ANNUAL SEA TURTLE MONITORING REPORT

HOUSTON-GALVESTON NAVIGATION CHANNELS NEW-WORK DREDGING

FISCAL YEAR 2000

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INTRODUCTION

This report is submitted in fulfillment of requirements of the Endangered Species Act and the Section 7 Consultation - Biological Opinion, dated December 7, 1998, concerning Deepening of Galveston Bay Entrance Channel (Houston-Galveston Navigation Channels Project) Using A Hopper Dredge. Specifically this report, summarizing hopper dredging operations in Fiscal Year (FY) 2000, is submitted in compliance with reasonable and prudent measure No. 9 - Reporting.

The following new-work dredging project was undertaken in FY 2000.

Jetty and Entrance Channels October 1, 1999 – March 4, 2000

The use of hopper dredges to construct this navigation project was necessary because of three factors: safety, weather conditions and productivity. These factors are closely interrelated; however, the underlying emphasis is placed on safety. The nearshore Gulf of Mexico is characterized by a wide shallow shelf. A cutterhead dredge operating offshore would require a pipeline length that could extend for several miles.

The dredges operating in this channel must be highly mobile to rapidly maneuver out of the way of other vessels. Pipeline cutterhead dredges are not self-propelled, and are held into position with spuds. Furthermore, the swing of the cutterhead is controlled by cables attached to the cutterhead arm. These cables are anchored along the outer limits of the channel to be dredged. Prior to moving the dredge, tenders must raise the anchors, and a towboat must be fastened to the dredge. These characteristics prevent the pipeline dredge from quickly moving out of the channel when other vessels approach. From a practical standpoint, dredges are generally not relocated for normal ship traffic, rather, dredging may be interrupted, but the dredge remains a stationary obstruction in half of the channel. This situation is encountered in inland bays. The use of hopper dredges in the Gulf avoids such a stationary obstruction.

Weather conditions also affect the safety of the dredge and crew. Pipeline dredges were not designed to operate in open-sea conditions. Due to the reasons stated above, these dredges cannot rapidly demobilize in harsh weather. The pipelines used to transport the dredged material to the placement sites would also be highly susceptible to breaking during rough weather. Even in relatively sheltered bays, cutterhead dredges often stop dredging in rough weather, and during frontal passages, only water is pumped to keep tension on the pipelines to prevent breaking. In the open Gulf of Mexico, this precaution would not be effective, even if it were possible to leave the dredge offshore. During relatively calm weather conditions, only the largest cutterhead dredges would be able to operate efficiently. Sea swells make it difficult to control the depth of the cutterhead; consequently, this affects the dredging operation. To illustrate this point, in 1977, a 27-inch diameter pipeline cutterhead dredge sank near the jetties while dredging the Entrance

Channel of the Port Mansfield project. A frontal passage caused large waves, which battered the dredge, breaking the spud used to secure the vessel. Water entered the dredge through cable ports faster than it could be pumped out. A 27-inch dredge is one of the largest dredges commonly used within the Galveston District.

Productivity of the dredging operation is important because the purpose of dredging is to remove shoals and provide a safe depth for waterborne traffic. The use of pipeline dredges in the open Gulf would result in frequent relocations, or other interruptions, due to weather and traffic conditions. Consequently, it would take longer to remove shoals, which present a hazard to safe navigation. The longer the time to remove the shoals, the longer a dredge must be on site to maintain the channel. The presence of the dredge and pipeline, themselves, present an obstruction to safe navigation. For these reasons, hopper dredges were used exclusively to construct this deep-draft entrance channel.

Due to the quantity of material required to be dredged from this project, it is not feasible to perform all the work within the recommended December 1 through March 31 time frame due to the availability of the hopper dredge fleet. Hopper dredging priorities are developed in concert with other Corps Districts that conduct these operations along the Atlantic and Gulf Coasts. The priorities are determined after considering the dredging needs and resident sea turtle populations within the various Districts. The Inshore segment extending from Bolivar Roads to the end of the jetties, however, was performed between November 15 and April 15, as required by Reasonable and Prudent Measure No. 2 of the Biological Opinion.

TURTLE MONITORING PROGRAM

A result of the consultation process was the requirement to document turtle takes by the dredges. In order to accomplish this task, before hopper dredging operations commenced, they were equipped such that all inflows and overflows would be screened. The configuration and location of the screens depended upon the construction of the dredge. Contract work began with a mixed-mesh configuration. The mesh size of the lower one-foot of the inflow screen was 6"x 6", the remaining screening mesh was 4"x 4". Additionally, around-the-clock monitoring by NMFS-approved turtle inspectors was conducted to identify any turtles or turtle parts that were caught on these screens. Draghead deflectors were also deployed to deflect any turtles that may happen to be in, or near, the path of the draghead during excavation.

The observers inspected and cleaned all inflow and overflow screening at the end of each load. Dragheads and deflectors were also inspected immediately after each load, and dredge personnel were informed if repairs were necessary. Data sheets were completed daily, detailing all biological samples and debris found in the screening and dragheads. The observers also recorded the start, end and discharge times for each load, the specific location of the dredging area, the type of material being dredged, weather, tide and water temperature data, the condition of the screening, and any other pertinent information. Any sea turtle encounters or takes were described on a separate incident report form. Additionally, all incidents were photographed and diagrams were made of the specimen sampled. Dead specimens were frozen until all concerned

parties were notified. Specimens were then weighted with scrap iron and disposed of at the dredged material placement site, thereby ensuring that these same samples would not wash ashore or be taken again by the dredge.

A bridge watch for sea turtles and marine mammals was maintained during all daylight hours, except when the observer was off the bridge, cleaning and inspecting the screens and dragheads. All sightings of cetaceans and sea turtles were recorded in a bridge watch logbook.

PROJECTS

Jetty and Entrance Channels

The channel construction conducted during this fiscal year was a continuation of the work that commenced on September 3, 1999, when contract hopper dredges began work on the Jetty and Entrance Channel segments of the Houston-Galveston Navigation Channels Project. Contract specifications required dredging an estimated 7,308,100 cubic yards (CY) of new-work clay material. The required depth of dredging was 47 feet below Mean Low Tide (MLT, Corps of Engineers Datum) along the Bolivar Roads Channel to Station 23+800 of the Outer Bar Channel. The remainder of the Outer Bar Channel and Entrance Channel were dredged to 49 feet MLT. All dredging provided for 2 feet of allowable overdepth.

Dredging began on September 3, 1999, and was completed on March 4, 2000. Three dredges were employed under this contract, they were the *Manhattan Island, Eagle I,* and *B.E. Lindholm*. The *Manhattan Island* worked from September 3, 1999 until November 24, 1999 dredging 565 loads; the *Eagle I* worked from September 21, 1999 until February 16, 2000 dredging 1,010 loads; and the *B.E. Lindholm* worked from January 28, 2000 until March 4, 2000, and dredged 221 loads of material. A total of 1,796 loads of dredged material were collected and deposited into Placement Area No. 1-A. Of this total, 1,511 loads were collected during FY 2000. Dredging was performed between Stations 0+000 along the Bolivar Roads Channel and 56+000 along the Entrance Channel. A total of 7,532,676 CY of material were excavated from this project, of which approximately 7,005,389 CY were dredged during the FY 2000.

The dredges were equipped with rigid draghead turtle deflectors, and 100% overflow screening with a 4-inch square mesh. The *Manhattan Island* began work with 100% inflow screening through a 6" x 6" mesh along the lower one-foot of the inflow cage and a 4" x 4" mesh along the remainder of the cage. The stiff clay that was dredged severely clogged and damaged the screens and cage. This resulted in a decrease in productivity of the dredging operation. On September 8th, after it became evident that the situation would not improve, the screens were fully opened. Even with the screens opened, the clay continued to clog the inflow cages. Despite these difficulties, 100% overflow, and the use of the draghead deflector continued.

On November 19, 1999, the *Manhattan Island* began dredging in a section between the jetties. Inflow screening was re-instituted with similar results as previously experienced. On

November 22, 1999, approval was given to open the inflow screens leaving the overflow screens as the primary monitoring tool.

The *Eagle I* began working gulfward of the jetties with 100% overflow screens, but without inflow screening, since the experiences of the *Manhattan Island* already established that inflow screening was subject to fouling and was thus ineffective. After relocating to channel segments inside the jetties, inflow screening was instituted. This screening proved to be ineffective due to clogging by the heavy clay being excavated. For this reason, on November 23, 1999, the inflow screen boxes were opened. Throughout the duration of operations, intermittent attempts were made to use the inflow screens while dredging in areas where the material was predominantly sand, nevertheless, the clay continued to present a fouling problem.

Monitoring aboard the *B.E. Lindholm* was conducted exclusively by overflow screening.

NMFS-approved turtle observers were employed by Coastwise Consulting, Inc. under a subcontract to the dredging contractor, Bean-Stuyvesant. They provided 24-hour/day monitoring of dragheads and screens for each load cycle.

During the performance of this dredging, one green sea turtle take was documented. This take occurred on September 29, 1999 in load No. 223. This take was previously described in the preliminary report and the FY 1999 report. During FY 2000, no sea turtle takes were documented.

Coordination was conducted with the Sea Turtle Stranding and Salvage Network (STSSN). There have been no reports which suggest the possibility that stranding deaths may have been caused by an encounter with a hopper dredge.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well mixed, as the surface and below mid-depth temperatures were often identical. Surface temperatures ranged from 9.4°C to 30.0°C, while below mid-depth temperatures ranged from 10.0°C to 30.0°C. The single turtle take occurred when the water column temperature was about 24.4°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins (*Tursiops truncatus*), and one sighting of pilot whales. During the period from commencement of the dredging project through November 2, 1999, a total of 14 observations were made of turtles swimming in the vicinity of the dredge. Of these sightings, eight were Kemp's ridleys and six were loggerheads. The water temperatures during these sightings ranged from 20.0°C to 30.0°C.

Since this is primarily new-work dredging, the material dredged consisted of predominantly clay, along with sand, silt, and old shell deposits. Non-biological samples commonly included wood, along with other miscellaneous debris. The most common biological samples were comprised of various species of fish, rays, skates, crabs, shrimp, jellyfish, and, eels.

COSTS

The costs incurred in performing the turtle-monitoring program for the H-GNC Project during FY 2000 include the costs for equipping and maintaining screens and draghead deflectors on contractor-owned dredges, as well as providing NMFS-approved observers. In addition to the direct costs are District costs for administration and oversight. Below is a table depicting the costs for FY 2000. However, costs not included in this discussion are unquantifiable costs associated with decreased dredging efficiency which may result from the use of the draghead deflectors, and downtime experienced during cleaning of excessively fouled screens. Estimates of these increased costs are anticipated by the potential contractors during the preparation of bids, and there is no way to determine the actual value of these costs.

PROJECT	COST OF MONITORING
Jetty and Entrance Ch.	130,100.00
District labor	9,107.00
TOTAL	$139,207.00

SUMMARY

During Fiscal Year 2000, new-work dredging in Jetty and Entrance Channels of the H-GNC Project was conducted by hopper dredges. There were no occurrence of lethal turtle encounters during this construction.