Mr. Alan Shirey, 69A Hagood Ave, Charleston, SC 29403-5107, (843) 329-8166, email Alan.D.Shirey@usace.army.mil. Copies of the Draft Environmental Assessment and Draft Finding of No Significant Impact were sent to approximately 45 agencies/organizations/tribes/individuals for coordination and consultation. The list of addressees and the comments that were received from these addressees are provided in Appendix C.

Table 6 provides a summary of compliance with all applicable federal laws and policies.

Table 6 - Relationship of the Proposed Action to Federal Laws and Policies
(Items identified as being in "Full Compliance" assumes their compliance status upon completion of the NEPA process.)

Public Laws		
Title of Public Law	US CODE	Compliance Status
Abandoned Shipwreck Act of 1987	43 USC 2101	Full Compliance
American Indian Religious Freedom Act	42 USC 1996	Not Applicable
Agriculture and Food Act (Farmland Protection Policy Act) of 1981	7 USC 4201 et seq.	Not Applicable
American Folklife Preservation Act of 1976, As Amended	20 USC 2101	Not Applicable
Anadromous Fish Conservation Act of 1965, As Amended	16 USC 757 a et seq.	Full Compliance
Antiquities Act of 1906, As Amended	16 USC 431	Full Compliance
Archeological and Historic Preservation Act of 1974, As Amended	16 USC 469	Full Compliance
Archeological Resources Protection Act of 1979, As Amended	16 USC 470	Full Compliance
Bald Eagle Act of 1972	16 USC 668	Not Applicable
Buy American Act	41 USC 102	Full Compliance
Civil Rights Act of 1964 (Public Law 88-352)	6 USC 601	Full Compliance
Clean Air Act of 1972, As Amended	42 USC 7401 et seq.	Full Compliance
Clean Water Act of 1972, As Amended	33 USC 1251 et seq.	Full Compliance
Coastal Barrier Resources Act of 1982	16 USC 3501-3510	Full Compliance
Coastal Zone Management Act of 1972, As Amended	16 USC 1451 et seq.	Full Compliance
Comprehensive Environmental Response, Compensation and Liability Act of 1980	42 USC 9601	Not Applicable

Table 6 (CONT'D)		
Title of Public Law	US CODE	Compliance Status
Conservation of Forest Lands Act of 1960	16 USC 580 mn	Not Applicable
Contract Work Hours	40 USC 327	Full Compliance
Convict Labor	18 USC 4082	Full Compliance
Copeland Anti-Kickback	40 USC 276c	Full Compliance
Davis Bacon Act	40 USC 276	Full Compliance
Deepwater Port Act of 1974, As Amended	33 USC 1501	Full Compliance
Emergency Flood Control Funds Act of 1955, As Amended	33 USC 701m	Not Applicable
Emergency Wetlands Resources Act	16 USC 3901-3932	Full Compliance
Endangered Species Act of 1973	16 USC 1531	Full Compliance
Estuary Program Act of 1968	16 USC 1221 et seq.	Full Compliance
Equal Opportunity	42 USC 2000d	Full Compliance
Farmland Protection Policy Act	7 USC 4201 et seq.	Not Applicable
Federal Environmental Pesticide Act of 1972	7 USC 136 et seq.	Full Compliance
Federal Water Project Recreation Act of 1965, As Amended	16 USC 4601	Full Compliance
Fish and Wildlife Coordination Act of 1958, As Amended	16 USC 661	Full Compliance
Flood Control Act of 1944, As Amended, Section 4	16 USC 460b	Full Compliance
Food Security Act of 1985 (Swampbuster)	16 USC 3811 et seq.	Not Applicable
Hazardous Substance Response Revenue Act of 1980, As Amended	26 USC 4611	Not Applicable
Historic and Archeological Data Preservation	16 USC 469	Full Compliance
Historic Sites Act of 1935	16 USC 461	Full Compliance
Jones Act	46 USC 292	Full Compliance
Land and Water Conservation Fund Act of 1965	46 USC 4601	Not Applicable
Magnuson Fishery Conservation and Management Act	16 USC 1801	Full Compliance
Marine Mammal Protection Act of 1972, As Amended	16 USC 1361	Full Compliance
Marine Protection, Research and Sanctuaries Act of 1972	33 USC 1401	Full Compliance
Migratory Bird Conservation Act of 1928, As Amended	16 USC 715	Full Compliance
Migratory Bird Treaty Act of 1918, As Amended	16 USC 703	Full Compliance
National Environmental Policy Act of 1969, As Amended	42 USC 4321 et seq.	Full Compliance
National Historic Preservation Act of 1966, As Amended	16 USC 470	Full Compliance
National Historic Preservation Act Amendments of 1980	16 USC 469a	Full Compliance
Native American Religious Freedom Act of 1978	42 USC 1996	Not Applicable
Native American Graves Protection and Repatriation Act	25 USC 3001	Full Compliance
Native American Religious Freedom Act of 1978	16 USC 469a	Not Applicable
National Trails System Act	16 USC 1241	Not Applicable
Noise Control Act of 1972, As Amended	42 USC 4901 et seq.	Full Compliance
Rehabilitation Act (1973)	29 USC 794	Full Compliance
Reservoir Salvage Act of 1960, As Amended	16 USC 469	Not Applicable
Resource Conservation and Recovery Act of 1976	42 USC 6901-6987	Not Applicable
River and Harbor Act of 1888, Sect 11	33 USC 608	Not Applicable
River and Harbor Act of 1899, Sections 9, 10, 13	33 USC 401-413	Full Compliance
River and Harbor and Flood Control Act of 1962, Section 207	16 USC 460	Not Applicable

Table 6 (CONT'D)		
Title of Public Law	US CODE	Compliance Status
River and Harbor and Flood Control Act of 1970, Sections 122, 209 and 216	33 USC 426 et seq.	Full Compliance
Safe Drinking Water Act of 1974, As Amended	42 USC 300f	Full Compliance
Shipping Act	46 USC 883	Full Compliance
Submerged Lands Act of 1953	43 USC 1301 et seq.	Full Compliance
Superfund Amendments and Reauthorization Act of 1986	42 USC 9601	Not Applicable
Surface Mining Control and Reclamation Act of 1977	30 USC 1201-1328	Not Applicable
Toxic Substances Control Act of 1976	15 USC 2601	Not Applicable
Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, As Amended	43 USC 4601 et seq.	Full Compliance
Utilization of Small Business	15 USC 631, 644	Full Compliance
Vietnam Veterans	38 USC 2012	Not Applicable
Executive Orders		
Title of Executive Order	Exec. Order Number	Compliance Status
Protection and Enhancement of Environmental Quality	11514/11991	Full Compliance
Protection and Enhancement of the Cultural Environment	11593	Full Compliance
Floodplain Management	11988	Full Compliance
Protection of Wetlands	11990	Full Compliance
Federal Compliance with Pollution Control Standards	12088	Full Compliance
Environmental Effects Abroad of Major Federal Actions	12114	Not Applicable
Offshore Oil Spill Pollution	12123	Full Compliance
Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances	12843	Full Compliance
Federal Compliance with Right-To-Know Laws and Pollution Prevention	12856	Full Compliance
Federal Actions to Address Environmental Justice and Minority and Low-Income Populations	12898	Full Compliance
Implementation of the North American Free Trade Agreement	12889	Full Compliance
Energy Efficiency and Water Conservation at Federal Facilities	12902	Full Compliance
Federal Acquisition and Community Right-To-Know	12969	Full Compliance
Protection Of Children from Environmental Health Risks and Safety Risks	13045	Full Compliance
Coral Reef Protection	13089	Full Compliance
Greening the Government through Waste Prevention, Recycling and Federal Acquisition	13101	Full Compliance
Invasive Species	13112	Full Compliance
Greening the Government Through Leadership in Environmental Management	13148	Full Compliance
Marine Protected Areas	13158	Full Compliance
Consultation and Coordination with Indian Tribal Governments	13175	Not Applicable
Responsibilities of Federal Agencies to Protect Migratory Birds	13186	Full Compliance
Executive Order Facilitation of Cooperative Conservation	13352	Full Compliance

7.0 CONCLUSIONS

The proposed action has fewer impacts and lower costs compared to the no action alternative and therefore the proposed action of additional advanced maintenance is recommended for implementation. The proposed action does not constitute a major Federal action significantly affecting the quality of the human environment; therefore the preparation of an Environmental Impact Statement (EIS) is not required. In addition, this project is consistent, to the maximum extent practicable, with the South Carolina Coastal Zone Management Program. Finally, the proposed action has been thoroughly assessed and coordinated and will not significantly affect the environment.

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Appendix A

Definition of Project Dredging Dimensions

Authorized Dimensions. Authorized dimensions are the depth and width of the channel authorized by Congress to be constructed and maintained by USACE. These authorized channel dimensions are generally based on maximizing net transportation savings considering the characteristics of vessels using the channel and include consideration of safety, physical conditions, and vessel operating characteristics. For entrance channels from the ocean into harbors, the authorized dimensions often include an additional allowance of safety for wave action for that portion of the channel crossing the ocean bar. For example, a 45-foot channel may have an authorized 47-foot depth over the ocean bar.

Advance Maintenance. Advance maintenance is dredging to a specified depth and/or width beyond the authorized channel dimensions in critical and fast shoaling areas to avoid frequent re-dredging and ensure the reliability and least overall cost of operating and maintaining the project's authorized dimensions. For maintenance dredging of existing projects, Major Subordinate Commanders (i.e., Division Commanders) are authorized to approve advance maintenance based on written justification. For new navigation projects, advance maintenance is approved as part of the feasibility report review and approval process based on justification provided in the feasibility report. In actual practice, the advance maintenance material is always dredged (if sufficient funding is available) during the dredging process.

Allowable Overdepth. Allowable overdepth dredging (depth and/or width) is a construction design method for dredging that occurs outside the required authorized dimensions and advance maintenance (as applicable) prism to compensate for physical conditions and inaccuracies in the dredging process while allowing for efficient dredging practices. The term "allowable" must be understood in the contracting context of which dredging quantities are eligible for payment, rather than in the regulatory context of which dredging quantities are reflected in environmental compliance documents and permits. Environmental documentation must reflect the total quantities likely to be dredged including authorized dimensions, advance maintenance, allowable overdepth, and non-pay dredging. In actual practice, the decision whether to dredge the allowable overdepth material is made by the dredging contractor, and is dependent upon the dredging equipment, the material being dredged, and the physical conditions of the water body being dredged.

Non-pay Dredging. Non-pay dredging, also known as non-paid overdepth, is dredging outside the paid allowable overdepth that may, and sometimes does, occur due to such factors as unanticipated variation in substrate, incidental removal of submerged obstructions, or wind or wave conditions that reduce the operators' ability to control the excavation head. In environmental documentation, non-pay dredging is normally recognized as a contingency allowance on dredging quantities, and may occur in varying magnitude and locations during construction and maintenance of a project.

Appendix B

Responses to Comments Received on Charleston Harbor Advanced Maintenance Dredging, Charleston Harbor, SC September 2009

(See Appendix C for Copies of Letters and Memoranda Received During the EA Comment Period)

B.1 South Carolina Archives and History Center

Comment: The State Historic Preservation Office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

Response: Noted.

B.2 Catawba Indian Nation

Comment 1: The Catawba agree that the proposed project does not significantly adversely affect human health and welfare or the environment and preparation of an Environmental Impact Statement is not warranted.

Response: Noted.

Comment 2: The Catawba are to be notified if Native American artifacts and/or human remains are located during the ground disturbance phase of this project.

Response: Agreed.

B.3 Choctaw Nation of Oklahoma

Comment: South Carolina is located outside of our areas of historical interest.

Response: Concur; this will be updated for any future projects in the Charleston Area.

B.4 Department of Health and Environmental Control – Bureau of Air Quality

Comment 1: Is this project located in an area designated as nonattainment for any of the pollutants outlined in the NAAQS?

Response: The air quality in Charleston and surrounding counties are designated by SCDHEC as an attainment area for all six criteria pollutants. Details regarding the air quality within the project area and air quality impacts associated with the proposed project can be found in sections 2.13 and 4.13 of the EA.

Comment 2: The Bureau would like to offer the following suggestions on how this project can help stay in compliance with the NAAQS;

Utilize Ultra-Low sulfur Diesel or alternatively fueled equipment.
Utilize other emission controls that are applicable to the project equipment.
Reduce idling time of equipment.
Limit the practice of open burning.
Consider alternatives to car-centric development patterns.
An asbestos survey may be required prior to any demolition activites.

All necessary environmental permits for the subject project must be obtained in accordance with applicable state and federal regulations.

Response: Those suggestions applicable to the proposed project will be considered and implemented where practicable.

B.5 South Carolina Department of Natural Resources

Comment 1: The issue of localized effects on salinity and DO in those areas where the unauthorized advance maintenance dredging has been conducted is not specifically addressed in the EA. For the sake of completeness, the SCDNR recommends that these potential impacts be acknowledged and discussed in the EA.

Response: Section 2.2 of the EA discusses DO and salinity issues. Section 4.2 of the EA has been revised to include more information related to DO and salinity.

Comment 2: If there are data from other projects or scientific studies that describe the physical or chemical characteristics of sediments in this depth zone within the Charleston Harbor estuary, the SCDNR recommends that any such information be presented and discussed in the EA.

Response: There is no additional data available that describes the physical or chemical characteristics of sediments within Charleston Harbor areas proposed for advanced maintenance.

Comment 3: The SCDNR generally concurs with the conclusion that the continued additional advanced maintenance dredging in those few areas described in the EA is not likely to have a significant environmental impact, provided it continues to be limited to those few areas that are prone to higher shoaling rates.

Response: Agreed.

B.6 United States Environmental Protection Agency

Comment 1: EPA recommends that section 4.2 also discuss the potential for lowered DO in the channel areas that are 2-4 feet deeper, and the effects on aquatic organisms. The EA should also address issues related to potential lowered DO measurements and the effects on the shortnose sturgeon and other managed species.

Response: Section 4.2 has been revised.

Comment 2: Water quality monitoring plans, in particular those designed to assess the impacts of salinity, turbidity, and lowered DO, should be addressed/discussed in the EA. The number of stations and their locations should be addressed, and a discussion on the need for more stations may be beneficial.

Response: Section 4.2 has been revised to incorporate information regarding monitoring plans.

B.7 United States Department of the Interior – Fish and Wildlife Service

Comment: Upon the review of the Draft EA the service concludes there will be no significant impacts to trust resources as a result of the Corps modification in their maintenance dredging practices within the Charleston Harbor.

Response: Noted.

B.8 National Oceanic and Atmospheric Administration – National Marine Fisheries Service

Comment 1: Separate from this letter, we will forward the Charleston District a PDF file with comments meant to improve the EFH discussion within the current EA.

Response: The PDF and associated comments were reviewed and considered during editing and finalization of this EA.

Comment 2: While we agree with the District's expectation that the incremental difference between the alternatives should be negligible, we note that no studies are presented to support this conclusion.

Response: Noted.

Comment 3: It would be useful if the final version of the current EA clarified the depth of the channel modeled for the 1996 EA; specifically, did the model include the advanced maintenance and over dredging?

Response: The 1996 EA model was based on an authorized project depth of 45 feet plus two feet of allowable overdepth and two feet of advanced maintenance for a total projected dredging depth of 49 feet. The 1996 EA, however, did not cover the additional potential 2-4 feet of advanced maintenance that would place the channel depth at 51-53 feet. This is outlined in section 1.1 and section 1.3 of the EA.

Comment 4: Impacts to EFH from the additional advanced maintenance dredging [at indicated locations] should not differ substantially from the impacts projected from the maintenance dredging described in the feasibility report and EA from 1996. Consequently, NMFS offers no recommendations at this time.

Response: Noted.

Appendix C

Project Coordination and Letters and Memoranda from Federal and State Agencies, Native American Tribes, and other Stakeholders Received During the EA Comment Period

List of Addressees for Draft EA and Draft FONSI

Honorable Bob Inglis U.S. House of Representatives	Honorable J. Gresham Barrett U.S. House of Representatives
Honorable Henry Brown U.S. House of Representatives	Honorable John Spratt U.S. House of Representatives
Honorable Joe Wilson U.S. House of Representatives	Honorable James E. Clyburn U.S. House of Representatives
Honorable Jim W. DeMint United States Senate	Honorable Lindsey Graham United States Senate
SC Wildlife Federation	SC Coastal Conservation League
Audubon South Carolina	SC Nature Conservancy
Sierra Club, SC State Chapter	Charleston Pilots Association
South Carolina State Ports Authority	South Carolina Institute of Archaeology and Anthropology
SCDHEC Bureau of Water	SC Department of Transportation
SCDHEC Bureau of Air Quality	South Carolina Department of Commerce
South Carolina Department of Natural Resources	SCDHEC Office of Ocean and Coastal Resource Management
South Carolina Department of Archives & History	US Department of Agriculture, Natural Resources Conservation Service
National Marine Fisheries Services	US Fish and Wildlife Service
US Environmental Protection Agency, Region 4	Absentee-Shawnee Tribe of Indians of Oklahoma
US Coast Guard Sector Charleston	Eastern Shawnee Tribe
The Chickasaw Nation	Kialegee Tribal Town
Cherokee Nation	Choctaw Nation of Oklahoma
Thlopthlocco Tribal Town	Alabama-Quassarte Tribal Town
Poarch Band of Creek Indians	Muscogee (Creek) Nation
Shawnee Tribe	Tuscarora Nation
The Eastern Band of the Cherokee Nation	United Keetoowah Band of Cherokee Indians
Seminole Tribe of Florida	Catawba Indian Nation

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
http://sero.nmfs.noaa.gov/

September 1, 2009 F/SER4:KD/pw

(sent via electronic mail)

Alan D. Shirey
USACE Charleston District
69A Hagood Avenue
Charleston, SC 29403

Dear Mr. Shirey:

NOAA's National Marine Fisheries Service (NMFS) reviewed your letter dated July 15, 2009, and the Environmental Assessment (EA) *Charleston Harbor Additional Advanced Maintenance Dredging, Charleston Harbor, South Carolina*, dated July 2009. The Charleston District proposes to revise a Feasibility Report and EA from 1996 for the deepening of the federal navigation channel within Charleston Harbor to reflect two to four feet of additional advanced maintenance dredging at five specific locations within the federal channel (Ordinance Reach and Turning Basin, Drum Island Reach, Wando Turning Basin, Lower Wando Reach, and Lower Town Creek Reach). The Charleston District indicates that additional advanced maintenance dredging at these locations has occurred on an on-going basis since the harbor was deepened during 1999 to 2004, and the current EA reflects a need to update the administrative record. The Charleston District's initial determination is that the proposed project would not adversely impact EFH or federally managed fishery species. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments are provided pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Separate from this letter, we will forward the Charleston District a PDF file with comments meant to improve the EFH discussion within the current EA. These comments are largely editorial in nature and their resolution would not alter our overall conclusion about the impacts to EFH from the action proposed in the current EA. Our assessment of the proposed action focuses upon impacts to the management of the disposal areas and to fishery species. Before discussing those potential impacts, comments are necessary about the duration of the outcome of this EFH consultation and its relationship to past environmental reviews.

EFH Consultation Duration
The maintenance dredging of the Charleston federal navigation channel is described across two EAs, the current EA and the EA from 1996. The latter EA was prepared before the Magnuson-Stevens Act was amended to include its EFH provisions; hence the EA from 1996 does not include an EFH Assessment and the Charleston District has not taken an action for the Charleston federal navigation channel that would trigger an EFH Assessment until the current EA, which has a significantly smaller spatial scope than the overall federal navigation channel. An EFH Assessment is needed for the operation and maintenance of the Charleston federal navigation channel. Considering this need, the reduced scope of

the current EA, and the likelihood within the next several years of the Charleston District investigating the feasibility of deepening the federal navigation channel, NMFS views the outcome of the current EFH consultation to be valid no more than 10 years from the date of this letter. If during that period NMFS or the Charleston District become aware of additional information that leads either agency to conclude adverse impacts to EFH may occur from continued operation or maintenance of the channel, re-initiation of the EFH consultation may be necessary.

Effects on Disposal Area Management

On average, the proposed action would result each year in an additional 310,000 cubic yards to be placed in the Charleston Ocean Dredged Material Disposal Site (ODMDS) and an additional 330,000 cubic yards of material to be placed in the Clouter Creek Disposal Area. With these additions, the projected annual placement in these areas is 1,360,000 cubic yards and 840,000 cubic yards, respectively. The current EA concludes these additions would not significantly affect the long-term capacity of these disposal areas. While the current EA provides no quantitative analysis for this conclusion, we believe it is accurate based on our reviews of previous reports and presentations from the Charleston District.

Effects on Fishery Species

The current EA does not provide results from environmental studies designed to characterize fishery or prey communities within the federal navigation channel. The current EA focuses on what the District estimates are the incremental differences between the no action alternative (i.e., 2 feet of advanced maintenance dredging) and the action alternative (i.e., 4 or 6 feet of advanced maintenance dredging at the five specific reaches listed above). While we agree with the District's expectation that the incremental difference should be negligible, we note that no studies are presented to support this conclusion. Section 4.4 states:

> *During maintenance, all the benthic resources will be removed from the channels to be dredged, but due to the rapid shoaling of similar material to what was removed, benthic organisms will begin recolonizing the disturbed areas in a short time. However, due to frequent disturbance for over 100 years, the navigation channel populations will probably not achieve the diversity and numerical abundance of nearby undisturbed areas. The more frequent dredging associated with the no action alternative compared to the proposed action would exacerbate this situation.*

We are not aware of studies that characterize the benthic communities within the Charleston federal navigation channel in a manner that allows recolonization rates and trajectories to be established and for constraints on those communities to be identified. While the absence of this information is not a significant issue for evaluation of the current EA, it should be noted that additional information would be needed if the District proposes broader modifications to the federal navigation channel or its maintenance.

On a related note, it would be useful if the final version of the current EA clarified the depth of the channel modeled for the 1996 EA; specifically, did the model include the advanced maintenance and over dredging? The several iterations of depth in the models used to project impacts from the Savannah Harbor Expansion Project show substantial differences in salinity regimes and the concentration of dissolved oxygen between 2-foot increments in channel depth.

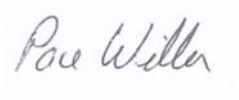
Conclusion

Impacts to EFH from the additional advanced maintenance dredging at Ordinance Reach and Turning Basin, Drum Island Reach, Wando Turning Basin, Lower Wando Reach, and Lower Town Creek Reach should not differ substantially from the impacts projected from the maintenance dredging described in the feasibility report and EA from 1996. Consequently, NMFS offers no recommendations at this time. Please note this conclusion is based on the limited spatial extent of the five channel reaches and should not be viewed as an indication that NMFS would support further deepening of the federal navigation channel within Charleston Harbor; NMFS' view of deepening the channel would be based on the results

of the future studies and the best scientific information available at the time, including the potential for the use of environmental windows to minimize impacts from dredging.

Thank you for the opportunity to provide these comments. Related questions or comments should be directed to the attention of Pace Wilber at our Charleston field office, 219 Ft Johnson Rd, Charleston SC 29412. He may be reached by telephone at 843-953-7200 or by e-mail at Pace.Wilber@noaa.gov.

Sincerely,



/ for

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc:

COE, Alan.D.Shirey@usace.army.mil
OCRM, RODGERMT@dhec.sc.gov
SCDNR, DavisS@dnr.sc.gov, WendtP@dnr.sc.gov
SAFMC, Roger.Pugliese@safmc.net
FWS, Mark_Leao@fws.gov
EPA, Lord.Bob@epa.gov
F/SER4, David.Dale@noaa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

08/12/2009

Mr. Alan D. Shirey,
U.S. Army Corps of Engineers, Charleston District
Planning Branch
69A Hagood Avenue
Charleston, South Carolina 29403-5107

Subject: Draft Environmental Assessment and Finding of No Significant Impact
Proposed Deepening and Widening of Charleston Harbor, South Carolina

Dear Mr. Shirey:

As requested, pursuant to Section 309 of the Clean Air Act (CAA) and Section 102(2)(C) of the National Environmental Policy Act (NEPA), the U.S. Environmental Protection Agency (EPA) Region 4 has reviewed the U.S. Army Corps of Engineers' (Corps) Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) developed for the proposed deepening and widening Charleston Harbor.

Under Section 309 of the CAA, EPA is responsible for reviewing and commenting on major federal actions significantly affecting the quality of the human environment. It is our understanding that the U.S. Army Corps of Engineers, Charleston District, has prepared this Draft Environmental Assessment (EA) to cover maintenance dredging practices not addressed in the 1996 Feasibility Report or in the 1996 EA for deepening and widening Charleston Harbor. The 1996 Report and EA discussed deepening the navigation channel to 45 feet plus 2 feet of advance maintenance dredging and 2 feet of allowable overdepth dredging. During the harbor deepening project (1999 thru 2004), portions of several sections of the channel were reportedly dredged deeper (i.e., additional advanced maintenance) because of historically higher shoaling rates. Maintenance dredging performed since completion of the harbor deepening project has also dredged these sections deeper. This additional advanced maintenance dredging in the higher shoaling areas was not addressed in the 1996 Report, necessitating the current Draft EA.

As requested, EPA reviewed the Draft EA and Draft Finding of No Significant Impact (FONSI). We found that the Draft EA is in compliance with the National Environmental Policy Act (NEPA) and we do have some recommendations for additions to the water quality sections of the Draft EA.

The Draft EA appropriately notes the following:

- Water quality in Charleston Harbor is classified as SB by the South Carolina Department of Health and Environmental Control (SCDHEC), which applies to (1) tidal salt water suitable for survival and propagation of aquatic life; (2) primary and secondary contact recreation; and, (3) crabbing and fishing for market purposes and/or human consumption.

- The progressive increase in the depth of the Federal navigation channel in the Cooper River over the past century has decreased the river bottom dissolved oxygen (DO) concentrations. Additionally, the freshwater flow into the Cooper River from Lake Moultrie affects vertical mixing and DO in the Lower Cooper River. The diversion of freshwater into the Cooper River beginning in the 1940s "caused the river to shift from vertically well mixed to a more stratified condition, which decreased DO concentrations along the bottom of the river and increased sedimentation and maintenance requirements in the harbor." Following rediversion of flows and reduction of the freshwater flow into the Cooper River (beginning in 1985) this stratification and sedimentation was greatly reduced. SCDHEC monitoring data in the Lower Cooper River (Station MD-045 at Daniel Island Bend) shows "a noteworthy decreasing trend in DO concentration prior to rediversion, but no substantial trend in DO concentration when only post-rediversion data (1986-1998) is considered."

- The Charleston Harbor system is not considered to be impaired under criteria of Section 303(d) of the Clean Water Act (CWA) except for an area 0.5 miles southeast from the mouth of Shem Creek. The impairment is for copper related to potential impacts on aquatic life, and available information indicates much of the system does not meet the applicable water quality standard for dissolved oxygen for significant periods of time and, therefore, is considered water quality limited for the purposes of wasteload allocation (WLA) development.

- Salinity concentration in the river affects the estuarine habitat in many ways. Along with tidal inundation, salinity generally determines the marsh vegetation species; it directly affects "the fish, crustacean and clam populations; and it influences the DO concentrations." Salinity in the river is also of concern from a water usage perspective. Bushy Park is a freshwater reservoir located in the upper reaches of the Cooper River and it is used by local industry for water supply. Salinity intrusion to the estuary can cause periodic increases in chloride concentration above acceptable limits at the reservoir. These events typically occur during periods of drought, very high tides, sustained wind conditions or storm events. To counter salinity intrusion events, there are several monitoring stations in the harbor and the freshwater discharge from Lake Moultrie can be managed by increasing flow during these events to lower salinity concentrations in the Cooper River.

- A section 401 Water Quality Certification was issued for disposal of dredged material associated with the project by the South Carolina Department of Health and Environmental Control (SCDHEC) on May 2, 1995. Since the dredging and disposal methods have not changed and no new disposal locations have been added, the Corps of Engineers reportedly considers the previous 401 certification to still be valid. Concurrence has been requested from SCDHEC via the EA process.

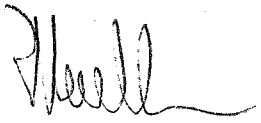
EPA recommends the following two topics be addressed and/or discussed in the Final EA:

- In Section 4.2 "Water Quality," the Draft EA appropriately discusses temporary changes in turbidity due to dredging activities. EPA recommends that Section 4.2 also discuss the potential for lowered DO in the channel areas that are 2-4 feet deeper, and the effects on aquatic organisms. Available information indicates much of Charleston Harbor already does not meet the applicable SCDHEC water quality standard for DO for significant periods of time and, therefore, is considered water quality limited for the purposes of wasteload allocation (WLA) development. The EA should address issues related to potential lowered DO measurements and the effects on the shortnose sturgeon and other managed species.

- Water quality monitoring plans, in particular those designed to assess the impacts of salinity, turbidity, and lowered DO, should be addressed/discussed in the EA. The number of stations and their locations should be addressed, and a discussion on the need for more stations may be beneficial.

Thank you, again, for the opportunity to comment on this project. If you wish to discuss EPA's comments, please contact me at 404/562-9611 (mueller.heinz@epa.gov) or Paul Gagliano, P.E., of my staff at 404/562-9373 (gagliano.paul@epa.gov)

Sincerely,



Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

August 5, 2009

Mr. Alan D. Shirey
Acting Chief, Planning Branch
Department of the Army
Charleston District, Corps of Engineers
69A Hagood Avenue
Charleston, SC 29403-5107

Re: Draft Environmental Assessment, Charleston Harbor Deepening, Charleston County, SC
FWS Log No. 42410-2009-FA-0291

Dear Mr. Shirey:

The U.S. Fish and Wildlife Service (Service) has received the Draft Environmental Assessment (EA) concerning the maintenance dredging practices for the deepening and widening of the Charleston Harbor. The U.S. Army Corps of Engineers (Corps) developed this Draft EA to address potential environmental impacts not covered in the 1996 Feasibility Report and EA regarding the Charleston Harbor project. In particular, the EA addresses impacts associated with over-dredging and an increased frequency of dredging episodes. Preparation of this Draft EA was pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended to review environmental consequences that may occur as a result of this project.

Upon review of the Draft EA the Service concludes there will be no significant impacts to trust resources as a result of the Corps modification in their maintenance dredging practices within the Charleston Harbor. The Service appreciates the opportunity to comment and reserves the opportunity to provide future comments on this project in its development. If you should have any questions, please contact Mr. Mark Caldwell at (843) 727-4707 ext. 215.

Sincerely,

for Timothy N. Hall
Field Supervisor

TNH/MAC/km

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South Carolina Department of
Natural Resources

John E. Frampton
Director
Robert H. Boyles
Deputy Director for
Marine Resources

August 14, 2009

Mr. Alan D. Shirey
U.S. Army Corps of Engineers
69A Hagood Avenue
Charleston, SC 29202

RE: Draft EA and Draft FONSI
Charleston Harbor Additional Advance Maintenance Dredging
Charleston County

Dear Mr. Shirey:

The S.C. Department of Natural Resources (SCDNR) has reviewed the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the project referenced above, and offers the following comments.

The Draft EA acknowledges that the *"progressive increase in the depth of the Federal navigation channel in the Cooper River over the past century has decreased the river bottom dissolved oxygen (DO) concentrations"*; however the issue of localized effects on salinity and DO in those areas where the unauthorized advance maintenance dredging has been conducted is not specifically addressed in the EA. For the sake of completeness, the SCDNR recommends that that these potential impacts be acknowledged and discussed in the EA.

Secondly, while it would have been preferable to have sampled and analyzed the new work material in the zone between the authorized depth and total depth of dredging in these areas, the SCDNR recognizes that this is no longer possible. Nevertheless, if there are data from other projects or scientific studies that describe the physical or chemical characteristics of sediments in this depth zone within the Charleston Harbor estuary, the SCDNR recommends that any such information be presented and discussed in the EA.

Finally, the SCDNR generally concurs with the conclusion that the continued additional advanced maintenance dredging in those few areas described in the EA is not likely to have a significant environmental impact, provided it continues to be limited to those few areas that are prone to higher shoaling rates. This conclusion should not be interpreted as an endorsement of dredging to these greater depths in any other areas of the Charleston Harbor estuary without additional sediment and water quality analyses, and a more thorough consideration of all of the potential environmental impacts of dredging to these depths.

The SCDNR appreciates the opportunity to comment on the Draft EA and FONSI. If you have any questions regarding these comments, please call me at 843-953-9305 or e-mail me at wendtp@dnr.sc.gov.

Sincerely,

Priscilla H. Wendt

Priscilla H. Wendt
Office of Environmental Programs

cc: SCDHEC-EQC
SCDHEC-OCRM
USFWS
NOAA-NMFS

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C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

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M. David Mitchell, MD

Glenn A. McCall

Coleman F. Buckhouse, MD

August 13, 2009

Mr. Alan D. Shirey, Acting Chief, Planning Branch
Department of the Army
Charleston District, Corps of Engineers
69A Hagood Avenue
Charleston, SC 29403-5107

Re: Charleston Harbor Additional Advanced Maintenance Dredging
Charleston County, SC

Dear Mr. Shirey:

We have received your letter dated July 15, 2009, regarding the proposed maintenance dredging for deepening and widening of the Charleston Harbor located in Charleston County, South Carolina. You requested that the Bureau of Air Quality (Bureau) review the proposed project and provide resource information as it relates to the proposed action.

As you know the Bureau of Air Quality is tasked with implementing the federal Clean Air Act (1990, as amended) in the State of South Carolina. The Bureau is required to ensure compliance with the National Ambient Air Quality Standards (NAAQS). Currently two NAAQS are of particular concern in South Carolina:

- **Ozone** – The 8-hour ozone standard (primary and secondary) is set at 0.075 parts per million.

- **Particulate Matter 2.5** (Particulates 2.5 microns in size and smaller) – The standard for maximum daily concentration is set at 35 micrograms per cubic meter. The standard for the maximum annual concentration is set at 15 micrograms per cubic meter.

Is this project located in an area designated as nonattainment for any of the pollutants outlined in the NAAQS? For more information, please visit http://www.epa.gov/oar/oaqps/greenbk .

If the project is located in a nonattainment area, it may be subject to prescriptive requirements such as Transportation Conformity or air quality modeling. Please contact our office if additional assistance is needed.

The Bureau would like to offer the following suggestions on how this project can help us stay in compliance with the NAAQS. More importantly, these strategies are beneficial to the health of citizens of South Carolina.

- Utilize Ultra-Low Sulfur Diesel or alternatively fueled equipment.

- Utilize other emission controls that are applicable to your equipment.

- Reduce idling time on equipment.

- Limit the practice of open burning. Some open burning is restricted by State regulation or by local ordinance. For more information, please visit: http://www.scdhec.gov/environment/BAQ/openburning.aspx .

- Please consider alternatives to car-centric development patterns such as compact, mixed use development that promotes the use of bicycling and walking.

- An asbestos survey and project license may be required prior to any demolition activities such as deconstruction of a bridge or removal of structure in the right-of-way of a road project. If you have any questions regarding asbestos regulatory applicability you may contact Robin Mack at (803) 898-4270 or mackrs@dhec.sc.gov .

- All necessary environmental permits for the subject project must be obtained in accordance with applicable State and Federal regulations. If you have not already done so, please contact the Bureau of Water at (803) 898-4300, the Office of Ocean & Coastal Resource Management at (843) 953-0200, and the Bureau of Land and Waste Management at (803) 896-4000 for input regarding those program areas' assessments of this proposed project.

Thank you for the opportunity to comment on this project. Should you have any further questions or comments concerning this matter, please do not hesitate to contact me at (803) 898-4122 or at robertln@dhec.sc.gov .

Sincerely,

L. Nelson Roberts, Jr.

L. Nelson Roberts, Jr., Manager
Air Planning and Assessment Section
Bureau of Air Quality

August 11, 2009

Alan D. Shirey
Department of the Army
Charleston District, Corps of Engineers
69A Hagood Avenue
Charleston, SC 29403-5107

Re: Charleston Harbor Advanced Maintenance Dredging
SHPO #: 09CW0475

Dear Mr Shirey:

Thank you for your letter of July 15, which we received on July 17, regarding the above referenced project. We also received the environmental assessment as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the Department of the Army Corps of Engineers pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800.

Based on the description of the Area of Potential Effect (APE) and the identification of historic properties within the APE, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

If you have any questions, please contact me at (803) 896-6169 or cwilson@scdah.state.sc.us.

Sincerely,

Caroline Dover Wilson

Caroline Dover Wilson
Review and Compliance Coordinator
State Historic Preservation Office

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

September 17, 2009

U.S. Army Corps of Engineers
Attn: Allen Shirey
69A Hagood Ave
Charleston, SC 29403-5107

Re: Charleston Harbor Advance Maintenance Dredging
Charleston County
Federal Consistency

Dear Mr. Shirey:

The staff of the office of Ocean and Coastal Resource Management (OCRM) certifies that the update to the Charleston Harbor Advance Maintenance Dredging project is consistent with the S.C. Coastal Zone Management Program provided that (1) no freshwater wetlands are disturbed or altered without appropriate authorization, (2) all necessary State and Federal permits and associated certifications are obtained, (3) the proposed work does not contravene the policies of the Coastal Zone Management Program. Specifically, the Charleston Harbor Advance Maintenance Dredging addresses after-the-fact maintenance dredging at five specific locations. The advance maintenance dredging reflects two to four feet of additional dredging beyond the originally proposed depths.

This after-the-fact certification shall serve as the final certification for the above referenced direct federal activity only and does not alleviate your responsibility to obtain any other required local, state or federal approvals.

Interested parties are provided fifteen days from receipt of this letter to appeal the action of OCRM.

Sincerely,

Blair N. Williams
Manager, Wetland Permitting and Certification

CC: Barbara Neale, Director – SCDHEC-OCRM
Heather Preston – SCDHEC-BOW

Choctaw Nation of Oklahoma

P.O. Box 1210 • Durant, OK 74702-1210 • (580) 924-8280

Gregory E. Pyle
Chief

Gary Batton
Assistant Chief

July 30, 2009

Alan D. Shirey
Dept of the Army
Charleston District, Corp of Engineers
69A Hagood Avenue
Charleston, South Carolina

Dear Mr. Alan Shirey:

We have reviewed the following proposed project (s) as to its effect regarding religious and/or cultural significance to historic properties that may be affected by an undertaking of the projects area of potential effect.

Project Description: Charleston Harbor Additional Advanced Maintenance Dredging

Comments: Thank you for seeking to consult with the Choctaw Nation of Oklahoma on this project. However, South Carolina is located outside of our areas of historical interest. If we may be of any further assistance, or if you would like a list of states and counties, in which we do have a historical interest, please contact us at 1-800-522-6170 ext. 2137.

Sincerely,

Terry D. Cole
Tribal Historic Preservation Officer
Choctaw Nation of Oklahoma

By: _____
Ian Thompson PhD, RPA
NAGPRA Specialist/Tribal Archaeologist
Choctaw Nation of Oklahoma

IAT:vr

Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791

August 10, 2009

Attention: Alan D. Shirey
Charleston District, Corps of Engineers
69A Hagood Avenue
Charleston, South Carolina 29403-5107

Re. THPO #	TCNS #	Project Description
2009-1-135		EA that covers maintenance dredging practices not addressed in the 1996 Feasibility Report and 1996 EA for deepening and widening Charleston Harbor

Dear Mr. Shirey,

The Catawba agree that the proposed project does not significantly adversely affect human health and welfare or the environment, and, therefore, preparation of an Environmental Impact Statement is not warranted. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Haire at 803-328-2427 ext. 226, or e-mail caitlinh@ccppcrafts.com.

Sincerely,

Caitlin Haire for

Wenonah G. Haire
Tribal Historic Preservation Officer