DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

July 21, 2006

REPLY TO THE ATTENTION OF

Environmental Section

To Interested Parties:

Please find enclosed a Draft Environmental Assessment (DEA) for the mining of the Barbour's Terminal Channel (BTC) to obtain new work material to repair failed levee segments at Spillman's Island Placement Area (PA) and to construct levees for the creation of beneficial use Cell M5/M6 at Atkinson Island, located along the Houston Ship Channel in upper Galveston Bay, Harris County, Texas.

The 1.5 mile BTC will be mined to a depth of -60 feet mean low tide (MLT) in the main channel and to a depth of – 53 feet MLT in the turning basin to provide approximately 1.5 million cubic yards (MCY) of material to build levees for Cell M5/M6 at Atkinson Island and 600,000 CY to repair levees at Spillman's Island PA.

For comments to be addressed in the Final EA, they must arrive at this office on or before August 7, 2006. If you need additional information, please contact Ms. Natalie Rund at 409.766.6384, or you may contact Ms. Carolyn Murphy at 409.766.3044.

Sincerely,

for Carolyn Murphy
Chief, Environmental Branch

Enclosure

DRAFT
ENVIRONMENTAL ASSESSMENT

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS, PROJECT

Mining Barbours Terminal Channel for Levee Repair and Construction

U.S. ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT
July 2006

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1.0 NEED FOR PROPOSED PLAN

1.1 INTRODUCTION

The purpose of this U.S. Army Corps of Engineers (USACE) Environmental Assessment (EA) is to describe the environmental impacts for a mining project for new work material from Barbours Terminal Channel (BTC) to repair levees at Spillman's Island Placement Area (PA) and to construct levees for the creation of beneficial use (BU) Cell M5/M6 at Atkinson Island, located along the Houston Ship Channel (HSC) in upper Galveston Bay, Harris County, Texas.

Relevant technical data referenced in this EA was obtained from the 1995 SEIS and the 2003 Barge Lanes EA and are incorporated into this document by reference.

The Houston-Galveston Navigation Channels, Texas, Project (H-GNC) is located in Galveston Bay on the upper Texas coast in Galveston, Harris, and Chambers counties (Figure 1). The BTC is located perpendicular to the HSC at the Bayou Station Number 7+66.48, north of Morgans Point and south of Spilman Island PA in Harris County, Texas. The purpose of the project is to mine approximately 2.5 million cubic yards (CY) from BTC to obtain stiff clay new work material to repair levees at Spillman's Island PA and construct the levees for Cell M5/M6 at the Atkinson Island BU site. The BTC will be mined from its current depth of -42 feet Mean Low Tide (MLT) to a depth of -60 feet MLT in the channel and from -40 feet MLT to -53 feet MLT in the turing basin. The mining will occur in two phases. Phase I will involve mining the turning basin to obtain approximately 600,000 CY to repair failed levee segments at Spillman's Island PA. Phase II will involve mining the channel to 1.9 million CY of material to be used to construct levees for a 320-acre BU Cell M5/M6, at Atkinson Island (Figure 2).

Mining BTC is necessary because there in insufficient suitable new work material in the nearby vicinity of the HSC to complete the currently proposed work and construct the remaining BU cell levees planned at Atkinson Island and other BU sites to accommodate maintenance material generated over the 50-year project life. BTC provides new work material similar to that occurring in the HSC, and

mining the material from BTC at this time is more cost-effective than mining it from the HSC because of a much shorter pumping distance to suitable new work material.

1.2 STUDY AUTHORITY

A Limited Reevaluation Report (LRR) and a Supplemental Environmental Impact Statement (SEIS) were completed in 1995 (USACE, 1995) and Congress authorized the H-GNC project for construction of a 45-foot navigation channel in the Water Resources Development Act of 1996, Public Law 104-303. The LRR provided for use of the Spillman's Island PA and the construction of BU sites at Atkinson Island to accomodate maintenance dredged material from the H-GNC Project. Levees were proposed to be be constructed from new work material from the construction of the H-GNC 45-foot project and mining the HSC to a depth of -60 feet MLT.

This EA is being prepared pursuant to the National Environmental Policy Act (NEPA) to address the impacts of mining new work material from -40 feet MLT to -53 feet MLT in the BTC turning basin and from -42 feet MLT to -60 feet MLT in the BTC main channel. The impacts of levee construction were addressed in the 1995 SEIS.

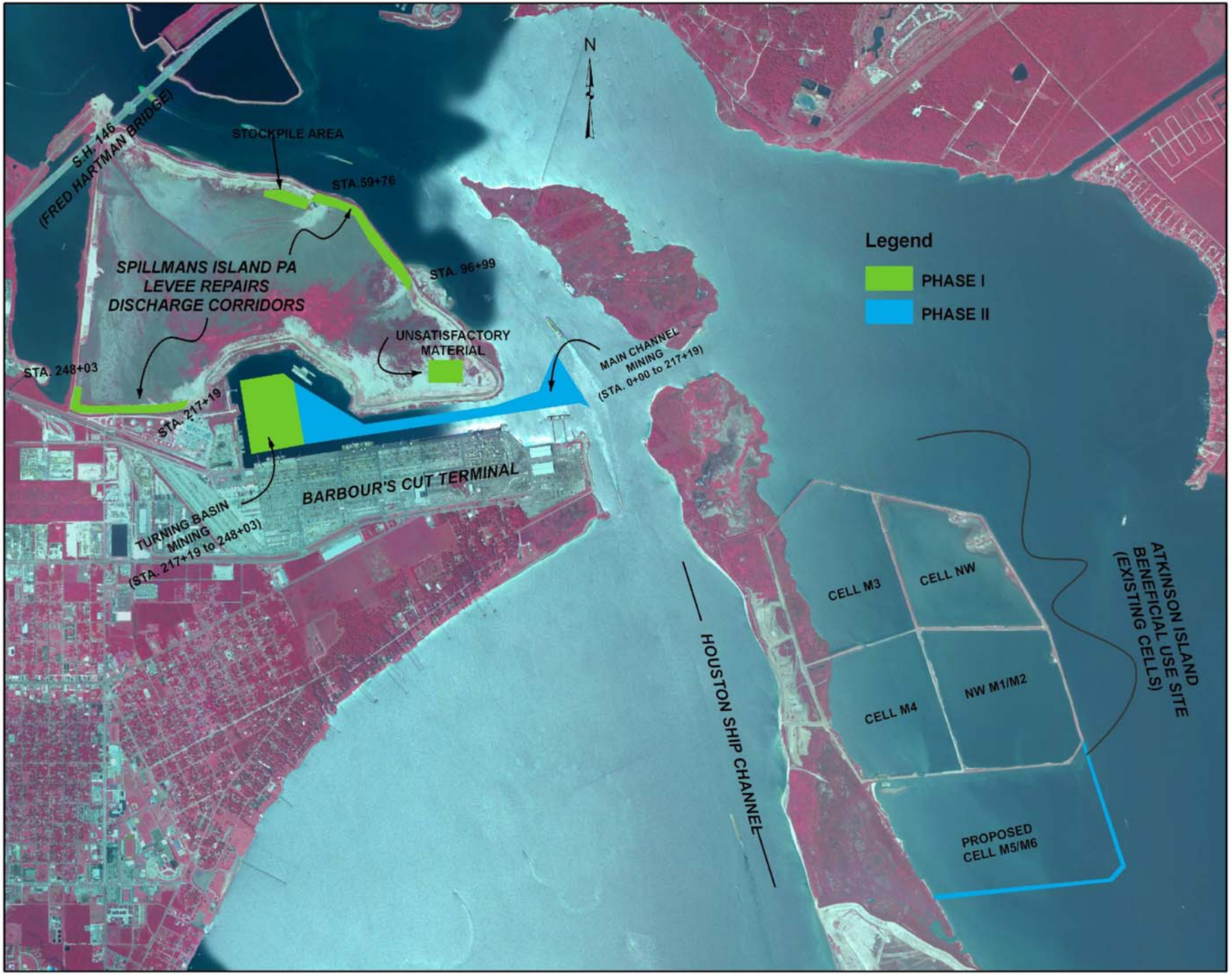

Figure 1. Mining of Barbour's Cut for Spillman's Island Levee Repair and Atkinson Island Beneficial Use Material Site Levee Construction

1.3 PROBLEMS AND NEEDS

The economy of the United States has become increasingly dependent on waterborne transportation for a wide range of manufactured goods and raw materials. In the 1970s and 1980s, increases in the number and size of both deep-draft and shallow-draft commercial vessels have resulted in a larger number of delays along navigation channels within Galveston Bay, primarily the HSC. These factors have provided the impetus for studies by the USACE and other public entities of the feasibility of enlarging the nation's existing waterways and developing alternative deep-water port systems.

The size and location of dredge material placement areas are vital in determining cost feasibility when enlarging waterways. Spillman's Island PA is an existing placement area immediately adjacent to the BTC, which has approximately 6,800 feet of levees that have failed. Repairs to the levee require suitable new work material for levee construction. Atkinson Island is a BU site creating wildlife habitat with dredged material. The construction of levees at Cell M5/M6 at Atkinson Island BU will also require suitable material to create approximately 8,000 linear feet of levees. The most suitable material to construct and repair levees is stiff clays that are generally found below the silty top layer of sediment found in the bottom of navigation channels. Stiff clays are not as easily liquified as silts during dredging and placement activities. Clays, therefore mound up better than silty material so that less material is lost during levee construction and repair work, which means that less dredged material is needed to complete a project.

As detailed in the 1995 SEIS, new work material could also be mined from the HSC, but it is more costly than the proposed plan, as described below.

1.4 PROJECT HISTORY

The Barbour Terminal Channel Federal Project was authorized by Section 107 of the River and Harbor Act of 1960. It was authorized and constructed as a 16-foot deep Federal project. (USACE, 1992). The Port of Houston was granted Deparment of Army Regulatory Permit Number 10902,

on November 18, 1975, to excavate the turning basin and channel to -42 feet mean low tide. The excavated material was placed in Spillman's Island PA. The USACE assumed maintenance of the BTC as a part of the Federal Project for the HSC in 1992. Historically, the BTC utilized Placement Area No. 17 on Spilman Island, a 856-acre confined placement area bounded by the HSC on the east and north, BTC and Southern Pacific Railroad on the south, and San Jancinto Bay on the west.

The H-GNC project proposed in the LRR consisted of deepening and widening the HSC from its then existing dimensions of -40 feet deep by 400 feet wide to -45 feet deep by 530 feet wide for most of its length. Construction of this authorized project is anticipated to be completed in 2009.

1.5 PROJECT DESCRIPTION

The proposed project involves mining BTC to obtain stiff clay new work material to repair approximately 6,500 linear feet of levee at Spillman's Island PA, and to construct approximately 8,000 linear feet of levee at Atkinson Island to create a 320-acre BU site, Cell M5/M6. The 1.5-mile BTC will be mined to a depth of -60 MLT in the main channel and to a depth of -53 MLT in the turning basin to provide approximately 1.5 million CY and 600,000 CY of material to build levees for Cell M5/M6 at Atkinson Island and to repair levees at Spillman's Island PA, respectively.

The BTC turning basin will be mined from approximately -40 feet MLT to -53 feet MLT by using a 24- to 30-inch cutter head dredge. Work will take place over a two month time frame, with the material going to repair levees at Spillman's Island PA. The BTC channel will be mined from -42 feet MLT to -60 feet MLT by using a 30-inch cutter head dredge over a span of about nine months, to construct levees for Cell M5/M6 at Atkinson Island.

There will be no widening of the existing BTC channel and turning basin as all mining activities will occur within the existing Federal project footprint. In addition, no maintenance dredging is being proposed under this EA.

2.0 ALTERNATIVES CONSIDERED

2.1 NO ACTION

Under the no action alternative, mining new work material in the BTC will not be performed. Construction of Cell M5/M6 and future cells at the Atkinson Island BU site would be performed as described in the LRR, which allows for mining short reaches of the HSC to a maximum depth of -60 feet MLT to obtain stiff clays for levee construction. (USACE, 1995). The portion of the HSC immediately adjacent to the Atkinson Island BU site has already been mined to provide levee material to construct the Demonstration Marsh as described in the LRR. Under this no action scenario, an area of the HSC located much further south of the project site would have to be mined to provide the stiff clays required to repair the levees at Spillman's Island PA and construct the levees at Cell M5/M6. This will result in increased costs, because of greater pumping distance and transportation costs to move the dredged material from the HSC to the BU site. In addition, mining the HSC to the north of the Atkison Island BU site will likely cause safety issues and vessel traffic delays as this is a highly constricted area of the channel. The no action alternative would be more costly and hazardous to vessel traffic than the preferred alternative.

2.2 PREFERRED ALTERNATIVE

The proposed action addressed in this EA is the preferred alternative. It involves mining the BTC for new work material to a maximum depth of - 60 feet MLT within the main channel and **-** 53 feet MLT within the turning basin to repair levees at Spillman's Island PA and to construct levees for the addition of Cell M5/M6 at Atkinson Island BU site. The BTC is the ideal location to obtain levee construction material for these purposes since it contains the stiff clays that are needed to perform the proposed levee repairs and construction. In addition, the close proximity of the BTC to both Spillman's and Atkinson Islands allows for a shorter dredged material pumping distance to move the dredged material making it more cost-effective than the no action alternative. There would also be fewer hazards to vessel traffic associated with this comparatively short pumping distance across the HSC compared to a long puming distance within the HSC that is associated with the no action alternative.

3.0 AFFECTED ENVIRONMENT

The affected environment has not changed substantially since the SEIS was published in November 1995. The Affected Environment section in this EA is a summary and update of the information in the SEIS and emphasizes those resources most likely to be affected by the one-time mining of the BTC for new-work material. Major additions in this EA are Essential Fish Habitat and Environmental Justice, which were not required in 1995.

3.1 DESCRIPTION OF THE AREA

The project area is located within the Texas Coastal Prairie, a region characterized by a nearly continuous series of embayments separated from the Gulf of Mexico by barrier islands or barrier peninsulas. The climate is dominated by the marine influence of the Gulf of Mexico and is characterized by short mild winters and long hot summers. Galveston Bay is Texas' largest estuary, about 600 square miles, receiving fresh water at its upper end primarily from the Trinity and San Jacinto Rivers and sea water at its lower end through three tidal connections: Bolivar Roads, San Louis Pass, and Rollover Pass. The greatest natural depths in the bay are typically 6 to 12 feet.

Galveston Bay is Texas' largest and most productive estuary. The annual harvest from the sport and commercial fisheries exceeds all other bay systems during most years. The bay is utilized year-round by numerous estuarine species, with use by the greatest variety and number occurring during warmer periods of the year. Although submerged seagrasses were once common in parts of the bay, today they are confined primarily to parts of West Bay and adjacent bays to the west.

3.2 VEGETATION

Vegetated wetlands (marshes, scrub/shrub, and forested wetlands) comprise a total area of 138,600 acres in the 5-county area surrounding Galveston Bay. Estuarine intertidal emergent wetlands (salt and brackish marsh) represent 78 percent (108,200 acres) of vegetated wetlands, while palustrine (fresh or interior marsh) emergent wetlands comprise 16 percent (22,200 acres) of the total. Palustrine scrub/shrub wetlands and palustrine forested wetlands represent 1.4 percent (2,000 acres) and 4 percent

(5,648 acres) of the total, respectively. Estuarine intertidal scrub/shrub wetlands comprise 0.4 percent (550 acres) of the total (White et al., 1993).

The area of mapped emergent wetlands (marshes) has decreased approximately 20 percent since the 1950s. Although scrub/shrub wetlands exhibited a net loss of 25 percent since the 1950s, this trend was offset by forested wetlands, which exhibited a net gain of 180 percent (White et al., 1993). The rate of wetland loss has decreased over time from 1,000 acres/year between 1953 and 1979 to about 720 acres/year between 1979 and 1989. Nineteen percent of the vegetated wetland system that existed in the 1950s has been lost (White et al., 1993 and GBNEP, 1994a).

White et al. (1993) reported a decline in acreage of submerged vascular vegetation (seagrasses) of 70 percent from the 1950s to 1989. In the past, continuous beds of submerged aquatic vegetation flourished around the Trinity River Delta and along the western shoreline of Galveston Bay from Seabrook to San Leon and in West Bay. The remaining 700 acres of this habitat is limited to Christmas Bay and a portion of Trinity Bay (GBNEP, 1994a).

The most significant loss of wetlands was the conversion of 30 percent of marshes to open water or barren flats. The remaining loss is represented by conversion of wetlands to upland, including rangeland, urban, cropland, and upland dredged material placement. Conversion of upland areas to wetlands accounts for a net increase of 21,000 acres of wetlands (White et al., 1993).

Shorelines within the Galveston Bay system are naturally recessional, but the rate of retreat is susceptible to local perturbations caused by variations in sediment influx, wave strength, and human activity (subsidence, excavation, landfill, and dredging). Most of the changes in shorelines of Galveston Bay were erosional following subsidence and represented the highest proportion of retreating shoreline and the lowest proportion of advancing and stable shoreline. Most of the shoreline advance was artificial by landfill or dredged material placement.

3.3 WILDLIFE RESOURCES

Water birds are the predominant wildlife in the project area. In a typical year, three quarters of all waterfowl in the central flyway winter along the Texas coast. Other wildlife such as coyote

(*Canis latrans*), raccoon (*Procyon lotor*), and nutria (*Myocastor coypus*) can be found on islands and PAs along the HSC in the vicinity of the BTC.

3.3.1 Birds

Approximately 140 species of birds have been recorded in the wetland and bay habitats of the Galveston Bay ecosystem (Galveston Bay Foundation, 1991 and GBNEP, 1994a). On average, over 52,000 colonial nesting waterbirds are found in the Galveston Bay system, utilizing a variety of nesting habitats: (1) low, mostly barren, sand or shell, or silt substrate; (2) dense herbaceous and low to medium woody vegetation at higher elevations, i.e. brush; and (3) medium to high woody vegetated sites, on larger islands or the mainland (Glass, 1994).

The seven most important nesting sites for the bare sand/shell nesting guilds were used by an estimated 78 percent of nesting birds in 1974, approximately 83 percent in 1989, and 90 percent in 1992 (Glass, 1994). Photographs of these sites during various tidal stages indicate that approximately 5.12 acres of habitat have accreted since 1974, with most occurring at Pelican Spit, located just north of Pelican Island. The most important losses of this type of habitat, from 1970 to present, were Tiki Island (through development), Atkinson Island (through dredged material placement), and Redfish Island (through erosion), although Redfish Island has been restored and now provides habitat for birds.

Eleven sites within the Galveston Bay system contained an estimated 96 percent of the brush nesting population in 1973 and 87 percent in 1989. Net area gain/loss of this habitat type was virtually zero from 1973 to present. However, the two most important islands, Pelican and Redfish (east of San Leon), were utilized only 1 percent and 0 percent in 1989, respectively. Erosion of brush habitat on Redfish and disturbance from oil drilling activities on Pelican are believed to be the underlying reason. All of the 11 sites show moderate to heavy human and predator disturbance. Redfish Island exhibited erosion in 1973 and 1989 and no longer represents a nesting habitat since becoming subtidal in 1992.

The most important nesting site for tree nesting birds from 1973–89 was Vingt-et-un Island, located just north of Smith Point. By 1990, 90 percent of the nesting population was found in four colonies, with 59 percent of these individuals found at the mouth of the Trinity River. With the loss of

Vingt-et-un Island and erosion of Alexander Island, high brush and tree nesting habitat has been greatly diminished.

3.4 AQUATIC RESOURCES

Shallow bay areas of the Galveston Bay system provide important nursery and feeding areas of the Galveston Bay system provide important nursery an feeding areas for such commercial and sport species as spotted seatrout, red drum, flounder, sheepshead, gafftopsail catfish, sand seatrout, black drum, croaker, menhaden, mullet, blue crab, and brown and white shrimp. The project is located in a highly industrialized area which does not provide prime habitat for fisheries (USACE, 1995).

3.4.1 Essential Fish Habitat

Congress enacted amendments to the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265) in 2005 that established procedures for identifying Essential Fish Habitat (EFH) and required interagency coordination to further the conservation of Federally managed fisheries. Rules published by the NMFS (50 CFR Sections 600.805–600.930) specify that any Federal agency that authorizes; funds or undertakes; or proposes to authorize, fund, or undertake an activity which could adversely affect EFH is subject to the consultation provisions of the above-mentioned act and identifies consultation requirements. This section was prepared to meet these requirements. This environmental assessment serves to initiate EFH consultation under the Act. The National Marine Fisheries Service will review this assessment and provide comments to EFH impacts.

The Gulf of Mexico Fishery Management Council (GMFMC) has identified the project area as EFH for adult and juvenile brown (*Farfantepenaeus aztecus*) and white shrimp (*Litopenaeus setifer*us), red drum (*Sciaenops ocellatus*), and Spanish mackerel (*Scomberomorus maculatus*).

The Act defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” When referring to estuaries, it is further defined as “all waters and substrates (mud, sand, shell, rock and associated biological communities) within these estuarine boundaries, including the sub-tidal vegetation (seagrasses and algae) and adjacent tidal vegetation (marshes and mangroves)” (GMFMC, 1998).

The following describes the preferred habitat, life history stages, and relative abundance of each EFH managed species based on information provided by GMFMC (2004).

Brown Shrimp. Brown shrimp eggs are demersal and occur offshore. The larvae occur offshore and begin to migrate to estuaries as postlarvae. Postlarvae migrate through passes on flood tides at night, mainly from February to April with a minor peak in the fall. In estuaries, brown shrimp postlarvae and juveniles are associated with shallow, vegetated habitats but also are found over silty sand and non-vegetated mud bottoms. Postlarvae and juveniles have been collected in salinity ranging from zero to 70 parts per thousand (ppt). The density of late postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water and oyster reefs. In unvegetated areas, muddy substrates seem to be preferred. Juvenile and sub-adult brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Sub-adults migrate from estuaries at night on ebb tide on new and full moons. Abundance offshore correlates positively with turbidity and negatively with hypoxia (low levels of oxygen in the water). Adult brown shrimp occur in neritic gulf waters (i.e., marine waters extending from mean low tide to the edge of the continental shelf) and are associated with silty, muddy sand, and sandy substrates (GMFMC, 2004). Adult brown shrimp are common within the project area from April to October, and juveniles are abundant year-round, peaking from April to October.

Marine habitat is critically important to the reproduction and survival of shrimp. Adult brown shrimp occur throughout the gulf's marine habitat to depths of about 360 feet.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton, epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae but also on algae and detritus. The habitat of these prey is essentially the same as that required by shrimp: estuarine and marine (GMFMC, 2005).

White Shrimp. White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. Their eggs are demersal and larval stages are planktonic; both

occurring in nearshore marine waters. Postlarvae migrate through passes mainly from May to November, with peaks in June and September. Migration is in the upper 6.5 feet of the water column at night and at mid-depths during the day. Postlarval white shrimp become benthic when they reach the estuary, where they seek shallow water with muddy-sand bottoms, high in organic detritus, or rich marsh, where they develop into juveniles. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edge and submerged aquatic vegetation, followed by marsh ponds and channels, inner marsh, and oyster reefs. White shrimp juveniles prefer salinities of less than 10 ppt and can be found in tidal rivers and tributaries. As juveniles mature, they move to coastal areas where they mature and spawn. Adult white shrimp move from estuaries to coastal areas, where they are demersal and inhabit soft mud or silt bottoms (GMFMC, 2004). Adult white shrimp are considered common from July to March, while juveniles are highly abundant year-round.

Marine habitat is critically important to the reproduction and survival of shrimp. Adult white shrimp occur throughout the gulf's marine habitat to depths of about 131 feet.

Larval shrimp feed on phytoplankton and zooplankton. Postlarvae feed on phytoplankton, epiphytes, and detritus. Juveniles and adults prey on amphipods, polychaetes, and chironomid larvae but also on algae and detritus. The habitat of these prey is essentially the same as that required by shrimp: estuarine and marine (GMFMC, 2004).

Red Drum. Red drum occupy a variety of habitats, ranging from depths of 131 feet offshore to very shallow estuarine waters. Spawning occurs in the gulf, near the mouths of bays and inlets in the fall and winter months. Eggs hatch mainly in the gulf and larvae are transported into the estuary where they mature, moving back to the gulf to spawn. Adult red drum use estuaries, but tend to spend most of their time offshore as they age. They are found over a variety of substrates including sand, mud, and oyster reefs, and can tolerate a wide range of salinities (GMFMC, 2004).

Estuaries are especially important to the larval, juvenile, and sub-adult red drum. Juvenile red drum are most abundant around marshes, preferring quiet, shallow, protected waters with

muddy or grassy bottoms. Sub-adult and adult red drum prefer shallow bay bottoms and oyster reef substrates (GMFMC, 2004).

Estuaries are also important to the prey species of red drum. This is essential to larvae, juvenile, and early adult red drum since they spend all of their time in the estuary. Larval red drum feed mainly on shrimp, mysids, and amphipods, while juveniles feed more often on fish and crabs. Adult red drum feed mainly on shrimp, blue crab, striped mullet, and pinfish. Protection of estuaries is important to maintain the essential habitat for red drum and because so many prey species of red drum are estuarine dependent (GMFMC, 2004). Within the estuary, adult and juvenile red drum are common year-round in the project area.

Spanish Mackerel. Spanish mackerel are pelagic, occurring at depths to 245 feet throughout the coastal zone of the Gulf of Mexico. Adults are usually found along coastal areas, extending out to the edge of the continental shelf; however, they also display seasonal migrations and will inhabit high salinity estuarine areas at times. The occurrence of adults in Gulf estuaries is infrequent and rare. Spawning occurs in offshore waters during May through October. Nursery areas are in estuaries and coastal waters year-round. Larvae are most often found offshore from depths of 30 to 275 feet. Juveniles are found offshore, in the surf area, and sometimes in estuarine habitats. Juveniles prefer marine salinities and are not considered estuarine-dependent. The substrate preference of juveniles is clean sand; the preferences of other life stages are unknown (GMFMC, 2004).

Estuaries are important habitats for most of the major prey species of Spanish mackerel. They feed throughout the water column on a variety of fishes, especially herrings. Squid, shrimp, and other crustaceans are also eaten. Most of their prey species are estuarine-dependent, spending all or a portion of their life cycle in estuarine. Because of this, Spanish mackerel are also dependent on the estuaries to some degree and, therefore, can be expected to be detrimentally affected if the productive capabilities of estuaries are seriously degraded (GMFMC, 2004). Adult and juvenile Spanish mackerel are considered common in the project area from April to October.

3.4.2 Finfish

The principal commercial finfish harvested from Galveston Bay are black drum (*Pogonias cromis)*, southern flounder (*Paralichthys lethostigma*), sheepshead (*Archosargus probatocephalus*), mullet (*Mugil cephalus*), Atlantic croaker (*Micropogonias undulatus*), and spotted seatrout (*Cynoscion nebulosus*).

Recreational boat landings for all finfish have also shown a decline, which may be due to shifts in effort and regulations. It should be noted that although data for landings are sometimes used as indicators of trends, the numbers are greatly influenced by economic and technological factors and do not always reflect the condition of fish stocks.

Even though the BTC does not support a significant commercial fishing industry, the Galveston Bay System maintains an important recreational and comericial fisheries for finfish.

3.4.3 Oysters

Oyster reefs are not present in bottom channel and turning basin of the BTC because the site is generally unsuitable for their growth. The BTC lacks sufficient currents that provide an adequate food source necessary to sustain oyster production. In addition, the silty substrate that accumulates within the channel creates unsuitable habitat for oysters to colonize. Furthermore, every 2 to 3 years, routine dredgeing of this accumulated silt layer is performed to maintain the BTC at its authorized depth for navigation.

3.4.4 Threatened and Endangered Species

A BA was prepared for this EA and is included in Appendix D. Table 1 is a current Federal Threatened and Endangered Species List. Both the U.S. Fish and Wildlife Service (FWS) and NMFS were contacted just prior to preparation of this EA to solicit any additional threatened and endangered species information or concerns in order to present all available information on potential impacts. Of the

species listed, only sea turtles are likely to be found in the project area. However, this mining effort would utilize a cutter head dredge, which has been found to have low potential for affecting sea turtles.

TABLE. Federally-Listed Threatened and Endangered Species for Harris County, Texas.

Common Name	Scientific Name	Listing Status
BIRDS		
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
FISH		
Smalltooth Sawfish	*Pristis pectinata*	Endangered
MARINE MAMMALS		
Blue Whale	*Balaenoptera musculus*	Endangered
Finback Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Sperm Whale	*Physeter catodon*	Endangered
REPTILES		
Green Sea Turtle	*Chelonia mydas*	Threatened
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Hawksbill Sea Turtle	*Eretmochelys imbricate*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
PLANTS		
Texas Prairie-dawn Flower	*Hymenoxys texana*	Endangered

SOURCE: SOURCE: US FISH & WILDLIFE SERVICE, SOUTHWEST REGION ECOLOGICAL SERVICES THREATENED AND ENDANGERED SPECIES WEBSITE LIST FOR HARRIS COUNTY, TEXAS, HTTP://WWW.FWS.GOV/IFW2ES/ENDANGEREDSPECIES/LISTS/LISTSPECIES.CFM***, ACCESSED JULY 13, 2006. NATIONAL MARINE FISHERIES SERVICE, LETTER DATED JUNE 19, 2006.***

3.5 WATER AND SEDIMENT QUALITY

3.5.1 Hydrology

The hydrodynamic regimes of the Galveston Bay system are the result of several interacting process, including the influence of tides, density currents, meteorological events, and freshwater inflows to the bay system. Because this large estuary is very shallow, bay water circulation and daily tidal amplitude is often more a function of wind speed and direction than astronomical forces. There is a strong horizontal salinity gradient across the length of Galveston Bay between the two large river mouths at the upper end and the three tidal connections at the lower end. A vertical salinity gradient or stratification is generally absent in the bay except in the dredged channels and during transitory large freshwater inflow events. General bay water salinity is a function of river inflow with highest values occurring in late summer and fall and lowest values found in late winter and spring. Bay water temperature generally ranges between 50 and 90 degrees Fahrenheit.

3.5.2 Water

Water quality has been described for the general project area between 1995 and 2001, were researched by the USACE and documented in the 2003 Barge Lanes EA .

Recent sediment quality data samples were collected from the BTC on August 2, 2005. Chemical analyses were conducted for several metals, pesticides, polycyclic aromatic hydrocarbons, and other organic compounds. These data are located at Appendix B. Along with these data on detected analytes, Appendix B also includes the complete list of contaminants analyzed and data sheets containing field-collected data and sample locations. The data show that detected contaminant levels in all water samples were below applicable EPA Water Quality Criteria, and Texas Surface Water Quality Standards.

A review of the National Response Center web page was also conducted (NRC, 2005). Records for the past three years indicated several reports of chemical spills in the project vicinity. These spills were generally small quantities of fuel or hydraulic oil, or unknown oil that resulted in a sheen.

These releases were either secured and removed, or they dissipated naturally. No significant chemical or petroleum spills were reported in the project vicinity.

Elutriate data are also included in Appendix B. The elutriate test was designed to simulate the process of hydraulic dredging and is used to predict any potential for resuspension of contaminants into the water column during dredging. The elutriate is prepared by creating a slurry which is then agitated to determine if contaminants associated with the sediment particles are resuspended into the water column. These data show that detected contaminant levels in all elutriate samples were below all applicable Texas Surface Water Quality Standards and EPA Water Quality Criteria.

3.5.3 Salinity

The Galveston Bay watershed encompasses 12.6 percent of Texas' surface area (33,066 square miles), and receives 60 percent of the state's treated wastewater. The Trinity and San Jacinto Rivers dominate freshwater inflows, while numerous tributaries draining the watershed of the bay make a significant cumulative contribution. On a seasonal basis, freshwater inflow to the estuary is normally characterized by peak springtime inflows in May, followed by minimum inflows in August. For the period 1941 to 1987, the average freshwater inflow to the Galveston Bay system was 10.1 million acre-feet (ac-ft) per year, or about 4.6 flushes of the bay (GBNEP, 1994a).

The BTC is a dead end shipping channel situated nearly perpendicular to the HSC. The BTC depends primarily on ship traffic and, to a lesser extent, tides for water circulation. The salinity with the BTC is essentially the same as that with the HSC and upper Galveston Bay. Mining the BTC one time to a depth of -60 feet MLT will have no affect on the existing salinity patterns within the BTC, HSC or Galveston Bay.

Sediment

The USACE 1995 LRR includes extensive documentation of sediment data and examines the statistical trends of sediment contaminants in Galveston Bay. Several studies have been performed on various Federal and permitted navigation projects in Galveston Bay to determine the

contaminant potential associated with dredging and placement of new-work dredged material (USACE, 1995). Based on these studies, the conclusion was that there were no contaminant concerns associated with new-work material to be dredged in connection with marsh creation.

Sediment quality data on recently collected surface sediments from the BTC are located at Appendix B. The sediment quality data are based on analyses of composite samples comprised of subsamples collected perpendicular to the centerline of the channel. There are no EPA quality criteria for sediments, so a comparison with sediment quality screening guidelines (Buchman, 1999) was made. Based on low levels of contaminants of concern relative to the sediment quality screening guidelines, the channel sediments in the BTC are considered to be non-hazardous and are suitable for use as proposed in this EA.

3.6 AIR QUALITY AND NOISE

3.6.1 Air

The 1995 Seis addressed air quality impacts for mining the HSC for H-GNC levee construction. Mining the BTC will result in the same impacts to the same project area and will not be further addressed.

3.6.2 Noise

The BTC is a container shipping facility in an industrially developed area. It may be assumed that normal background noise levels range from a low of 56.2 decibels (dB) with temporary increases to 74.0 dB, during the passage of some of the larger vessels. Noise impacts of mining HSC for levee construction were addressed in the 1995 SEIS.

3.7 HISTORIC RESOURCES

Extensive historic and archaeological investigations have been conducted in conjunction with the various phases of the H-GNC project, which can be found in the 1995 SEIS. Because the project template remains the same for both H-GNC and mining the BTC, there will be no impacts to archeological sites in these already disturbed project areas.

3.8 SOCIOECONOMIC RESOURCES

This section presents updated economic and demographic characteristics for Harris county regarding the current socioeconomic environment within the BTC and adjacent area. A discussion concerning the socioeconomic environment for the HGNC study area can be found in the 1995 SEIS (USACE, 1995. P. 6-15). Literature sources reviewed include publications by the U.S. Bureau of Census (USBOC), the Texas State Data Center (TSDC), the Texas Workforce Commission (TWC), and the Texas Water Development Board (TWDB).

3.8.1 Population Trends

Harris County is expected to experience an annual population increase between the years of 2000 and 2040. Projections show that it is expected to increase from 3,303,757 to 3,809,510 between 2000 and 2010, and continue to rise to 4,434,334 by 2020, to 4,796,682 by 2030, and to 5,249,691 by 2040. During the same time period, the State population growth rates are projected to increase annually between 2000 and 2040, reaching a population of 36,436,265 (TWDB, 2001).

3.8.2 Leading Economic Sectors

TWC employment figures for 2000 show that the leading economic sectors in Harris County are services, trade, and government. By comparison, the leading economic sectors for Texas are services, trade, government, and manufacturing (USBOC, 2002).

3.8.3 Environmental Justice

In compliance with Executive Order (EO) 12898 – Federal Action to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations, an evaluation has been performed to determine whether the proposed project will have a disproportionate adverse impact on minority or low-income population groups within the project area. The EO requires that minority and low-income populations do not receive disproportionately high adverse human health or environmental impacts, and requires that representatives of minority or low-income populations, who could be affected by the project, be involved in the community participation and public involvement process.

Morgan's Point, Texas is the nearest community in the vicinity of the proposed project. Morgan's Point is located immediately south of the BTC. As of the census of 2000 (U.S. Census Bureau, 2000), the population of Morgan's was 336 people. The ethnic distribution of the area is 88.7 percent white, 4.5 percent black, 0.9 percent American Indian or Alaska Native, and 4.5 percent some other race, and 1.5 percent two or more races. Of the total population, 12.8 percent are Hispanic or Latino (of any race), which is not race-based but culturally referenced. Per capita income for Morgan's Point in 2000 was $32,446, with only 5 individuals (2.2 percent of the population) living below the poverty level.

Profile of General Demographic Characteristics in 2000 Morgan's Point, Harris County, Texas		
	# Of Individuals	**% Total Population**
One race	331	98.5
White	*298*	*85.7*
Black or African American	*15*	*4.5*
American Indian &Alaska Native	*3*	*0.9*
Asian	*0*	*0*
Native Hawaiian & Other Pacific Islander	*0*	*0*
Some other race	*15*	*4.5*
Two or more races	5	1.5
Total Population	336	100
Hispanic or Latino (of any race)	43	12.8

Source: U.S. Census Bureau, Census 2000 Table DP-1. Profile of Geneal Demographic Characteristics: 2000. Geographic Area: Morgan's Point City, Texas.

3.9 PRIME AND UNIQUE FARMLANDS

Since the project is a dredging project with an aquatic disposal plan, no prime or unique farmlands exist within the project area.

3.10 RECREATIONAL RESOURCES

The BTC is a heavily trafficked industrialized area without much recreational fishing. In addition, there are no public boat ramps surrounding BTC. Therefore, any potential impacts to recreational fishing will be minimal for this particular area.

3.11 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES

There are no HTRW sites present in the BTC project area.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

4.1 VEGETATION

The BTC is approximately -40 feet MLT and currently used as a container shipping terminal and turning basin by the maritime industry. No wetlands or vegetated shallows are located within the BTC project area.

4.2 WILDLIFE

Temporary impacts to wildlife from mining material for levee construction have already been addressed in the 1995 SEIS and will be the same for mining the BTC. No major impacts of convern have been identified by this action.

4.3 AQUATIC RESOURCES

4.3.1 Essential Fish Habitat

Managed species tend to use the shallow water estuaries for feeding and spawning. In addion, the BTC is a 42-foot deep dead end or terminal channel. Due to limited flushing and periodic dredging in the area, the BTC is not likely to present suitable habitat for EFH species or their prey. Any potential impacts would be identical to those already experienced during periodic routine maintenance dredging of the BTC.

4.3.2 Oysters

Due to the lack of a constant current and the amont of silt within the BTC, oysters are not present at the project location and will not be impacted.

4.3.3 Shrimp and Finfish

The mining of BTC will have short-term temporary impacts on shrimp and finfish, and are identical to the impacts of routine maintenance dredging of the BTC.

4.4 THREATENED AND ENDANGERED SPECIES

There will be no impacts to any threatened or endangered species through the mining of the BTC.

4.5 WATER AND SEDIMENT QUALITY

4.5.1 Water Quality

No unacceptable water or sediment quality impacts are foreseen. Only a temporary increase in suspended particulates and turbidity is expected to occur only during the dredging periods. The dredging period for Phase I is expected to occur over a period of approximately two months, and Phase II for approximately 9 months.

4.5.2 New Work Material

Several studies have been performed on various Federal and permitted navigation projects in Galveston Bay to determine the contaminant potential associated with dredging and placement of new-work dredged material (USACE, 1995). Based on these studies, it was concluded that there are no contaminant concerns associated with new-work material to be dredged in connection with levee construction. Therefore, no impacts are anticipated in association with the use of the mined material from the BTC.

4.6 AIR QUALITY AND NOISE

The air and noise impacts of mining material for levee construction were addressed in the 1995 SEIS. The proposed action will produce the same impacts in the same H-GNC project area.

4.7 HIstoric Resources

No historic resources have been identified that will be impacted by the proposed mining of the BTC addressed in this EA. The potential for numerous shipwrecks has been identified by archival research, but no specific locations for significant historic shipwrecks are known in.

4.8 SOCIOECONOMIC RESOURCES

The socioeconomic impacts of the H-GNC project are beneficial. Mining the BTC wil contribute to the H-GNC project. No minority or low-income population will be disproportionately or adversely impacted by this project. The proposed action described in this EA will not adversely impact the population trends or the leading economic sector for Harris County.

4.9 Prime and Unique Farmlands

Since no prime or unique farmlands exist in the area of the proposed modifications, there would be no impacts to prime or unique farmlands.

4.7 RECREATIONAL RESOURCES

No recreational resources will be impacted by the proposed project. Recreational boaters travel very infrequently within the BTC. The proposed mining would pose no additional safety hazard to recreational boaters, besides what already exists with the existing BTC.

4.8 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES

There are no HTRW sites that will be impacted by the proposed mining addressed in this EA.

4.9 MITIGATION

No adverse impacts to the environment have been identified as a result of the proposed project. Therefore, no mitigation is proposed.

4.13 CUMULATIVE IMPACTS

The Council on Environmental Quality's regulations for implementing NEPA define cumulative effects as the effects on the environment that result from the incremental effect of the action when added to other past, present and reasonably foreseeable future actions, regardless of the agency (Federal or non-Federal) or person undertaking such other actions.

For the purpose of cumulative impact analysis, the area of influence (AOI) identified for the mining of the BTC generally includes the upper Bay portions of Galveston, Harris, and Chambers counties. For the air analysis, the eight-county area identified by the H-GAC as the Houston Galveston Area is used and for socioeconomics, the full areas of Galveston, Harris, and Chambers counties is included. The proposed project and all alternative action sites are located within this AOI.

The cumulative environmental impact of constructing the H-GNC project in the Galveston Bay system is discussed in the SEIS for the project (USACE, 1995) and included numerous projects being built, or proposed at that time. Other pertinent projects that have been proposed or instituted since the SEIS was prepared in 1995 are as follows:

1. The La Porte Bayfront Master Plan, based on City of La Porte (1993) proposes a marina and entrance channel, a park, and a commercial area centered on a waterfront hotel.

2. In 2001, the TNRCC has approved changes to the State Implementation Plan (SIP) for the Houston-Galveston ozone nonattainment area and is considering additional revisions.

3. The Texas City Shoal Point Container Terminal permit application and EIS are for a container terminal to be built at Texas City in three phases, ultimately encompassing 400 acres of terminal, six berths, and ancillary support infrastructure.

4. Three air permits were issued in 2000 for American Acryl acrylic acid and butyl acrylate plants and utilities at the Bayport Industrial District.

5. San Jacinto Rail Limited plans to construct a 12.8-mile rail line, connecting plastics and chemical plants in the Bayport Industrial District to a Union Pacific Railroad line near the southeast corner of Ellington Field.

6. The Port of Houston Bayport Container Terminal permit application and EIS are for a container terminal and cruise ship facility, ultimately encompassing 1,100 acres for a container terminal complex including wharves, container yards, intermodal yards, and ancillary facilities, plus 7,000 feet of wharves and berths for the container facility and 5,000 feet of wharves and berths for the cruise operations.

7. Modification to the Texas City Wye are proposed, which would gradually widen and turn the eastbound approach channel between the Texas City Channel and the Gulf Intracoastal Waterway to −14 feet MLT, to assist tows making the turn between the two channels.

All of these projects have been examined under the NEPA process and the NEPA documentation for the larger projects has included an examination of cumulative impacts. Changes to the SIP have made air quality requirements more stringent on all projects, including the one addressed in this EA.

The GLO provided a list of all easements located in any state-owned waterbodies in the general vicinity of the project in Harris, Chambers, and Galveston counties, currently being processed or active (Table 3). Each file requiring a GLO easement was evaluated and categorized by activity. The largest number of activities is categorized as construction, maintenance or removal of marine structures (piers, docks, boathouses and lifts), followed by the installation, maintenance or removal of pipelines (water, gas, natural gas and hazardous material). Other activities include shoreline stabilization, habitat creation, transportation projects, communication/electric line construction and miscellaneous marine-

related structures. Each easement is examined for beneficial and detrimental impacts and found acceptable by the GLO and review agencies.

Permitted activities occurring within the general project area between 1995 and 2001 were researched by the USACE and illustrated in the 2003 Barge Lanes EA. Dredge and fill activities along with the construction, maintenance, or removal of marine structures proved to be the most widely permitted activities. Other activities include shoreline stabilization, habitat creation, wells and drilling activities, transportation projects, transmission line construction, stormwater and wastewater activities, commercial and industrial construction, and miscellaneous permitted activities. Unfortunately, many permits do not designate the areal extent of habitats impacted, and there is no available database that provides these data. However, like the GLO easements, each permit application is examined by the USACE and State and Federal regulatory agencies and either is found acceptable for approval, is modified until it is acceptable, or is withdrawn or rejected.

There will be no salinity increase caused by mining of BTC. This effort will not cause any discernible change in the abundance or distribution of the living marine resources of the Galveston Bay system.

TABLE 3

TEXAS GENERAL LAND OFFICE PERMITTING ACTIVITY

	Permitting Activity Categories *						
	MS	MI	SS	PL	CL	HC	TP
Chambers County/Galveston Bay	416	59	241	435	2	10	0
Galveston County/Galveston Bay	193	22	65	111	9	3	3
Galveston County/Gulf of Mexico	3	8	0	46	1	5	0
Other Waterbodies	814	144	143	459	18	7	2
Totals	1,426	233	449	1,051	30	25	5

Source: GLO, 2001.

* Abbreviations:

MS	Marine Structures
MI	Miscellaneous Marine
SS	Shoreline Stabilization
PL	Pipelines
CL	Communication/Electric Lines
HC	Habitat Creation
TP	Transportation

In summary, it can be concluded that mining the BTC will result in no, or minimal, impacts to vegetation, wildlife, EFH, noise, and historical resources, so there would be no change in the cumulative impacts for these resources. There will be long-term beneficial impacts to shrimp and finfish from marsh creation, which was captured in the1995 SEIS. The cumulative effect of this project, when added to other past, present and reasonably foreseeable future actions, should not be significant.

5.0 COMPLIANCE WITH THE TEXAS COASTAL MANAGEMENT PROGRAM

5.1 INTRODUCTION

The Houston-Galveston Navigation Channels, Texas Project was authorized for construction by the Water Resources Development Act of 1996. The Final Consistency Determination for the Houston Ship Channel and other Galveston Bay projects was submitted to the Coastal Coordination Council on May 6, 1997. By letter dated July 9, 1997, the Council declared the project consistent with the Texas Coastal Management Program (TCMP) goals and policies.

The USACE, Galveston District, has prepared this Consistency Determination for the mining of the BTC to obtain material to repair the levee at Spillman's Island PA and create Cell M5/M6 at Atkinson Island as described in Section 2 of this EA. This determination was prepared in accordance with the *Texas Coastal Management Program, Final Environmental Impact Statement*, dated August 1996.

The mining of the BTC is assessed for consistency with the goals and policies of the TCMP. A statement on the additions' consistency with the TCMP goals and policies follows the presentation of supporting data and information.

5.2 IMPACTS ON COASTAL NATURAL RESOURCE AREAS (CNRA)

Several of the CNRAs listed in 31 TAC §501.3 are found reasonably close to the area discussed in this EA. A short description of each CNRA near the project and methods to minimize or avoid potential impacts is provided below.

Coastal Barrier: No coastal barrier areas, as presented in the latest GLO database (www.glo.state.tx.us/gis), occur in the vicinity of the Upper Bay BTC project, although there are some on Bolivar Peninsula and one at Swan Lake near Texas City. The mining of the BTC will not have any effect on these CNRAs.

Coastal Historic Area: These areas consist of sites listed or eligible for the National Register of Historic Places (NR) and State Archeological Landmarks. Compliance with the TCMP

regarding coastal historic areas is accomplished through procedures established by Section 106 of the National Historic Preservation Act of 1965 (NHPA), as amended. Impacts to coastal historic sites from all USACE maintenance and new construction activities are coordinated with the Texas Historical Commission and requirements for all historic property investigations are developed in consultation with the SHPO. There will be no impacts to historic sites or National Register eligible sites through the mining of BTC. Therefore, SHPO coordination was not required for this effort.

Coastal Preserve: This natural resource includes Federal and state lands and parks. There are three preserves in the general area of the activities covered under this EA: the Moody National Wildlife Refuge, Anahuac National Wildlife Refuge, and Candy Abshier State Wildlife Management Area. However, these are too distant from the activities covered under this EA to be affected. The Galveston Island State Park is too far south and west to be impacted by activities covered under this EA.

Coastal Shore Area: This type of area, located at the Entrance Channel where it traverses through Bolivar Roads from the Gulf of Mexico into Galveston Bay, is characterized as beach and dune fields. Specifically, these areas are far removed from the BTC project and the activities covered under this EA do not impact this category of CNRA.

Coastal Wetlands: No coastal wetlands are found in the BTC. The BTC is located in the open waters of Galveston Bay.

Critical Dune Area: No critical dune areas are found in the BTC. The BTC is located in the open waters of Galveston Bay.

Critical Erosion Area: No critical erosion areas are found in the BTC. The BTC is located in the open waters of Galveston Bay.

Gulf Beach: No Gulf beach is found in theBTC. The BTC is located in the open waters of Galveston Bay.

Hard Substrate Reef: No hard substrate reef areas are found in the BTC. The BTC is located in the open waters of Galveston Bay.

Oyster Reef: No oyster reefs are found in the BTC. The mining effort in the BTC will not consist of widening, therefore no oyster reefs will be effected. The BTC is located in the open waters of Galveston Bay.

Special Hazard Area: These are low-lying, flood-prone areas as shown on Flood Insurance Rate maps. As expected for flat coastal plain, most of the area surrounding the project channel, including the city of Galveston and town of Port Bolivar, qualifies for this designation. The mining of BTC will not affect low-lying areas since the BTC is not located in a flood-prone area.

Submerged Land: The areas immediately adjacent to the BTC are characterized as submerged land. There will be no new impacts to submerged land from the mining of BTC, and placement of the material will be confined to beneficial use PA's that have already been discussed in the 1995 SEIS.

Submerged Aquatic Vegetation: Only remnant populations of submerged aquatic vegetation remain in the Galveston Bay system. These populations are located in Christmas and Trinity Bays, 10 to 30 miles from the area of work. No impacts to this resource are expected as a result of the mining of the BTC.

Tidal Sand or Mud Flats: No large areas of tidal flats are located in upper Galveston Bay. No impacts to this resource are expected as a result of the mining of the BTC.

Water of the Open Gulf of Mexico: None of the work described for mining the BTC in this EA will affect the open waters of the Gulf of Mexico.

Water Under Tidal Influence: The entire project is located in a region which experiences tidal influence. All material mined from the BTC is being used beneficially. The placement of the material has already been discussed in the 1995 SEIS.

5.3 COMPLIANCE WITH GOALS AND POLICIES

The following goals and policies of the TCMP were reviewed for compliance.

§501.14(j) – Dredging and Dredged Material Disposal and Placement

§501.14(h) – Development in Critical Areas

§501.15 – Policy for Major Actions

5.3.1 Compliance with §501.14(j) – Dredging and Dredged Material Disposal and Placement

Appendix A provides a summary of actions designed to comply with the specific requirements of §501.14(j)(1)-(6). Paragraph (1) discusses avoidance and minimization of effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches. The beneficial use of dredged material has been maximized to establish high quality fish and wildlife habitat through development of tidal marsh. Paragraph (2) discusses techniques to minimize adverse effects of placing dredged material. All available dredged material generated by the activities covered under this EA will be used beneficially. Paragraph (3) discusses previous compliance for PAs unless modified. The purpose of this EA is to satisfy NEPA and consistency requirements for the location of mining to obtain material to repair levees at Spillman's Island PA and create a new Cell M5/M6, which has been previously coordinated in the 1995 SEIS. Paragraph (4) discusses dredged material as a potentially reusable resource that must be used beneficially in accordance with this policy. All available dredged material generated by the activity covered under this EA will be used beneficially. Paragraph (5) discusses giving preference to alternative PAs if the dredged material is not used beneficially. All available dredged material generated by the activity covered under this EA will be used beneficially. Paragraph (6) discusses avoiding effects on adjoining private property. Sufficient real estate has been purchased and levees constructed to prevent impacts to adjoining private lands.

The remaining paragraphs of §501.14(j) are not applicable to the mining of the BTC as described in this EA. Paragraph (7) of the section discusses emergency dredging procedures and are not applicable to the mining of the BTC as described in this EA. Paragraph (8) discusses the mining of shell, marl, gravel, and mudshell and is not applicable to the mining of the BTC discussed in this EA. Paragraph (9) is not applicable to the USACE.

5.3.2 Compliance with §501.14(h) – Development in Critical Areas

No dredging or discharge of dredged or fill material into critical areas will occur as a result of the mininging to the H-GNC project for Federal navigation project construction described in this EA. Therefore, these changes are in compliance with this section.

5.3.3 Compliance with §501.15 – Policy for Major Actions

This project change does not constitute a major action. No modifications to the project are proposed which will require a supplemental Environmental Impact Statement.

5.4 CONSISTENCY DETERMINATION

The mining of the BTC described in this EA has been reviewed for consistency with the goals and policies of the TCMP. CNRAs in the project area are identified and evaluated for potential impacts from activities associated with these changes. It is determined that these activities will not adversely impact the CNRAs. All placement areas are identified and used as described in the 1995 SEIS.

6.0 RELATIONSHIP OF PLAN TO ENVIRONMENTAL REQUIREMENTS

This EA has been prepared to satisfy the requirements of all applicable environmental laws and regulations and has been prepared using the Council on Environmental Quality's (CEQ) National Environmental Policy Act regulations (40 CFR Part 1500) and the USACE regulation ER 200-2-2 (Environmental Quality: Policy and Procedures for Implementing NEPA, 33 CFR 230). The following sections present a summary of environmental laws, regulations, and coordination requirements applicable to this EA.

6.1 NATIONAL ENVIRONMENTAL POLICY ACT

This EA has been prepared in accordance with CEQ regulations in compliance with NEPA provisions. All impacts on terrestrial and aquatic resources have been identified. There will be no losses of environmental resources generated by this project.

6.2 NATIONAL HISTORIC PRESERVATION ACT OF 1966

Compliance with the National Historic Preservation Act of 1966, as amended, requires identification of all National Register or eligible properties in the project area and development of mitigation measures for those adversely affected, in coordination with the SHPO and ACHP. Investigation of this project indicates no National Register-eligible or listed properties or State Archeological Landmarks occur in the area of the proposed modifications. There are no impacts to historic properties from this project.

6.3 ENDANGERED SPECIES ACT

Updated Endangered Species lists were requested for this project and a BA was written. There will be no impacts to Federally listed species resulting from the project addressed in this EA. The USACE sent letters requesting concurance with this assessment to the NMFS and the USFWS on May 30, 2006. The NMFS concurred with this assessment by a letter sent dated June 19, 2006. (Appendix C).

6.4 FISH AND WILDLIFE COORDINATION ACT OF 1958

The proposed mining of the BTC has been coordinated with the FWS, NMFS, and TPWD throughout the course of the H-GNC project. No unresolved issues remain and the proposed modification is in compliance with the Act.

6.5 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1996

Congress enacted amendments to the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265) as amended in 1996 that established procedures for identifying Essential Fish Habitat (EFH) and required interagency coordination to further the conservation of Federally managed fisheries. Rules published by the National Marine Fisheries Service (50 CFR Sections 600.805 – 600.930) specify that any Federal agency that authorizes, funds or undertakes, or proposes to authorize, fund, or undertake an activity that could adversely affect EFH is subject to the consultation provisions of the above-mentioned act and identifies consultation requirements.

EFH consists of those habitats necessary for spawning, breeding, feeding, or growth to maturity of species managed by Regional Fishery Management Councils in a series of Fishery Management Plans. Sections 3.4.1 and 4.3.1 of the EA were prepared to address EFH in the Project Area and initiate consultation under the act.

6.6 CLEAN AIR ACT OF 1972

This act is intended to protect and enhance the quality of the nation's air resources; to initiate and accelerate research and development to prevent and control air pollution; to provide technical and financial assistance for air pollution prevention and control programs; and to encourage and assist regional air pollution prevention and control programs. Air impacts of mining material for levee construction were addressed in the 1995 SEIS.

6.7 CLEAN WATER ACT

The activity addressed in this EA is mining of suitable material for repairing and constructing levees. Water quality standards were considered and it was determined that this activity will not exceed those standards. The present mining of material is within the intent of the 1995 SEIS and, therefore, a Texas Water Quality Certification is not required for the proposed action described in this EA.

6.8 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

This EO directs Federal agencies to avoid undertaking or assisting in new construction located in wetlands unless there is no practical alternative. The proposed project has been analyzed for compliance with EO 11990. No construction will occur in wetlands.

6.9 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

This EO directs Federal agencies to determine whether the project change described in this EA will have a disproportionate adverse impact on minority or low-income population groups within the project area.

The proposed project has been analyzed for compliance with EO 12898. The mining of the BTC will not have disproportionate adverse effects on any low-income or minority population.

6.10 MARINE MAMMAL PROTECTION ACT OF 1972

This act, passed in 1972 and amended through 1997, is intended to conserve and protect marine mammals, establish a marine mammal commission, establish the International Dolphin Conservation Program, and establish a Marine Mammal Health and Stranding Response Program. The proposed action addressed in this EA is in compliance with this Act.

6.11 FEDERAL WATER PROJECT RECREATION ACT

This 1995 act requires consideration of opportunities for outdoor recreation and fish and wildlife enhancement in planning water resource projects. The beneficial uses for the dredged material,

as addressed in the 1995 SEIS, include opportunities for outdoor recreation and fish and wildlife enhancement. The proposed action addressed in this EA will not adversely impact these opportunities.

6.12 TEXAS COASTAL MANAGEMENT PROGRAM

The proposed mining of the BTC complies with the Texas Coastal Management Program, as shown in Section 5.0 and Appendix A of this EA.

6.13 CEQ MEMORANDUM DATED AUGUST 11, 1980, PRIME OR UNIQUE FARMLANDS

The project area does not contain any prime or unique farmlands; so the dredging will not impact prime or unique farmlands.

6.14 GALVESTON BAY NATIONAL ESTUARY PROGRAM

As noted in Section 9.0 of the SEIS, the Director of the Galveston Bay National Estuary Program (GBNEP) and the Chair of the Scientific/Technical Advisory Committee of GBNEP were appointed to participate in the ICT for the SEIS. Additionally, the USACE served on the key committee overseeing the management planning for the GBNEP's *Galveston Bay Plan* (GBNEP, 1994b). Work in both the ICT and GBNEP proceeded in a collaborative fashion and, in both groups, traditionally divisive concerns were discussed and negotiated to final successful resolution. The Beneficial Uses Plan in the SEIS was developed by the ICT's Beneficial Uses Subcommittee in parallel with similar initiatives in *The Galveston Bay Plan*, and the work of each group benefited the other. Consequently, the SEIS is consistent with *The Galveston Bay Plan*. The mining of the BTC that is addressed in this EA is also consistant with the Galveston Bay Plan.

7.0 COORDINATION WITH OTHERS

The mining of BTC to obtain new work material for repairing levees at Spillman's Island Placement Area and constructing levees at Atkinson Island (Cell M5/M6) has been discussed and agreed

upon during H-GNC Interagency Coordination Team (ICT) meetings and has been reviewd on multiple occasions at Beneficial Use Group (BUG) meetings.

This EA which discusses the mining of the BTC terminal basin and main channel to obtain material to repair levees at Spillman's Island PA and create a new cell at Atkinson Island (Cell M5/M6) is being coordinated with federal and state resource agencies, as well as the public.

In accordance with Section 7 of the Endangered Speicies Act, as amended, a list of threatened and endangered species was requested from the FWS and the NMFS. This EA will also initiate EFH coordination through the NMFS.

8.0 CONCLUSIONS

The 1.5-mile BTC will be mined to a depth of -60 feet MLT in the main channel and a depth of -53 feel MLT in the turning basin, to provide approximately 1.5 million CY and 600,000 CY of material to construct the levees for Cell M5/M6 at Atkinson Island and to repair levees at Spillman's Island PA, respectively. This EA addresses effects on vegetation; wildlife; aquatic resources; including Essential Fish Habitat; threatened and endangered species; cultural resources; public safety and socioeconomic resources; Prime and Unique Farmlands; recreational resouces; HTRW; air quality and noise, and water and sediment quality. After careful consideration it is determined to be environmentally acceptable to mine BTC as described in this assessment, and will not have an adverse effect on the quality of the human environment.

9.0 LITERATURE CITED

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11.0 ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
CEQ	Council on Environmental Quality
CNRA	Coastal Natural Resource Area
cy	cubic yard(s)
DO	Dissolved oxygen
EA	Environmental Assessment
ECE	Entrance Channel Extension
EFH	Essential Fish Habitat
EH&A	Espey, Huston & Associates, Inc.
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FWS	U.S. Fish and Wildlife Service
GBANS	Galveston Bay Area Navigation Study
GBNEP	Galveston Bay National Estuary Program
GLO	Texas General Land Office
GMFMC	Gulf of Mexico Fishery Management Council
H-GAC	Houston-Galveston Area Council
H-GNC	Houston-Galveston Navigation Channel, Texas, Project

HSC	Houston Ship Channel
HTRW	Hazardous, Toxic, Radioactive Waste
ICT	Interagency Coordination Team
LRR	Limited Reevaluation Report
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mgd	Million gallons per day
MLT	mean low tide
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PA	placement area
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
TSDC	Texas State Data Center
TSS	Total Suspended Solids
TWC	Texas Workforce Commission
TWDB	Texas Water Development Board
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
USACE	U.S. Army Corps of Engineers

USBOC U.S. Bureau of the Census

VOC volatile organic compound

APPENDIX A

TEXAS COASTAL MANAGEMENT PROGRAM

APPENDIX A

COMPLIANCE WITH GOALS AND POLICIES - SECTION 501.14(J)(1)-(6)
DREDGING AND DREDGED MATERIAL DISPOSAL AND PLACEMENT

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS - ENVIRONMENTAL ASSESSMENT

BARBOUR'S TERMINAL CHANNEL (BTC) MINING

Section 501.14(j) Dredging and Dredged Material Disposal and Placement

(1) Dredging and the disposal and placement of dredged material shall avoid and otherwise minimize adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches to the greatest extent practicable. The policies of this subsection are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public. In implementing this subsection, cumulative and secondary adverse effects of dredging and the disposal and placement of dredged material and the unique characteristics of affected sites shall be considered.

Compliance: The use of dredge material to repair failed levee segments at Spillman's Island Placement Area (PA) and to construct levees at Atkinson Island beneficial use site (Cell M5/M6) was addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997. Obtaining the needed material from the BTC allows for the beneficial use of dredged material to establish high quality fish and wildlife habitat through development of tidal marsh. Minor affects of dredging to bay bottom in the BTC will be more than offset by the construction of the beneficial use site marsh cells.

(A) Dredging and dredged material disposal and placement shall not cause or contribute, after consideration of dilution and dispersions, to violation of any applicable surface water quality standards established under subsection (f) of this section.

Compliance: No action covered in this EA will alter project impacts on water quality from those described in the H-GNC project 1995 SEIS, and is deemed consistent with the original consistency determination identified above.

(B) Except as otherwise provided in subparagraph (D) of this paragraph, adverse effects on critical areas from dredging and dredged material disposal or placement shall be avoided and otherwise minimized, and appropriate and practicable compensatory mitigation shall be required, in accordance with subsection (h) of this section.

Compliance: The action covered in this EA is not expected to have adverse effects on critical areas. No mitigation will be required due to avoided impacts.

(C) Except as provided in subparagraph (D) of this paragraph, dredging and the disposal and placement of dredged material shall not be authorized if:

(I) there is a practicable alternative that would have fewer adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches, so long as that alternative does not have other significant adverse effects;

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Compliance: The alternative would be to mine the Houston Ship Channel for suitable clay material, which has the same effects as mining the BTC and all impacts have been previously covered for the H-GNC project in the 1995 SEIS. Therefore, there is no practicable alternative that would have fewer adverse affects.

(ii) all appropriate and practicable steps have not been taken to minimize adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches; or

Compliance: All practicable steps have been taken to minimize adverse affects on these resources.

(iii) significant degradation of critical areas under subsection (h)(1)(G)(v) of this section would result.

Compliance: No critical areas are affected by dredging of the BTC; therefore, no significant degradation would result.

(D) A dredging or dredged material disposal or placement project that would be prohibited solely by application of subparagraph (C) of this paragraph may be allowed if it is determined to be of overriding importance to the public and national interest in light of economic impacts on navigation and maintenance of commercially navigable waterways.

Compliance: Application of subparagraph (C) does not prohibit the use of the proposed dredging alternative.

(2) Adverse effects from dredging and dredged material disposal and placement shall be minimized as required in paragraph (1) of this subsection. Adverse effects can be minimized by employing the techniques in this paragraph where appropriate and practicable.

Compliance: Adverse effects of dredging as described in this EA have been minimized as described under "Compliance" for paragraph (1) of this subsection.

(A) Adverse effects from dredging and dredged material disposal and placement can be minimized by controlling the location and dimensions of the activity. Some of the ways to accomplish this include:

(I) locating and confining discharges to minimize smothering of organisms;

(ii) locating and designing projects to avoid adverse disruption of water inundation patterns, water circulation, erosion and accretion processes, and other hydrodynamic processes;

(iii) using existing or natural channels and basins instead of dredging new channels or basins, and discharging materials in areas that have been previously disturbed or used for disposal or placement of dredged material;

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(iv) limiting the dimensions of channels, basins, and disposal and placement sites to the minimum reasonably required to serve the project purpose, including allowing for reasonable overdredging of channels and basins, and taking into account the need for capacity to accommodate future expansion without causing additional adverse effects;

(v) discharging materials at sites where the substrate is composed of material similar to that being discharged;

(vi) locating and designing discharges to minimize the extent of any plume and otherwise control dispersion of material; and

(vii) avoiding the impoundment or drainage of critical areas.

Compliance: Impacts associated with dredging have been minimized by mining material from within the existing bottom footprint of the BTC Channel, which is an existing navigation channel.

(B) Dredging and disposal and placement of material to be dredged shall comply with applicable standards for sediment toxicity. Adverse effects from constituents contained in materials discharged can be minimized by treatment of or limitations on the material itself. Some ways to accomplish this include:

(I) disposal or placement of dredged material in a manner that maintains physicochemical conditions at discharge sites and limits or reduces the potency and availability of pollutants;

(ii) limiting the solid, liquid, and gaseous components of material discharged;

(iii) adding treatment substances to the discharged material; and

(iv) adding chemical flocculants to enhance the deposition of suspended particulates in confined disposal areas,

Compliance: Surface sediments to be dredged from the BTC Channel have been tested for a variety of chemical parameters of concern to resource agencies since the 1970s. The results of the analyses are in Appendix B of the EA. There were no contaminant concerns. Furthermore, there are generally no contaminant concerns associated with using new-work material (EA Section 5.0). Therefore, no impacts are anticipated in association with the use of the mined material from the BTC.#

(C) Adverse effects from dredging and dredged material disposal or placement can be minimized through control of the materials discharged. Some ways of accomplishing this include:

(I) use of containment levees and sediment basins designed, constructed, and maintained to resist breaches, erosion, slumping, or leaching;

(ii) use of lined containment areas to reduce leaching where leaching of chemical constituents from the material is expected to be a problem;

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(iii) capping in-place contaminated material or, selectively discharging the most contaminated material first and then capping it with the remaining material;

(iv) properly containing discharged material and maintaining discharge sites to prevent point and nonpoint pollution; and

(v) timing the discharge to minimize adverse effects from unusually high water flows, wind, wave, and tidal actions.

Compliance: The use of dredge material to maintain Spillman's Island Placement Area (PA) and to construct levees at Atkinson Island (Cell M5/M6) was addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997.

(D) Adverse effects from dredging and dredged material disposal or placement can be minimized by controlling the manner in which material is dispersed. Some ways of accomplishing this include:

(I) where environmentally desirable, distributing the material in a thin layer;

(ii) orienting material to minimize undesirable obstruction of the water current or circulation patterns;

(iii) using silt screens or other appropriate methods to confine suspended particulates or turbidity to a small area where settling or removal can occur;

(iv) using currents and circulation patterns to mix, disperse, dilute, or otherwise control the discharge;

(v) minimizing turbidity by using a diffuser system or releasing material near the bottom;

(vi) selecting sites or managing discharges to confine and minimize the release of suspended particulates and turbidity and maintain light penetration for organisms; and

(vii) setting limits on the amount of material to be discharged per unit of time or volume of receiving waters.

Compliance: The use of dredge material to maintain Spillman's Island Placement Area (PA) and to construct levees at Atkinson Island (Cell M5/M6) was addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997.

(E) Adverse effects from dredging and dredged material disposal or placement operations can be minimized by adopting technology to the needs of each site. Some ways of accomplishing this include:

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(I) using appropriate equipment, machinery, and operating techniques for access to sites and transport of material, including those designed to reduce damage to critical areas;

(ii) having personnel on site adequately trained in avoidance and minimization techniques and requirements; and

(iii) designing temporary and permanent access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement.

Compliance: The use of dredge material to maintain Spillman's Island Placement Area (PA) and to construct levees at Atkinson Island (Cell M5/M6) was addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997.

(F) Adverse effects on plant and animal populations from dredging and dredged material disposal or placement can be minimized by:

(I) avoiding changes in water current and circulation patterns that would interfere with the movement of animals;

(ii) selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species that have a competitive edge ecologically over indigenous plants or animals;

(iii) avoiding sites having unique habitat or other values including habitat of endangered species;

(iv) using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics;

(v) using techniques that have been demonstrated to be effective in circumstances similar to those under consideration whenever possible and, when proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiating their use on a small scale to allow corrective action if unanticipated adverse effects occur;

(vi) timing dredging and dredged material disposal or placement activities to avoid spawning or migration seasons and other biologically critical time periods; and

(vii) avoiding the destruction of remnant natural sites within areas already affected by development.

Compliance: The mining of the BTC will have no adverse affects on plant and animal populations. Mobile marine organisms migrate from the area until dredging activities cease. The dredging will be performed using a cutterhead dredge, the use of which does not affect spawning or migration and is not limited to certain seasons.

(G) Adverse effects on human use potential from dredging and dredged material disposal or placement can be minimized by:

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(I) selecting sites and following procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the site, particularly with respect to water quality;

(ii) selecting sites which are not valuable as natural aquatic areas;

(iii) timing dredging and dredged material disposal or placement activities to avoid the seasons or periods when human recreational activity associated with the site is most important; and

(iv) selecting sites that will not increase incompatible human activity or require frequent dredge or fill maintenance activity in remote fish and wildlife areas.

Compliance: The mining of the BTC will have no adverse affects on human use potential of the area. Mining the BTC to construct beneficial use sites will contribute significantly to the human use potential and enjoyment of Galveston Bay through creating wetlands of high habitat quality for fish and wildlife. This will attract recreational fishermen and bird watchers.

(H) Adverse effects from new channels and basins can be minimized by locating them at sites:

(I) that ensure adequate flushing and avoid stagnant pockets; or

(ii) that will create the fewest practicable adverse effects on CNRAs from additional infrastructure such as roads, bridges, causeways, piers, docks, wharves, transmission line crossings, and ancillary channels reasonably likely to be constructed as a result of the project; or

(iii) with the least practicable risk that increased vessel traffic could result in navigation hazards, spills, or other forms of contamination which could adversely affect CNRAs;

(iv) provided that, for any dredging of new channels or basins subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on minimization of secondary adverse effects need not be produced or evaluated to comply with this subparagraph if such data and information is produced and evaluated in compliance with §501.15(b)(1) of this title (relating to Policy for Major Actions).

Compliance: No new channels or basins are proposed in this EA.

(3) Disposal or placement of dredged material in existing contained dredge disposal sites identified and actively used as described in an environmental assessment or environmental impact statement issued prior to the effective date of this chapter shall be presumed to comply with the requirements of paragraph (1) of this subsection unless modified in design, size, use, or function.

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Compliance: **The placement areas receiving dredged material from the BTC will not be modified in design, size, use, or function and, therefore, complies with the requirements of paragraph (1) of this subsection.**

(4) Dredged material from dredging projects in commercially navigable waterways is a potentially reusable resource and must be used beneficially in accordance with this policy.

Compliance: **Most of the material mined from the BTC is being used beneficially for wetland habitat creation. The material not used beneficially is necessary to repair levees as addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997.**

(A) If the costs of the beneficial use of dredged material are reasonably comparable to the costs of disposal in a non-beneficial manner, the material shall be used beneficially.

(B) If the costs of the beneficial use of dredged material are significantly greater than the costs of disposal in a non-beneficial manner, the material shall be used beneficially unless it is demonstrated that the costs of using the material beneficially are not reasonably proportionate to the costs of the project and benefits that will result. Factors that shall be considered in determining whether the costs of the beneficial use are not reasonably proportionate to the benefits include, but are not limited to:

(I) environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits;

(ii) the proximity of the beneficial use site to the dredge site; and

(iii) the quantity and quality of the dredged material and its suitability for beneficial use.

(C) Examples of the beneficial use of dredged material include, but are not limited to:

(I) projects designed to reduce or minimize erosion or provide shoreline protection;

(ii) projects designed to create or enhance public beaches or recreational areas;

(iii) projects designed to benefit the sediment budget or littoral system;

(iv) projects designed to improve or maintain terrestrial or aquatic wildlife habitat;

(v) projects designed to create new terrestrial or aquatic wildlife habitat, including the construction of marshlands, coastal wetlands, or other critical areas;

(vi) projects designed and demonstrated to benefit benthic communities or aquatic vegetation;

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(vii) projects designed to create wildlife management areas, parks, airports, or other public facilities;

(viii) projects designed to cap landfills or other waste disposal areas;

(ix) projects designed to fill private property or upgrade agricultural land, if cost-effective public beneficial uses are not available; and

(x) projects designed to remediate past adverse impacts on the coastal zone.

Compliance: Total compliance with paragraph (4) is discussed above.

(5) If dredged material cannot be used beneficially as provided in paragraph (4) (B) of this subsection, to avoid and otherwise minimize adverse effects as required in paragraph (1) of this subsection, preference will be given to the greatest extent practicable to disposal in:

Compliance: The dredged new work material will be used to repair the existing Spillman's Island Placement Area (PA) and to construct levees at the Atkinson Island beneficial use site (Cell M5/M6) as addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997.

(A) contained upland sites;

(B) other contained sites; and

(C) open water areas of relatively low productivity or low biological value.

(6) For new sites, dredged materials shall not be disposed of or placed directly on the boundaries of submerged lands or at such location so as to slump or migrate across the boundaries of submerged lands in the absence of an agreement between the affected public owner and the adjoining private owner or owners that defines the location of the boundary or boundaries affected by the deposition of the dredged material.

Compliance: The dredged new work material will be used to repair the existing Spillman's Island Placement Area (PA) and to construct levees at the Atkinson Island beneficial use site (Cell M5/M6) as addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995 and Final Consistency Determination dated May 6, 1997. No new sites will be created as a result of this project.

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APPENDIX B

WATER AND

SEDIMENT QUALITY DATA

WATER AND SEDIMENT QUALITY DATA

Sampling of the Barbours Cut Terminal Channel (BTC) for water and sediment chemical analysis was performed on August 2, 2005. Chemical analyses were conducted for several metals, pesticides, polycyclic aromatic hydrocarbons, and other organic compounds to determine the suitability and consistency of the surface sediments in the BTC for performing the work described in this EA.

Sample locations are shown in Figure 1. Tables 1 through 3 show the concentration of detected compunds (ug/L) in water, elutriate, and sediments within the BTC. Table 4 shows the general water quality characteristics for each of the sample locations shown in Figure 1. The data show that detected contaminant levels in all water samples were below applicable EPA Water Quality Criteria, and Texas Surface Water Quality Standards (Table 5).

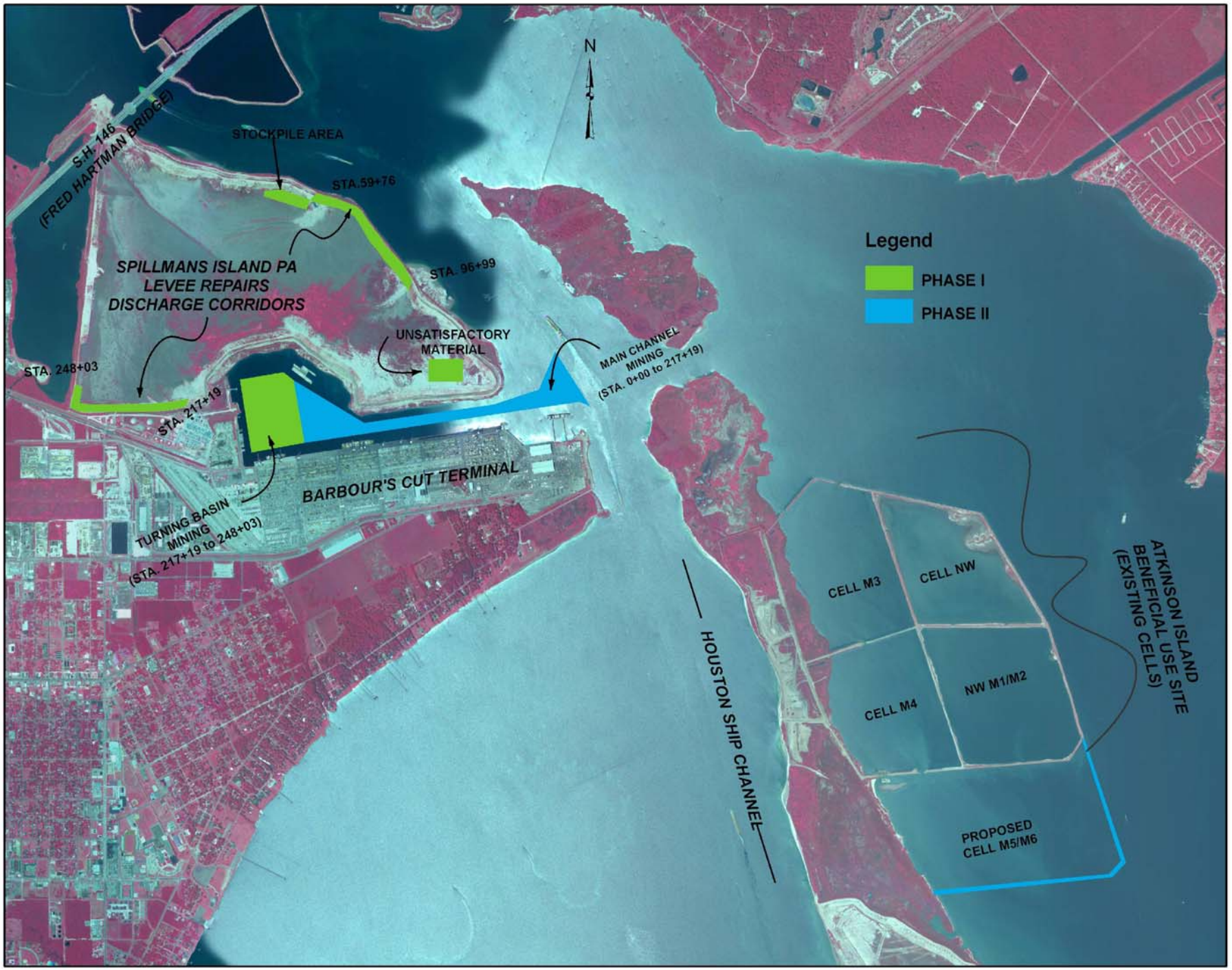

Figure 1. Mining of Barbour's Cut for Spillman's Island Levee Repair and Atkinson Island Beneficial Use Material Site Levee Construction

TABLE 1

CONCENTRATIONS OF DETECTED COMPOUNDS (ug/L)
WATER
HSC - Barbours Cut Terminal Channel

Date Sampled: August 2, 2005

Parameter	WQS**		Detection	H-BT-05										
	Acute	Chronic	Limit	01	02	03	04	04 Dup	05	06	07	08	09	Field Blank
Antimony	N/A	N/A	3.00	1.02 J	4.64	3.37	2.15 J	1.50 J	1.80 J	3.24	2.52 J	2.10 J	1.99 J	BDL
Arsenic	149	78	1.00	3.65	3.93	4.57	3.58	3.51	3.94	5.40	3.94	3.92	3.73	BDL
Beryllium	N/A	N/A	0.20	BDL	BDL	BDL	BDL	BDL	BDL	0.32	BDL	BDL	BDL	BDL
Cadmium	45.4	10.0	1.00	0.25 J	0.56 J	0.23 J	BDL	0.28 J	0.38 J	0.41 J	0.41 J	0.58 J	BDL	BDL
Copper	13.5	3.6	1.00	1.63	0.55 J	1.68	0.98 J	0.98 J	1.12	1.40	1.19	1.17	1.01	BDL
Lead	133	5.3	1.00	0.68 J	0.62 J	0.59 J	0.92 J	0.43 J	1.31	1.00	1.43	1.07	1.13	BDL
Nickel	118	13.1	1.00	1.50	BDL	0.60 J	0.31 J	0.38 J	0.36 J	0.70 J	0.43 J	0.44 J	0.43 J	BDL
Selenium	564	136	2.00	1.13 J	1.80 J	1.68 J	2.23	2.07	1.83 J	1.67 J	2.17	1.89 J	1.72 J	BDL
Thallium	N/A	N/A	1.00	BDL	0.48 J	0.34 J	0.23 J	0.24 J	0.15 J	0.73 J	0.40 J	0.45 J	0.16 J	BDL
Zinc	92.7	84.2	1.00	1.57	2.06	1.96	1.98	1.83	2.13	3.68	2.43	3.06	1.63	BDL
Ammonia*	N/A	N/A	0.03	0.16	0.13	0.10	0.12	0.13	0.14	0.17	0.18	0.10	0.13	N/A
TOC*	N/A	N/A	0.10	6.70	5.90	7.00	7.40	7.70	6.10	8.30	6.70	6.10	7.70	N/A

Dup = Duplicate Sample
BDL = Below Detection Limits
* mg/L
** Texas Water Quality Standards for Saltwater

TABLE 2

CONCENTRATIONS OF DETECTED COMPOUNDS (ug/L)
ELUTRIATE
HSC - Barbours Cut Terminal Channel

Date Sampled: August 2, 2005

Parameter	WQS**		Detection	H-BT-05									
	Acute	Chronic	Limit	01	02	03	04	04 Dup	05	06	07	08	09
Antimony	N/A	N/A	3.00	5.65	2.67 J	1.86 J	1.15 J	0.80 J	1.45 J	1.05 J	1.00 J	1.12 J	0.85 J
Arsenic	149	78	1.00	5.20	1.72	5.75	3.11	3.87	4.09	3.99	3.30	3.82	4.17
Beryllium	N/A	N/A	0.20	BDL	0.40	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium	45.4	10.0	1.00	0.33 J	0.42 J	0.50 J	BDL	0.37 J	BDL	BDL	0.27 J	0.56 J	BDL
Copper	13.5	3.6	1.00	0.41 J	0.32 J	0.58 J	0.44 J	0.73 J	0.49 J	0.66 J	BDL	1.03	0.32 J
Lead	133	5.3	1.00	0.89 J	1.39	0.97 J	0.63 J	BDL	0.31 J	BDL	BDL	0.31 J	BDL
Nickel	118	13.1	1.00	1.62	6.44	2.22	1.99	0.66 J	1.32	BDL	0.45 J	0.41 J	1.09
Selenium	564	136	2.00	1.48 J	1.32 J	1.58 J	1.83 J	1.54 J	1.65 J	2.12	1.63 J	2.00	1.34 J
Silver	2	N/A	1.00	0.39 J	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Thallium	N/A	N/A	1.00	0.60 J	0.75 J	0.21 J	0.16 J	BDL	0.12 J	BDL	0.23 J	0.14 J	0.35 J
Zinc	92.7	84.2	1.00	4.58	3.89	2.28	3.52	1.85	1.53	0.94 J	5.76	8.89	3.03
Ammonia*	N/A	N/A	0.03	0.37	0.64	0.52	0.29	0.24	0.20	0.38	0.67	0.51	0.52
TOC*	N/A	N/A	0.10	8.90	8.30	9.30	8.60	10.1	8.90	5.75	8.90	6.72	5.74

TABLE 3

CONCENTRATIONS OF DETECTED COMPOUNDS (dry weight)
SEDIMENT
HSC - Barbours Cut Terminal Channel

Date Sampled: August 2, 2005

Parameter	Units	Detection Limit	NOAA ERL	H-BT-05 01	02	03	04	04 Dup	05	06	07	08	09
Arsenic	mg/kg	0.30	8.2	5.66	6.81	4.98	5.82	6.30	6.10	6.12	5.16	4.93	5.86
Cadmium	mg/kg	0.10	1.2	BDL	BDL	BDL	BDL	BDL	0.63	BDL	BDL	BDL	BDL
Chromium, Total	mg/kg	1.00	81.0	16.7	20.2	15.3	18.3	21.2	19.7	21.3	18.3	15.4	20.4
Chromium III	mg/kg	1.00	N/A	16.7	20.2	15.3	18.3	21.2	19.7	21.3	18.3	15.4	20.4
Copper	mg/kg	1.00	34.0	12.9	16.8	12.6	14.0	17.7	17.2	17.3	15.5	14.2	17.3
Lead	mg/kg	0.30	46.7	19.7	23.2	17.4	21.5	23.7	22.0	25.3	20.9	24.1	22.5
Nickel	mg/kg	0.50	20.9	14.2	16.4	12.7	14.9	16.1	16.20	16.9	14.5	14.8	16.0
Selenium	mg/kg	0.50	N/A	0.27 J	0.33 J	BDL	BDL	0.28 J	0.30 J	0.30 J	0.29 J	0.24 J	0.30 J
Thallium	mg/kg	0.20	N/A	0.37	0.46	0.27	0.24	0.19 J	0.21	0.21	0.18 J	0.14 J	0.17 J
Zinc	mg/kg	2.00	150	18.6	23.3	21.3	22.1	24.3	24.2	25.2	23.5	25.70	29.2
Ammonia	mg/kg	0.10	N/A	194	64.1	62.5	203	253	274	233	217	194	269
TOC	%	0.10	N/A	0.91	0.86	0.98	0.93	1.08	0.91	0.91	0.82	0.66	1.08
Percent Solids	%	0.10	N/A	37.5	32.5	37.7	33.3	32.4	33.1	33.0	34.1	42.4	29.7
Gravel	%	N/A		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Sand	%	N/A		7.1	3.0	10.2	3.7	2.9	1.1	5.2	4.9	14.0	3.6
Silt	%	N/A		29.1	15.2	19.9	20.1	15.1	12.7	16.7	16.7	22.8	22.7
Clay	%	N/A		63.8	81.8	69.9	76.2	82.0	86.2	78.1	78.4	62.4	73.7
D50	mm	N/A		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Dup = Duplicate Sample
BDL = Below Detection Limit

TABLE 4

WATER QUALITY DATA

Project: **HSC - Barbours Cut Terminal Ch.** Task Order #:

Date(s) Collected: 02 August 2005 Tide, MLT: +0.9'@14:12

Wind Direction: SE Wind Speed: 5-7

Weather and Water Conditions: Sunny, 30% cloud cover, 33°C, water calm

Sample Number	H-BT-05-01A	H-BT-05-01B	H-BT-05-01C	H-BT-05-02A	H-BT-05-02B	H-BT-05-02C	H-BT-05-03A	H-BT-05-03B	H-BT-05-03C
Station	14+00	14+00	14+00	24+00	24+00	24+00	34+00	34+00	34+00
Distance From C_L (Ft.)	100' S	0	500' N	100' S	0	300' N	100' S	0	100' N
Water Depth MLT (Ft.)	48.0	47.9	42.0	47.8	42.2	45.0	46.9	45.8	44.3
DO (mg/L)[1]	--	--	--	--	--	--	--	--	--
pH	8.02	8.07	7.95	8.19	8.43	8.26	8.39	8.22	7.93
Salinity ($^{o}/_{oo}$)	17.34	17.76	17.45	17.10	17.53	17.44	17.82	18.05	17.70
Water Temp. (°C)	31.63	31.41	31.42	32.36	31.75	31.86	32.00	31.94	32.11
Air Temp. (°C)	33.9	33.7	31.6	32.5	32.9	32.10	32.6	32.6	32.10
Lat.									
Long.									
Time	1356.00	1406.00	1436.00	1445.00	1458.00	1452.00	1515.00	1521.00	1510.00
Comment									

REMARKS: [1] Due to electronic failure DO was not collected during this field survey.

TABLE 4, continued

WATER QUALITY DATA

Project: **HSC - Barbours Cut Terminal Ch.** Task Order #:

Date(s) Collected: 02 August 2005 Tide, MLT: +0.9'@14:12

Wind Direction: SE Wind Speed: 5-7

Weather and Water Conditions: Sunny, 30% cloud cover, 33°C, water calm

Sample Number	H-BT-05-04A	H-BT-05-04B	H-BT-05-04C	H-BT-05-05A	H-BT-05-05B	H-BT-05-05C	H-BT-05-06A	H-BT-05-06B	H-BT-05-06C
Station	44+00	44+00	44+00	54+00	54+00	54+00	64+00	64+00	64+00
Distance From C_L (Ft.)	100' S	0	100' N	100' S	0	100' N	100' S	0	100' N
Water Depth MLT (Ft.)	44.9	45.6	45.4	46.2	49.5	43.9	49.9	49.9	42.7
DO (mg/L)	--	--	--	--	--	--	--	--	--
pH	7.98	8.28	8.51	7.98	8.19	8.15	8.52	8.11	8.58
Salinity ($^{o}/_{oo}$)	18.20	18.37	17.93	18.22	18.30	18.32	17.84	18.31	18.16
Water Temp. (°C)	31.94	31.85	32.07	32.18	32.02	32.00	32.90	31.69	31.90
Air Temp. (°C)	32.4	31.8	33.1	32.8	32.00	33.00	32.4	32.3	33.10
Lat.									
Long.									
Time	1538	1548	1544	1612	1622	1616	1648	1707	1656
Comment	DUP	DUP	DUP						

REMARKS: [1] Due to electronic failure DO was not collected during this field survey.

TABLE 4, continued

WATER QUALITY DATA

Project: **HSC - Barbours Cut Terminal Ch.** Task Order #:

Date(s) Collected: 02 August 2005 Tide, MLT: +0.9'@14:12

Wind Direction: SE Wind Speed: 5-7

Weather and Water Conditions: Sunny, 30% cloud cover, 33°C, water calm

Sample Number	H-BT-05-07A	H-BT-05-07B	H-BT-05-07C	H-BT-05-08A	H-BT-05-08B	H-BT-05-08C	H-BT-05-09A	H-BT-05-09B	H-BT-05-09C
Station	74+00	74+00	74+00	84+00	84+00	84+00	84+00	84+00	84+00
Distance From C_L (Ft.)	100' S	0	800' N	100' S	0	100' N	900' N	1,000' N	1,100' N
Water Depth MLT (Ft.)	46.5	47.3	41.5	47.3	46.8	46.5	43.2	43.1	42.0
DO (mg/L)	--	--	--	--	--	--	--	--	--
pH	8.48	8.21	8.19	8.35	8.65	8.40	8.49	8.59	8.78
Salinity ($^{o}/_{oo}$)	18.35	18.34	18.26	18.18	18.03	18.01	18.08	17.87	17.86
Water Temp. (°C)	31.73	31.86	31.71	32.41	32.67	32.61	32.36	32.93	33.01
Air Temp. (°C)	33.6	33.3	32.7	32.6	32.2	32.1	32.1	31.8	31.7
Lat.									
Long.									
Time	1720	1724	1714	1744	1756	1750	1810	1821	1815
Comment									

REMARKS: [1] Due to electronic failure DO was not collected during this field survey.

TABLE 5

Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
Metals[e]		
	mg/kg	**µg/l**
Antimony	2.5	3 (0.02)[c]
Arsenic	0.3[b]	1 (0.005)[c]
Beryllium	1[b]	0.2
Cadmium	0.1	1 (0.01)[c]
Chromium (total)	1[b]	1
Chromium (3+)	1	1
Chromium (6+)	1	1
Copper	1[b]	1 (0.1)[c]
Lead	0.3[b]	1 (0.02)[c]
Mercury	0.2	0.2 (0.0002)[c]
Nickel	0.5[b]	1 (0.1)[c]
Selenium	0.5[b]	2
Silver	0.2	1 (0.1)[c]
Thallium	0.2	1 (0.02)[c]
Zinc	2[b]	1 (0.5)[c]
Conventional/Ancillary Parameters		
	mg/kg	**mg/l**
Ammonia	0.1	0.03
Cyanides	2	0.1[d]
Total Organic Carbon	0.1%	0.1%
Total Petroleum Hydrocarbons	5	0.1
Grain Size	1%	-
Total Solids/Dry Weight	0.1%	-
LPAH Compounds		
	µg/kg	**µg/l**
Naphthalene	20	0.8[b]
Acenaphthylene	20	1.0[b]
Acenaphthene	20	0.75[b]
Fluorene	20	0.6[b]
Phenanthrene	20	0.5[b]
Anthracene	20	0.6[b]

Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
HPAH Compounds		
	µg/kg	**µg/l**
Fluoranthene	20	0.9[b]
Pyrene	20	1.5[b]
Benzo(a)anthracene	20	0.4[b]
Chrysene	20	0.3[b]
Benzo(b&k)fluoranthene	20	0.6[b]
Benzo(a)pyrene	20	0.3[b]
Indeno[1,2,3-c,d]pyrene	20	1.2[b]
Dibenzo[a,h]anthracene	20	1.3[b]
Benzo[g,h,i]perylene	20	1.2[b]
Organonitrogen Compounds		
	µg/kg	**µg/l**
Benzidine	5	1
3,3-Dichlorobenzidine	300[b]	3[b]
2,4-Dinitrotoluene	200[b]	2[b]
2,6-Dinitrotoluene	200[b]	2[b]
1,2-Diphenylhydrazine	10	1
Nitrobenzene	160[b]	0.9[b]
N-Nitrosodimethyl amine	-	3.1[b]
N-Nitrosodi-n-propylamine	150[b]	0.9[b]
N-Nitrosodiphenylamine	20	2.1[b]
Phthalate Esters		
	µg/kg	**µg/l**
Dimethyl Phthalate	50	1[b]
Diethyl Phthalate	50	1[b]
Di-n-butyl Phthalate	50	1[b]
Butyl Benzyl Phthalate	50	4[b]
Bis[2-ethylhexyl] Phthalate	50	2[b]
Di-n-octyl Phthalate	50	3[b]
Phenols/Substituted Phenols		
	µg/kg	**µg/l**
Phenol	100	10
2,4-Dimethylphenol	20	10
Pentachlorophenol	100	50
2,4,6-Trichlorophenol	140[b]	0.9[b]
4-Chloro-3-methylphenol	140[b]	0.7[b]

Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
2-Nitrophenol	200[b]	2[b]
4-Nitrophenol	500[b]	5[b]
2,4-Dinitrophenol	500[b]	5[b]
2-Chlorophenol	110[b]	0.9[b]
2,4-Dichlorophenol	120[b]	0.8[b]
4,6-Dinitro-o-cresol	600	10
Polychlorinated Biphenyls		
	µg/kg	**µg/l**
Total PCB	1	0.01
Pesticides		
	µg/kg	**µg/l**
Aldrin	3[b]	0.03[b]
Chlordane and Derivatives	3[b]	0.03[b]
Dieldrin	5[b]	0.02
4,4'-DDD	5[b]	0.1
4,4'-DDE	5[b]	0.1
4,4'-DDT	5[b]	0.1
Endosulfan and Derivatives	5[b]	0.1
Endrin and Derivatives	5[b]	0.1
Heptachlor and Derivatives	3[b]	0.1
Alpha-BHC	3[b]	0.03
Beta-BHC	3[b]	0.03
Delta-BHC	3[b]	0.03
Gamma-BHC (Lindane)	3[b]	0.1
Toxaphene	50	0.5
Chlorinated Hydrocarbons		
	µg/kg	**µg/l**
1,3-Dichlorobenzene	20	0.9[b]
1,4-Dichlorobenzene	20	1[b]
1,2-Dichlorobenzene	20	0.8[b]
1,2,4-Trichlorobenzene	10	0.9[b]
Hexachlorobenzene	10	0.4[b]
2-Chloronapthalene	160[b]	0.8[b]
Hexachlorocyclopentadiene	300[b]	3.0[b]
Hexachloroethane	100	0.9[b]
Hexachlorobutadiene	20	0.9[b]

Target Detection Levels[a] (TDLs) for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
Halogenated Ethers		
	µg/kg	**µg/l**
Bis(2-chloroethyl)ether	130[b]	0.9[b]
4-chlorophenyl phenyl ether	170[b]	0.6[b]
4-Bromophenyl phenyl ether	160[b]	0.4[b]
Bis(2-chloroisopropyl)ether	140[b]	0.7[b]
Bis(2-chloroethoxy)methane	130[b]	1[b]
Miscellaneous		
	µg/kg	**µg/l**
Isophorone	10	1

[a]The primary source of these TDLs was EPA 823-B-95-001, *QA/QC Guidance for Sampling and Analysis of Sediments, Water and Tissues for Dredged Material Evaluations.*

[b]These values are based on recommendations from the EPA Region 6 Laboratory in Houston; these values were based on data or other technical basis.

[c]The values in parentheses are based on EPA "clean techniques", (EPA 1600 series methods) which are applicable in instances where other TDLs are inadequate to assess EPA water quality criteria.

[d]This value recommended by Houston Lab using colorimetric method.

[e]Metals shall be expressed as Dissolved values in water samples, except for mercury and selenium, which shall be reported as Total Recoverable Concentrations.

APPENDIX C

COORDINATION

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

May 30, 2006

Mr. Brian Cain
U.S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, Tx 77058

Dear Mr. Cain:

As part of the Houston Galveston Navigation Channel Project, the U.S. Army Corps of Engineers in conjunction with the Port of Houston will mine Barbour's Terminal Channel (BTC) to a depth of – 60 Mean Low Tide. New work material will used to repair levees at Spilman Island Placement Area and to construct levees for the creation of Cells M5 and M6 at Atkinson Island, located along the Houston Ship Channel in upper Galveston Bay, Harris and Chambers Counties, Texas.

To ensure compliance with the requirements of Section 7 of the Endangered Species Act, a list is requested of any species that are listed or proposed to be listed as threatened or endangered within your jurisdiction of the BTC, and has the potential to be affected by the mining of new work material from BTC (map enclosed).

Your assistance with our coordination responsibilities is appreciated. If you have any questions, please contact Ms. Natalie Rund by phone at 409-766-6384 or by e-mail at Natalie.A.Rund@swg02.usace.army.mil.

Sincerely,

Carolyn Murphy
Chief, Environmental Branch

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

May 30, 2006

Mr. David Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Dear Mr. Bernhart:

As part of the Houston Galveston Navigation Channel Project, the U.S. Army Corps of Engineers in conjunction with the Port of Houston will mine Barbour's Terminal Channel (BTC) to a depth of – 60 Mean Low Tide. New work material will used to repair levees at Spilman Island Placement Area and to construct levees for the creation of Cells M5 and M6 at Atkinson Island, located along the Houston Ship Channel in upper Galveston Bay, Harris and Chambers Counties, Texas.

To ensure compliance with the requirements of Section 7 of the Endangered Species Act, a list is requested of any species that are listed or proposed to be listed as threatened or endangered within your jurisdiction of the BTC, and has the potential to be affected by the mining of new work material from BTC (map enclosed).

Your assistance with our coordination responsibilities is appreciated. If you have any questions, please contact Ms. Natalie Rund by phone at 409-766-6384 or by e-mail at Natalie.A.Rund@swg02.usace.army.mil.

Sincerely,

Carolyn Murphy
Chief, Environmental Branch

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5312, Fax 824-5309
http://sero.nmfs.noaa.gov

JUN 19 2006

Dear Colleague:

Pursuant to section 7(a)(2) of the Endangered Species Act (ESA), the Protected Resources Division of NOAA's National Marine Fisheries Service (NMFS) has reviewed your letter regarding the Houston Galveston Navigation Channel Project (Barbour's Terminal Channel).

___**There are no ESA-listed species** or designated critical habitat under our purview in the action area.

___**We cannot determine** impacts to threatened or endangered species, or designated critical habitat, under NOAA Fisheries purview because the letter lacks sufficient information to evaluate the project.
Enclosed are guidelines to conduct a proper biological evaluation.

___**Please provide a letter** from the lead federal action agency designating you to conduct ESA section 7 consultation with this office.

_X__**Enclosed is a list** of federally-protected species under the jurisdiction of NMFS for the state of Texas. Biological information on federally-protected species and candidate species can be found at the following website addresses: http://www.nmfs.noaa.gov/prot_res/prot_res.html; http://www.cccturtle.org;. http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm); http://endangered.fws.gov/wildlife.html#Species; http://www.cmc-ocean.org/main.php3; http://floridaconservation.org/psm/turtles/turtle.htm; ttp://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm; Gulf sturgeon critical habitat rule and maps (http://alabama.fws.gov/gs/).

__ **It is NMFS' opinion that the project will have no effect** on listed species or critical habitat protected by the ESA under NOAA Fisheries purview. No further consultation with NOAA Fisheries pursuant to section 7(a)(2) of the ESA is required unless the project description changes.

Consultation with NMFS' Habitat Conservation Division (HCD), pursuant to the Magnuson-Stevens Fishery Conservation and Management Acts requirements for essential fish habitat consultation, may be required. Please contact HCD at (727) 824-5317. If you have any ESA questions, please contact consulting biologist, _____, (727) 824- 5312 or by e-mail at _____ or our ESA section 7 coordinator, Eric Hawk, at the same number or by e-mail at eric.hawk@noaa.gov.

Sincerely,

Teletha Mincey

Teletha Mincey
Assistant Support Assistant
Protected Resources Division

Enclosure

File: 1514-22 F.1 TX

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

July 21, 2006

REPLY TO THE ATTENTION OF
Environmental Section

Mr. Rusty Swafford
Habitat Conservation Division
National Marine Fisheries Service
4700 Avenue U
Galveston, Texas 77550

Dear Mr. Swafford:

Please find enclosed a copy of the Barbour's Terminal Channel (BTC) Draft Environmental Assessment (DEA) that addresses the mining of new work material from the BTC to repair levees at Spillman's Island Placement Area and to construct levees for the creation of beneficial use Cell M5/M6 at Atkinson Island, located along the Houston Ship Channel in upper Galveston Bay, Harris County. This EA initiates Essential Fish Habitat (EFH) coordination.

Sections 3.4.1 and 4.3.1 of the EA discuss EFH issues. The EA concludes that there will be no impact to EFH because the impact area is a deep-draft navigation channel, while managed species tend to use shallow water estuaries for feeding and spawning. In addition, due to limited flushing and periodic dredging in the area, the BTC is not likely to present suitable habitat for EFH species or their prey.

We request your concurrent that the proposed action will not adversely impact EFH. Your comments are requested by August 7, 2006, which is the close of the public comment period. If you have any questions, please contact Ms. Natalie Rund at 409-766-6384.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

July 21, 2006

Environmental Section

Mr. David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701-5511

Dear Mr. Bernhart:

Please find enclosed a copy of the Draft Environmental Assessment (DEA) that addresses the mining of the Barbour's Terminal Channel (BTC) to obtain new work material to repair levees at Spillman's Island Placement Area and to construct levees for the creation of beneficial use Cell M5/M6 at Atkinson Island. The BTC, a side channel of the Houston Ship Channel, is located in upper Galveston Bay, Harris County, Texas. As discussed in the EA, the EA concludes that mining the BTC for new work material will have no effect on Federally listed threatened or endangered species.

This DEA is being provided for your agency's review and comment during the 15-day review period in accordance with the National Environmental Policy Act (NEPA) and for your review of the Biological Assessment (BA) attached to the DEA in Appendix D in accordance with the Endangered Species Act. Your comments on the DEA are requested by August 7, 2006, the close of the public comment period. If you have any questions, please contact Ms. Natalie Rund at 409-766-6384.

Sincerely,

for Carolyn Murphy
Chief, Environmental Section

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

July 21, 2006

REPLY TO THE ATTENTION OF

Environmental Section

Mr. Tom Calnan
Coastal Biologist
Texas General Land Office
1700 N. Congress Ave.
Austin, Tx 78703

Dear Mr. Calnan:

Pursuant to 31 TAC §506.20, Consistency Determination for Federal Agency Activities and Development Projects of the Texas Coastal Management Program, please find enclosed a copy of the Barbour's Terminal Channel (BTC) Draft Environmental Assessment (DEA), with the Consistency Determination that addresses the mining effort of the BTC to obtain new work material to repair levees at Spillman's Island Placement Area and to construct levees for the creation of beneficial use Cell M5/M6 at Atkinson Island. The BTC, a side channel of the Houston Ship Channel, is located in upper Galveston Bay, Harris County, Texas. The U.S. Army Corps of Engineers finds that the proposed action addressed in the DEA is consistent with the goals and policies of the Texas Coastal Management Program. The consistency determination may be found in the DEA in Appendix A.

We request that you initiate consistency review of this project based on our Consistency Determination. If you have any questions, please contact Ms. Natalie Rund at 409-766-6384.

Sincerely,

for Carolyn Murphy
Chief, Environmental Section

Enclosure

APPENDIX D

BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT FOR FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

MINING OF BARBOUR'S CUT FOR SPILLMAN'S ISLAND LEVEE REPAIR AND ATKINSON ISLAND BENEFICIAL USE MATERIAL SITE LEVEE CONSTRUCTION HARRIS COUNTY, TEXAS

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) is being prepared for the purpose of fulfilling the U.S. Army Corps of Engineers (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. The proposed Federal action is mining approximately 2.5 million cubic yards (CY) of new work material from the Barbour's Cut Terminal Channel (BTC) for levee repair at Spillman's Island upland placement area (PA) and for marsh cell levee construction at the Houston-Galveston Navigation Channels (H-GNC) Project Atkinson Island beneficial use (BU) site (Figure 1). The use of dredged material to maintain levees at Spillman's Island Placement Area (PA) and to construct levees at Atkinson Island (Cell M5/M6) was addressed in the 1995 Supplemental Environmental Impact Statement (SEIS) dated November 1995.

This BA is being prepared to assist the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) personnel in fulfilling their obligations under the ESA.

1.2 DESCRIPTION OF THE PROPOSED PROJECT

The proposed mining of the BTC is located at Morgan's Point in La Porte, Harris County, Texas. The mining of BTC and discharge of new work material at Spillman's Island PA and Atkinson Island will be accomplished using a cutterhead dredge and will occur in two phases.

Phase I involves mining the BTC turning basin from its current depth of -40 feet MLT to -53 feet MLT to obtain approximately 600,000 CY of new work material to repair 6,800 linear feet (lf) of failed levee at two locations at Spillman's Island PA. The material will be

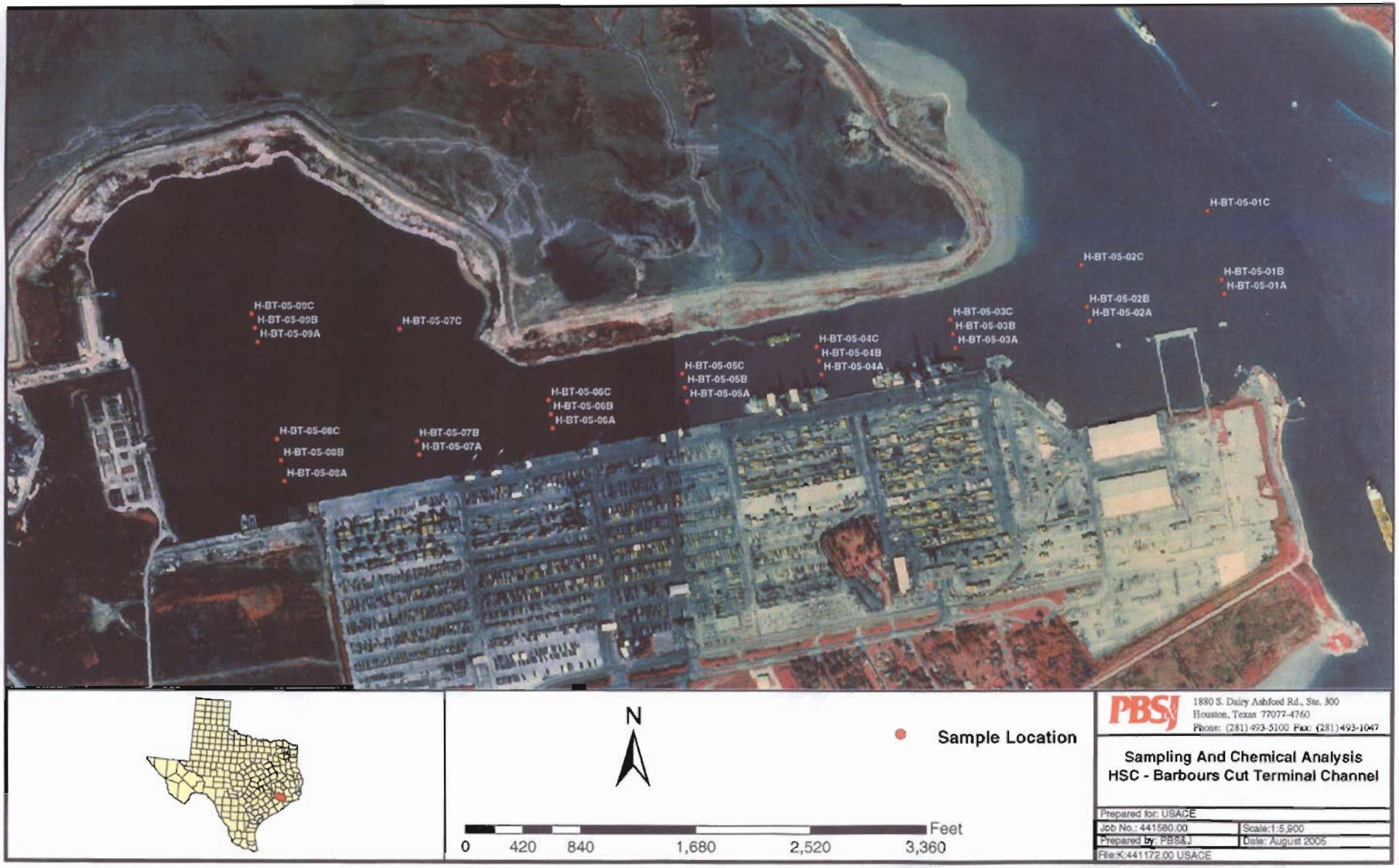

FIGURE 1. Sample Locations for Water and Sediment Analyses in the Barbours Cut Terminal Channel, Harris County, Texas

placed in discharge corridors from Station 217+19 to 248+03 located along the southwest perimeter of Spillmans Island PA just north of the BTC turning basin and from Station 59+75 to 96+99 located along the northeast perimeter of Spillman's Island PA, just east of the Houston Ship Channel (HSC). Material will be discharged beyond the existing berm to prevent material from flowing back into the BTC turning basin and the HSC.

Phase II involves mining the main channel of the BTC from its current depth of -42 feet MLT to a depth of -60 feet MLT to obtain approximately 1.9 million CY of material for the construction of 8,000 lf of levee to create a 320-acre marsh cell (Cell M5/M6) at the H-GNC Atkinson Island BU site. The levees for Cell M5/M6 will be constructed in the same manner as the existing beneficial use cells identified as Cells NW, M1/M2, M3 and M4 located to the north. Most of the material is expected to settle out within about 250 feet of the discharge point, with the coarser-grained material settling within the first 100 feet. These distances depend on the grain-size distribution of the dredged material.

2.0 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

The project area is in the coastal vicinity of Harris County, Texas. The USFWS and NMFS consider the endangered or threatened species contained in Table 1 as possibly occurring in this county. No other species, and no designated or proposed critical habitat under their jurisdictions were identified as possibly occurring in the BTC project vicinity.

TABLE 1
Federally-Listed Threatened, Endangered, and Species of Concern for Harris County, Texas

Common Name	Scientific Name	Listing Status
BIRDS		
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
FISH		
Smalltooth Sawfish	*Pristis pectinata*	Endangered
MARINE MAMMALS		
Blue Whale	*Balaenoptera musculus*	Endangered
Finback Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered

TABLE 1 (Cont'd.)
Federally-Listed Threatened, Endangered, and Species of Concern
for Harris County, Texas

Common Name	Scientific Name	Listing Status
Sperm Whale	*Physeter catodon*	Endangered
REPTILES		
Green Sea Turtle	*Chelonia mydas*	Threatened
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
PLANTS		
Texas Prairie-dawn Flower	*Hymenoxys texana*	Endangered

Source: Source: US Fish & Wildlife Service, Southwest Region Ecological Services Threatened and Endangered Species Website List for Harris County, Texas, http://www.fws.gov/ifw2es/EndangeredSpecies/lists/ListSpecies.cfm, accessed July 13, 2006. National Marine Fisheries Service, letter dated June 19, 2006.

2.1 BALD EAGLE

The bald eagle is the second largest North American bird of prey with an average 7-foot wingspan. It has a distinctive white head and white tail offset against a dark brown body and wings in adult birds. Females are about 25% larger than males; sexes are otherwise similar in appearance. Bald eagles are opportunistic foragers and diet varies across the range based on prey species available. They prefer fish, but will eat a great variety of mammals, amphibians, crustaceans, and birds, including many species of waterfowl.

The current range of the bald eagle includes all of the conterminous United States and Alaska. The bald eagle is especially common in areas with large expanses of aquatic habitat where they prefer coastal areas, river, lakes, and reservoirs with forested shorelines or cliffs for breeding, selecting large, super-canopy roost trees that are open and accessible, mostly conifers. They winter primarily in coastal estuaries and river systems of the lower 48 states and Alaska. (USFWS, 2006B)

Foraging and nesting bald eagles are common along the Texas Coast and may be

found in the project area.

2.2 SMALLTOOTH SAWFISH

Smalltooth sawfish are generally slow growing, long lived (25-30 years), late-maturing fish. They produce a very small number of young, resulting in a very low rate of population growth for these species. Smalltooth sawfish species inhabit shallow coastal nearshore waters and estuaries throughout tropical regions of the world. They are often found in sheltered bays, on shallow banks, and in estuaries or river mouths.

The U.S. smalltooth sawfish population is found only in the Atlantic Ocean and Gulf of Mexico. Historically, the U.S. population was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to Cape Hatteras. Once common throughout its historic range, the smalltooth sawfish has declined dramatically in U.S. waters over the last century. Its current range is contracted to peninsular Florida, where they are relatively common only in the Everglades region of the extreme southern portion of the state (NMFS, 2006). Based on its present range, it is unlikely that this species occurs in the project vicinity.

2.3 WHALE SPECIES

The five species of whales listed by the NMFS are known to occur in waters off the Texas coast. Only eight whale strandings were reported through 1992 (USEPA, 1992). Of the eight stranded whales, seven were identified by the NMFS. Five were sperm whales, one was a right whale, and one was a fin whale. Whales are open-ocean species and would not be expected to enter the shallow waters of the project site. Historical records indicate that it is unlikely that any of these species will appear within the project area.

2.4 SEA TURTLES

Of the five species of endangered and threatened sea turtles known to occur in the Gulf, only the green, Kemp's Ridley, and loggerhead normally enter bays. None of these species are likely to occur in the proposed project area.

The loggerhead sea turtle frequents the temperate waters of the continental shelf along the Atlantic Ocean and Gulf of Mexico, where it forages around rocks, coral reefs, and shellfish beds. Sub-adults will also commonly enter bays, lagoons, and estuaries. There are scattered records of loggerhead sea turtles within the Texas bays, all of which

were subadults. Juvenile or subadult green sea turtles are known to inhabit lagoon waters and bays along the Florida and Texas coasts.

The Kemp's ridley sea turtle is the most critically endangered sea turtle. The primary range of the Kemp's ridley sea turtle is the Gulf of Mexico, but it also utilizes shallow water bays throughout its known distribution. Distribution appears closely related to the abundance of blue crabs, a favorite food item (Lutcavage and Musick, 1985). A favorite feeding ground is the crab-rich waters adjacent to the Mississippi Delta, east of Sabine Pass (Hildebrand, 1979).

The hawksbill turtle, listed as endangered by the NMFS, is rare in Texas coastal waters. Adults are extremely rare, and Hildebrand (1983) believes that the hawksbills occurring in Texas waters are waifs. This species is not likely to be found in the project vicinity.

The leatherback turtle is rare along the Texas coast. This is not surprising because the leatherback is generally considered to be a pelagic species, tending to keep to deeper offshore waters, where it feeds primarily on jellyfish. Fritts *et al*. (1983), however, found this turtle more frequently in shallower waters in the Gulf than previously supposed. The last report of a leatherback nest in Texas was more than 55 years ago (USEPA, 1992). There are no known aggregation sites or feeding areas in the project area. Therefore, this species is not likely to be found in the project vicinity.

2.5 TEXAS PRAIRIE DAWN-FLOWER

Texas prairie dawn-flower is a delicate annual plant measuring from one to six inches tall. Its yellow flower heads, less than 1/2 inch in diameter, stand out brightly in the patches of dull gray barren sand in which the species is normally found. Suitable habitat is limited to a very small geographic area. As a result, Texas prairie dawn was not encountered by botanists for almost 100 years after its original discovery, and was thought to be extinct. It flowers from March to early April, disappearing by mid-summer. (TPWD, 2006).

This wildflower is found in Fort Bend and Harris Counties, southeast Texas. It is known to occur at about 50 sites, many within Addicks and Barker Reservoirs in western Harris County. It grows in sparsely vegetated areas ("slick spots") at the base of small mounds of dirt known as mima mounds (also called pimple mounds) or other nearly barren areas on slightly saline soils in coastal prairie grasslands. (TPWD, 2006).

Suitable habitat for the Texas prairie dawn-flower is not located in the BTC vicinity. The dredging site is a navigation channel that contains only deepwater aquatic habitat.

3.0 EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

3.1 BALD EAGLE

Bald eagles are common along the Texas Coast and may be found in the project area. However, the dredging site is a navigation channel that contains only deepwater aquatic habitat. Therefore, it is determined that the proposed project will have no effect on this species.

3.2 SMALLTOOTH SAWFISH

Based on its present range, it is unlikely that the smalltooth sawfish occurs in the project vicinity. However unlikely, if the smalltooth sawfish were found to be present in the project vicinity, it is unlikely that the species would venture into the BTC since the channel is a dead end, terminal channel with low productivity limiting prey for this species. Furthermore, the action of the cutterhead dredge would likely discourage the species from entering the BTC during dredging activities. Therefore, it is determined that the proposed project is not likely to adversely affect the smalltooth sawfish.

3.3 EFFECTS ON WHALES

Whales occur in offshore waters and none of these species are likely to wander into shallow coastal estuaries. Therefore, it is determined that the proposed project will have no effect on these species.

3.4 EFFECTS ON SEA TURTLES

While sea turtles may occur in the project area, turtles would not venture into the areas that would receive the dredged material, and no nesting habitat would be affected. Furthermore, dredging would be conducted by cutterhead dredge which has been found to have low potential for affecting sea turtles. Therefore, it is determined that the proposed project will have no effect on these species.

3.5 TEXAS PRAIRIE DAWN-FLOWER

Suitable habitat for the Texas prairie dawn-flower is not located in the BTC vicinity. The dredging site is a navigation channel that contains only deepwater aquatic habitat. Therefore, it is determined that the proposed project will have no effect on this species.

4.0 CONCLUSIONS

The overall conclusion is that the proposed project will have no effect on any federally-listed threatened or endangered species, nor will it adversely modify critical habitat. Although several threatened or endangered species may occur in the project vicinity, no regularly used habitat is known to exist in the immediate project site. Should any of these species wander into the project vicinity, the size and mobility of these animals would allow them to avoid the immediate project site during dredging operations.

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