

**FINAL
ENVIRONMENTAL STATEMENT**

**MAINTENANCE DREDGING
GULF INTRACOASTAL
WATERWAY
TEXAS SECTION**

MAIN CHANNEL AND TRIBUTARY CHANNELS



**VOLUME 1
TEXT**



**PREPARED BY
U. S. ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT**

OCTOBER, 1975

Reprinted January 1984

FINAL
ENVIRONMENTAL STATEMENT

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GULF INTRACOASTAL WATERWAY - TEXAS SECTION

TEXT AND APPENDICES

PREPARED BY
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS
13 OCTOBER 1975

(Reprinted January 1984)

SUMMARY

MAINTENANCE DREDGING GULF INTRACOASTAL WATERWAY - TEXAS SECTION

() Draft (X) Final Environmental Statement

Responsible Office: U.S. Army Engineer District, Galveston
Don S. McCoy, Colonel, CE
District Engineer
P.O. Box 1229
Galveston, Texas 77550
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1. Name of Action: (X) Administrative () Legislative

2. Description of Action: Maintain the Texas Section of the Gulf Intracoastal Waterway (GIWW) and its tributary channels by periodic dredging of shoal deposits. The GIWW traverses the Texas coast from the Sabine-Neches Waterway near Louisiana to the town of Port Isabel near the Mexican border. The channel follows the coastline, crossing numerous bays, rivers, bayous, and land areas. Channel dimensions are typically a 12-foot depth and a 125-foot bottom width. The project includes alternate channel routes, barge mooring basins, fishing boat harbors, and turning basins. Tributary channels include Offatts Bayou, Chocolate Bayou, the San Bernard River Channel, Colorado River Channel and Floodway, Channel to Palacios, Channel to Victoria, Channel to Seadrift, Channel to Rockport, Aransas Pass Channel, Port Mansfield Channel, Channel to Harlingen, and the Port Isabel Side Channel and Small Boat Harbor. Tributary channels are generally of lesser dimensions than the main channel. Dredging is accomplished by hydraulic pipeline dredge except for the Port Mansfield Entrance Channel which is normally maintained by hopper dredge. Periodic maintenance dredging of these channels is required to keep them open to commercial and recreational navigation. Nearly all disposal areas have been used previously for disposal of materials dredged during construction or subsequent maintenance.

3. a. Environmental Impact: While maintaining the capacity of the channels for efficient movement of navigation, the action will remove or disturb motile and bottom dwelling organisms, cover vegetation of value to fish and other wildlife, result in temporary increases in turbidity from dredging and disposal operations, possibly resuspend some polluted materials, displace fish life during operations, and continue existing low productivity levels in channels and disposal areas. Objectionable odors may result from disposal of dredged material on emergent areas. Productive marsh habitat will be converted to high ground habitat in some disposal areas. Continued maintenance will preserve environmental benefits such as improved water circulation and disposal islands that resulted from channel construction. Other benefits include continued access to back bays for recreational craft, bird nesting areas on disposal islands, oyster development on submerged disposal areas, and fish escape routes, migration routes, and refuge areas. Maintenance is essential to the existing economy and will contribute to continued economic growth of the Texas Gulf Coast.

b. Adverse Environmental Effects: The action will cover vegetation of value as fishery resource habitat and food for wildlife. Bottom dwelling organisms will be covered by dredged materials. High turbidities will characterize dredging and disposal sites. Resuspended pollutants may adversely affect water quality in some areas. Disposal areas will not be aesthetically pleasing because of inherent unsightliness, and objectionable odors may result from disposal of materials on land areas.

4. Alternatives: No action, alternate modes of transportation; alternate methods of dredging and disposal.

5. Comments Received:

Region VI, Environmental Protection Agency
United States Department of Commerce
United States Department of the Interior
Advisory Council on Historic Preservation
Region VI, Department of Health, Education, and Welfare

Region VI, Department of Housing and Urban Development
Department of Transportation
Office of the Governor, Division of Planning Coordination
Texas Water Rights Commission
Texas Water Development Board
General Land Office
Texas Parks and Wildlife Department
Texas Air Control Board
Texas Department of Agriculture
Texas Water Quality Board
Texas Highway Department
Bureau of Economic Geology
Texas State Soil and Water Conservation Board
Texas Historical Commission
City of Texas City
Galveston County Navigation District No. 1
Brazos River Harbor Navigation District of Brazoria County
Brownsville Navigation District
Houston-Galveston Area Council
National Audubon Society
Johnnie Hammond, Student, SMU, School of Law
Bob Winn
Joseph H. Fonfara, Student, SMU, School of Law
Kendall A. Laughlin, Student, SMU, School of Law
George Parker, Student, SMU, School of Law

6. Draft Statement to CEO 31 October 1974 .
Final Statement to CEO 26 January 1976 .

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FINAL
ENVIRONMENTAL STATEMENT

MAINTENANCE DREDGING
GULF INTRACOASTAL WATERWAY - TEXAS SECTION

1. PROJECT DESCRIPTION.

1.01 Introduction. The purpose of this statement is to identify and evaluate the environmental impact of continuing maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway (GIWW) and tributary channels. The statement addresses all reasonable alternatives and describes mitigation measures taken to reduce adverse environmental effects and enhance economic, social, and environmental values.

1.02 Existing Project. The Texas Section of the Gulf Intracoastal Waterway is a link in the chain of navigable channels which extend from Florida to the Rio Grande Valley in Texas. The GIWW intersects all deep-draft ship channels along the Gulf Coast and connects with many navigable waterways to shallow-draft ports in Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida. This system of channels serves as the primary pathway for nearly all small commercial and recreational vessels berthed on the United States Gulf Coast. The Texas Section of the GIWW extends from the area of the Sabine River at the Port Arthur Canal to near the Mexican border at Port Isabel. The channel follows a course paralleling the Texas coast and offers a shortened, protected route between major ports allowing shallow-draft vessels to transport cargo that would otherwise require larger Gulf vessels. The length of the GIWW from the Sabine River to near Port Isabel, Texas is approximately 403 miles. The channel is generally 12 feet deep and 125 feet wide. Figure 1 (Vol II) is an area map of the Texas Section of the GIWW and its tributaries and intersecting channels. Table 1 lists the tributary channels and the project dimensions currently maintained.

1.03 History. The first Federal project for an inland shallow-draft channel on the Gulf Coast was authorized

in 1828 when Congress appropriated \$18,000 for construction of a channel from Mobile Bay to Mississippi Sound. From then until 1942, the inland waterway developed in sections as needs arose, gradually becoming more extensive with interconnecting waterways and with heavily used sections being deepened and widened. The connected shallow-draft channel system became known as the Gulf Intracoastal Waterway. On 23 July 1942, Congress authorized enlargement of the Gulf Section of the Intracoastal Waterway from the vicinity of Apalachee Bay, Florida, to Corpus Christi, Texas, with an extension to the vicinity of the Mexican border. The authorization provides for a channel 12 feet deep with a minimum width of 125 feet throughout the entire length of the waterway. Since that time, many improvements have been made. In Texas, these improvements include flood gate systems at the Brazos and Colorado Rivers, rerouting of the main channel between Aransas and Corpus Christi Bays along the northwest shore of Redfish Bay in 1960, and an alternate channel across south Galveston Bay between Bolivar Peninsula and the Galveston Causeway, completed in 1954.

1.04 Proposed Action. The proposed action is continued periodic maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway and its tributary channels. With the exception of the Port Mansfield Entrance Channel, all dredging will be accomplished by hydraulic pipeline dredges. The Port Mansfield Entrance Channel is normally maintained by hopper dredges. Dredged materials will be disposed of in both land and open water areas near the channels. Periodic maintenance dredging is required to permit continued utilization of the channels by commercial and recreational navigation. Frequency of dredging and annual shoaling rates are shown on Table 3. In maintenance dredging operations, the details of disposal of materials, including location and dimensions of disposal areas to be used and containment levees required, are governed by considerations of impacts on the environment, cost, available rights-of-way, and engineering feasibility. The proposed action will conform to Federal dredging regulations (33 CFR 209.145) and Discharge of Dredged or Fill Material (40 CFR 230).

1.05 Coordination. In accordance with the Fish and Wildlife Coordination Act and the Federal Water Pollution Act as amended, proposed disposal plans are coordinated with the Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USF&WS), the Texas Water Quality Board, Texas Parks and Wildlife Department, and National Marine Fisheries Service. The procedure was developed by informal agreement among the concerned agencies to expedite the coordination process and provide a unified set of recommendations for mitigation of adverse environmental effects. These agencies review the plans, consider alternatives, and, if necessary, recommend appropriate modifications for protecting the environment. If practicable, the disposal plans are revised as requested and resubmitted for information. In instances where requested modifications are not practicable, an explanation is sent to the concerned agencies. Reevaluation of dredging and disposal plans is made about every five years to allow for periodic review for any needed changes, including those that might result from application of new criteria. Reevaluation of disposal plans is also accomplished whenever specific problems arise with particular disposal sites. Coordination of disposal plans is not complete for all reaches and tributary channels of the Texas Section of the GIWW. Disposal areas have been coordinated for maintenance dredging between Port Isabel and Corpus Christi Bay, between San Antonio Bay and Matagorda Bay, and between High Island and Port Bolivar. Coordination has also been completed for the Port Mansfield Channel, Channel to Palacios, the San Bernard River, the Colorado River Channel, and the Channel to Harlingen. Coordination has not yet been initiated for Offatts Bayou Channel, which should not require maintenance for several years, and the Channel to Rockport, which has not previously required Federal maintenance and for which none is scheduled. All other reaches and tributaries are in various stages of coordination. Details of the coordination are given in Section 9 of this statement. Copies of the letters of coordination are included in Appendix B and proposed disposal areas are shown on Figures 7 through 110 in Volume II.

1.06 Detailed Description. A detailed description of the Texas Section of the GIWW and tributaries follows.

For purposes of this statement, the GIWW has been subdivided into reaches normally dredged under separate contracts. Table 2 lists the main channel sections usually dredged under a single contract and their channel mile and station number endpoints. Channel miles are measured generally westward and southward from Harvey Lock, Louisiana.

1.07 Port Arthur Canal to High Island (See Figure 2, Volume II or page 302, Volume III) This reach, which includes a barge mooring basin 75 feet wide and 2,300 feet long at channel mile 290 near Eagle Lake, extends from the industrialized Port Arthur Canal of the Sabine-Neches Waterway system southwestward by land cut through marsh areas across Salt Bayou, Spindletop Gulley, Seth Slough, Barnes Slough, Oil Well Slough, and the North Prong of Mud Bayou to the bridge on Texas Highway 124 near the community of High Island. Proposed disposal areas are depicted on Figures 7 through 16 in Volume II or pages 303 through 311, Volume III. Letters of coordination are shown on pages B-1 through B-20.

1.08 High Island to Port Bolivar (See Figures 2 and 3, Volume II or page 193, Volume III). This route crosses a marsh area by land cut and follows the general downstream direction of East Bay Bayou by land cut. The channel then crosses a shallow section of East (Galveston) Bay and proceeds into the grass and marsh area of Bolivar Peninsula. Following a land cut along the north side of Bolivar Peninsula, the GIWW extends to Port Bolivar, Texas. A barge mooring basin 300 feet wide and 5,500 feet long is maintained near Port Bolivar at channel mile 346. A steel sheet pile dike with a stone and concrete cap at elevation +4.0 MLT protects the northwest side of the GIWW as it enters Galveston Bay near channel mile 349. The entrance channel to the land cut reach has been widened to 300 feet at this point. Proposed disposal plans for this reach are depicted on Figures 17 through 21 in Volume II or pages 194 through 198, Volume III. Coordination letters are shown on pages B-21 through B-37.

1.09 Port Bolivar to Oyster Creek (See Figure 3, Volume II or page 66 Volume III). The alternate route follows a dredged channel across lower Galveston Bay crossing the

Houston Ship Channel and Texas City Channel and cuts through the northerly tip of Pelican Island. A barge mooring basin 75 feet wide and 3,000 feet long is maintained at Pelican Island. The alternate route then crosses a 4 to 7 foot deep section of Galveston Bay joining the main channel route to Galveston Channel. The channel then passes under the Galveston highway and railroad causeways and intersects the Offatts Bayou Channel which extends into the recreational, residential, and commercial developments of Offatts Bayou on Galveston Island. From there, the GIWW crosses West (Galveston) Bay to its northwest shore. A land cut skirts the north shore of West Bay to Chocolate Bay, where there is a 110 foot wide and 2,300 foot long barge mooring basin. The channel then crosses Chocolate Bay, Oyster Lake, Alligator Slough, and Bastrop Bayou and continues a southward land cut, edging Christmas Bay and Drum Bay, through marsh areas to Oyster Creek. Proposed disposal plans for this reach are depicted on Figures 22 through 29 in Volume II or pages 64 through 74 in Volume III. Coordination letters are on pages B-38 through B-59. Although the disposal areas used for construction of the tributary Offatts Bayou Channel are shown on Figures 68 and 69 (Volume II), they have not been coordinated for use in maintenance dredging. However, their future use for this purpose is proposed.

1.10 The existing channel in Chocolate Bayou was partially constructed by and has been maintained by local interests operating under a Department of the Army permit. A Federal project for widening and deepening the existing channels is authorized but unconstructed. If and when the project is constructed, periodic maintenance will be required. Proposed disposal plans for maintenance dredging are depicted on Figures 70 through 73 in Volume II. Letters of coordination are shown on pages B-136 through B-163.

1.11 Oyster Creek to Colorado River (See Figures 3 and 4, Volume II or page 66 in Volume III). This portion of the channel passes under State Highway 332 intersecting the Freeport Harbor Channel and follows a land cut to the Brazos River and the Brazos River floodgates. Continuing a

land cut, the GIWW crosses Jones Creek and the San Bernard River, skirts the north shore of Cedar Lake, crossing Cedar Lake Creek, Salt Bayou, and Caney Creek, and follows the north shoreline of East Matagorda Bay to near the town of Matagorda, Texas. Proposed disposal plans are depicted on Figures 29 through 37 in Volume II or pages 74 through 84 in Volume III. Letters of coordination are shown on pages B-38 through B-59.

1.12 The Brazos River floodgates have a horizontal clearance of 75 feet and a sill depth of 15 feet MLT. The major tributary in this reach, the San Bernard River Channel, extends up the river 26 miles to near Sweeny, Texas, and is 9 feet deep and 100 feet wide. Proposed disposal plans for the tributary San Bernard River Channel are depicted on Figures 74 through 76 in Volume II or pages 261 through 263 in Volume III, and the letters of coordination are shown in pages B-164 through B-175.

1.13 Colorado River to Port O'Connor (See Figure 4, Volume II or page 66 in Volume III). The GIWW follows a land cut across the Colorado River and through the adjacent locks. It then proceeds southwestward and crosses Devils Elbow, Culver Cut, Mad Island Slough, and Oyster Lake along the north shore of Matagorda Bay. A barge mooring basin 65 feet wide and 5,000 feet long is maintained near Oyster Lake at channel mile 455. The channel crosses Matagorda Bay which has depths up to 14 feet, intersecting the Channel to Palacios and the Matagorda Ship Channel. One tributary in this reach, the Colorado River Channel, originates at the GIWW, and extends 15.5 miles inland. The channel is 9 feet deep and 100 feet wide and terminates at a silting basin and a turning basin 400 feet wide and 500 feet long. A flood discharge channel extends down the Colorado River from the GIWW to the Gulf. The Colorado River lock chambers have 1,200 foot lengths, 75 foot horizontal clearances and 15 foot depths over the sills. The Tributary Channel to Palacios, Texas, which extends across Tres Palacios Bay, is 12 feet deep and 125 feet wide. In Volume II, Figures 37 through 39 (pages 82 through 84 in Volume III) depict disposal plans for the main channel, Figures 77 through 83 in Volume II or page 11 in Volume III depict disposal

plans for the Colorado River Channel, and Figures 84 through 87 in Volume II (pages 331 through 334 in Volume III) depict disposal plans for the Channel to Palacios. Pages B-38 through B-59, B-176 through B-191, and B-192 through B-204 show the respective letters of coordination. Coordination of disposal plans for the Colorado River Flood Discharge Channel will be initiated at a later date.

1.14 Port O'Connor to Live Oak Point, Texas (See Figure 4, Volume II or page 390 in Volume III). The GIWW exits Matagorda Bay by way of the Port O'Connor jetties and follows a land cut along the northwest side of Barroom Bay and Espiritu Santo Bay through grass areas, tidal flats, and mud flats before entering San Antonio Bay. At this point, a barge mooring basin 110 feet wide and 2,150 feet long is maintained. The channel then extends into San Antonio Bay and is joined by the Tributary Channel to Victoria. On the east side of San Antonio Bay, a shallow draft channel extends from the Channel to Victoria to the town of Seadrift, Texas. The GIWW extends across San Antonio Bay, which has an average depth of six feet, to a land cut near Live Oak Point, Texas. Coordinated disposal areas for this reach are shown on Figures 40 through 47 in Volume II and page 391 through 398 in Volume III. Letters of coordination are shown on pages B-60 through B-75.

1.15 At Port O'Connor, steel sheet pile dikes have been constructed with a concrete or stone cap at elevation +4.0 MLT to protect the channel from shoaling. A barge mooring basin 50 feet wide and 5,000 feet long is maintained at channel mile 474.

1.16 The first 14 miles of the Channel to Victoria is in open water and follows the northeast shore of San Antonio Bay joining a 2 mile long side channel 9 feet deep and 100 feet wide to Seadrift, Texas. The channel then skirts the northeast shore of Guadalupe Bay and Mission Lake and follows a land cut along Green Lake. From its junction with the GIWW, the Victoria Channel extends 34.8 miles passing under bridges on U.S. Highway 35 and the MPRR Line, following a land cut parallel to the Guadalupe River and terminating at a turning basin

9 feet deep, 100 feet wide, and 800 feet long near Victoria, Texas. The channel is protected from river overflows by a levee along the river side. Disposal plans for the Channel to Victoria and the Channel to Seadrift are depicted on Figures 88 through 98 in Volume II and page 362 in Volume III. Letters of coordination are shown on pages B-205 through B-223.

1.17 Live Oak Point to Aransas Pass (See Figures 4 and 5, Volume II and page 424 in Volume III). This reach crosses Mustang Slough, Rattlesnake Island, Sundown Bay, and numerous other unnamed cuts and sloughs. The channel passes through Bludworth Island on the north shore of Mesquite Bay and enters Aransas Bay, which has depths of 5 to 12 feet. It then crosses Aransas Bay and turns toward the mainland and Redfish Bay grass flats, passing near the Channel to Rockport and branches to the modified GIWW route and the Lydia Ann Channel. The modified route follows a land cut along the northwest shore of Redfish Bay to near the city of Aransas Pass, Texas, intersecting the Aransas Pass Channel. The Tributary Channel to Rockport is found in this reach.

1.18 The original channel (Lydia Ann Channel) of the GIWW, 3.2 miles longer than the modified channel, extends across Aransas Bay to Harbor Island and a junction with the Corpus Christi Ship Channel near Port Aransas, Texas. Disposal plans for the modified channel and the Lydia Ann Channel are depicted on Figures 48 through 57 in Volume II and pages 425 through 436 in Volume III. Letters of coordination are shown on pages B-76 through B-95.

1.19 Aransas Pass to Encinal Peninsula (See Figure 5 in Volume II or page 424 in Volume III). Leaving the Aransas Pass Channel the GIWW continues to follow the northwest shore of Redfish Bay passing a small private channel to Ransom Island and intersecting the deep water Corpus Christi Ship Channel at Port Ingleside. The GIWW follows the Corpus Christi Ship Channel inland and turns into Corpus Christi Bay following the Encinal Channel. It then heads southwestward, crossing Corpus Christi Bay which has natural depths of 12 to 13 feet. The channel exits Corpus Christi Bay between Mustang Island and the mainland at Encinal Peninsula. A barge mooring basin 100 feet wide and 2,500 feet long is maintained on the south side of the Corpus

Christi Ship Channel across from Port Ingleside. Disposal plans for the main channel are depicted on Figures 58 and 59 in Volume II and page 431 through 436 in Volume III. Letters of coordination are shown on pages B-76 through B-95.

1.20 Aransas Pass Channel extends from Aransas Pass to Port Aransas and is 12 feet deep and 125 feet wide. The Aransas Pass Turning Basin is 12 feet deep, 300 feet wide, and 2,212 feet long, the Channel to Conn Brown Harbor is 12 feet deep and 125 feet wide, and Conn Brown Harbor is 12 feet deep, 300 feet wide, and 1,800 feet long. Disposal plans for the Aransas Pass Channel are shown on Figures 60 and 61 in Volume II and page 481 in Volume III. Letters of coordination are shown on pages B-76 through B-95.

1.21 Encinal Peninsula to Lower Laguna Madre (See Figure 5 in Volume II or page 228 in Volume III). The GIWW follows a route between Padre Island and the mainland passing under John F. Kennedy Causeway and crossing numerous private channels made by fishing camp owners and oil companies. The channel then follows the Laguna Madre southward. The channel passes Baffin Bay and intersects the shoaled Yarbrough Pass Channel between channel mile 586 and 587. At approximately channel mile 590, near the area of "The Hole," the GIWW exits shallow water areas and begins a land cut across mud flats. Three side channels are maintained in the area of "The Hole." These channels were dredged to improve water circulation and fish migration in "The Hole." The channel exits the mud flat area near channel mile 614 and enters the shallow waters of the lower Laguna Madre. Disposal plans for this reach are depicted on Figures 63 through 65 in Volume II or pages 229 through 231 in Volume III, and letters of coordination are included as pages B-96 through B-114.

1.22 Lower Laguna Madre to Port Isabel, Texas (See Figure 6 in Volume II or page 130 in Volume III). The GIWW follows the shallow waters of the lower Laguna Madre in a southerly direction. The average depth of the Laguna Madre is from two to three feet, but some areas adjacent to the channel south of the mud flats and in Redfish Bay are seven to nine feet deep. The channel crosses Redfish Bay and intersects the Port Mansfield Channel. The GIWW

continues to follow the Laguna Madre between Padre Island and the mainland, but water depths adjacent to the channel become shallower, seldom exceeding 3 feet. The 12 foot deep and 125 foot wide Arroyo Colorado Channel to Harlingen extends westward from the main channel near mile 646 at which point a barge mooring basin is maintained. Disposal plans for the main channel are depicted on Figures 65 through 67 in Volume II or pages 131 through 133 in Volume III. Letters of coordination are shown on pages B-115 through B-135.

1.23 The GIWW continues southward past the entrance channel to the Port Isabel Small Boat Harbor, around the south side of Port Isabel to its southern terminus at the turning basin south of Port Isabel in the Brazos Island Harbor project.

1.24 The Gulf end of the Port Mansfield Channel has a jettied entrance channel 26 feet deep and 250 feet wide. The jetties are stone capped and are approximately 2,300 feet long with 10 foot crown widths. The Gulf Entrance Channel is 26 feet deep and 100 feet wide, and is followed by a 26 foot deep, 300 foot wide, and 300 foot long turning basin to accommodate a hopper dredge. The Port Mansfield Channel from Padre Island to the GIWW is 14 feet deep and 100 feet wide with connecting channels 12 feet deep and 100 feet wide. The channel between the GIWW and Port Mansfield is 14 feet deep and 125 feet wide followed by an approach channel 14 feet deep and 200 feet wide, to the main turning basin, 14 feet deep, 350 feet wide, and 1,250 feet long. A 14 foot deep turning basin extension connects to a shrimp fleet basin 12 feet deep, 350 feet wide and 1,450 feet long, and a small craft basin 8 feet deep, 160 feet wide, and 860 feet long. The overall length of the channel from the Gulf of Mexico to Port Mansfield, including the main turning basin, is about 10 miles. The Harlingen Channel extends inland 25.8 miles to a turning basin 12 feet deep, 400 feet wide, and 500 feet long near Rio Hondo, Texas. Disposal plans for the Port Mansfield Channel are shown on Figure 100 in Volume II and page 32 in Volume III. For the Harlingen Channel, disposal plans are shown on Figure 101 through 110 in Volume II and page 157 in Volume III. Respective letters of coordination are shown on pages B-224 through B-237 and B-238 through B-248.

1.25 The Port Isabel Small Boat Harbor entrance channel is 7 feet deep, 75 feet wide, and 1.4 miles long on the north side of Port Isabel. The harbor channel, 6 feet deep and 50 feet wide, links the entrance channel to the multi-channel boat basin. The Port Isabel Side Channel, 12 feet deep and 125 feet wide, loops around the south and west side of Port Isabel and connects with the main GIWW Channel on the south side of Port Isabel. Disposal plans for these channels are included with the main channel coordination.

1.26 Tributaries. Projects to be maintained included in this statement as tributaries to the GIWW are Offatts Bayou Channel, Chocolate Bayou Channel, San Bernard River Channel, Colorado River Channel, Palacios Channel, Victoria Channel, Channel to Seadrift, Rockport Channel, Aransas Pass Channel, Port Mansfield Channel, Channel to Harlingen via Arroyo Colorado, Port Isabel Side Channel, and the Port Isabel Small Boat Harbor. Alternate routes in Galveston and Aransas Bays are also included. Other related channels serving as connecting links to recreational, manufacturing, and industrial areas will be described in separate statements and will not be discussed in this statement. The related waterways are Sabine-Neches Waterway, Liberty Channel, Anahuac Channel, Houston Ship Channel, Double Bayou, Cedar Bayou, Dickinson Bayou, Clear Lake and Clear Creek, Galveston Harbor and Channels, Texas City Channel, Port Bolivar Channel, Freeport Harbor, Matagorda Ship Channel, Corpus Christi Ship Channel, and Brazos Island Harbor.

1.27 Methods of Maintenance. With exception of the Port Mansfield Entrance Channel, all maintenance dredging of the GIWW and its tributaries is performed by hydraulic pipeline dredges. These dredges are not self propelled and must be towed to the job site. They have cutterheads at the end of a long pump intake pipe and work by loosening the materials from the bottom, sucking them into the pump intake, and pumping them through a pipeline to a disposal site.

1.28 Pipeline dredges provide an economical means for handling large volumes of material. Equipped with properly designed cutterheads, they can excavate material ranging from light silts to heavy rock and effectively pump the

dredged material through floating and shore discharge lines to remote disposal areas. With the aid of booster pumps in the line, the material can be pumped to disposal areas located considerable distances from the waterway being dredged. Pipeline dredge sizes are designated by the diameter of the pump discharge, varying from 6 inches to 36 inches. They can operate over a wide range of depths and can be used to excavate material above water level by undercutting the bank below the waterline.

1.29 The Port Mansfield Gulf Entrance Channel is normally maintained by a Government-owned hopper dredge. A hopper dredge is a self-propelled vessel equipped with hopper bins to contain and transport hydraulically dredged material to a place of disposal where the dredged materials are dumped through doors in the bottom of the hoppers. Dredging is accomplished with drag arms extending down from the dredge, centrifugal pumps being connected to the inboard end and a draghead on the suction end. Suction pipes are installed along each side of the hull. The unique feature of the hopper dredge is its ability to excavate material while underway, without benefit of anchors or other moorings. The hopper dredge thus provides a minimum of interference with passing vessels while operating in the channel to be dredged.

1.30 Hopper dredges range in size from a hopper capacity of 500 cubic yards to 8,000 cubic yards in the larger dredges presently in service and can excavate material to a depth of 70 feet below the water level. There are no hopper dredges capable of large scale dredging operations in the Texas area except those owned by the Corps of Engineers.

1.31 Shoaling. The frequency of maintenance dredging of a channel depends on rate of sedimentation in the channel bottom, which is usually referred to as shoaling. Maintenance dredging must be performed often enough to prevent shoaling from interfering with or halting shipping. Table 3 shows the frequency of dredging and annual shoaling rates for the various reaches and tributaries of the GIWW.

1.32 Benefits Derived from Maintaining the GIWW. The primary benefit of maintaining the GIWW and its tributaries is the continuation of savings in transportation cost for the movement of waterborne commerce. Interstate and local commerce are the primary movements on the waterway. Savings in transportation costs were originally estimated by comparing the difference in costs between the original movements and proposed movements on the GIWW. These savings were then projected over the life of the project and brought back to present worth for an average annual equivalent benefit. These benefits were then compared with the annual cost, which included cost of maintenance dredging; therefore, benefits applicable to maintenance dredging of the GIWW were included in the original savings. It was authorized on the expectation that it would originally develop five million tons of commerce annually. In 1974 the Texas section alone carried almost 67 million tons of waterborne commerce, which included such commodities as crude petroleum, gasoline, other petroleum products, chemicals, marine shells, limestone, sand and gravel, primary metals and sulphur. These many diversified commodities would make it almost impossible to evaluate accurately any benefits-to-costs ratio. The GIWW has grown consistently and has contributed substantially to the regional and national economy. A recent study by Texas A&M University has placed the total direct and indirect value of the GIWW to the State of Texas at more than \$19 billion per year (Phillips, 1975).

1.33 Pollutant Sampling and Monitoring Programs. As a result of requests from the Environmental Protection Agency and the Texas Water Quality Board, additional sampling of water and sediment and monitoring of the effects of dredging on water quality will be accomplished. Initial work will be concentrated in areas known to contain or suspected of containing excessive pollutants. Eventually, all the channel reaches will be sampled. The sampling and monitoring programs will be coordinated with the EPA and the TWQB.

1.34 Should the sampling and monitoring programs reveal areas where dredging is having a significant adverse effect

on water quality, action will be taken to eliminate or mitigate those effects. Possible actions include construction of levees for disposal areas, construction of baffle levees within disposal areas, use of larger disposal areas, reduced pumping rates to increase retention time, and use of flocculents to settle suspended materials.

1.35 Because of the repetitive nature of the proposed action, repeated sampling for subsequent dredgings may be required in certain areas known to contain excessive levels of pollutants. Sampling and monitoring will be continued until it is known that the action taken will not have an unacceptable adverse impact on water quality.

1.36 Future sampling will include sediments from that portion of the Port Mansfield Channel which is maintained by hopper dredge. Since the materials dredged from this portion of the channel are deposited in the Gulf of Mexico, the pollution status of this work is determined by criteria contained in regulations (40 CFR 227) published by EPA pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972. Past sampling of the Port Mansfield Channel (Table 17) has shown that the materials were essentially sand, and, by virtue of the referenced regulations, are considered unpolluted.

2. ENVIRONMENTAL SETTING.

2.01 General. The overall project area includes the Texas coastal zone between the Texas-Louisiana and the Texas-Mexico borders. The geographic area comprises 18 counties bordering the Gulf Coast which, along with the 18 adjacent counties, includes seven major estuaries, many miles of sandy Gulf beaches and shoreline, a number of State and Federal parks and refuges, and large industrialized cities and petrochemical complexes.

2.02 The almost unbroken line of narrow barrier islands and peninsulas is perhaps the most distinguishing feature of the Texas coastline. The shoreline is broken by many bays and estuaries. These barrier islands, bays, and the mainland area constitute three distinct divisions along the coast.

2.03 The Texas coast contains about 293,000 acres of salt marsh, 157,000 acres of brackish to freshwater marsh, and 62,000 acres of freshwater marsh. In commenting on the draft statement, the Texas Parks and Wildlife Department submitted the following abstract from "The Value of the Tidal Marsh" by James Gosselink, Eugene Odum, and R. M. Pope:

"Natural tidal marshes are evaluated in monetary terms. By-product production (fisheries, etc.) on a per-acre basis yields a value of only about \$100 per year, even when the whole value of the fishery is imputed to the marsh. More intensive uses, such as oyster aquaculture, which preserve many of the natural functions of the marsh-estuarine ecosystem, have a potential up to \$1,000 per acre per year. The potential for waste assimilation is much higher, about \$2,500 per acre per year for tertiary treatment. Summation of the noncompeting uses approaches and ecological life-support value of about \$4,000 per acre per year, based on the gross primary productivity (in energy terms) of the natural marsh, using a conversion ratio from energy to dollars based on the ratio of Gross National Product to national energy consumption. When these annual social values of \$2,500-\$4,000 are income capitalized at 5 percent interest the estimated total social values are \$50,000-\$80,000 per acre. Some estuaries, such

as the Potomac or the Hudson, are now performing waste assimilation work of even greater value, but such estuaries are overloaded to the point of degradation. Analysis based on the total value of the life support role of a natural tidal marsh-estuary suggests that a strategy of optimization in land use planning should replace, or supplement, reliance on the pricing system which is inadequate for preservation of natural systems that increase in value with the intensity of adjacent development."

Areas of submerged vegetation or truly aquatic plants are found along the estuaries of the entire coast but are more abundant in some areas than in others. These grass and algae beds provide a valuable source of food for migratory waterfowl and shorebirds and are prime nursery areas for shrimp, crabs, and fish of many types. In areas where marshes are negligible or absent, these grasses are the most important source of primary productivity in the bay system. (U.S. Army Corps of Engineers, 1973)

2.04 Physiographic Reaches. For purposes of this statement the Texas coast has been divided into three reaches, as shown on Figure 1, Volume II, based primarily on climate and geographical characteristics.

2.05 Reach I. Reach I includes the area between the Sabine River at the Texas-Louisiana border and the Port O'Connor jetties and is primarily a wet subtropical region. The mean annual temperature ranges between 69 and 71 degrees Fahrenheit and average rainfall ranges from 38 to 50 inches per year. Major bay areas in this reach of the Texas coast include the Galveston Bay system, the Matagorda-Lavaca Bay system, and Sabine Lake. All of these bays are typified by high river inflows, low to moderate salinities, and depths ranging up to 12 feet. Galveston Island, Bolivar Peninsula, and Matagorda Peninsula, the barrier formations in this reach, are characterized by low vegetated sand dunes or virtually no dunes at all. The mainland area is characterized by generally flat featureless terrain.

2.06 The soils of this reach are separated mainly into Holocene and Pleistocene sediments. The major soil types

along the coast are silty and sandy silty clays, sand, silty and clayey sands, and clayey silt. Sands and silty sands form the barrier islands. It is hypothesized and fairly well substantiated that the present barriers have formed on top of a Pleistocene unconformity existing since sea level was at least 600 feet lower than it is at the present. Recent sands appear to be from 20 to 30 feet thick overlying Gulf near-shore silty sand deposits. Soils of the Texas coast range from deep, very permeable, excessively drained sands to deep, nearly impermeable, very poorly drained clays. Some of the soils are saline coastal sands flooded by Gulf tides and subject to wind erosion. Sticky, wet saline soil characterizes the marshes. A large portion of the soil located in the upper half of the coast is fertile and highly productive.

2.07 Normal tidal fluctuation in Reach I is small, with a diurnal range of 1.0 to 2.0 feet. However, maximum variations are controlled by wind and storm activity with possible lows of -4.0 feet during strong northwesterly winds and highs during hurricane surges to +15.0 feet. The strength and direction of these winds and intensity of rainfall also promote variations in salinity levels in the bays and estuaries. The bays of this reach have average fluctuations in salinity of about 15 parts per thousand (ppt), with maximums seldom exceeding 32 ppt. These bays are capable of supporting varied populations of plant and animal life.

2.08 The upper coast is typified by extensive estuarine marshes which provide primary productivity important to shallow water nursery and feeding areas for commercial and sport species of marine animals. The areas of salt marsh surrounding the bays provide a major source of primary food production for the bays and estuaries. Brackish to freshwater marshes, bordering the salt marshes and acting as a buffer to upland vegetation, have a high value for migratory waterfowl and provide another source of food for organisms in neighboring bays and estuaries. Freshwater marshes, limited to river bottoms and creeks whose discharge rates rarely allow the salt waters to exert any influence on the vegetation, do not contribute the amount of food to the marine ecosystems

that the other marshes do but still constitute an excellent source of food for wildlife.

2.09 Very little submerged aquatic vegetation exists in Reach I for two principal reasons. The high natural turbidities resulting from silts and clays deposited in the bays regularly by incoming rivers and the relatively deep waters that are prevalent combine to reduce sunlight penetration to the bottom. For submerged vegetation to develop, sunlight must penetrate to the bottom with sufficient intensity most of the time. As a result, submerged aquatic vegetation in Reach I is generally limited to very shallow areas near barrier islands or natural passes to the Gulf.

2.10 Commercially important invertebrates in Reach I include white and brown shrimp, blue crab, and oysters. The shrimp and oysters in Galveston Bay constitute the largest commercial fishery in the Texas estuaries. Brown shrimp, the most important of the three species of shrimp, essentially support the shrimp fishery of Texas. They are concentrated in the intermediate shelf zone (12 to 35 fathoms) in the Gulf. The young develop in the estuaries. The brown and white shrimp are the most valuable catches for all areas, inshore and offshore. In Reach I, the catch of white shrimp was valued at approximately \$5,261,347 and brown shrimp at \$748,627 in 1973. These totals do not include shrimp caught in the Gulf and landed at Texas ports. Brown and white shrimp catches from the Gulf were valued at \$61,990,646 and \$15,572,172, respectively in 1973. Blue crab occur throughout the bay areas as well as the inner shelf water (2 to 12 fathoms). Total blue crab landings were valued at \$548,576 in this reach in 1973. Major commercial oyster reefs are located in Galveston and Matagorda Bays. The oyster landings from these bay systems were valued at \$1,648,645 in 1973. (U.S. Department of Commerce, 1974)

2.11 The most important commercial and sport fishes in the waters of Reach I are sand and spotted seatrout, mullet, red and black drum, sheepshead, flounder, and croaker. Commercial fin fisheries, including all these fishes and

others, landed a total catch of \$229,155 in 1973. A list of all common commercial and sport fishes that inhabit the coastal waters from the Sabine River to the Mexico border is shown on Table 4.

2.12 Marshes and land around the estuaries provide habitat for various bird and wildlife species. Birds commonly observed in Reach I include the pied-billed grebe, white pelican, cormorant, heron, cattle egret, white ibis, roseate spoonbill, mallard, mottled duck, canvasback duck, ruddy duck, sparrow hawk, American coot, tern, gull, catbird, brown thrasher, yellow warbler, redwinged blackbird, and many others. A more complete list is given in Table 5. Some of the common wildlife species in this reach include rabbit, skunk, muskrat, nutria, raccoon, and armadillo. A list of mammals occurring within the study area is in Table 6. Reptiles include turtles, snakes, and alligators. A list of reptile and amphibian species is given in Table 7.

2.13 Biologically Sensitive Areas. Several biologically sensitive areas which could be affected by the maintenance dredging operation are located in Reach 1. One of these areas is a freshwater reservoir located west of the waterway from Station 630+00 to Station 831+00 (Figures 10 and 11, Volume II). This freshwater reservoir covers about 8,000 acres and provides valuable feeding and breeding habitat for waterfowl, shore and wading birds, numerous furbearers, and freshwater fish. The reservoir also supports the largest concentration of American alligators in Texas. In order to protect the reservoir from possible adverse effects resulting from the dredging operation, the disposal area adjacent to the reservoir has been leveed. This was done to prevent the entry of dredged material into the reservoir ecosystem. Another sensitive area exists in West Galveston Bay. Recent reports indicate that productive oyster reefs have become established on previously deposited dredged material in existing disposal areas adjacent to the waterway. Disposal operations in these areas will be modified so as to minimize or eliminate adverse effects on existing oyster populations.

2.14 Endangered species of vertebrate animals for the Texas coastal area are listed in Table 8. Species on

this list which are most likely to occur in Reach I are the American alligator, Houston toad, southern bald eagle, Arctic peregrine falcon, Attwater's greater prairie chicken, and red wolf. One of the five known active southern bald eagle nests in Texas is located on the Pat Welder Ranch adjacent of the Channel to Victoria.

2.15 There are a significant number of historical and archeological sites located in Reach I, including shipwrecks, buildings, forts, and towns. The most obvious and common type of archeological site known for the Texas coast from Sabine Lake to Corpus Christi Bay is the shell midden. Thus far, 717 sites have been recorded. Numerous vessels of historical significance are known to have sunk on the Texas coast over the past 400 years. Probably the most significant of these presently known are the "La Belle" and the "Amiable" which are known to have sunk somewhere in Matagorda Bay. Several other important historic sites, such as the town of Velasco, the Mission Nuestra de la Luz, St. Mary's Cathedral, San Jacinto Battleground, and Battleship Texas, can be found in this reach. A list of historical sites is given in Table 12.

2.16 Changes in population usually occur in direct response to the level and nature of economic activity, a fact demonstrated by the steady increase in population in the study area. Population growth is not evenly distributed along the coast. The population in this reach is concentrated in the Beaumont-Port Arthur-Orange, Houston, and Galveston-Texas City Standard Metropolitan Statistical Areas (SMSA's). The eight counties adjacent to the coast in this reach are Orange, Jefferson, Chambers, Galveston, Harris, Brazoria, Matagorda, and Calhoun. These counties had a 1970 population of 2.4 million. During the years from 1960 to 1970, with the exception of Jefferson County, these counties increased in population an average of 22 percent. Most of the population growth in the state is expected to continue in the existing urban areas of the coastal zone.

2.17 The study area contains a wide range of rich recreational resources. The counties in this reach have over 1,900 acres of county and city parks and many major

lakes, wildlife refuges, and recreational areas owned and administered by Federal, State, county, and city agencies. Some land is controlled by private organizations such as the Audubon Society. There are many miles of beaches open for public use along the coastline. Hundreds of square miles of marshes, vegetated sand dune areas, and open bays offer favorable areas for year-round recreation and wildlife habitat. Many of these areas have high recreational values relating to outdoor activities such as bird watching, nature study, photography, hunting, camping, boating, swimming, and fishing. The barrier islands and Gulf and bay beaches provide additional recreational activities such as surfing and shell collecting. Texas coastal recreational areas are listed in Table 9, and county and city parks along the coast are listed with their total acreages in Table 10.

2.18 The land areas in this reach are predominantly devoted to agriculture. This agricultural land is basically cropland, forest land, and pastureland. From 1959 to 1968, manufacturing employment increased approximately 28 percent, and agricultural employment decreased approximately 38 percent. These data reflect a trend of agricultural contraction and industrial development for this area. The highest density of urban industrial development has occurred along the coast. Development in this coastal strip includes major urban areas such as the Galveston-Texas City, the Houston, and the Beaumont-Port Arthur-Orange SMSA's.

2.19 Most of the industrial development of the area has occurred near the waterways. Major ports in the area are Port Arthur, Orange, Beaumont, Houston, Galveston, and Freeport. Typical port facilities include petrochemical, fishing, and other vessel docks. Other facilities such as seafood processing plants, grain elevators, sulphur terminals, bulk cargo wharves, and warehouses are located at these ports.

2.20 The recorded commercial tonnage handled by ports and moved on the GIWW between the Sabine River and the Port O'Connor jetties was approximately 40 million tons in 1974. The principal commodities moved over the waterway include crude petroleum and petroleum products,

unmanufactured shell, basic chemicals and related products, minerals, iron and steel products, grain and food products, and missiles and space vehicles.

2.21 Reach II. Reach II includes the dry subtropical region between the Port O'Connor jetties and the Kennedy Causeway. The climate in this area is a product of the combined effects of the humid subtropical region to the northeast, the semi-arid region to the west and southwest, and the warm moist influences of winds from the Gulf of Mexico. The mean annual temperature ranges from 70 to 72 degrees, and the average annual rainfall ranges from 30 to 38 inches per year.

2.22 The major bays in this reach are Corpus Christi, Nueces, Aransas, San Antonio, and Espiritu Santo. Corpus Christi Bay is one of the deepest bays with a large portion of it exceeding 12 feet. The barrier islands, St. Joseph Island, Mustang Island, and Matagorda Island, are characterized by high, vegetated sand dunes. The geology of this area is similar to that of Reach I.

2.23 This section of the project is located in an area of great salinity fluctuations for bays and estuaries. Winds do not generally have as much influence on water levels in Reach II as in the other reaches but may cause fluctuations of 1.5 to 3 feet above and below mean sea level. Variations in climate promote variations in salinity to well over 30 ppt in this reach. Salinities as high as 40 ppt in Aransas, Copano, and San Antonio Bays during one period have dropped to zero following rainfalls accompanying hurricanes.

2.24 Aransas Bay most nearly approaches Gulf salinities of 30 ppt to 34 ppt and has normal high salinity, species diversity, and populations of animals. San Antonio Bay, a relatively low salinity estuary, is characterized by large numbers of oyster reefs and relatively low diversity of invertebrates and fish. Corpus Christi Bay, with salinities ranging from 2 ppt to 45 ppt, has poor standing crops of plants and animals compared to the other Texas bays (Corps of Engineers, 1973).

2.25 Reach II contains significant marsh areas and extensive submerged vegetation. The marshes are generally limited to areas near bay waters, while the submerged plants cover the shallow bay bottoms adjacent to the barrier islands.

2.26 The most numerous sport fishes in Reach II are red and black drum, speckled trout, and flounder. The commercial fin fishery for these fishes and others landed a total catch valued at \$404,304 in 1973. Landings for shrimp were valued at \$2,867,648 in 1973 while landings for blue crab and cysters were valued at \$258,177 and \$183,410 respectively. (U.S. Department of Commerce, 1974)

2.27 The species of fishes, plants, birds, and animals that inhabit this area are shown in Tables 4, 11, 5, and 6 respectively.

2.28 Biologically Sensitive Areas. Biologically sensitive areas in Reach II include the wintering grounds of the endangered whooping crane, nesting grounds for the endangered brown pelican, the shallow water areas of the eastern end of Espiritu Santo Bay, the submerged grass flats of Shoalwater Bay near Port O'Connor, and various shallow water areas in Redfish Bay. Dredging in the areas used by the two endangered species is limited to times of the year that will not conflict with the birds' use of affected areas. With regard to affected shallow water areas, levees have been or will be constructed to prevent, to the maximum practicable extent, encroachment on these valuable areas.

2.29 Rare and endangered species of vertebrate animals which are likely to occur in this reach are the American peregrine falcon, Attwater's greater prairie chicken, and American alligator. The eastern brown pelican is a year round resident in Reach II and the whooping crane is known to seasonally visit Reach II. A list of endangered vertebrate animals for the Texas coast is shown on Table 3.

2.30 As in Reach I, population is not evenly distributed. The population is concentrated in the Corpus Christi SMSA which had a population of 284,882 in 1970. The six

counties adjacent to the coast in this reach are Refugio, Aransas, San Patricio, Nueces, Victoria, and part of Calhoun. The total population in these counties was 374,825 in 1970. This figure represents an increase of 27,183 people since 1960. Of these 27,183 people, 18,238 are located in the Corpus Christi SMSA. Population growth is expected to continue in the existing urban areas.

2.31 The recreational features of this reach are similar to those of Reach I. Located in this reach are Lake Corpus Christi, Aransas National Wildlife Refuge, Goose Island State Park, Corpus Christi Museum, Art Museum of South Texas, Welder Wildlife Refuge at Sinton, and the Naval Air Station in Corpus Christi. The counties in this reach contain over 1,300 acres of county and city parks as shown in Table 10.

2.32 About two thirds of the land in this reach is used for rangeland. The remainder is used primarily as cropland with small areas for urban-industrial development. However, this area is also experiencing a trend of agricultural contraction and is becoming more industrialized. Major ports include Corpus Christi, Victoria, and Port Aransas (Harbor Island). The total tonnage moved in this reach was about 23 million short tons in 1974. Principal commodities moved are similar to those in Reach I and include mud shell and gravel.

2.33 Reach III. Reach III includes the area between the Kennedy Causeway and the Texas-Mexico border. The climate in this area is semi-arid and is characterized by tropical temperatures with a mean annual range from 72 to 74 degrees and low rainfall which ranges from 26 to 30 inches per year. Padre Island, a barrier island typified by high sand dunes and sparse vegetation, extends along the entire coastal length of this reach. The major bay areas in this reach are the upper and lower Laguna Madre and Baffin Bay. The Laguna Madre averages 2 to 3 feet in depth with maximums of 8 and 9 feet except in the GIWW. Baffin Bay is somewhat deeper, averaging 7 to 8 feet.

2.34 A unique physiographic feature along the shores of the Laguna Madre is the extensive mud flat areas.

These are non-vegetated areas occasionally covered with water during unusually high tides. It is believed that the high salt content of the soil in these areas prevents the development of marsh vegetation. A lack of significant marsh areas is characteristic of this reach. Large areas of submerged vegetation such as shoalgrass, widgeongrass, and turtlegass are responsible for most primary production and overall biological productivity. Some salt marsh grows on the back side of the northern Laguna Madre and in the deltaic flats of the Rio Grande. Ideal growth conditions for submerged plants are provided by the typically shallow, clear bays of this reach.

2.35 The upper Laguna Madre is characterized by shallow flats and is noted for hypersalinity, large fish populations, and occasional water discoloration. No true reefs are present, but serpulid "rock" is plentiful near Baffin Bay. The average water depth is 3 feet and the average width is 4 miles. The tributary watershed area is small with freshwater inflow limited to creeks into Baffin Bay. Prior to dredging of the GIWW, massive fish kills occurred periodically in the upper Laguna. These kills were normally the result of either extremely low temperatures or hypersalinity. The completion of the GIWW in 1947 practically eliminated the mortality caused by hypersalinity. The opening of fish passes to the Gulf has been attempted on several occasions, but all such attempts have met with failure (Simmons, 1957).

2.36 The Redfish Bay portion of the lower Laguna Madre prior to construction of the GIWW and Port Mansfield Channel was an inaccessible hypersaline shallow bay. The hypersalinity resulted from naturally restricted water circulation, very little freshwater inflow, and high rates of evaporation. The salinities, which often exceeded twice that of the Gulf, inhibited the growth of vegetation and made the area undesirable to many species of valuable marine fish and crustaceans. Fish kills resulting from sudden drops in temperature and hypersalinity were relatively common. Since the dredging of the GIWW in 1948, fish kills due to hypersalinity have not occurred (Breuer, 1962). The deeper areas of the channel provide a valuable refuge for marine species during cold weather, resulting in the survival of many fish that would otherwise perish.

2.37 Since the completion of the Port Mansfield Pass in 1957, several notable changes have occurred in the ecology of the bay area. The number of juvenile redbfish inhabiting the bay has substantially increased. Juvenile brown shrimp populations extended their range from south of Port Mansfield to nearly all of the northern section of the lower Laguna Madre, a vast area previously of very low productivity. Landings of flounder by both sport and commercial fishermen have increased many fold since the opening of the pass. It has also been noted from trawl samples that juvenile trout have been found in abundance in the established grass beds which have increased in stand since the opening of the pass. This has occurred in areas where juvenile trout were not previously recorded. Vegetation, including shoal and widgeongrass, has increased both in range and in stand. This was shown by comparison of vegetative mappings made by Joseph P. Breuer, Marine Biologist for the Texas Game and Fish Commission in 1955 and 1957, to mappings made by James Pipkin, Wildlife Biologist for the Texas Game and Fish Commission in 1961.

2.38 "The Hole" in the Laguna Madre near Baffin Bay shows the greatest salinity variation on the coast, ranging from 5 ppt to 120 ppt. Extremes in salinity such as this greatly restrict both diversity and abundance of animal life. Therefore, this area has been characterized by very few species and relatively few individual organisms. In the lower Laguna Madre salinities range between 5 ppt and 60 ppt while other portions of the Laguna Madre have a smaller range of salinities, but the same few species of marine organisms become extremely abundant in numbers of individuals (Breuer, 1962).

2.39 Commercial fin fisheries in this reach landed a total catch valued at \$551,003 in 1973. The shellfish industry landings, including crab, shrimp, and oysters only, were valued at \$167,868 in 1973. (U.S. Department of Commerce, 1974).

2.40 The species of fishes, plants, birds, and animals that inhabit this area are shown on Table 4, 11, 5, and 6 respectively.

2.41 Some of the endangered species in this reach are American alligator, eastern brown pelican, whooping crane, and American peregrine falcon. A complete list is given in Table 8.

2.42 Biologically Sensitive Areas. Sensitive areas in Reach III include "The Hole" near Baffin Bay, the Port Mansfield Channel, the lower Laguna Madre in the vicinity of the Queen Isabella Causeway at Port Isabel, and South Bay, located between Port Isabel and the Mexican border. "The Hole" is an area where channels have been constructed to prevent recurrence of fish kills that resulted from natural conditions of hypersalinity and poor circulation. The channels will be maintained to preserve this environmental benefit. The inflow of Gulf waters from the Channel to Port Mansfield keeps salinities from becoming so high as to preclude vegetal growth and use by marine animals. The bay area in the vicinity of the Queen Isabella Causeway is critical to adequate flushing of the lower Laguna Madre south of Port Mansfield. South Bay is significant in that it produces commercially harvestable oyster crops and that the oysters are particularly resistant to high salinity and oyster diseases.

2.43 Historical sites in this reach include the Palo Alto and the Resaca de la Palma Battlefields, the Port Isabel Lighthouse, the Brazos Depot Complex, and numerous shipwrecks including the "Capitana," "Frontier," "Colonel Harvey," and the "Globe". Other sites are listed in Table 12.

2.44 The 1970 population of the four counties adjacent to the coast between and including Kleberg and Cameron Counties was 189,732. The majority of this population was concentrated in the Brownsville-Harlingen-San Benito SMSA in Cameron County which had a 1970 population of 140,368. This SMSA experienced an increase in population of 25,928 people from 1950 to 1960, but showed a decrease of 10,730 people from 1960 to 1970 due to structural changes that occurred in its economy. Closing of the Harlingen Air Force Base was the most substantial change. However, the population of Cameron County is expected to increase at the rate of 2.95 percent from 1970 to 1980

according to the Corps of Engineers Southwestern Division's projections.

2.45 Recreational resources in this area are similar to those in Reach I. Padre Island National Seashore, Brazos Island State Park, Padre Island State Park, and Laguna Atascosa National Wildlife Refuge are located in this area. The counties in this area contain over 450 acres of county and city parks as shown in Table 10.

2.46 The land in this reach is considered ranch country and is devoted almost entirely to rangeland with a small percentage used for cropland. In 1973 almost 1.5 million tons of Mexican cargo moved via the GIWW through Brownsville.

2.47 Proposed Disposal Areas. The following paragraphs give a detailed description of the environmental setting in and adjacent to all proposed disposal sites. Some of the disposal areas described below have not been completely coordinated. The status of coordination is covered in Section 9. For purposes of discussion the project is divided into the same reaches used for the coordination of disposal areas. Some of these reaches differ from those described in Section 1. Specifically, the Galveston Bay to Matagorda Bay reach discussed below includes the Port Bolivar to Oyster Creek, Oyster Creek to Colorado River, and Colorado River to Port O'Connor reaches discussed in Section 1. Further, the Matagorda Bay to San Antonio Bay reach discussed below is the same as the Port O'Connor to Live Oak Point reach discussed in Section 1. The San Antonio Bay to Corpus Christi Bay reach discussed below includes the Live Oak Point to Aransas Pass and Aransas Pass to Encinal Peninsula reaches described in Section 1. The Corpus Christi Bay to Mud Flats reach corresponds with the Encinal Peninsula to Laguna Madre reach, and the Port Isabel to Mud Flats reach corresponds with the Laguna Madre to Port Isabel reach.

2.48 Port Arthur Canal to High Island (Figures 7 through 16 in Volume II, pages 290 through 319 in Volume III, pages B-1 through B-20, partially coordinated). The disposal areas for this reach are predominantly on salt or brackish water marshes.

2.49 The disposal areas have been used previously for disposal of dredged materials. Several species of wild-life use the lands in and around the disposal areas. Waterfowl and shore and wading birds use the marsh areas for feeding, resting, and nesting. Total area of marsh within designated disposal areas may be as much as 1,400 acres. This total is based on areas depicted as vegetated on recent coastal charts, and the actual area of marsh involved is probably somewhat smaller because of previous disposal.

2.50 High Island to Port Bolivar (Figures 17 through 21, in Volume II and pages 178 through 213 in Volume III, pages B-21 through B-37, coordination complete). With one exception all of the disposal areas are primarily on land. All disposal areas have been used previously for dredged materials. The only disposal area completely in open water lies between Station 3015+00 and 3190+00.

2.51 The bay bottom in the vicinity of the open water disposal area contains some submerged aquatic vegetation and scattered oysters. Juvenile fish and crustaceans use the shallow areas as nursery grounds. Waterfowl and shore and wading birds are common in the area.

2.52 Some of the land disposal areas contain salt and brackish water marsh. Nearly all of the marsh areas near the channel along the East Bay shoreline have formed on dredged materials. Animals using these areas include mourning dove, raccoon, opossum, rabbit, mink, otter, nutria, muskrat, coyote, red wolf, and American alligator. Waterfowl and other birds use the marsh areas for feeding, resting, and nesting. Total marsh area within designated disposal areas may be as much as 326 acres. This total is based on areas depicted as vegetated on recent coast charts, and the actual area of marsh is probably somewhat smaller.

2.53 Galveston Bay to Matagorda Bay (Figures 22 through 29 in Volume II and pages 46 through 113 in Volume III, pages B-38 through B-59, partially coordinated). The designated disposal areas east of the Galveston Causeway are on alternate sides of the channels in Galveston Bay

and on Pelican Island. West of the causeway, the designated disposal areas generally alternate from one side of the channel to the other. Several designated disposal areas are partially or completely leveed.

2.54 The wildlife habitat in and around the designated disposal areas includes bays, tidal marshes, tidal streams, and low-lying uplands. Most of the designated disposal areas have been used for disposal of material from previous maintenance dredging. The bays, tidal marshes, and tidal streams provide feeding, resting, and nesting habitat for many species of waterfowl and other birds while the tidal marshes and streams provide important habitat for several other species of wildlife. The low-lying uplands and the dredged material mounds provide habitat for mourning dove, raccoon, opossum, rabbit, skunk, coyote, and red wolf.

2.55 With the exception of portions of Galveston and Matagorda Bays which have depths generally ranging from 5 to 12 feet below mean low tide, the bay areas in the vicinity of the project area have shallow waters with depths less than 4 feet. Most of the shallow water areas contain submerged aquatic vegetation. The bays, tidal marshes, and streams provide high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery grounds. The tidal marshes also provide important nutrients to the bays.

2.56 The total area of marsh within designated disposal areas may be as high as 1,336 acres. This total is based on areas depicted as vegetated on recent coastal charts, and the actual area of marsh is probably somewhat smaller.

2.57 Matagorda Bay to San Antonio Bay (Figures 40 through 47 in Volume II, page 375 through 407 in Volume III, pages B-60 through B-75, coordination complete). In San Antonio Bay between Stations 766+000 and 732+000, the disposal areas are mostly submerged. Three openings of 2,000 feet each have been provided and maintained within this reach and are centered at Stations 742+200, 750+500, and 759+500. The disposal islands in this reach have been created by past dredging.

2.58 In Espiritu Santo Bay between Stations 730+300 and 626+500, the disposal areas are emergent, and vary in width from 600 to 2,000 feet. Originally, 12 openings of 1,600 feet each were provided between banks and one opening of 2,000 feet was provided for the Air Force Ferry Channel. Deposition and runoff as well as wind and wave erosion have filled in all but four of these openings which are centered at Stations 715+400, 692+600, 657+000, and 633+546. An opening between Barroom Bay and Matagorda Bay near the South Jetty at Port O'Connor also has been filled in.

2.59 The project channel traverses important fish and wildlife habitat in Barroom, Espiritu Santo, Shoalwater, and San Antonio Bays as well as on adjoining tidal flats and marshes and low-lying uplands. The greater portion of the bay area lies to the south of the waterway. A large part of the tidal flats, marshes, and coastal plains in the project area is north of the channel.

2.60 Barroom, Espiritu Santo, and Shoalwater Bays are shallow in depth, varying from a few inches to about 4 feet in the project area. Shoalwater Bay is especially suited as nursery habitat for fishes and crustaceans. Dense growths of submerged and emergent vegetation occupy much of these shallow areas. Oyster reefs occur in the western parts of Barroom and Shoalwater Bays. The San Antonio Bay reach of the waterway is in deeper water, varying from 3 to 6 feet. Vegetation on disposal islands in this area is sparse. Some oyster reefs are present near Turnstake Island and in the far western portion of the bay.

2.61 Wildlife habitat in the project area consists of bay areas, tidal flats, tidal marshes, and coastal plains with shallow, water-filled depressions.

2.62 The coastal plains support populations of white-tailed deer, bobwhite, mourning dove, waterfowl, wading birds, and shorebirds. The tidal flats and marshes and the bay areas support primarily populations of waterfowl, wading birds, and shorebirds.

2.63 The shallow vegetated bay areas, the tidal flats and marshes, and the shallow water-filled depressions on the coastal plains are used by ducks for feeding. The deeper parts of the bays are used by ducks for resting. Geese use the cordgrass areas associated with the shallow, water-filled depressions in the coastal plains as feeding grounds. The fresh water in these depressions provides drinking water for many species of wildlife.

2.64 As given in the coordination contained in Appendix B, numerous recommendations have been made by the U.S. Fish and Wildlife Service in conjunction with the National Marine Fisheries Service and the Texas Parks and Wildlife Department. Recommendations include construction of toe levees on emergent banks at specified distances from the channel centerline and maintenance of openings through disposal areas to allow continued circulation of water. These recommendations are intended to minimize losses of fish and wildlife habitat.

2.65 San Antonio Bay to Corpus Christi Bay (Figures 48 through 61 in Volume II, pages 408 through 470 in Volume III, pages B-76 through B-95 coordination in progress). From Station 770+000 to Station 838+000 disposal areas are located on emergent islands adjacent to the channel. These disposal areas have been or will be leveed and the return of effluent to open water is controlled by spillway structures. From Station 838+000 to Station 978+200 nearly all disposal areas are in open water or on emergent ground formed by previous dredging operations. Where possible, these areas will be leveed as recommended by the U.S. Fish and Wildlife Service. Openings between disposal areas will be maintained to prevent damaging compartmentalization.

2.66 Habitat in the area includes bay waters, tidal marshes and flats, and disposal islands. The bay waters are relatively clear and support large beds of aquatic vegetation. These bays provide brackish water habitat for many species of fishes and crustaceans. Numerous oyster reefs occur primarily in Aransas Bay adjacent to the main channel of the waterway.

2.67 The tidal flats and disposal islands are sparsely vegetated. The flats and marshes and the shallower,

less saline portions of the bays are important as breeding and nursery habitat for fishes and crustaceans.

2.68 Many species of shore and wading birds including herons, egrets, gulls, and terns use the area for nesting, resting, and feeding. Waterfowl are seasonally abundant. The mottled duck, a resident specie, is known to nest on densely vegetated islands in the bay adjoining and south of the Aransas National Wildlife Refuge.

2.69 A section of the main channel between Stations 772+600 and 830+000 cuts through the southern margin of the Aransas National Wildlife Refuge creating several narrow islands south of the channel. The world's only population of wild whooping cranes winter on the refuge and on the islands. The recommendations of the U.S. Fish and Wildlife Service with regard to seasonal dredging of the reach of channel which adjoins the Refuge will be adhered to. Dredging will not be accomplished during the months that the whooping cranes are in the refuge.

2.70 Corpus Christi Bay to Mud Flats (Figures 62 through 65, in Volume II and pages 214 through 248 in Volume III, pages B-96 through B-114 coordination completed). Disposal areas for this reach of the GIWW are located in both land and open water areas. Nearly all open water areas contain large islands formed by previous dredging. When open water areas become emergent above mean high water at a distance of 1,500 feet from the centerline of the channel, toe levees will be constructed to prevent further encroachment on the shallow bay bottoms. These levees will be refurbished prior to each dredging operation.

2.71 Dense growths of submerged vegetation are found throughout most of the shallow waters. This vegetation provides high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery areas. Disposal islands support substantial growths of vegetation and provide important habitat for coyote, rabbit, bobwhite, mourning dove, waterfowl, wading birds, and shorebirds. The shallow vegetated bay areas and tidal flats are used by waterfowl for feeding. South Bird Island, a National Audubon Society Sanctuary, and all other disposal islands north of Station 88+500 to the John F. Kennedy

Memorial Causeway, as well as several islands south of Station 88+500, are used heavily by many species of birds. They nest in these areas during the months of March through July and often into August. Primary recreation in the area is fishing followed by waterfowl hunting.

2.72 Prior to dredging the fish access channels to the shallow area known as "The Hole", about 100,000 pounds of game fish perished there annually during low water periods. These fish kills were caused by the fish becoming trapped in the shallow area where evaporation caused excessively high salinities. About every five years a massive kill of approximately one million pounds occurred. The access channels will be maintained to prevent recurrence of this problem.

2.73 Recommendations made by the U.S. Fish and Wildlife Service included dredging openings between some existing disposal areas. This was done. It was also recommended that dredging not be done from March through June between Stations 26+800 and 88+500 to prevent disturbance of nesting birds. This and other recommendations made by USF&WS will be followed.

2.74 Port Isabel to Mud Flats (Figures 62,66, and 67 in Volume II and pages 114 through 142 in Volume III, pages B-115 through B-135 coordination complete). Nearly all disposal areas are in open water areas previously used for this purpose. Islands formed by previous dredging cover much of the proposed disposal areas. All areas are to be leveed as recommended by the USF&WS. Openings between disposal areas are maintained to prevent damaging compartmentalization.

2.75 Wildlife habitat in the area can be found on disposal islands, in bay waters, and on tidal flats. The disposal islands are vegetated and have populations of coyote, rabbit, bobwhite, mourning dove, waterfowl, wading birds, and shorebirds. Green Island and Three Islands are both National Audubon Society Sanctuaries. The shallow vegetated bay areas and tidal flats are used by waterfowl for feeding and by juvenile fish and crustaceans for nursery areas.

2.76 Tributary Channels. The following paragraphs address the disposal plans for maintenance of the various tributary channels.

2.77 Tributary Channel in Offatts Bayou (Figures 68 and 69 in Volume II, coordination not started). Construction of this channel was completed in 1973. Two open water disposal areas and one land disposal area are proposed for channel maintenance.

2.78 The wildlife habitat in and around the disposal areas consists of shallow bay, upper lowlands, and small disposal islands.

2.79 The shallow bay areas are used by many species of fishes and crustaceans as feeding, breeding, and nursery areas. The small disposal islands are vegetating rapidly and are used by shore and wading birds for resting, nesting, and feeding. Local sport fishermen have reported excellent flounder gigging around the new disposal mounds.

2.80 The land areas are not used by wildlife to any great extent because of the great amount of urban and industrial development that has previously occurred in the area.

2.81 Chocolate Bayou (Figures 70 through 73 in Volume II, pages B-136 through B-163 coordination complete). All but two disposal areas for this channel are in open water. The two land disposal areas lie above elevation +7 and are completely leveed. The water effluent is returned to the waterway by means of spillways, small natural streams, and man-made ditches.

2.82 The wildlife habitat found in and around the disposal areas consists of bay waters and low lying uplands. The bay waters are used by many species of fishes and crustaceans. There is significant oyster production in the bay. However, commercial and sport harvest of oysters is prohibited since coliform bacteria levels exceed standards set by the Texas State Department of Health.

2.83 The areas in and around the land disposal areas do not support significant wildlife populations. However,

the general area is used by waterfowl for resting and feeding.

2.84 San Bernard River (Figures 74 through 76 in Volume II and pages 249 through 289 in Volume III, pages B-164 through B-175 coordination complete). All disposal areas are or will be leveed to protect environmentally sensitive areas.

2.85 Several species of wildlife inhabit the areas in and around the disposal areas. The most important wildlife in the project vicinity is waterfowl with several species wintering in the area.

2.86 Colorado River Channel (Figures 77 through 83 in Volume II and pages 1 through 17 in Volume III, pages B-176 through B-191 coordination complete). There are nine land disposal areas for this channel. All but three of these areas are leveed. One of the unleveed areas will be leveed as recommended by the U.S. Fish and Wildlife Service if the area is used. There have been no requests to levee the remaining two areas.

2.87 The lands in and around the disposal areas provide valuable habitat for various species of upland game animals. When the river flood plain is flooded during fall and winter months the area provides feeding and resting habitat for wintering waterfowl.

2.88 Channel to Palacios (Figures 84 through 87 in Volume II, page 320 through 346 in Volume III, pages B-192 through B-204 coordination complete). Disposal areas are on the west of the municipal basin and north of the city basin. There are 14 areas in open water varying in length from 2,500 to 5,000 feet. Openings between the areas range from 2,000 to 4,000 feet in width. The limiting dimensions were recommended by the U.S. Fish and Wildlife Service.

2.89 The existing channel to Palacios is a shallow-draft channel of 12-foot depth. Much of this channel traverses by water 10 feet or more in depth. Materials from previous dredging have not accumulated to the extent to cause circulation problems or hinder boat or fish movement. Disposal

islands have not been formed. Adverse environmental effects have been minimal.

2.90 The project is located in an area of high-quality habitat used by fishes and crustaceans as feeding, breeding, and nursery grounds. A live oyster reef lies across Tres Palacios Bay in the general vicinity of Station 135+000 and 176+00. The area also contains habitat of importance to waterfowl, shorebirds, and wading birds. Most of the waterfowl use is by migrants during the winter.

2.91 Channel to Victoria (Figures 88 through 98 in Volume II page 347 through 374 in Volume III, pages B-205 through B-223 coordination in progress). The majority of the disposal areas for this channel are leveed land disposal areas, but several open water areas will be used. The recommendations of the U.S. Fish and Wildlife Service with regard to leveeing of these open water disposal areas will be followed to the maximum feasible extent. Exceptions are discussed in paragraph 9.31. All of the disposal areas have been used for previous dredging.

2.92 Wildlife habitat in and around the disposal areas consists of open bay, tidal flats and marshes, disposal islands, and low-lying uplands. The bay and marsh areas are important nursery, breeding, and feeding areas for several species of fishes and crustaceans. Several oyster reefs are located near the disposal areas.

2.93 Wintering waterfowl, shore birds, and wading birds are the most abundant wildlife in the project area, but the upland portion of the project area provides habitat for several other types, including white-tailed deer. One of the five known active southern bald eagle nests in Texas is located on the Pat Welder Ranch on the north side of the Victoria Channel.

2.94 Channel to Rockport (Figure 99 in Volume II, coordination not started). This channel was constructed in the early 1940's and has not been federally maintained since. There are no current plans for future maintenance. Three open water disposal areas are designated for dredged material.

2.95 Lydia Ann Channel and Channel to Port Aransas (Figures 48 through 61 in Volume II, page 471 through 496 in Volume III, pages B-76 through B-93 coordination in progress). These channels are being coordinated along with the modified and main channel reaches, San Antonio Bay to Corpus Christi Bay.

2.96 Channel to Port Mansfield (Figure 100 in Volume II and pages 18 through 45 in Volume III, pages B-224 through B-237 coordination complete). The designated disposal areas are on both sides of the channel. They are on the north side of the channel from deep water in the Gulf of Mexico to Station -3+200, from -3+000 to -1+650 from station 0+850 on Padre Island to about Station 12+400 in the Laguna Madre, and from Station 39+050 to the intersection with the GIWW. There are three areas on the south side of the channel between Stations 12+400 and 34+000 and on the shoreline and mainland of El Sauz Island.

2.97 When disposal areas become emergent above mean high water at a distance of 1,500 feet from the centerline of the channel, toe levees will be constructed and refurbished prior to each dredging job. Openings between areas will be maintained. Land disposal areas are leveed or will be the next time they are used.

2.98 Most of the disposal areas contain islands formed during original construction of the channel. These islands support only sparse vegetation because of the high salinity of the soils and the low rainfall in the area. The islands support populations of coyote, rabbit, mourning dove, bobwhite, quail, waterfowl, wading birds, and shore-birds. The shallow bay areas in and around the designated disposal areas contain substantial growths of submerged aquatic vegetation.

2.99 Channel to Harlingen, via Arroyo Colorado (Figures 101 through 110 in Volume II and pages 143 through 177 in Volume III, pages B-221 through B-248 coordination complete). The majority of disposal areas for this channel are leveed land disposal areas. One open water disposal area is scheduled for use. All proposed disposal areas have been used previously.

2.100 The lower reach of the Channel to Harlingen traverses open bay and tidal marshes and flats. The upper reach traverses low lying gently rolling coastal plains of the Rio Grande delta. The Laguna Atascosa National Wildlife Refuge provides valuable habitat for several species of fishes and crustaceans. The Wildlife Refuge was created primarily to provide wintering habitat for migrating waterfowl.

2.101 The lower portion of the Arroyo Colorado is one of the few brackish water areas in the lower Laguna Madre and provides a nursery ground for marine species of the region. Juvenile menhaden, rockfish, speckled trout, and white shrimp are the most economically important organisms in the area. Brown shrimp and blue crabs are also found. Spotted seatrout provide a substantial commercial and sport fishery in the area.

2.102 Shoaling Along the Coast Shoaling rates and quantities are highly variable because of the different conditions which produce sedimentation. Floods may erode land areas and deposit material in channels or may cause rapid turbulent flows which deepen or widen channels. Wind driven waves and tidal surge may also produce strong currents which cause movement of sediments. High head differential between inland bays and the Gulf cause rapid, often turbulent flows in channels. These flows may cause either erosion of or deposition on channel bottoms. Passes, such as Corpus Christi Pass, opened through barrier islands by one storm may be closed by another in following years. Rough seas and pounding waves erode banks and scour mud bottoms of shallow bays moving large volumes of materials. Also, turbulence caused by propellers and wakes of boats erodes banks and places materials in suspension. Loaded seagoing vessels plying various channels cause a certain amount of water flow and wave action which contribute to placing bottom material in suspension and eroding of channel banks. Sediments in disposal areas are often resuspended by the waves and currents and deposited back into the navigation channels. In addition, materials being transported by open barge (shell, gravel, and sand) may fall into the channels.

2.103 Another major cause of shoaling is the littoral transport of sediment. Channels connecting to the Gulf such as the Port Mansfield Channel, are highly susceptible to shoaling by littoral material transported by wave and current action. Littoral transport occurs on a smaller scale along inland bays.

2.104 Streams intersecting channels carry suspended sediment as well as bottom bed loads which are deposited in or near channels. Areas where saline water and fresh stream water mix also are susceptible to sediment deposition. Flood stage shoaling may also be caused by the deposition of the bed load as a result of its motion being retarded by the saltwater wedge. Not only does the volume of sediment in a stream affect the rate of deposition, but also the shape of the sediment particles. In other words, a particle which approaches a sphere in shape would settle much more readily than a flat, flake, or disk-like particle of the same weight. Streams intersecting the GIWW and its tributaries contain highly variable sediment volume and particle sizes, shapes, and weights.

2.105 High rates of shoaling are common to areas near sediment laden streams, land cut channels subject to bank or tidal erosion, channels with nearby disposal sites subject to erosion, and Gulf entrance channels. Representative areas are the GIWW sections near the Colorado River, San Bernard River, the Tributary Channel to Victoria (mile 0 to mile 14), the main channel through Laguna Madre, the channel to Harlingen, and the Port Mansfield Entrance Channel.

2.106 Maintenance dredging frequencies in these areas approximate 12 to 18 months. The next highest rates of shoaling will occur in GIWW sections crossing shallow bays which are not near disposal sites or streams. Last to shoal will be sections across large open bays not subject to high stream sediment inflows. Table 3 lists the project reach, average frequency of dredging in months, and the estimated average annual maintenance material removed in cubic yards.

2.107 Pollutant Content of Sediments. A number of water and sediment samples have been taken and tested for pollutant content from various areas in and near the GIWW. Sediment sample test results are shown in Table 13, and water sample results are shown in Table 14. Three of the sets of samples were taken specifically for use in coordinating disposal plans for the GIWW. These are High Island to Port Bolivar, Texas City Channel to North Deer Island, and Offatts Bayou Channel. Samples from Matagorda Ship Channel and Freeport Ship Channel were taken for coordination of disposal plans for those channels. Samples from Chocolate Bayou and Jones Bay were taken for evaluating proposed new work in those areas.

2.108 The Environmental Protection Agency criteria shown on Tables 13 and 14 are in tentative status. The criteria shown on Table 13 were furnished to the Corps of Engineers by letter dated 27 June 1973. On 5 September 1975, EPA published regulations for disposal of dredged materials in inland waters. The regulations address elutriate testing and monitoring as the primary methods for predicting adverse effects on water quality. These regulations also give considerations to fishery resources including nursery grounds, shellfish beds, and wetland areas. Actions required by these regulations will be made.

2.109 Besides the heavy metals and other chemical pollutants covered in the above mentioned criteria, the possible presence of pesticides in the sediments of some areas also poses a potential water quality problem. In an ecological survey of the Arroyo Colorado (Channel to Harlingen) (Bryan, 1971), it was found that all organisms showed traces of pesticide contamination. All showed traces of DDT and most showed traces of Endrin and Dieldrin. Traces of DDT were also found in water and sediment samples. The general results of the survey indicate that the Arroyo Colorado had the highest degree of sustained DDT contamination of any area of the Texas coast which had been sampled. Water and sediment samples from the same area also contained other pesticides.

2.110 The primary problem with using bulk analysis of sediments for guidance in disposal practices is that there is no readily discernible correlation between the quantities of pollutants found in a sediment and the quantities of those pollutants that will be released

into the water column by dredging and disposal. Appendix D contains a technical discussion of some of the reasons why pollutants are seldom resuspended by dredging.

2.111 The water quality effects of open water disposal of materials containing excessive pollutants are unknown. Many different natural conditions affect the release of pollutants into the water column. The ongoing research programs of the Waterways Experiment Station, Office of Dredge Material Research, should develop improved methods for the disposal of dredged materials that will be useful along the GIWW and tributaries. In addition, actions required by 40 CFR 230 (discharge of dredge or fill material) should result in provision of additional information on pollutant resuspension.

2.112 Sampling and testing of the various reaches of the GIWW and tributary channels will be continued where sources of pollutants are known or suspected to exist. Pollutants come primarily from developed areas and areas of intensive agricultural activity. Such areas might include the open water reach across Galveston Bay, the Chocolate Bayou Channel, the reach of the main channel in the vicinity of Freeport, the San Bernard River Channel, the Colorado River Channel, the open water reach across Matagorda Bay, and the open water reach across Corpus Christi Bay. Sampling of reaches where development and agriculture are practically non-existent will be minimal. The GIWW from the John F. Kennedy Memorial Causeway to Port Isabel is such an area. Pollutant levels found in this type of area would represent naturally occurring levels and should not be significant except for some pesticide in the Arroyo Colorado area.

2.113 In addition, the EPA NPDES waste discharge permit program establishes effluent criteria and implementation schedules that will significantly improve the water and sediment quality. This program will eventually eliminate the need for further monitoring of the quality of sediments to be dredged.

2.114 Pipelines from the numerous oil and gas activities in the offshore waters cross the GIWW in route to terminal and refining operations onshore. With rapid expansion of the offshore activities, it is expected that the number of pipeline crossings will increase. The Department of Interior is initiating a pipeline management study of the

Western Gulf of Mexico vicinity to determine the least environmentally hazardous areas in which to require the placement of lines. The placement of these pipeline corridors will require coordination with the Corps of Engineers to insure that these lines will not interfere with maintenance of the GIWI.

2.115 Conformance With Marine Protection, Research, and Sanctuaries Act of 1972. The hopper dredge disposal action proposed for maintenance of the Port Mansfield entrance and jetty channels is in compliance with regulations, procedures, and criteria established pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972 (PL 92-532). The final Rules and Regulations established pursuant to this act were published in the Federal Register on 13 October 1973 by the Environmental Protection Agency. Section 227.61 of these Rules and Regulations states that dredged material may be considered unpolluted if it is composed essentially of sand and/or gravel, or of any other naturally occurring sedimentary materials with particle sizes larger than silts and clays. Table 17 shows that the materials dredged in the past were essentially sands with a few isolated pockets of sandy clays or sandy silts. In 1972 a pocket of clayey sand was found at Station -1+000, but the materials located near this station in 1973 were sand. Some sandy clay was found between Station 0+000 and Station 1+000 in 1969 and 1972, but in 1970 and 1973 only sand was encountered.

2.116 In view of the predominance of relatively pure sands found throughout the channel over the past four years, the materials to be dredged and deposited in the Gulf are considered essentially sands and are unpolluted. Section 227.62 of the Rules and Regulations provides that material which is determined to be unpolluted may be dumped at any site approved for the dumping of settleable solid wastes of natural origin. The proposed disposal areas have been approved for disposal of hopper dredged materials in the separate coordination of disposal plans. The letters of coordination are on pages B-224 through B-237.

2.117 Economic Summary. Economic growth along the Texas coast has been stimulated by the availability of resources and shipping lanes, and the creation of resort facilities. The natural resources that provide the impetus for industrial growth include adequate industrial water supplies; nearby timber supplies; large quantities of minerals such as oil, gas, and sulphur; and abundant supplies of oyster shell. Construction of a water transportation system facilitated and encouraged exploitation of these resources and provided an economical means of transportation of industrial products. In addition to these factors, the rapid development of tourism and the influx of government expenditures (in the form of defense and scientific programs) have provided significant stimulation for economic growth. Employment reflects the results of these factors. Most of the total employment for the entire study reach is related to manufacturing. Wholesale and retail trade is the second most important employment source, with professional services and business services also being important. A recent study by Texas A&M University has placed the total direct and indirect value of the GIWW to the State of Texas at more than \$19 billion per year (Phillips, 1975).

2.118 Mineral Industries Along the Waterway. The major industries engaged in mining activities that use the waterway include petroleum extraction, extraction of non-metallic minerals, and the dredging of oyster shell.

2.119 The petroleum industry is the most important mineral industry in the state. Petroleum accounts for approximately 63 percent of the state's annual mineral production value. All of the counties adjacent to the waterway have petroleum extraction activities as well as refining processes.

2.120 The non-metallic mineral industries which include cement, clays, gypsum, limestone, salt, gravel, and sulphur represent the second major category of mineral industries. A majority of these non-metallic minerals are mined in the general area of the waterway and are shipped via the waterway to various areas of the country for processing.

2.121 Dredging of oyster shell is restricted to the coastal region, where it is a major industry. The shell is used extensively as a source of lime for the cement and chemical industries and as road bed material. It is recovered by dredging from bays and estuaries between Galveston Bay and Corpus Christi Bay and is shipped via the GIWW.

2.122 Other important mineral industries which use the waterway include the magnesium and aluminum industries. The largest magnesium producing plant in the world, responsible for production of over half of the world's magnesium, is located at Dow Chemical in Freeport. At the plant, sea water is piped from the nearby Gulf, and the magnesium is extracted from the seawater by chemical and electrolytic process. Although bauxite is not mined in the Texas coastal zone, its processing into aluminum constitutes a major refining industry along the coast.

2.123 Reach I of the study area is part of the Bureau of Economic Analysis (BEA) Beaumont-Port Arthur-Orange and Houston economic areas and includes three SMSA's: Beaumont-Port Arthur-Orange, Galveston-Texas City, and Houston. The majority of the area of Reach II is located in the Corpus Christi BEA economic area while two of its counties are in the San Antonio economic area. The coastal counties of Reach III are contained in the McAllen-Pharr-Edinburg and Corpus Christi BEA Areas 144 and 143, respectively. The Brownsville-Harlingen-San Benito SMSA is located in Cameron County, one of the four counties of BEA Area 144. The economy of these areas is heavily dependent on wholesale and retail trade. In 1973 almost 1.5 million tons of Mexican cargo moved via the GIWW through Brownsville.

2.124 Another important factor in the economy is the commercial fishing industry which has an average annual catch valued between \$30 and \$40 million for the Texas coast, (U.S. Dept. of Commerce, Texas Landings Annual Summaries). In terms of dollars, the shrimp catch is the most valuable with oysters ranking second.

2.125 One major development that has influenced economic development was the establishment of the NASA Manned Spacecraft Center in Harris County. The GIWW is occasionally used for the transportation of missiles and other equipment owned by the spacecraft center.

2.126 In addition to all other economic forces, there is the inter-dependency of the port-related activities on the economy. The economy is highly dependent on the manufacturing industries, and these, in turn, depend heavily upon low cost, waterborne transportation for shipping and receiving goods and raw materials.

3. RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS.

3.01 The proposed action will not adversely affect any known land use plans in the project vicinity. All land disposal areas have been obtained by means of easement from landowners. In many cases these easements were granted with the intent of allowing disposal until ground elevations become too great for economic operation, after which time the area could be developed or utilized for grazing or other agricultural use. The proposed plan of action is necessary to the realization of such plans. All major ports along the Texas Gulf Coast are served by the GIWW. Continued economic development of these areas is dependent upon operation of the waterway. Continued safe operation of the waterway is not possible without maintenance dredging. Several parks, wildlife refuges, and recreation areas are located in areas possibly affected by the proposed plan. Table 9 is a listing of these areas. Special consideration was given to disposal plans in such areas in order to minimize adverse effects. Particular emphasis was placed on disposal plans which could affect wildlife refuges and management areas. Several specific examples of modifications to the proposed plan in order to minimize possible conflict with land use plans can be cited. In Sea Rim State Park, portions of a disposal area were eliminated in order to avoid possible conflict with plans for continued availability of a critical and traditional goose habitat area and roost. Dredging activities in the Aransas National Wildlife Refuge are limited to certain months of the year in order to avoid possible conflict with use of the area by wintering whooping cranes. U.S. Department of Interior, in commenting of the draft statement, stated: "The proposed action will not adversely affect any proposed unit of the National Park Service nor any site eligible for registration as a National Historic, Natural, or Environmental Education Landmark." The Department of Interior also stated that if the period of dredging and notification procedures requested by the USF&WS are adhered to, prior to issuance of contracts for maintenance dredging of this reach, there should be no adverse effect on Padre Island National Seashore.

3.02 The State of Texas does not have an approved coastal zone management program, but is in the process of developing such a program. Initial studies undertaken by the state (Texas A&M University, 1973) indicate awareness of the importance of the Intracoastal Waterway to the economy of the state and the nation.

4. ENVIRONMENTAL IMPACT OF PROPOSED ACTION.

4.01 General. The environmental impacts of maintenance dredging of the Gulf Intracoastal Waterway and its tributary channels are complex and varied, with no single action entirely detrimental or beneficial to man's environment. To properly evaluate these impacts, the overall effects as well as individual actions must be considered. The principal beneficial effect of maintaining the channel system is that man's social and economic well-being is enhanced. The disadvantage is that in some areas this maintenance requires a reduction in the quality of the natural environment.

4.02 Purpose of Coordination. In order to best serve the total environment, each individual disposal action, such as open water disposal or construction of containment levees, is carefully considered by the Corps of Engineers, Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Texas Water Quality Board, and Texas Parks and Wildlife Department. The purpose of this coordination is to develop a disposal plan that will have a minimal adverse impact on the environment.

4.03 Construction and subsequent maintenance of the Texas Section of the GIWW and tributary channels has resulted in many significant improvements to the natural environment along the Texas coast. These improvements include increasing the productivity of the lower Laguna Madre, creation of many valuable bird nesting areas for several rare and endangered species such as the whooping crane and brown pelican and peripheral species such as the wood ibis and roseate spoonbill, creation of marsh areas around the periphery of disposal islands, provisions of usable access routes to remote areas thereby benefitting recreation and commercial fishing, provision of routes for migratory marine species thereby providing access to some previously inaccessible bay and marsh areas, provision of a deep water refuge for marine animals fleeing temperature extremes, and improved circulation in some back bays.

4.04 Benefits. The benefits of construction and maintenance of the GIWW to man's social and economic welfare

along the Texas coast are of great value. The coastal waterway system has contributed substantially to the high standard of living enjoyed by most Texas residents today.

4.05 One principal effect of this is that more people can afford to participate in recreational activities than ever before. The channels have provided water access to many miles of previously inaccessible bays and marshes. The public uses these channels for access to waterfowl hunting areas, fishing spots, and isolated camping areas. Recreational boating occurs extensively along the GIWW.

4.06 Sales of boats and other recreational vehicles are increasing at a rapid rate. Opportunities for outdoor recreation for many Texans have been materially increased because of the high standard of living that has resulted in part from construction and maintenance of the GIWW.

4.07 Many benefits to the natural environment have resulted from improved water circulation caused by construction of the GIWW and the Port Mansfield Channel across the lower Laguna Madre. These benefits include increased vegetative growth both in stand and in range, elimination of fish kills due to hypersalinity, increased flounder landings, and an increase in the range of juvenile brown shrimp. The perpetuation of these benefits, which are discussed in depth in Section 2, is dependent on continued maintenance of these channels. Failure to maintain these channels would result in gradual return to near preconstruction conditions of reduced circulation, hypersalinity, and lower productivity.

4.08 Another significant benefit to the natural environment that has resulted from construction and maintenance of the GIWW and its tributary channels is the value of disposal islands to wildlife. Numerous species of fish-eating birds use the islands for rookery, resting, and feeding sites. The degree to which disposal islands are used for these purposes depends upon several factors, including the age of the islands, type and density of vegetation, and security from disturbance and predators. Relatively new islands, from 6 months to about 18 months old, are preferred by skimmers and terns. Gulls, Louisiana

herons, and certain terns begin to use islands two and three years old as vegetation becomes established. Islands ten or more years old are preferred by species of egrets and herons.

4.09 At least two species which may become endangered, the reddish egret and the white-faced ibis, use disposal islands along the Texas section of the GIWW for resting, nesting, and feeding. Both of these species require the mid-climax to climax vegetation which exists along the crests of older disposal islands. Some small areas of the climax and mid-climax vegetation may be damaged during dredging by placement of the discharge pipeline over the crests of the islands. Discharge of materials normally occurs only on the low areas of the islands and would not affect the climax vegetation. The deposition of dredged material on low areas of the islands not only serves to increase habitat for birds but also protects existing habitat from erosion. Disposal islands paralleling the Aransas National Wildlife Refuge are heavily used by whooping cranes. Sydney Island, North Deer Island, Lydia Ann Island, South Bird Island, Green Island, and Medio Island and Primero Island of the Three Islands Chain are islands formed partially or completely of dredged materials and have been leased by the Audubon Society for bird sanctuaries. The importance of disposal islands as bird nesting areas stems primarily from the fact that they provide the ideal conditions of relatively inaccessible nesting areas close to required feeding areas.

4.10 A major benefit of the GIWW to commercial fishing vessels and large recreational craft is the provision of an inland waterway for refuge and safe travel during stormy or windy weather. Without the channels, loss of vessels during rough weather would be a more common occurrence. Many vessels plying the waters of the GIWW are not capable of safely transiting long distances on the open Gulf because of frequently stormy weather. Most commercial tow boats now using the GIWW are not designed for use in rough seas.

4.11 Without the waterway transportation system, the existing level of industrial development along the coast

would probably have not occurred. Benefits derived include savings in shipping costs to Texas industries, safe inshore access routes for small craft, shorter travel distances for commercial fishing vessels between fishing grounds and processing plants, and reduced travel distances between some ports. Additional savings will result from reduced hull and propeller damage caused by grounding and bottom scraping.

4.12 Many coastal cities derive revenue from water oriented activities. Various manufacturers use the GIWW as a route for obtaining supplies and for transporting their products. Oil and gas companies use the GIWW and its tributaries as access routes to wells for drilling and service. Existence of the waterway does not preclude mineral resource extraction in the immediate vicinity. Similarly, maintenance dredging to preserve or restore the dimensions of the waterway should not produce any adverse effects on mineral resources recovery. No proposed disposal sites conflict with existing mineral extraction operations, and it is not anticipated that present disposal plans will deter future mineral exploration or extraction.

4.13 Other Texas cities (Houston, Port Lavaca, Corpus Christi, Beaumont, Port Arthur, Brownsville, et al.) have manufacturing concerns which frequently use the GIWW system, but they have alternate water routes which may be more costly or less convenient. The influence of the water transportation rates results in the establishment of lower rail and truck rates to and from the port vicinity. Lower transportation cost via inland waterway routes have provided many industries with access to raw material sources and to markets from which they have been previously barred by high freight rates.

4.14 The establishment of new industries and businesses attracted to cities and towns along the inland waterway by the availability of safe, economical inland waterway transportation have brought substantial increases in employment, in potential purchasing power, and in tax revenues. Inland waterway transportation helps to maintain many auxiliary services at inland waterway ports such as warehousing, marine supplies, dry-docking and boat

repairing, bunkering, marine insurance, banking charter and brokerage agencies, engine repairing and parts, salvage and diving contractors, and harbor towing.

4.15 Throughout the period of World War II millions of tons of petroleum products were transported on the inland waterways by tank barges. This transportation of such a vitally needed commodity helped to make up for the loss in petroleum shipments caused by the withdrawal to other services and the sinking of coastwise tankers. Among our systems of transportation, the inland waterway industry, in relation to its capacity, handled a greater volume of essential war cargo than any other system, pipelines excepted.

4.16 Whatever development occurs as a result of continued existence of the project channels will have some minor adverse effects on the natural environment. Industrial expansion results in increased employment opportunities required by an expanding population, increased local population and consequent residential development, increased air and water pollution control needs, and increased loss of wildlife habitat. While some of these effects are considered adverse with regard to the natural environment, economic needs of an expanding population must be met in some manner in various locations in the nation. Industrial expansion in the project area will help meet this need, but continued population expansion will probably be accompanied by increased crime rates, pollution problems, and waste disposal problems.

4.17 Adverse Effects. Maintenance dredging of the Gulf Intracoastal Waterway and its tributary channels does have adverse effects on the natural environment. The significance of these effects varies according to type of dredge used, disposal practices employed, weather conditions, type of bottom material, and quantity of similar surrounding habitat.

4.18 Dredging. The removal of shoal materials accumulated in the channels and basins will disturb or remove swimming and benthic organisms. However, because of the pollutants found in some sediments, instability of the

sediments, and the frequency of maintenance dredging operations, it is expected that the productivity of the bottom dwelling organisms is already low and of little consequence to the overall productivity of the Texas coastal estuaries. Rogers and Darnell (1973) have demonstrated that dredge cuts reduce the population of small benthic (meiobenthic) animals to about one-third of their former levels, and that recovery is only about 80 percent complete a decade later. This study further indicated that modifications of the particle structure of the sediments was probably the prime causative factor for the slow rate of recovery. Pfitzenmeyer (1970) also concluded from the dredging and disposal studies in Chesapeake Bay that because of the instability of bottom sediments, the benthic biomass in the channel may remain low, even though recovery from dredging began soon after dredging operations had ceased. Other observers have reported shorter times for benthic organisms recovery. The main value of the channel to animals is probably its use as a migration route for swimming organisms and a deep water shelter in time of large temperature fluctuations in the adjacent shallow bay areas. Other detrimental effects of dredging include turbidity caused by the action of the cutterhead assembly, resuspension of pollutants in that turbid area, and destruction of any fish or crustaceans caught by the cutter or pulled into the pipeline by the pump. These effects are limited to an area immediately surrounding the dredge cutterhead. Some attempts have been made to reduce the effects of dredge caused turbidities by the use of a curtain arrangement around the cutterhead. Such devices have been found useful in still water areas. However, where moderate or high flow velocities are encountered, they are not effective. In nearly all of the channels covered by this statement, moderate to strong tidal or river flow velocities are encountered, and the practicability of using such a device is doubtful. Consideration will be given to the use of such devices in areas where flow velocities are not excessive.

4.19 In evaluating the effects of turbidities created around the dredge cutterhead, consideration should be given to the size of the area affected and the fact that similar turbidities caused by normal winds regularly

affect entire bay areas. Adverse effects of dredge related turbidities should not exceed those resulting from turbidities occurring on typical windy days.

4.20 The average annual area dredged during maintenance of the GIWW and tributaries is approximately 3,600 acres. This total includes all land cut portions of the channels and all inland turning basins and mooring facilities. This figure represents about twenty-three hundredths of one percent of the total bay bottom area along the Texas coast. If the total is reduced to consider only those sections of channels which are within the confines of a bay area, the percentage drops to about one tenth of one percent. It should be recognized that this total is not cumulative with time as the areas dredged are dredged repeatedly.

4.21 Normally, maintenance dredging does not destroy any submerged vegetation or oysters, as channel depths preclude development of vegetation because of reduced sunlight penetration, and the soft materials constantly accumulating on the channel bottom prevent oysters from developing. Maintenance dredging usually has little effect on motile marine species as they are able to easily avoid the dredge. Studies reported in "World Dredging" dated July 1973 indicated that dredging activities often attract fish and shrimp which feed on the materials and organisms stirred up or removed from the soil by the dredge.

4.22 Disposal. The most significant adverse environmental effects of maintenance dredging are associated with the disposal methods employed rather than the actual dredging. The disposal practices along the GIWW include both open water disposal and land disposal. Most disposal practices in previous years did not include the use of containment levees to reduce the spread of materials. In the past, the dredged materials were allowed to flow into any nearby low areas, filling marsh lands, low prairie areas, and local stream and bayou beds. Under present procedures, containment levee systems are being developed for nearly all land disposal areas. Actual dimensions and locations of containment levees to be

built are now determined on a site by site basis by qualified personnel from the concerned agencies.

4.23 Open Water Disposal. Open water disposal of dredged materials is often considered to be more environmentally detrimental than land disposal because of the effects of highly visible localized turbidity, burial of bottom dwelling organisms, compartmentalization of bay areas, resuspension of pollutants, and burial of submerged aquatic vegetation. Open water disposal is not entirely detrimental. A number of beneficial aspects are known. These beneficial effects include formation of bird nesting areas where islands develop, creation of suitable substrate for oysters, resuspension of nutrients, and provision of public recreational areas. In evaluating the environmental effects of open water disposal, consideration must be given to all factors in order to understand and evaluate the procedures and alternatives.

4.24 Turbidities associated with open water disposal have some damaging effects on productivity of the bay ecosystem. High turbidities reduce photosynthetic activity and could cause suffocation of small fish and other marine animals by coating gill tissues with sediment particles. Reduction of photosynthetic activity results in a corresponding reduction at the base of the aquatic food chain. This loss will be projected up the food chain, resulting in fewer organisms available for man's use. That loss which does occur may be in part compensated for by increases in productivity following resuspension of nutrients and aeration of sediments and organic matter. Bacteria and fungi are thought to be the most important link in the food chain of marine animals such as penaeid shrimp and many other common estuarine species (Odum, 1971). Increases in productivity have been reported following dredging (Odum and Wilson, 1962; Odum, 1973; Virginia Institute of Marine Science, 1967). It is not possible to determine the overall net effect on the Texas coast except for general findings in very small, isolated areas.

4.25 Studies discussed below have shown that almost all dredged material disposed of in open water settles very rapidly and is transported along the bottom as a flocculated density flow separate from the water column.

All other measurable sediment transport does not exceed natural levels caused by normal winds beyond about 1,600 feet or less from the point of discharge. The widespread visible surface turbidity sometimes produced by dredges does not exceed natural levels caused by freshets or normal winds beyond a few hundred feet from the discharge. The visible plume has little relation to the distribution of dredged sediments, and it does not measurably increase silting (May, 1973). Because of this, detrimental effects of the visible plume should be of less significance in the productivity of a bay system than occasional rainstorms or normal winds.

4.26 Mackin (1961) reported that the distance to which materials are carried away from a dredge is a function of the current velocity, specific gravity of the solids, grain size and shape, and flocculation of the grains at the time of transport. His observations of turbidity drifts showed that there is a decrease in suspended matter and diminution in turbidity due to (1) rapid deposition of suspended material and (2) dilution. For example, Mackin observed that in waters having an average current velocity of 0.25 knots and dredging material discharge having a wet weight specific gravity of 1.7, only 0.1 percent of the total material removed in the dredging operation remained in suspension outside a radius of 100 feet from the dredged material discharge point. Fine material was lost in the natural turbidities at distances over 1,000 feet and had the same effect on the environment as materials put into suspension by natural conditions. He also noted that during his control study, turbidity in one secondary bay caused by shrimp trawlers on one day was greater than that produced at a distance of 300 feet from the dredge discharge.

4.27 The U.S. Army Corps of Engineers (1967) found that hydraulic dredging in Bon Secour Bay, Alabama transported silt 1,200 feet from the discharge and that the dredging operation, when compared to wind, was an insignificant contributor to the total sediment movement in the bay.

4.28 Studies on the direct effect of channel dredging effluents on water quality in open Alabama estuaries have

shown that most of the sediment discharged settles to the bottom and very quickly forms a concentrated density flow out to a distance of about 1,600 feet or less. This fluid mud which is partially oxygenated displaces the bottom water and consolidates rapidly without potentially harmful components of mud entering the interstitial or overlying water. These studies concluded that dissolved oxygen content is lowered very little except in the mud flow near the bottom. The mud flow outside of the dredge cuts consolidates to form a layer less than one inch to several inches thick that covers the original bottom and suffocates some benthic organisms. Other studies have shown that areas covered with dredged materials become repopulated with benthic organisms in about 6 months. (Harrison, 1967; Virginia Institute of Marine Science, 1967; Flemer et al., 1968; Cronin et al., 1970).

4.29 Texas Parks and Wildlife Department (Appendix A-27), in commenting on the draft statement, stated that it has documented instances where siltation has been biologically damaging as far as 5,400 feet from a shell dredge. TP&WD did not, however, furnish any information concerning the nature and extent of the damages and did not cite any references that would contain that information. Under certain conditions involving high current velocities and clay materials, it is possible that slight increases in turbidity and siltation could occur at a distance of 5,400 feet from a dredge discharge point. However, such a situation would be very unusual, and the siltation probably would not exceed that which occurs on typical windy days along the Texas coast.

4.30 One organism of particular concern with respect to possible dredge related damages is the oyster. Oysters are not only a valuable commercial species but serve as food for various fish and other marine animals. Since oysters are not motile, they cannot escape the effects of silting and turbidities caused by dredges. With respect to the possibility of coverage of oyster reefs with sediment, a number of special considerations must be made. The distance that suspended sediment from dredge effluents in estuarine water will exceed ambient levels or will cover

an area of the bottom is dependent upon the kind and amount of material being pumped and the bottom configuration. With this information, the safe distance from channels, shorelines, and oyster reefs that dredges can discharge can be determined by monitoring the existing circumstances (May, 1973). Oyster reefs, in most cases, are raised above the surrounding bottom and would not be greatly susceptible to coverage by dredge effluents if proper precautions are followed. These precautions can be properly established on an individual disposal site basis. This procedure should minimize or eliminate significant maintenance dredging related damage to live oyster reefs.

4.31 In many bay areas, construction and maintenance of the GIWW and its tributary channels has had a beneficial effect on oyster production. One such example is the West Galveston Bay area, including Chocolate and Jones Bays. During the original and maintenance dredging of channels across the open waters of these bays, all of the materials were disposed of in the surrounding bay area. In almost every case, the areas where dredged materials were deposited have become live oyster reefs. Prior to dredging, these areas contained only scattered clumps of oysters. The cause of this development is that the coarser dredged materials, including shell, settle close to the discharge point forming a harder, more suitable area for oyster development, while the soft, unsuitable materials flow across larger distances of the bottom, settling in low areas. The ridges thus formed apparently provide ideal locations for oyster growth, as they are rapidly transformed into live reefs.

4.32 Submerged aquatic vegetation plays an important role in maintaining the productivity of the Texas coastal bay systems, particularly along the lower coast where marshes are negligible or absent. Disposal of dredged materials in open water will cover any vegetation that exists in the disposal area. In nearly all cases, areas that will be used for deposition of sediments have previously been used for this purpose. Therefore, that vegetation which will be covered has developed on sediments deposited during previous dredging. It can be assumed that past development will be repeated and that the areas of freshly deposited sediment will be covered

with new growth of vegetation. In the shallow Redfish Bay area, Odum (1963) and Odum and Wilson (1962) observed enhanced productivity and dense grass after dredging in areas adjacent to the disposal islands except where benthic communities had been smothered with soft silt. This enhancement was attributed to release of nutrients from redistribution of the dredged sediments. The areas affected by the density flow had not revegetated at the end of the study (about two years after dredging).

4.33 Table 15 identifies bay bottom areas covered by dredged materials disposed of annually in the open waters of Texas bay systems. Precise determination of the area of Texas bay bottoms covered by a given volume of dredged material is not practicable, but estimates of possible upper and lower limits of areas directly covered can be made. The average annual volumes shown on the table have been estimated from the average annual shoaling rates for the various channels. The minimum and maximum areas covered are based on assumed average depth limits of one and two feet of deposited sediments. This assumption is based on illustrations presented by May (1973). The one foot depth is the assumed minimum average depth of the mud flow.

4.34 It should be recognized that over a period of years, the effect is only partially cumulative. The same areas are used repeatedly so that a minimum area of the natural bay bottoms is affected. Repeated deposition in a particular area is possible for long term disposal operations because natural sediment transport mechanisms normally remove large volumes of the deposited materials between dredging jobs. Wave and current action eventually carry much of the material to the Gulf where it settles on the Continental Shelf. For example, the submerged disposal areas paralleling the Houston Ship Channel have been used for more than 60 years and are still submerged. The depth of accumulated materials varies from about 1 foot to 4 feet. Those disposal areas along the Houston Ship Channel which have become emergent were formed during construction, not during maintenance dredging. For a realistic estimate of the bay bottom area affected by one dredging job, the frequency of dredging must also be considered. If the frequency is once in two years, the

area affected during maintenance would be approximately twice the area covered by the average annual volume dredged.

4.35 The relative significance of open water disposal as an environmentally detrimental action can be seen on Table 15. In the worst case, San Antonio Bay, an estimated maximum of fifty-five hundredths of one percent of the productive bay bottom will be covered with dredged sediments on an annual basis. In the least detrimental case, Corpus Christi Bay, the area of bay bottom to be temporarily in a non-productive status could be as small as twenty-four thousandths of one percent of the available productive area.

4.36 Another important possibility for dredging related adverse environmental effects is that of compartmentalization of bay areas. This can result from long continuous disposal areas blocking or changing the normal current patterns in bay areas. Not much information is available concerning instances where this has happened, but serious consideration must be given to the disposal of dredged materials so that possible adverse effects will be minimized or eliminated. The environmental productivity mechanisms involved include salinity levels, migration of marine animals, oxygen levels, and nutrient supplies. Texas coastal bay ecosystems are so complex and varied that general statements concerning the effect of compartmentalization cannot be made. Each individual dredging action and disposal area must be carefully studied by qualified personnel to determine the possible effects. During this process, the disposal areas are dimensioned and located in such a manner as to minimize or eliminate adverse effects. Such considerations usually include aligning disposal areas parallel to the current flows, leaving gaps in disposal areas at regular intervals, and the dredging of side channels to promote circulation in critical areas. It is believed that, through this process, detrimental effects can be minimized and beneficial effects maximized.

4.37 Another aspect of open water disposal to be considered is the formation of islands. Islands are usually created in shallow bays during original construction of a channel. Maintenance dredging normally adds enough

material every few years to counteract erosion and assure the permanence of the island or results in gradual enlargement of the island. Formation and enlargement of such an island represents a direct loss of aquatic habitat. The area occupied by the island contributes little to the productivity of the bay system. However, there are several beneficial features involved in the development of disposal islands. The waters surrounding the islands are very shallow and become productive. Emergent or submerged vegetation usually develops, and the surrounding area may support live oysters. This usually represents an increase in productivity over an original non-vegetated mud bottom, and the productivity permanently lost may be in part compensated for.

4.38 The islands so formed provide excellent bird habitat as previously discussed, and are often used by campers, fishermen, and waterfowl hunters, thereby contributing to public recreation in the area. Vegetation and oysters attract game fish that feed on the small fish and other marine life dwelling in the area, improving the quality of sport fishing. The shallow water and vegetation attract waterfowl that often find the area suitable for feeding and resting.

4.39 A list of endangered species known to range along the waterway is included in Table 8. The effects of dredging on these species include temporary loss of terrestrial and aquatic habitat caused by disposal operation and slight increases in turbidity in the immediate area. Noise from the dredge may frighten birds from an area, temporarily affecting their feeding activities and food supplies, but these effects are localized. Noise from a passing pleasure craft would have a similar effect. Because dredging and disposal influence such a small area in comparison to the enormous surrounding area available to birds, the effects are considered insignificant. The National Audubon Society has stated that the barge traffic through the GIWW with cargos of highly toxic industrial chemicals and various petroleum products probably poses the greatest present threat to wintering whooping cranes. Spills of these cargos, which have occurred in and near the refuge, could contaminate food supplies and, in the cases of several

chemicals, could kill a large portion of the whooping crane population outright.

4.40 Pollutant Problems. Along some reaches of the Texas Section of the Gulf Intracoastal Waterway there exist sediments containing pollutants in excess of proposed Environmental Protection Agency criteria for open water disposal of dredged materials. A list of proposed criteria was furnished the Corps of Engineers in November 1971. Those parameters for which criteria have been proposed include volatile solids, chemical oxygen demand, total Kjeldahl nitrogen, oil and grease, mercury, lead, and zinc. The sources of these pollutants may be municipal and industrial waste effluent, natural runoff, and return flows from irrigated fields, with some of the volatile solids consisting of natural organic detritus. A probable source of some of the zinc is the cathodic protection plates used on most metal hulled vessels.

4.41 Almost all land disposal areas along the Texas Section of the Gulf Intracoastal Waterway have been or will be leveed to reduce the return of pollutants and sediments to the watercourse or the adjacent marshes. In some cases, local landowners have objected to this levee construction because it affects large areas of vegetation utilized as cattle pasturage and creates the possibility of cattle straying into the levee borrow ditch and drowning. Theoretically, the leveed disposal areas should reduce the levels of resuspended pollutants returned to the watercourse below levels that might adversely affect marine animals. Therefore, adverse effects are not expected in these areas.

4.42 Open water disposal of polluted sediments is of much greater concern and presents more problems than land disposal. The main concern results from the possibility that pollutants resuspended by dredging may enter the marine food chain, causing high concentrations of toxic materials in sport and commercial species. Other possible effects include fish kills, lowered phytoplankton productivity, and exclusion of desirable species of benthic organisms from the disposal areas. There is also the possibility of adverse effects on marine life such as impairment of reproductive capacity and increased susceptibility to disease, parasites, and predation.

4.43 Fish kills along the GIWW as a result of resuspended pollutants are considered possible but unlikely. Past dredging of the GIWW is not known to have caused any fish kills; and since sediments dredged in the past were in all probability at least as polluted as those that will be dredged in the future, fish kills are not anticipated.

4.44 Exclusion of some species of benthic organisms from the disposal areas may occur as a result of the addition of pollutants to the area. However, these areas have been used for disposal for many years, and, in all probability, sediments deposited previously have been at least as polluted as those that will be deposited in the future. It is therefore assumed that any species of benthic organisms existing in these areas are either tolerant of the local pollution levels or have recolonized the area since the last maintenance dredging occurred. In either case, the organisms, if they exist, should repeat their past performance and survive or recolonize.

4.45 Laboratory testing has shown that under controlled conditions, pollutants can be resuspended by stirring up sediments. However, little or no data exist indicating that dredging and disposal of polluted sediments has caused a significant degradation in water quality. The Corps of Engineers' Dredged Material Research Program, after two years of intensive study of this problem, has reported that initial results of the laboratory studies have shown that most heavy metals in sediments are unavailable to the water column and that zinc, mercury, cadmium, and most other heavy metals are immobile and unavailable biologically.

4.46 Many studies of this problem have been made in recent years. These studies, discussed below, were generally made in the actual areas being dredged and reflect the naturally occurring influences of chemicals and materials present in bay areas.

4.47 The results of most of the studies discussed below indicate that a portion of the pollutants contained in sediments may be resuspended in the bay waters immediately

surrounding the point of disposal and that these pollutants are then rapidly removed from biological accessibility through natural mechanisms. In pilot laboratory studies, Gustafson (1972) discussed the fallacies connected with turbidity and resuspension of sediments by dredging. He stated recent regulatory actions concerning dredging were based on insufficient data and ignored the fact that turbidity created by winds and tides dwarf those of man's activities. He also showed that suspended clays attract bacteria and remove oils, pesticides, sewage products (except nitrates), and metals from the water and demonstrated the probability that metals adsorbed to clays are not released when clays are resuspended and that organic molecules are not liberated in amounts sufficient to cause ecological concern.

4.48 Because of rapid settlement of dredged materials, volatile solids are of little importance to dredging situations unless they are high enough to have already degraded water quality (May, 1973).

4.49 In conjunction with the coordination of disposal areas for maintenance dredging of the Matagorda Ship Channel, an extensive sampling program was carried out by the Corps of Engineers in an attempt to ascertain the effects of dredging contaminated sediment. The sampling program was requested by the Environmental Protection Agency because the sediments were known to contain high concentrations of mercury. Samples were taken from channel areas and disposal areas before, during, and after actual maintenance dredging operations. The results of this sampling program showed a general pattern of few minor increases in suspended mercury during dredging and a rapid return to original levels when dredging operations ceased. Out of 113 samples tested during this study, only 5 contained mercury in excess of proposed EPA criteria. Two of these were taken before dredging, two during dredging, and one after dredging.

4.50 Several other studies on the possible resuspension of toxic materials and pollutants have been made by various agencies and private interests. Two such studies that are of particular interest were made recently by

Blanton and Blanton (1972). Theories advanced by them state that "reduced marine sediments remove mercury from biological accessibility very rapidly." "Reduced" was used in reference to the oxidative state. Their studies showed no significant increases in the mercury content of motile bay organisms as a result of mercury concentrations in sediments in Matagorda Bay, Texas. A direct quotation (May, 1973) in support of the position that resuspension of pollutants caused by dredging is not significantly detrimental to the environment is included in Appendix D.

4.51 In most areas where polluted sediments are known to exist, the Corps of Engineers has constructed retaining levees and controlled spillways to obtain maximum clarification of dredge return waters and to minimize return of pollutants to the bay systems. This will continue to be done wherever practicable.

4.52 In some areas where sediments are found to contain pollutants in excess of proposed EPA criteria, it may not be found practicable or desirable to construct such levees. Open bay areas displaced by containment levees and disposal materials represent a permanent loss to the productivity of the bay system where the previous practice of open water disposal may have enhanced productivity. In many cases, the possible effects of resuspending pollutants during dredging may be outweighed by the productivity lost by constructing a permanent leveed disposal area in open water.

4.53 Construction of levees in open water often creates serious engineering and construction problems concerned with poor foundation conditions and lack of suitable construction materials. Often, suitable foundations for a levee can only be obtained by dredging away many feet of the overlying sediments and then dredging large adjacent areas for construction materials. Such an undertaking could be more environmentally damaging than the temporary resuspension of pollutants. The approach of constructing retaining levees only after the disposal area becomes emergent is the method proposed for most of the open water disposal areas along the GIWW. An evaluation of which

procedure is the most advantageous can best be made on an individual disposal area basis.

4.54 In areas where sediments are known to be excessively polluted, a practical program for monitoring appropriate water quality parameters will be developed. This should permit a reasonable evaluation of the effects of pollutants resuspended by dredging and should indicate whether or not containment of the materials is desirable. If it is found that the water quality is lowered sufficiently to constitute a significant health hazard to man as a result of toxic materials entering the marine food chain, an alternate plan of disposal will be initiated.

4.55 It is Corps of Engineers' policy to follow the recommendation of Federal and State advisory agencies wherever practicable. The purpose is to guard against any potential long-term damages unforeseen at the present time. On 5 September 1975, EPA published regulations for disposal of dredged or fill material in inland waters (40 CFR 230). These regulations were developed by a joint task force in the Washington offices of the Corps of Engineers and EPA. All GIWW maintenance dredging will be conducted in accordance with these regulations as discussed in paragraph 2.108.

4.56 It is recognized that some resuspension of pollutants during dredging may be unavoidable, even though everything practicable and reasonable is done to reduce the quantities and thereby any adverse effects. In consideration of the almost immediate detrimental effects on the economy and fuel supply of the state and nation that would result from lack of maintenance, it is not believed that the environmental damages justify failure to maintain the Gulf Intracoastal Waterway or its major tributary channels.

4.57 The hopper dredge disposal proposed for maintenance of the Port Mansfield Entrance and Jetty Channels is in compliance with regulations, procedures, and criteria established pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972 (PL-92-532). The act states that dredged material may be considered unpolluted if it is composed essentially of sand and/or gravel, or of any

other naturally occurring sedimentary materials with particle sizes larger than silts and clays. In view of the predominance of relatively pure sands found throughout the channel over the past four years (Table 17), the materials to be dredged and deposited in the Gulf disposal area are considered essentially sands and are unpolluted.

4.58 Water Quality. As can be seen on Table 14, the open waters of many Texas bays and channels exceed proposed EPA criteria for one or more parameters in nearly all samples. Resuspension of pollutants caused by dredging is not responsible for the levels of pollutants shown on the table. The data given simply shows the existing water quality in the concerned bays. Since these bays are currently producing large quantities of fish and shellfish for human consumption, it must be assumed that the waters are suitable for the propagation of these animals. It is recognized that the proposed water quality criteria may represent desirable goals for excellent marine water quality. However, such low levels of trace elements and other pollutants may not be obtainable in the foreseeable future. In addition, the levels of pollutants and heavy metals found in most Texas bays have not been shown to be harmful to the marine organisms found along the Texas coast. There are a few exceptions to this where a single sample has contained an unusually high concentration of a particular element and where sessile marine organisms were located adjacent to a point source of the particular pollutant involved. In general, it is not expected that dredging will significantly affect the overall water quality of Texas coastal estuaries. Exceptions will be handled on an individual site basis with maximum feasible mitigation efforts being accomplished.

4.59 In view of the temporary nature of most adverse effects of maintenance dredging, the most serious long-term impact is believed to be continued suppression of productivity in the affected areas. Areas dredged or covered with dredged sediments are not at peak productivity all of the time. For example, in an area where vegetation is covered with sediment every two years, the productivity lost during the recovery time is probably about 60 percent or more of the potential maximum. The loss is governed

by the frequency of dredging. The more frequent the dredging, the less time an affected area is at maximum productivity.

4.60 In areas where a major portion of shoal material is contributed from an outside source such as a river discharge, the effect on productivity may be cumulative to some extent over the years. The area covered during one dredging is essentially the same in size as the area covered during any previous dredging, but the areas do not necessarily coincide and the total area affected by deposited materials may increase. The cumulative effects are limited because older deposits not affected by subsequent disposal operations usually recover to near normal bay bottom conditions and can no longer be considered unproductive. With regard to maintenance dredging in areas where the only significant source of shoal materials is the surrounding bay bottom, the cumulative effects are further limited because the materials deposited are usually dispersed over possibly the entire bay area during the period between dredgings, resulting in very little accumulation of material in the disposal areas. This is particularly true where the materials to be dredged are primarily silts and clays, which is the case for the large majority of the channels.

4.61 Land Disposal. Adverse environmental effects of disposal of dredged material on land include destruction of vegetation; loss of foraging, feeding, nesting, and resting areas for birds, mammals, and reptiles; temporary reduction of air quality in the immediate vicinity; and long-term partial suppression of the productivity of the disposal area.

4.62 When a land area is used for disposal of dredged materials, most of the vegetation is covered or destroyed, particularly where containment levees are used. This loss of vegetation forces birds, mammals, and reptiles to leave the area until the vegetation recovers. Recovery of the vegetation usually begins within 6 months to a year. A recent aerial observation tour of all the disposal areas used for deposition of maintenance materials from the GIWW and its tributary channels showed that almost all the areas were covered with vegetation. Those that were

not covered with vegetation had generally been used within the past year for disposal. A few disposal areas, particularly those in hypersaline areas, never completely revegetate. Considering the very small relative size of the total area used for disposal when compared to the thousands of square miles of similar habitat in the surrounding coastal area, it is doubted that such effects are significant.

4.63 In a few unique areas the significance of the damage might be considerable. In a few cases, adjustments coordinated with other agencies have resulted in relocation of a disposal area to protect unique habitat such as timber containing squirrels and black mangrove swamps near Aransas Pass.

4.64 In some instances, the disposal of dredged materials on land results in the degradation of air quality as a result of the release of odors. These odors are caused by the decay of organic materials that had collected on the channel bottom and decay of vegetation in the disposal area. This is noticeable principally with disposal areas near inhabited areas and is considered more a nuisance than a health problem. Odors can be controlled by chemically treating the disposal area with a proprietary product containing essential oils and deodorized kerosene. This product has been used successfully in treating disposal areas along the Houston Ship Channel with no apparent adverse effects. The product was initially recommended for use by the Director, Harris County Pollution Control Department. The product manufacturer advises that all the essential oils are on the GRAS (Generally Regarded as Safe) list of chemicals approved by the U.S. Department of Agriculture for use. If needed, the mixture of essential oils and deodorized kerosene in a 1 to 4 ratio can be applied over the area at a rate of .5 gallon per acre. The frequency of application could vary from once every 2 days to once every 10 days depending on the severity of the problem. Exhaust emissions from the dredge will have no significant effect on air quality, and noise levels will not be increased except in the immediate vicinity of the dredge.

4.65 The only significant long-term adverse environmental effect that results from land disposal of maintenance

dredged materials is the suppression of productivity in the disposal areas. Because of repeated disposal of materials, the vegetation is not in a constant state of maximum productivity. Maximum productivity occurs only between the time of full recovery and the next deposition of sediments. This time period is highly variable, running from two to ten years for most areas. Where a disposal area is used for the first time, the vegetation will normally change to a lower quality type. This may permanently lower the productivity of an area. Changes in vegetation type will be minimal, as most areas to be used for disposal have been used previously, and the changes have already occurred.

4.66 Marsh Disposal. Disposal of dredged materials in marshes is significantly detrimental to the ecology of the surrounding bay systems. Such disposal has the effect of converting the highly productive marsh area to a high ground area with a corresponding change in types of vegetation. Marshes are highly productive, often contributing as much as ten tons of organic matter per acre to the bay systems every year. Because of the high value placed on marsh lands as primary food source areas, dredging practices have been changed to avoid disposal in marsh areas wherever practicable.

4.67 Many miles of levees have been and will be constructed to prevent dredged materials being placed in existing disposal areas from running into adjacent marshes. The precise layout of these levees is best determined by qualified personnel. Detailed studies are required to determine heights of levees, locations of spillways and enclosed areas necessary for obtaining maximum water clarification, minimum affected area, and acceptable capacity. It is not known whether existing disposal areas have in any way acted as barriers to the movement of water onto or away from adjacent land and marsh areas. Levees have been constructed in many areas specifically to prevent dredged materials from blocking significant creeks, streams, and bayous. As a result of coordination efforts, many formerly blocked water passages have been reopened, and it is anticipated that additional openings will be dredged in the future. Significant blockage of water exchange in wetlands will be avoided wherever practicable.

4.68 It may occasionally be necessary to dispose of some materials in marsh areas. This will occur when all alternative disposal areas have been investigated and the decision reached that such a disposal plan is the only practicable plan. Such a decision would be reached in the separate coordination phase. Marsh areas will only be used if that use is believed to be justified by the social and economic benefits to be derived from maintenance of the channel.

4.69 Table 16 gives estimated acreages of marsh areas that may be affected by future disposal operations. These figures reflect only those marshes bordering on the GIWW or major marsh areas near the channel. They do not include the marsh areas surrounding the major bays or river inlets. The estimates were prepared by Corps of Engineers personnel from the most recent coast charts available. It has not been practicable to make surveys of each area to determine the exact extent of marsh land within the disposal area limits. The estimates are therefore based primarily on vegetative cover shown on the coast charts. It is considered that much of the acreage included as marsh to be covered has been covered by past dredging and is no longer marsh. It is believed that reduction of marsh areas caused by dredging of the GIWW and its tributary channels will be minimal. It will not be practicable to prevent all losses and continue to maintain the channels. Continuation of existing levels of commerce will require some additional losses of wetlands along the Texas coast.

4.70 Archeological Resources. It is doubtful that maintenance dredging of the Gulf Intracoastal Waterway will have any significant adverse effects on these resources for several reasons. The maintenance dredging should have no effect because the channels are not enlarged. The materials to be dredged consist entirely of sands, silts, and clays deposited since the last maintenance dredging occurred. Any archeological or historical resources that existed in the area to be dredged would have been removed or covered many years ago.

4.71 In nearly all cases, the disposal areas have been used as disposal sites for many years. Any archeological

or historical resources located in the areas would have already been covered with dredged materials, making them difficult or impossible to locate. Future maintenance dredging will only cover these areas deeper.

4.72 In shoreline areas near or along land cuts, some archeological or historical resources may currently be exposed to wave action damage resulting from winds and boat traffic. Original construction of the channel may have caused or contributed to this situation. However, failure to maintain the channels would not result in significant lessening of these damages. Wind caused wave action and most recreational boat wakes would continue unabated.

4.73 Even though the potential for damages to archeological and historical resources is slight, every reasonable effort is made to prevent those damages which might occur. Before any new disposal areas are selected, the National Register of Historic Places is consulted to see if any listed resources are near the project site. The Texas Historical Survey Committee is then consulted to find out if any unlisted sites exist in the project area. When the investigation is completed, disposal areas are revised, if required, to avoid placing materials on important sites and the use of heavy equipment is prohibited in areas that contain sites. This procedure is particularly appropriate when other agencies have requested the relocation of a disposal area.

4.74 Some damages to archeological and historical resources will be unavoidable. Sites exposed to wave action will continue to erode, and sites previously covered with sediment may be covered more deeply. It is believed that all reasonable precautions are being taken, and that the damages which might occur in spite of these precautions do not justify the economic and social disadvantages of failure to maintain the channels.

4.75 Some areas of the GIWW have been thoroughly investigated for archeological and historical resources, but many have not. Information concerning possible effects of maintenance dredging on such resources has been requested

from the Texas Historical Commission, and the reply is given in Appendix C. The recommendations made in the reply will be followed where practicable. Advice concerning possible historical resources will be sought from appropriate agencies when new disposal sites are proposed.

4.76 Related Non-Federal Channels, Slips, and Berths. Along the GIWW project there are hundreds of non-federally constructed and maintained channels, slips, and berths. Some of these facilities require periodic maintenance and others have not required maintenance since construction. Many of the facilities are essential appurtenances to the Federal navigation project in that they are the major dockside areas where transport barges are moored for loading and unloading. Without such facilities, effective utilization of the Federal project could not be realized.

4.77 Those facilities which are essentially appurtenant to the project are usually maintained concurrently with the project, utilizing the same dredge and the same disposal areas. Although smaller in quantity, the sediments to be removed from the non-Federal facilities are essentially the same as those found in the Federal project. The environmental effects of maintaining these facilities are identical with and additive to the effects of maintenance of the Federal project. Quantitatively, maintenance of the non-Federal facilities results in small increases in the total area dredged, the total volume of materials removed, the time required to perform the work, and the depth of materials deposited in the disposal areas.

4.78 There are also numerous smaller non-Federal channels, slips, or berths which have been constructed and maintained adjacent to the Federal project. These smaller facilities are generally used by crew boats, commercial fishing vessels, and pleasure craft, rather than by commercial cargo vessels. They are generally shallow, seldom exceeding 6 feet in depth. They are infrequently maintained, and dredged material is usually placed on land. The environmental effects of their maintenance are the same as for maintenance dredging and disposal for the Federal project, but the same disposal areas are not

necessarily involved and the times of dredging would probably not coincide. These smaller non-Federal facilities are essential to overall marine activities and to the quality of recreation available along the Texas coast.

4.79 Quantification of the fragmentary environmental effects of irregular maintenance of all these non-Federal facilities in relation to the Federal project is not practicable. Installation and maintenance of each non-Federal facility is controlled by means of the Corps of Engineers' permit program. Under this program, proposed activities with respect to construction or maintenance of each facility are brought to the attention of all interested parties by means of public notices. Pertinent comments regarding environmental or other considerations are appropriately evaluated on a case by case basis in connection with the permit application.

4.80 Possible Secondary Effects. The existing waterway is maintained by the Federal Government in order to provide free and open navigation waterways for transportation of commodities and to insure safety by decreasing the possibility of vessel collisions, and, therefore, the possibility of spills of petroleum or other toxic materials. Although the purpose of maintaining the existing waterway is not to prompt additional development in the coastal zone, it is recognized that the continued existence of the waterway may contribute to such development. Developments such as marinas, condominiums, Venice type subdivisions, and light and heavy industry could be environmentally adverse in those land resource areas already heavily stressed by air, water, noise, and solid waste pollution. Realizing the significance of the coastal region, the State of Texas has initiated an effort to develop a coastal zone management program. One of the goals of such a program would probably be to regulate development in the coastal zone in an effort to minimize or eliminate adverse effects of such development. An adequate coastal zone management program would protect unique and highly productive natural areas from loss caused by development.

5. ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSED ACTION BE IMPLEMENTED.

5.01 Bottom Dwelling Organisms. Removal or destruction of nearly all of the bottom dwelling organisms present in the bottom of a reach of the Texas Section of the Gulf Intracoastal Waterway or its tributary channels cannot be avoided during dredging. Depending upon the shoaling rates for the various reaches of the channels, this would occur as often as once a year in some areas and as seldom as once in six years in others. Expected frequencies for the various reaches and tributary channels can be found on Table 3. The average area dredged annually is 3,550 acres. This represents slightly over one fifth of one percent of the total bay bottom area along the Texas coast and includes maintenance of all land cuts, inland turning basins, and mooring basins. If the total is reduced to consider only those portions of channels within the confines of a bay area, the percentage drops to less than one tenth of one percent.

5.02 Turbidities. Turbidities caused by dredging and disposal operations will inhibit phytoplankton productivity and may suffocate a relatively small number of individual marine animals. This effect will occur in the immediate area of the cutterhead and, if in open water, within about 1,600 feet of the point of disposal. The duration of the effects will be primarily limited to the period of dredge operation. Turbidities beyond a few hundred feet from the dredge or disposal area will not exceed levels caused by natural processes.

5.03 Open Water Disposal. Disposal of dredged materials in open water will bury submerged aquatic vegetation and bottom dwelling organisms including oysters in the affected area. The vegetation is of value as a source of primary productivity and food for waterfowl. Oysters are of importance as a commercial species.

5.04 Other benthic animals are important as food sources for marine animals. The average area expected to be covered with dredged materials on an annual basis should

be less than one half of one percent of the surrounding coastal bay bottoms; and since the same areas are used repeatedly, the effects are not cumulative over the years.

5.05 Open water disposal may result in some submerged areas eventually becoming emergent. This will constitute a permanent loss of marine habitat. The area will probably develop vegetation and become a valuable area for shore and wading birds, emergent vegetation, oyster production, and recreational use.

5.06 Resuspension of pollutants found in some areas may be unavoidable. Theoretically, resuspended pollutants can enter the marine food chain causing higher concentrations of heavy metals and other toxic materials in sport and commercial species and could result in fish kills or other adverse effects short of mortality. However, previously cited recent studies made under natural conditions have shown that harmful quantities of pollutants are not always released into the water column by dredging or disposal operations, and Corps of Engineers sampling operations have supported this finding. Further, since sediments dredged in past years were in all probability at least as polluted as sediments to be dredged in the future, resuspension of pollutants and resultant effects caused by the proposed dredging should not exceed what has occurred in the past. Past dredging is not known to have resulted in any increased levels of toxic materials in sport or commercial species or to have resulted in any fish kills. Practical programs for monitoring the effect of resuspension of pollutants on water quality will be implemented during dredging of channel sediments containing excessive pollutants. If such monitoring indicates a definite need, dredge operations can be adjusted to prevent significant adverse effects, and disposal, if practicable, will be changed to a less detrimental alternative.

5.07 Disposal in Marsh Areas. Deposition of dredged materials in some marsh areas cannot be avoided. This will result in a change of habitat type in those areas used, and will be detrimental to the marine environment. Marsh areas covered with materials will contribute a

substantially smaller quantity of nutrients to the nearby open water areas. Filled areas should develop vegetation typical of high ground areas in the surrounding area and should furnish habitat for various reptiles, birds, and land mammals. The maximum possible area of marsh that could be covered with dredged materials in the foreseeable future is approximately 4,464 acres. This represents approximately 1.6 percent of the marsh areas immediately surrounding the Gulf Intracoastal Waterway and its tributary channels. When the total area of salt, brackish, and freshwater marsh along the coast is considered, this figure is reduced to less than nine tenths of one percent of the Texas coastal marsh area.

5.08 Disposal on High Ground. High ground areas used for deposition of dredged materials will become temporarily unsuitable as habitat for most land animals and birds, particularly where containment levees are used. In most areas where containment levees are not used, recovery of the vegetation should begin within six months, with a reasonably well developed stand occurring in less than two years. Where containment levees are used, regrowth of vegetation takes longer because the sediments are not as effectively drained and require longer to consolidate and leach out salt sufficiently for plant growth to occur. Use of containment levees does, however, reduce the area covered with sediments and prevents sediments from flowing into any adjacent marsh areas.

5.09 Oyster Production. In some areas, small portions of existing oyster reefs will be covered with dredged sediments. In all such cases, the oysters that will be affected have developed directly on previously deposited sediments, as such areas often become suitable oyster habitat. Deposition of more sediments will not destroy all the oysters in these areas and is expected to expand the total area of the live reef. Points of discharge will be situated to minimize damages. Because of this, it is believed that coverage of small areas of existing live reefs that have developed in disposal areas will have only temporary detrimental effects on the oyster populations there and will probably expand the area of live reef available to fishermen.

5.10 Aesthetic Problems. Aesthetic problems caused by maintenance dredging will include odors, vector problems, unsightliness of land disposal areas, and turbidities near dredging operations. Odors are a problem only with land disposal sites near developed areas and can be controlled with applications of chemical deodorizers. Natural mechanisms eliminate the problem shortly after dredging ceases. Problems arise when rodents are excluded from disposal sites near developed areas, and mosquito breeding areas can be formed in sites surrounded by containment levees. The rodent problem is minor, and the mosquito problem is normally handled by aerial spraying. High turbidities are displeasing to sport fishermen, but since dredge caused turbidities are limited to the vicinity of the dredge and disposal operations, fishermen can fish elsewhere during dredging. Dredges are easily observable in the flat coastal areas of the GIWW. However, dredges are small compared to the size of the bays and their presence is not overwhelming.

5.11 Noise Problems. It is known that birds are not influenced by dredging operations or ship traffic in the waterways. The noise from dredges is observable in this area where the only other noise is produced by commercial and pleasure boats. Studies in Mobile Bay with an oyster dredge indicate that the noise level on the dredge MALLARD was recorded in the range of 100 decibels in the engine room and 80 decibels on the upper decks. Noise levels of the operating dredge were 60 decibels at a distance of 2,000 feet. Noise levels of 80 decibels or higher for sustained periods of time become injurious to health and impair hearing. Ordinary conversation has a sound level of 60 decibels, a vacuum cleaner around 70 decibels, and a diesel truck moving 40 mph produced about 80 decibels at a distance of 50 feet away (U.S. Army Engineer District, Mobile, Alabama; Draft Environmental Statement on "Permit Application by Radcliff Materials, Inc., Dredging of dead-reef shells, Mobile Bay, Alabama; October 1972). Noise levels from pipeline dredges are not expected to differ significantly from those of a shell dredge, and, therefore, no significant adverse effects of noise levels are expected to occur from pipeline dredging.

5.12 Suppression of Productivity. A probable major adverse effect of maintenance dredging will be the

suppression of productivity in channel bottoms and disposal areas. Because of repeated disposal of materials, the vegetation and/or benthic community is not in a constant state of maximum productivity. Maximum productivity occurs only between the time of full recovery and the next deposition of sediments. This time period is highly variable, running from one to five years for most areas. This loss of productivity will be incurred so long as the channels are maintained. The loss will be an additional loss only where new disposal areas are used. For those areas already in use, there will occur only continuation of the existing situation.

5.13 In commenting on the draft statement, the Texas Parks and Wildlife Department stated that in its opinion, disposal from maintenance dredging of the GIWW and its tributaries is more detrimental to fauna than it is beneficial.

6. ALTERNATIVES TO THE PROPOSED ACTION.

6.01 General. Consideration of alternatives should include effects on the economic stability and social well-being of inhabitants of the area, state, and nation as well as the effects on the natural environment. The only true alternative to maintenance of the Gulf Intra-coastal Waterway and its tributary channels is cessation of maintenance. Maintenance dredging could be stopped on all or any part of the channel system, with the consequences dependent on where the maintenance dredging ceased.

6.02 Cessation of Maintenance. The direct consequence of failure to maintain a channel is its eventual closure to navigation as a result of shoaling. The length of time that would pass before commercial navigation was stopped would depend upon the shoaling rate of the channel involved and the draft of vessels using the channel. For the various reaches and tributary channels, the shoaling rates given in Table 3 can be used to predict exclusion of vessel traffic. For example, a 12 foot deep channel which requires maintenance every two years would be closed or constrained to one way traffic for vessels with an eleven foot draft within three years of the last maintenance dredging job. Barring unusual conditions resulting in sudden excessive shoaling, the channel depth would decrease at about one foot per year for a few years, and then continue to decrease less than one foot per year. Within about a six year period, the channel would be effectively closed. The economic and social effects of closure of a channel would depend on what ports were affected. For example, if the channel to Port Mansfield were closed, the shrimp industry and related businesses would be unable to continue operations. Since the commercial fishing industry and related employment is the only industry in the area, probably all of the town's 731 inhabitants would be severely affected. If a main channel were closed, affecting ports such as Texas City, Freeport, Houston, and Port Arthur, the effects would be much more significant in terms of fuel production and jobs lost. Employment would be affected in the petroleum industry, concrete production,

steel manufacture and distribution, and grain and food product transportation as well as in the towing companies and barge, tow boat, and other vessel manufacturing and repair industries.

6.03 In order to continue operations, all industries using the waterways would use rail, truck, and pipeline transportation, thereby increasing their costs of transportation of raw materials and products. Transportation by truck or rail for most products is several times as expensive as transportation by barge. Fuel consumption for truck and rail transportation is also usually higher than for barge transport. Pipeline transportation of fluids is roughly equivalent in cost to barge transport. This increase in costs would make many of the industries less competitive, and some would close or relocate near another channel. Higher prices to the consumer would result, with no corresponding increase in value added.

6.04 The increased use of truck, rail, and pipeline transportation would have several effects. Increased usage of these facilities would result in construction of additional roads, rails, trucks, trains, and pipelines. Such construction would require the loss of substantial areas of natural wildlife habitat. Longer routes and less efficient equipment would mean larger volumes of fuel consumed and resultant increases in noise pollution. This alternative would also result in an increase in air pollution. In this coastal area with much fog, the gaseous and particulate emissions would react with the fog resulting in photochemical smog, a public health hazard.

6.05 Some environmental gains would result from the "no action" alternative. Productivity of the areas affected along the central and upper coast would be improved. The acreages of bay bottom now being dredged or used for deposition of sediments would not be disturbed, and maximum normal productivity of these areas would be reestablished. No oysters would be buried, and no additional marsh area would be removed from the marine environment.

6.06 In the Laguna Madre area, overall benefits to the environment would not result from the "no action" alternative.

As the GIWW and the Channel to Port Mansfield began to shoal, circulation would be reduced, and hypersalinity would eventually worsen to near preconstruction conditions. In all probability, this would substantially reduce the area now covered with submerged aquatic vegetation; reduce the area of the bay suitable as habitat for red drum, trout, and brown shrimp; and lower the overall productivity. Shoaling of the channels dredged into "The Hole" at the southern end of the upper Laguna Madre would result in return of predredged conditions of massive fish kills caused by lack of escape routes. Fish kills resulting from extremely cold temperatures would become larger and more frequent as the deep water refuge areas were lost.

6.07 Some environmental losses would also occur along the central and upper coast as a result of the "no action" alternative. Some of the disposal islands now serving as bird and animal habitat would eventually erode away and become aquatic habitat again, and the marsh areas around such islands would be lost. This has already occurred in several areas where the materials added by maintenance dredging were insufficient to prevent erosion of the original island. The area of live oyster reefs existing on deposits of dredged material would not be increased.

6.08 Reduced circulation in some back bays would have a detrimental effect on marine productivity there. Shoaling of the GIWW from Port Bolivar to Port Arthur would reduce the saltwater circulation in the vast salt marsh areas there, causing loss to the bay systems of nutrients and marine animals produced there. Such areas would, however, become more useful to freshwater animals and waterfowl.

6.09 For the San Bernard River Channel, the Colorado River Channel, and the Arroyo Colorado Channel, stoppage of maintenance dredging would probably have little beneficial effect on the marine environment as disposal areas are almost all on land. Benefits would be limited to freshwater animals in the rivers, land animals and birds

in the disposal areas, and marine organisms along the saltwater portions of the channels.

6.10 Along the Channel to Victoria, beneficial effects of no maintenance would be primarily limited to the first eight miles of the main channel and the Channel to Seadrift. Along the Channel to Palacios, beneficial effects would be limited to the last 5 1/2 miles of the channel, which is the only portion that requires dredging. In Matagorda Bay, only 9 of the 17 miles of the GIWW require dredging. The rest of the channel crosses areas that are naturally deeper than 12 feet. In Galveston Bay, marine environmental benefits would generally be limited to the 20 miles of open water channels, including the alternate route and Offatts Bayou Channels. Along the central and upper Texas coast, land cut reaches of the main channel comprise more than 70 percent of the total channel length. Land cut reaches of the tributary channels constitute more than 85 percent of the total length of the tributaries.

6.11 In view of the detrimental environmental effects of the "no action" alternative, it is questionable whether the net effect of ceasing maintenance dredging along the Texas coast would be beneficial to the marine environment. The net effect along the entire coast is indeterminate. If consideration is given to the severe economic and social problems associated with the "no action" alternative, it is apparent that, subject to the limitations established in coordination of the disposal areas with other agencies, the proposed plan of action will best serve the public interest.

6.12 Maintaining the channels at less depths than authorized is not a reasonable alternative. Large tank and cargo barges would be unable to use the channels. The smaller benefits to be derived from a shallower channel would be disproportionate to the costs incurred. No significant environmental gains would result from adoption of this alternative. After an interim period allowing for shoaling of the channels to the new depths, maintenance would have to be resumed, and the quantities of dredged material to be removed would not decrease.

6.13 Alternate Dredging Methods. The disposal of dredged material is an increasingly complex problem. The desire to reduce repetitive redredging of material in the channels has intensified efforts to provide positive retention of dredged materials where they are deposited. The emphasis on clean waters has redirected planning toward alternative disposal techniques which minimize pollution aspects of some methods of dredging. These alternatives probably will result in more costly disposal methods to provide accepted means of accomplishing required dredging work.

6.14 Various Types of Dredges Available. Dredges are generally divided into two categories-mechanical and hydraulic. The major types of mechanical dredges are dipper dredges, ladder dredges, and bucket dredges. Hydraulic dredges include hopper dredges, pipeline dredges, and side casting dredges. Hydraulic dredges are discussed in Section 2 of this statement.

6.15 Environmentally, hopper and pipeline dredges are the least hazardous since dredged material is taken up by pumps, producing only limited turbidity, and deposited in a controlled manner into prearranged disposal sites. Dipper and bucket dredges have a dragging or scooping motion which causes high turbidity and scatters dredged material. The dipper or bucket dredges are usually best for dredging new channels or hard materials. The GIWW maintenance material normally consists of soft slurry materials such as silt, sand, and clay.

6.16 Dipper Dredge. The dipper dredge is basically a power shovel, such as is used for earth excavation, which has been mounted on a barge. It has the advantage of being capable of excavating hard materials such as blasted rock or loose boulders that cannot easily be removed by other types of dredges. The digging boom, or dipper stick, limits the depth of excavation generally to not more than 60 feet. Beyond this depth, the boom must be massive and presents a severe design problem. The barge, which serves as the work platform for the power shovel, has spuds to anchor it in the work area while operating. Two spuds are used at the forward end

to stabilize the dredge, and a single spud is centered at the stern of the barge.

6.17 Ladder Dredge. The ladder dredge is so named because of its chain of buckets passing over and under a long steel frame or ladder. This ladder is usually mounted in the middle of the dredge and extends toward the front of the barge. The operating depth of the ladder can be altered to suit the channel depth being excavated, but is limited by design considerations. Larger dredges in this class use buckets of approximately 2-cubic yard capacity and can operate at depths of 100 feet. Dredging with the ladder dredge is accomplished by forcing the buckets into the material to be excavated. The dredge is set up over the cut with an anchored cable set out ahead to pull on and side cables placed to either side to stabilize the barge while working. The ladder dredge is advantageous for dredging varied types of material at great depths in a comparatively confined location.

6.18 Bucket Dredge. The bucket dredge is so named because it utilizes a bucket to excavate material to be dredged. The type bucket utilized (clamshell, orange-peel, or dragline) often can be changed to suit the job conditions and material to be removed. Different size buckets can be employed by the same dredge, again dependent on the character of the dredged material. Buckets holding up to 15 cubic yards are currently in use. The bucket dredge is mostly used to remove material in confined areas, such as around docks and piers. It is generally not economical for large scale excavation projects unless nearby disposal areas are available.

6.19 Side Casting Dredge. The side casting dredge evolved from use of hopper dredges to provide overboard discharge of dredged material. Under certain conditions this type of dredging is feasible and by far the most economical means of providing and maintaining channel depths. These dredges can be designed for side casting only, or the conventional hopper dredge can be equipped to provide the capability for side cast dredging. All of this equipment is self-propelled with the discharge

of the dredged material usually accomplished through a boom pipeline alongside the dredged channel. Side casting dredges are particularly effective in locations where the littoral currents do not return a significant amount of the dredged material to the navigation channel. The side caster can handle the same range of material that a hopper dredge can. Its ability to maneuver in the channel makes this dredge particularly useful in opening shallow inlets to the ocean. Side casting dredges range in discharge pipeline size from 12 inches to 26 inches. They can excavate material from as deep as 60 feet below the water level.

6.20 Generally, dredging operations will be done with high volume dredges so that the least amount of time will be spent at a location, resulting in shorter disturbance time of natural habitats and lower dredging costs. Alternative time schedules of maintenance dredging are also considered to insure against disturbance of wildlife during nesting, migration, and reproduction. Jetties, dikes, and other retaining structures have been used to reduce the frequency of dredging and quantity of shoal materials.

6.21 The only dredges that can reasonably be expected to be utilized in maintenance dredging are the pipeline dredge and the hopper dredge. The other dredges described previously would result in higher turbidities, hazards to navigation, and higher costs and would not provide any significant benefits to the environment. Therefore, the methods of dredging considered in the proposed plan are considered to be the best from both an environmental and an economical viewpoint.

6.22 The hopper dredges available along the Texas coast require a minimum water depth of 20 feet for operation. The entrance channel at Port Mansfield is the only portion of the GIWW with sufficient depth to accommodate a hopper dredge.

6.23 Coordination of Alternate Disposal Sites. Detailed consideration of alternative means of disposal is made for each site during coordination of disposal areas with

other agencies. The overall plan for maintenance dredging of the Gulf Intracoastal Waterway and Tributaries contemplates the use of all reasonable methods of disposal, and the potential environmental effects of each of these are discussed in Section 4 of this statement. The following paragraphs are summaries of the proposed alternative disposal methods, all of which will be utilized to some extent. The methods are listed generally in descending order of detrimental environmental effects.

6.24 Disposal in Marsh Areas Without the Use of Containment Levees. This practice has been substantially reduced because of the damages to vegetation and water exchange that can result from uncontrolled flow of materials. Confinement of the materials results in smaller affected areas and prevents the silting up of small streams and bayous that serve as the major water transport system of the marsh. This alternative is used only when other sites are not available and conditions at the site make levee construction impracticable or unnecessary.

6.25 Disposal in Marsh Areas With the Use of Containment Levees. This procedure is used where alternate disposal means are not practicable or possible. For example, from Port Bolivar to Port Arthur, the marsh areas paralleling the GIWW are often so wide that dredged materials would have to be transported several miles to reach high ground. Transport of the dredged materials across miles of marsh lands by pipeline would be probably as detrimental to the marsh as the proposed plan of using confined areas adjacent to the waterway and would be more expensive. The relatively small dimensions of the GIWW channel require the use of small dredges to avoid blockage of the channel during dredging. Small dredges used on the GIWW have a maximum pumping capability of about 1 3/4 mile, and disposal areas must, therefore, be available a minimum of every a minimum of 3 miles along the channel. If disposal areas were located on high ground inland from the coastal marshes, pipeline connection points and booster stations would be required every 3 miles along the waterway. Additional booster pumps would be required every 1 3/4 miles across the marsh. The most feasible method for placing the pipeline across the marsh would be construction of an effluent return ditch and a vehicular roadway

built from the materials excavated from the ditch. The pipeline and booster stations could be maintained, fueled, and operated by means of access along the roadway. The effluent return ditch would be needed to prevent destruction of large areas of fresh and brackish water marsh near the distant disposal areas that would be caused by periodic release of highly saline waters from the channel. Large areas of marsh would be displaced by the ditch, and many more acres would be damaged by construction of the vehicular roadway. Although the marsh damaged by the traffic would recover somewhat between dredgings, the relatively minor amount of marsh area productivity that would result is not considered to justify the high cost of the alternative.

6.26 It is concluded that in specific instances, this alternative might result in some mitigation of adverse effects on marsh area productivity. The beneficial effects depend primarily on the distance from the channel to high ground above the marshes. During periodic re-evaluation of disposal plans, such an alternative might be used in instances where significant benefits would occur. In other cases, where the marsh areas are too extensive, costs would not be justified by the small amount of productivity preserved.

6.27 Disposal in Shallow Water Less Than Four Feet Deep. This alternative is used only where more desirable sites do not exist within reasonable proximity of the dredging site. This becomes a problem where channels cross long expanses of shallow water and where long distances to high ground or deeper water areas make transport of material to them impractical. In such cases, determining the best disposal site within a reasonable distance is accomplished after analysis of individual areas.

6.28 Disposal in Open Water With the Use of Containment Levees. Use of containment levees in open water removes large areas of a bay from the marine environment and results in long-term high turbidities caused by wave action on earthen embankment. The only advantage in the use of such levees is the confinement of polluted or toxic materials that might be resuspended in the water column by disposal operations. Since studies cited

previously have indicated that resuspension of pollutants does not occur in quantities sufficient to damage the environment, it is probably less detrimental to not construct such levees.

6.29 Because of the adverse environmental effects, the difficult engineering and construction problems, and the exceptionally high costs, future maintenance of the GIWW will probably not include construction of open water levees. Construction of levees around disposal areas in open water will probably be limited to those areas which become emergent as a result of repeated disposal.

6.30 Disposal in Open Water More Than Four Feet in Depth. Disposal of dredged materials in deep areas of bays may, in some cases, be beneficial to the environment. The nutrients released and shallower waters created may be more productive than the conditions prior to disposal, thus compensating for those plants and animals buried under the deposited materials. Maintenance dredging almost never results in emergence of a disposal island in deep water, and, therefore, does not normally remove any of the bay bottom from the marine environment. A substantial portion of the materials dredged from channels covered by this statement will be disposed of in this manner.

6.31 Disposal in Wooded Areas. Materials dredged from the GIWW and its tributary channels will probably not be placed in any wooded areas. Wooded areas near the channels are relatively scarce. Where wooded areas do occur near the channels, high ground prairie areas and previously used sites are usually nearby. These sites are used in preference to wooded areas. It is therefore expected that wooded areas affected will be negligible.

6.32 Disposal in a High Ground Area Without Containment Levees. This method of disposal is employed very little because of the cost of acquiring sufficient land area for allowing the materials to spread. It is more economical to purchase a smaller land area and use containment levees to prevent the materials from being transported beyond the property limits. This method will be used only where the land is of such low value that construction of

containment levees is uneconomical or where the landowner has refused to permit construction.

6.33 Disposal in a High Ground Area Within Containment Levees. This is the plan of disposal that will be used for deposition of the majority of materials dredged from the channels covered by this statement. Use of this method eliminates hazards to the marine environment but displaces land animals and vegetation. Areas considered to be high ground include those areas which have become high as a result of past dredging. Future dredging will include more leveed high ground disposal areas than have been used in the past, as submerged areas will be leveed upon emergence, and low areas within leveed sites will become high ground with continued deposition of materials.

6.34 Disposal at Sea. Adverse environmental impacts would be considerably mitigated by dispersal of the GIWW maintenance dredged materials at sea. However, there is little prospect of using this method of disposal for any area other than the Port Mansfield Entrance Channel. The only method of dredging that can reasonably utilize disposal at sea is hopper dredging, and the hopper dredges operating along the Gulf Coast are all deep-draft vessels incapable of operating in the shallow waters of the GIWW. Construction and subsequent use of shallow draft hopper dredges would be economically infeasible, considering the distances the materials would have to be hauled, the small size and capacity of the dredges, additional fuel, and number of dredges required. Costs would be increased from fifteen to twenty times present levels. In view of the relative significance of the detrimental environmental effects of the proposed plan and the high costs and inefficiency of hopper dredging on inland waterways like the GIWW, hopper dredging of channels other than entrance channels is not considered a reasonable alternative.

6.35 Dredging by mechanical means and barging the materials to the Gulf for dumping is another alternative similar to hopper dredging. The environmental advantage of this method would be disposal of materials at sea rather than in bays or marshes. The disadvantages include

higher turbidities in the vicinity of the dredge, and a much longer time required for dredging. Use of inefficient dredges and long barging distances would result in increasing dredging costs by a factor greater than ten. In view of the high costs and limited environmental benefits, this plan is considered impracticable.

6.36 Summary of Alternatives. Site conditions may influence the final location and dimensions of disposal areas. For example, it may be found less detrimental to dispose of dredged materials in a marsh area of low productivity rather than in a shallow bay area containing submerged vegetation if high ground areas are not available within a reasonable distance. For each of the several hundred sites required, the final decisions will be based on environmental effects, areas required, and costs. Other factors being equal, costs will govern. Where it is agreed that the environment will be benefitted by the selection of a more expensive alternative site, that alternative will be selected, provided that the additional cost is not unreasonable. It is believed that by this method, the economic and social well-being of the public can be maintained at a minimum cost in environmental values.

7. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF
MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF
LONG-TERM PRODUCTIVITY.

7.01 Maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway and its tributaries should not induce any basic change in short or long-term productivity of the environment. Short-term effects include loss of bottom dwelling organisms, loss of vegetation, resuspension of pollutants, reduced photosynthetic activity; forced relocation of motile marine and land animals, and aesthetic problems involving recreation.

7.02 Long-term productivity of the channel bottoms and portions of the disposal areas will be held to reduced levels as long as the channels are maintained. However, the areas concerned represent only an extremely small fraction of the total producing area; and the loss in productivity of the bay systems should not be significant. All detrimental effects are probably reversible, either by natural or mechanical means, should the need for maintenance of the channels cease.

7.03 Beneficial uses of the environment should not be significantly curtailed because of maintenance dredging. In some cases maintenance of the channels may be necessary to perpetuate environmental gains such as bird nesting areas, recreational boating routes, and improved water circulation. The proposed action will help maintain the present productivity of local industries, and contribute to the short and long-term economic and social well-being of the inhabitants of the Texas coast and, to a lesser extent, the Nation.

8. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN THE PROPOSED ACTION.

8.01 The labor, material, and capital resources expended during the routine maintenance of the project are irretrievable commitments of resources.

8.02 Frequency of dredging will suppress productivity of animals and plants in the channels and disposal areas as long as the channels are maintained. Productivity lost is a resource that cannot be recovered even though the effect may some day be eliminated.

8.03 Archeological sites covered by previously deposited sediments will probably never be recovered.

8.04 Filling of marsh areas will permanently reduce the potential productivity of those areas by causing a change in vegetation type, unless the process is reversed by natural settlement or mechanical removal of the dredged materials.

8.05 Islands formed by dredged materials may eventually erode completely wherever disposal is discontinued in favor of an alternative area. This will permanently reduce the number of isolated areas now used for nesting, feeding, and resting by many birds, including some rare and endangered species.

9. COORDINATION WITH OTHERS.

9.01 Public Participation. In accordance with Federal dredging regulations (33 CFR 209.145), public notices concerning the proposed maintenance dredging of the GIWW and its tributaries were issued. Table 19 contains a listing of the public notices issued as of 30 May 1975.

9.02 Coordination of Disposal Plans. Formal coordination, under the Fish and Wildlife Coordination Act, of disposal plans for the Texas Section of the GIWW and its tributary channels was accomplished by circulating detailed plans for disposal to the U.S. Fish and Wildlife Service (USF&WS) and the Environmental Protection Agency (EPA). The USF&WS coordinated its review with the Texas Parks and Wildlife Department (TP&WD) and the National Marine Fisheries Service (NMFS), and EPA coordinated its work with the Texas Water Quality Board (TWQB). Copies of plans and specifications were also furnished directly to TP&WD, TWQB, and NMFS to facilitate and expedite coordination. Copies of the letters of coordination are included as Appendix B, and drawings of the coordinated disposal plans are included in Figures 7 through 110 in Volume II.

9.03 Additional Coordination Required by Federal Dredging Regulations. In accordance with Federal dredging regulations (33 CFR 209.145), public notices on the proposed maintenance dredging of the GIWW and its tributaries were circulated to all interested State and Federal agencies and known interested persons. Persons interested in commenting on the public notice and/or requesting a public hearing on the proposed action were asked to do so in writing within 30 days of the date of the notice. Requests for a public hearing require sufficient justification. After all recommendations concerning a given reach or tributary were received and evaluated, an environmental assessment and a statement of findings were prepared and sent to the Regional Administrator of the Environmental Protection Agency for approval (Volume 3). Paragraphs 9.04 through 9.49 contain details of coordination by project reach and tributary channel.

9.04 Port Arthur Canal to High Island

The USF&WS issued a final coordination report on 14 February 1972. Every effort has been made to comply with the recommendations of the USF&WS, but, in several cases, landowners' objections have prevented compliance. The USF&WS recommended that no material be placed north of the waterway between Stations 630+00 and 827+00 in order to protect a freshwater reservoir. Because of an inability to obtain disposal easements south of the waterway, it was necessary to continue disposal operations on the north side. A levee has been constructed in an effort to protect the reservoir to the maximum extent possible. Because of landowners' objections to disposal operations on their properties between channel Station 630+00 and 827+00, it became necessary to revise disposal plans for use of areas obtained from other landowners. All necessary revisions to the recommended plan were reported to USF&WS and were apparently accepted as indicated in its response to the public notice.

9.05 In responding to public notice No. IWW-M-12, the USF&WS and NMFS recommended that back levees be constructed on disposal areas Nos. 14, 15, 19, 20, and 21 and that, until the levees are constructed, discharge points should be on areas of high ground. NMFS also recommended that these discharge points should be used in subsequent maintenance dredging operations. The recommended levees will be constructed. Until the levees are built, the dredged material will be discharged as close to the channel as possible, within the designated disposal area.

9.06 EPA made several recommendations in a report dated 10 May 1971, all of which were complied with. In a letter dated 11 June 1975, EPA approved the dredging and dredged material disposal plans under 33 CFR 209.145 for one year, subject to the following restrictions:

a. Effluent from all fully confined disposal areas shall be discharged through control structures into the Gulf Intracoastal Waterway.

b. Dredged material shall not be discharged further than 1,000 feet from the channel centerline into disposal areas 14, 15, 19, 20, and 21.

c. The backside of each open water disposal area shall be leveed as soon as possible, and as near the channel as feasible. The back levees shall not be more than 1,650 feet from the center line of the channel.

In a letter dated 9 October 1975 (Vol I, page F-1), EPA modified these recommendations by deleting recommendation b. All requirements will be complied with. Long-term EPA approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.07 High Island to Galveston Bay.

The USF&WS issued a final coordination report on 10 September 1971. Their recommendations included construction of back levees, refurbishing existing levees, construction of weirs to control effluent water from disposal areas, and other restrictions on the placement of dredged materials. All recommendations have been incorporated into the project plans.

9.08 Public notice No. IWW-M-8 was issued 22 October 1974 for the channel reach from High Island to Galveston Bay. Four responses to the public notice have been received. A favorable response was received from the Port of Houston Authority. The Galveston Regional Group, Sierra Club, responded with a single letter commenting on 5 public notices. The Sierra Club indicated that the notices did not give sufficient recognition to the importance of both natural and previously disturbed habitat and to living organisms in the project areas. The letter also made suggestions for alternatives to be considered and pollutant monitoring programs. All such considerations are routinely made in other project documents, including Environmental Statements and assessments. Responses from the USF&WS and the NMFS reiterated recommendations contained in the USF&WS report dated 10 September 1971. The recommendations stated that toe levees should be constructed along back limits and ends of each unconfined disposal area when the areas become emergent above Mean High Water. The recommendation stated that the toe levees should be as close to the channel as practicable and no further than

1,350 feet from the channel centerline for disposal areas 38 and 41 and 2,300 feet for disposal area No. 43. The distance of 1,350 feet is considered to be the minimum necessary to provide sufficient capacity for future disposal operations. Levees will be constructed at this distance from the channel centerline when the areas become emergent above Mean High Water. Maintenance of levees and drainage structures prior to and during dredging operations, as recommended by NMFS, is routinely accomplished. The NMFS also recommended that the Corps of Engineers conduct surveys of disposal areas for oyster reefs and marsh vegetation and prepare plans and specifications designating specific discharge locations to avoid affecting such resources. Surveys of selected disposal sites will be accomplished within six months prior to beginning any dredging. While predesignation of discharge points is not considered practicable from a contractual standpoint, the intent of that recommendation will be met by adjusting disposal areas on a case by case basis to permit maximum feasible mitigation of adverse effects on oysters and marsh vegetation.

9.09 EPA made several recommendations in a report dated 1 February 1971, all of which were accepted. In a letter dated 26 March 1975, EPA approved the dredging and dredged material disposal plan under 33 CFR 209.145 for one year, subject to the following restrictions:

- a. Dredged material containing more than 1.0 mg/kg mercury or 50 mg/kg lead shall not be deposited in open water disposal areas.
- b. Sufficient monitoring of the effluent from disposal area No. 42 shall be accomplished for predicting the quality of effluent that can be expected from the area and the possible affect on the quality of the receiving stream. Parameters selected for monitoring must be representative of the waste products discharged to the stream where dredging will be accomplished.
- c. Effluent from all fully confined disposal areas shall be discharged through control structures into the Gulf Intra-coastal Waterway.

d. The backside of each open water disposal area shall be leveed as soon as possible, and as near the channel as feasible. The back levees shall not be more than 1,350 feet from the centerline of the channel. The dredged materials shall not be discharged or allowed to become emerged further than 1,350 feet from the channel centerline.

In a letter dated 9 October 1975 (Vol I, Page E-1), EPA modified recommendation d. to 2,300 feet instead of the 1,350 feet restriction. All requirements will be complied with. Long term EPA approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.10 Galveston Bay to Matagorda Bay.

The USF&MS issued a final coordination report on 13 April 1972. In this report, several recommendations were made including: relocation of disposal areas; construction of back levees and toe levees; maintenance of stream, bayou, and lake openings; and the use of weirs to control effluent water. Recommendations will be complied with as follows:

a. Disposal areas Nos. 60, 79, and 91 will not be used.

b. The local sponsor will be requested to obtain disposal area easement on the north side of the waterway for disposal areas Nos. 63 (between Station 77+000 and 84+300), 93, 96 (between Stations 302+000 and 310+000), 101 (between Stations 343+800 and 347+000), 102 (between Stations 354+000 and 370+500), and 104 (between Stations 383+500 and 397+000).

c. Disposal areas No. 75 (between Stations 165+000 and 169+000), 94, and 95 will be moved to the north side of the waterway provided a permit can be obtained from the Department of Interior allowing disposal in the San Bernard and Brazoria National Wildlife refuges.

9.11 Public notice No. IWW-M-3 was issued on 8 October 1974 for the reach from Galveston Bay to Matagorda Bay. Eight responses to the public notice have been received.

Favorable responses were received from the Matagorda County Navigation District and the Port of Houston Authority. Other responses included letters from Transcontinental Gas Pipe Line Corporation and Blue Dolphin Pipe Line Company giving information on the locations of pipelines not shown on the disposal area drawings, and the Department of the Interior indicated the location of two reference marks near disposal area No. 102. The Galveston Regional Group, Sierra Club, responded with a single letter commenting on 5 public notices. This response was discussed in paragraph 9.08. The USF&WS and NMFS reiterated recommendations made during the formal coordination of this reach. In addition, the USF&WS and NMFS recommended that disposal areas Nos. 60, 61, 63, 76, 79, 102, 104, 105, 106, and 111 be examined for the presence of oysters and marsh vegetation within 6 months prior to dredging, and that contract plans designate discharge point locations for minimizing adverse effects. Selective surveys of these resources will be made by staff biologists as necessary, and all practicable mitigation efforts will be accomplished. However, predesignation of specific pipeline discharge points is not practicable from a contractual standpoint. The intent of this recommendation will be met by adjustment of disposal areas on a case by case basis.

9.12 EPA made several recommendations in a report dated 12 April 1971, all of which were complied with. In a letter dated 24 March 1975, the Environmental Protection Agency approved the dredging and dredged material disposal plan (under 33 CFR 209.145) for one year, subject to the following restrictions:

a. Dredged material shall not be placed in the following areas:

- Disposal area No. 60
- Disposal area No. 63 between Stations 77+000 and 84+300
- Disposal area No. 75 between Stations 165+000 and 169+000
- Disposal area No. 79
- Disposal area No. 91 west of Station 267+000
- Disposal areas Nos. 93, 94, and 95

Disposal area No. 96 between Stations 295+400 and 298+000; 302+000 and 310+000

Disposal area No. 101 between Station 343+800 and and 347+000

Disposal area No. 102 between Stations 354+000 and 370+000

Disposal area No. 104 between Stations 383+500 and 397+000

b. No dredged material shall be placed or allowed to spill into Cedar Lakes or Cow Trap Lakes (Bayou) at anytime.

c. The backside and ends of each open water disposal area shall be leveed as soon as possible. The back levees shall not be more than 2,000 feet from the centerline of the channel in Galveston Bay and not more than 1,500 feet from the centerline of the channel in West Bay, Chocolate Bay, and Matagorda Bay.

d. The following disposal areas shall be reduced to 50 percent of the area defined in current disposal plans: areas Nos. 63, 76, 102, 104, 105, 106, and 111.

e. Disposal areas shall be selected to minimize destruction of valuable fish and wildlife habitat.

f. Effluent from all fully confined disposal areas shall be discharged through control structures into the Gulf Intracoastal Waterway.

In a letter dated 9 October 1975 (Vol I, page E-1) EPA modified these recommendations by deleting recommendation d. The restrictions in part a above will be complied with as discussed in paragraph 9.10. All other recommendations will be complied with. Long term approval of the dredging plan was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.13 Matagorda Bay to San Antonio Bay.

The USF&WS issued a final coordination report on 29 July 1970. In this report, several recommendations were made including construction of levees; maintenance of stream

bayou, and lake openings; and the use of weirs to control effluent from disposal areas. All recommendations were incorporated into the project plans.

9.14 In response to public notice No. IWW-M-10, the USF&WS and NMFS recommended that disposal areas Nos. 118, 119, and 120 be completely confined, and that the effluent from these disposal areas, as well as disposal area No. 117, be directed into the GIWW. The NMFS also recommended that disposal areas be examined for the presence of oysters and marsh vegetation within 6 months prior to dredging, and that contract plans designate discharge point locations for minimizing adverse effects. The local sponsor will be requested to furnish alternate disposal areas for those areas which have been recommended for deletion or reduction to sizes not feasible for use. Selective surveys of the resources will be made by staff biologists as necessary, and all practicable mitigation efforts will be accomplished. However, predesignation of specific pipeline discharge points is not practicable from a contractual standpoint. The intent of this recommendation will be met by adjustment of disposal areas on a case by case basis. The National Audubon Society supported NMFS recommendations.

9.15 EPA, in a letter dated 3 November 1970, recommended that sediments to be disposed of in open water should not exceed the following criteria:

<u>Parameter</u>	<u>Conc. % (dry wt. basis)</u>
Volatile Solids *	8.0
Organic Nitrogen	0.15
Oil & Grease	0.15
Mercury	0.0001

*To be verified by COD and Total Organic Carbon (TOC analysis).

A request for final approval of dredging and dredge material disposal plans under 33 CFR 209.145 from EPA will be made in the near future.

9.16 San Antonio Bay to Corpus Christi Bay.

The USF&WS issued a final coordination report on 11 October 1974 and a subsequent revision dated 3 December 1974. Several of the recommendations in this report require the acquisition of land for use as disposal areas to replace some existing open water disposal areas. Several other actions recommended concerning size limitation of some of the disposal areas would be restrictive to the point of seriously limiting future use of these areas for disposal operations. Leveeing of some disposal areas was recommended. In some cases, the recommended areas are submerged. Levee construction under these conditions would be extremely difficult and impractical. The local sponsor will be requested to furnish alternate disposal areas for those areas which have been recommended for deletion or reduction to sizes not feasible for use.

9.17 Six responses to public notice No. IWW-M-13 for this reach of the channel have been received. One favorable response was received from the city of Corpus Christi, Texas; and Mr. Raulie L. Irwin, Jr. offered dry land-disposal areas to replace open water disposal areas No. 147, 148, 149, and 150. Further investigation of these alternate disposal sites is being made. The Rockport Conservation Association, Inc. strongly opposed the project and requested that all dredged material be deposited in a manner that will not jeopardize the nursery, rearing grounds, and harvest areas essential to sport and commercial fisheries of the area. The association also urged full cooperation with State and Federal fish and wildlife agencies. A copy of the draft Environmental Statement was sent to the Rockport Conservation Association in an effort to show the coordination efforts underway with the various conservation agencies and the measures being taken to reduce adverse environmental effects that could result from the project. J. Rochelle, Student, SMU Environmental Law Clinic, requested that specific evaluations of the adverse effects of the project on the environment be made and suggested that a public notice concerning the relative environmental effects of this project be issued. J. Rochelle was advised to refer to 33 CFR 209.145 for the policies, practices, and procedures followed by the Corps of Engineers in Federal projects which involve the disposal of dredged material and to refer to the Environmental Statement for information on environmental

effects of this project. The USF&WS and NMFS reiterated the comments made in the final coordination report (9.16) dated 11 October 1974. Additionally, the NMFS requested field investigations to determine the existence of submerged and intertidal vegetation and oysters in unconfined disposal areas and that necessary adjustment in disposal plans be made to protect these areas. The USF&WS also suggested the discontinuation of the Redfish Bay cutoff and use of the Lydia Ann Channel to Port Aransas as an alternate route to prevent the "potentially severe ecological damage to Redfish Bay" that could result from continued disposal operations as proposed. The Corps of Engineers is directed to maintain the authorized channel. However, since the State of Texas has assumed local sponsor responsibilities for the GIWW, it is now possible to obtain new disposal areas on environmentally acceptable high ground areas. The final coordination report also recommended that certain disposal areas be deleted or reduced to sizes not feasible for use. The areas recommended for deletion include disposal areas Nos. 128, 147-152, 156, 158-159, and 162, and those recommended for reduction to sizes not feasible for use include disposal areas 129, 153, 154, and 157. The local sponsor will be requested to furnish new areas to replace these areas. As requested, surveys to determine the existence of submerged and intertidal vegetation and oysters in unconfined disposal areas will be made. Adjustments in disposal plans, as determined by these surveys, will be made. Additionally, several of the disposal areas in this reach are located within the Aransas National Wildlife Refuge. The disposal sites in this refuge are coordinated each time dredging is required in order to prevent damages to or enhance the environment for the rare and endangered whooping cranes. Disposal sites are subject to change on short notice in order to protect the cranes' habitat. Such changes are made to protect the natural environment to the

maximum practicable extent and are fully coordinated with the U.S. Fish and Wildlife Service.

9.18 EPA made several recommendations in a report dated 18 May 1971, all of which were accepted. A request for final approval of dredging and dredge material disposal plans under 33 CFR 209.145 from EPA will be made as soon as coordination with USF&WS and NMFS is complete.

9.19 Corpus Christi Bay to Mud Flats.

The USF&WS issued a final coordination report on 20 August 1971. Recommendations included deletion of disposal areas, modification in size of disposal areas, provisions for 1,000 to 2,000-foot openings between disposal areas, and construction of a channel to "The Hole." All recommendations were accepted.

9.20 Five responses to public notice No. IWW-M-9 have been received. One response, from the Coastal Bend Conservation Association, gave objections to continuing maintenance dredging of the channel without having first filed a final Environmental Statement with the Council on Environmental Quality (CEQ). Current schedules indicate that the final statement should be filed with CEQ prior to the next maintenance dredging. Should dredging be required before the final statement is filed, the procedures given in Federal dredging regulations, 33 CFR 209.145, which address continued maintenance in absence of a final statement, will be followed. Carlos H. Mendoza, Student, Texas A&I University, requested that dredging activities not occur during the nesting season of large fish-eating birds (Feb. - Aug.), and that dredged material be deposited in such a manner as to increase the possibility of the disposal areas being used as rookeries. As previously coordinated with USF&WS, dredging operations will not be performed during March through June between Stations 26+800 and 88+500. Also, an effort to increase disposal areas for use as rookeries

will be made. In responding to the public notice, the National Park Service made several recommendations for the protection and enhancement of major bird rookeries located within Padre Island National Seashore. The recommendations included limiting the disposal of dredged material to the unvegetated portion of disposal areas No. 185 and 191 and other existing islands. All of the above recommendations have been resolved. The two responses received from other Federal agencies noted compliance with their recommendations concerning mitigation of adverse effects and pointed out additional environmental benefits that have resulted from construction and maintenance of the channel, including expanded rookeries and additional growths of submerged vegetation.

9.21 EPA made several recommendations in a report dated 1 February 1971, all of which were accepted. In a letter dated 27 February 1975, the Environmental Protection Agency approved the dredging and dredge material disposal plan under 33 CFR 209.145 for one year subject to the following restrictions:

a. Openings between spoil disposal areas shall be maintained such that, in any two mile segment of the channel between Stations 0+00 and 217+870, no more than 50 percent of the longitudinal section parallel to the channel is blocked. Openings shall be maintained at sufficient depths to allow maximum possible flow between dredged material disposal areas.

b. Dredging that would require use of disposal areas Nos. 175-185 or 191 will not be scheduled during March through June.

c. The backside and ends of each open water disposal area shall be leveed as soon as possible. The back levees shall not be more than 1,500 feet from the centerline of the channel, and the dredged material

shall not be discharged or allowed to become emerged further than 1,500 feet from the channel centerline.

d. Dredged material shall not be placed on the vegetated portion of emergent land located between Stations 88+000 and 88+500 or between Stations 125+600 and 126+500.

e. Dredged material shall not be placed in disposal area No. 185 except for the purpose of expanding the size of the rookery presently established on emergent land located between Stations 88+000 and 88+500. The method of placement and boundaries must conform to the Department of the Interior recommendations for preservation of vegetation on the emergent land and shallow water area between the emergent land and South Bird Island.

In a letter dated 9 October 1975 (Vol I, Page E-1), EPA modified these recommendations by deleting recommendation a. All requirements will be complied with. Long-term approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.22 Port Isabel to Mud Flats.

The USF&WS issued a final coordination report on 13 July 1971 and subsequent revisions dated 29 May 1975. Recommendations included maintenance of openings between disposal areas, construction of toe levees, and limitations of the size of disposal areas. All recommendations were accepted.

9.23 Public notice No. IWW-M-4 was issued 15 October 1974. Responses received from the USF&WS and NMFS reiterated recommendations contained in the USF&WS coordination report. All of these recommendations have been accepted. The NMFS also recommended that disposal areas be examined for the presence and density of submerged seagrasses and tidal marsh. From these surveys, pipeline discharge point locations should be designated. The suggested surveys will be made. However, predesignation

of discharge points is not feasible from a contractual basis. The purpose of this recommendation will be met by adjusting disposal areas on a case by case basis to permit maximum feasible mitigation of adverse effects.

9.24 EPA made several recommendations in a report dated 1 February 1971, all of which were accepted. In a letter dated 20 March 1975, EPA approved the dredging and dredge material disposal plan under 33 CFR 209.145 for one year, subject to the following restrictions:

a. Openings between dredged material disposal areas shall be maintained such that, in any two mile segment of the channel, no more than 50 percent of the longitudinal section parallel to the channel is restricted by sediment. Openings shall be maintained at sufficient depths to allow maximum possible flow between dredged material disposal areas.

b. The backside and ends of open water disposal areas Nos. 211-220 shall be leveed as soon as possible. The back levees shall not be more than 1,500 feet from the centerline of the channel, and the dredged material shall not be discharged or allowed to become emerged further than 1,500 feet from the channel centerline. Except for disposal area No. 226, the limiting distance for all other open water disposal areas shall be 1,200 feet from the channel centerline.

c. The backside of disposal area No. 226 must be leveed prior to any further use. This area may be leveed at 2,000 feet from the centerline of the Channel to Harlingen, but no more than 1,200 feet from the GIWW Channel.

A second letter, dated 3 April 1975, approved a minor change in the disposal plan. In a letter dated 9 October 1975 (Vol. I, page E-1), EPA modified these recommendations by deleting recommendation a. All requirements have been or will be complied with. Long-term approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.25 Colorado River Channel. The USF&WS issued a final report on 7 February 1974. Recommendations in the report included size limitations on disposal areas Nos. 1, 4, and 5 and construction of levees to confine the dredge material. In areas where levee construction was recommended, the landowners involved will be contacted for permission to construct the levees. However, the recommended size limitations on disposal areas would not allow sufficient capacity for future disposal operations.

9.26 Public notice No. IMW-M-1 was issued on 1 October 1974 for the Colorado River Channel. The two responses received were from the USF&WS and NMFS. Both agencies noted compliance with the recommendations contained in the USF&WS coordination report dated 7 February 1974. The USF&WS was especially concerned that the cutoff bendway located between disposal areas Nos. 5 and 5A be protected. In an effort to protect this area, levees will be constructed, subject to obtaining the landowners permission.

9.27 EPA made several recommendations in a report dated 23 July 1971, all of which were complied with. In a letter dated 21 February 1975, EPA approved the dredging and dredge material disposal plan under 33 CFR 209.145 for one year, subject to the following restriction:

Dredged material disposal in disposal areas Nos. 5 and 5A shall be managed to preclude deposition of sediment in the bendway channel surrounding disposal area No. 5A

The requirement will be complied with. Long-term approval of dredging plans was deferred until a final environmental statement has been filed with the Council on Environmental Quality.

9.28 Tributary Channel to Harlingen Via Arroyo Colorado. The USF&WS issued a final report on 2 June 1975. This report stated that disposal practices implemented along the GIWW reach from Port Isabel to Mud Flats (Station 126+260 to 130+900) were also applicable for this channel. There was also a recommendation that EPA be consulted for control measures necessary to prevent dissemination of

pollutants into the bay. All recommendations will be complied with.

9.29 Public notice No. IWW-M-5 was issued 21 October 1974. Six responses to the public notice were received. One response, from the Willacy County Navigation District, was favorable; and responses from the USF&WS and NMFS recommended several revisions to the plan of disposal. Revised disposal plans have now been accepted by these agencies. Responses were also received from the Town of Rio Hondo and the Arroyo Boat and Ski Club requesting public hearings in regard to future disposal of dredged materials in disposal areas 21 and 9 respectively. Subsequently, the request by the Arroyo Boat and Ski Club was withdrawn following assurance that previous requests for modification of disposal operations will be accommodated. Also, dredging in this reach of the channel is not anticipated in the near future. The Town of Rio Hondo requested a public hearing in order to protest continued use of disposal area No. 21. This disposal area will not be used unless the objections raised by the Town of Rio Hondo are resolved. The National Audubon Society agreed with recommendations of NMFS.

9.30 EPA made several recommendations in a report dated 9 June 1971, all of which were complied with. In a letter dated 17 April 1975, EPA approved the dredging and dredged material disposal plan under 33 CFR 209.145 for one year, subject to the following restrictions:

a. The backside and ends of open water disposal area No. 1 shall be leveed as soon as possible. The back levee shall not be more than 1,200 feet from the centerline of the channel, and the dredged material shall not be discharged or allowed to become emerged further than 1,200 feet from the channel centerline.

b. The backside of disposal area No. 2 must be leveed prior to any further use. This area has been leveed as previously described in EPA correspondence concerning public notice No. IWW-M-4.

c. The backside and ends of disposal areas Nos. 3, 4, 5, and 6 shall be leveed as soon as possible.

The back levee for areas 3 and 4 shall not be more than 2,000 feet from the centerline of the channel, and the dredged material shall not be discharged further than 2,000 feet from the channel centerline.

d. Disposal area No. 21 shall not be used for dredged material disposal.

In a letter dated 9 October 1974 (Vol. 1, page E-1) EPA modified these recommendations by deleting recommendation c. All requirements will be complied with. Long-term approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.31 Tributary Channel to Victoria. The USF&WS issued a final report on 8 May 1971. Several of the actions recommended in the report cannot be complied with. The USF&WS recommended size limitation on disposal areas 1, 2, 3, and 14. Its recommendations called for back limits 750 feet from channel centerline for disposal area No. 14 and 1,000 feet of disposal areas Nos. 1, 2, and 3. These dimensions are too restrictive to provide disposal areas of adequate size to effectively handle the dredged material. A back limit of 1,350 feet from channel centerline is proposed. This dimension would provide disposal areas of adequate size without significant impact on the environment. Further, USF&WS recommended that disposal areas 13 and 23 should be leveed using emergent materials for construction. In both cases, all or major portions of these disposal areas are submerged at high tide. Levee construction under these conditions would be extremely difficult, if not impossible. It has also become necessary to add a disposal area in the vicinity of the turning basin.

9.32 In responding to public notice No. IWW-M-7, five (5) responses to public notice No. IWW-M-7 have been received. Two responses were favorable. The National Audubon Society agreed with recommendations of USF&WS and NMFS. Responses from USF&WS and NMFS requested that all recommendation in the 8 May 1974 USF&WS coordination report be implemented. The recommendations will be handled as follows:

Recommendation No. 1 - Leveeing disposal areas Nos. 1, 2, and 3 at 1,000 feet from the centerline of the channel is considered too restrictive, as the existing crest of disposal is approximately 400 feet from the centerline of the channel. Therefore, these areas will be leveed at a distance of 1,350 feet.

from the channels centerline, making these areas 950 feet wide from the existing crests to the back limit of the area.

Recommendation No. 2 - The emergent portion of disposal area No. 4 will be leveed prior to its next use.

Recommendation No. 3 - As requested, disposal areas Nos. 5, 6, 7, 8, 9, 10 (same as public notice disposal area No. 12), 11, and 12 (same as public notice disposal area No. 13) will be leveed. The toe levees will be constructed when the areas become emergent and stabilized above Mean High Water along their ends and backsides at 1,350 feet from the centerline of the channel.

Recommendation No. 4 - Disposal area No. 13 (same as public notice disposal area No. 14) does not presently have enough emergent land within its limits to construct levees as described. Therefore, levees will be constructed in a manner similar to recommendation No. 3.

Recommendation No. 5 - Precautions will be taken to prevent material from being placed in or allowed to enter the bay from that portion of disposal areas No. 14 (same as public notice disposal areas Nos. 15 and 16) lying between Stations 630+00 and 700+00.

Recommendation No. 6 - In order to eliminate a portion of disposal area No. 14 (same as public notice disposal areas Nos. 15 and 16) between Stations 630+00 and 700+00, additional width in the disposal area is needed. Therefore, plans are to levee the reaches between Stations 432+00 and 630+00 and 700+00 and 771+75 when they become emergent above mean high water at 1,350 feet from the centerline of the channel. Leveeing at 1,350 feet will allow elimination of a portion of the area between Stations 630+00 and 700+00 as requested in Recommendation No. 5 and still retain the disposal area capacity needed for future maintenance along this reach of the channel.

Recommendation No. 7 - Until toe levees are constructed in the disposal areas mentioned in Recommendations Nos. 1, 3, 4, and 6, the points of discharge will be relocated as frequently as practicable to permit the uniform buildup of material equidistant from the channel centerline.

Recommendation No. 8 - An area the size recommended is considered much too small to be practical or economically

feasible. Therefore, levees in this area will be constructed in a manner similar to recommendation No. 3.

Recommendation No. 9 - Contract plans and specifications for review during the advertising period for each contract will be furnished USF&WS and NMFS.

9.33 EPA made several recommendations in a report dated 7 July 1971, all of which were complied with. In a letter dated 7 October 1975, EPA approved the dredging and dredged material disposal under 33 CFR 209.145, for one year. Long-term approval was deferred until the final Environmental Statement has been filed with the Council on Environmental Quality.

9.34 Lydia Ann Channel and Channel to Aransas Pass. In the formal coordination, these channels were coordinated with the GIWW main channel reach from San Antonio Bay to Corpus Christi Bay (Paragraphs 9.16-9.18 above).

9.35 Public notice No. IWW-11-6 was issued 21 October 1974 for the Tributary Channel to Aransas Pass. Four responses have been received. Exxon Pipeline Company raised objections to the use of disposal area No. 2. Exxon's main objection was that this disposal was on private property and was used by Exxon to contain maintenance material from the maintenance dredging of nearby Exxon boat slips. During a meeting between the Corps of Engineers and Exxon representatives, agreement was reached that both concerns would use the disposal area. The Texas Highway Department requested information on the method of transporting dredged material to disposal areas Nos. 3 and 4 and plans for handling traffic across State Highway 361. The requested information was furnished, and it was noted that the Corps of Engineers had successfully used this method of disposal for these sites in the past. Responses from the USF&WS and the NMFS recommended that disposal area No. 3 be confined to the 40 acre tract nearest Texas Highway 361 and that all effluent be drained into the channel paralleling the highway. When the channel is improved, disposal area No. 3 will be leveed with a spillway on the side adjacent to the highway borrow ditch. This disposal area will be enlarged in the future, as needed, to contain the material removed during maintenance dredging operations.

The USF&WS and NMFS also recommended that dredged material be confined by levees in disposal area No. 4 at or above the Mean High Tide line to mitigate adverse effects on oyster beds and tidal marsh. This recommendation will be complied with. Maintenance of levees and drainage structures prior to and during dredging operations, as recommended by USF&WS, is routinely accomplished. As recommended by NMFS, plans and specifications will be furnished to Federal and State fish and wildlife agencies prior to issuance of contracts for dredging.

9.36 In the formal coordination with EPA, these channels were coordinated with the GIWW main channel reach from San Antonio Bay to Corpus Christi Bay (Paragraph 9.16-9.18 above). In a letter dated 3 July 1975, EPA approved the dredged material disposal plan under 33 CFR 209.145 for one year provided the disposal areas are leveed prior to their next use. Long-term approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.37 San Bernard River Channel

The USF&WS issued a final report on 1 June 1973. Recommendations in the report included relocation of disposal areas between Station 7+00 and 45+00, and construction of a levee to prevent disposal material from spilling into Pelican Lake. All recommendations were accepted.

9.38 Public notice No. IWW-M-11 was issued 13 December 1974 for the San Bernard River Channel. Nine responses to the public notice have been received. One response, from Phillips Petroleum Company, was favorable, and responses from the USF&WS and NMFS recommended that disposal area No. 2, be totally confined prior to the next maintenance dredging. Disposal area No. 2 has been deleted from consideration at this time and will not be used without additional future coordination. Ms. Norma Schillinger protested any dredging planned for the San Bernard River and requested a public hearing on the dredging and an Environmental Statement on the project. Ms. Schillinger was sent a copy of the draft Environmental Statement and was requested to send additional information regarding the protest and request for a public hearing. Additional

information has not been received and it was concluded that her request had been withdrawn. Mrs. D. M. Parmalee expressed concern that the Ducroz Cemetery was being destroyed by dredged material. The area concerned is disposal area No. 2. The area has been deleted from consideration at this time. The National Audubon Society agreed with recommendations of USF&WS and NMFS. Mr. Arthur C. Fennekohl wanted information on the possible effects maintenance dredging would have on bank erosion along the channel and if some type of protection was possible. Bank erosion in many rivers along the Texas coast is a natural process and will occur with or without a navigation channel. Barge traffic along the river causes some additional bank erosion, but the natural flow of water is the principal factor. No provision for bank protection was included in the Congressional Act authorizing the project. A letter from Mr. Kirk F. Sniff raised several objections. The first objection requested solution to pollution problems associated with dredging and disposal along the channel. At this time, no known sources of significant pollutants exist in the channel. However, sediment and water samples will be taken before dredging in the upper reaches of the project channel to determine their pollutant status. If sediments are found to exceed established criteria, necessary measures will be taken to confine the dredged material. In addition, Mr. Sniff requested justification for the urgency of the project. A recent hydrographic bulletin, shows that, between mile 0 and 0.5, shoals have reduced the project depth of 9 feet to 6 feet on the left outside quarter and 7 feet on the right outside quarter. The remainder of the project does not require dredging at this time, and no dredging is scheduled in the near future. Finally, Mr. Sniff requested a public hearing. Additional information is required to determine the need for a public hearing. Mr. Sniff was requested to furnish information concerning his interest to be affected, but that information has not been received. The Texas Water Quality Board requested that they be furnished detailed disposal plans prior to the initiation of the project. Plans will be sent prior to issuance of dredging contracts.

9.39 In a letter dated 9 June 1971, EPA made several recommendations, all of which were complied with. In a letter dated 21 April 1975, EPA approved the dredged material disposal plan under 33 CFR 209.145 for one year, subject to the following restrictions:

a. Dredged material shall not be placed in disposal area No. 2.

b. No dredged material shall be placed or allowed to spill into Cedar Lakes at any time.

c. Material dredged above river mile 10 shall be placed in fully confined disposal areas until sediment surveys are completed. After the sediment quality is defined, disposal in unleveed areas can be considered.

d. In disposal areas Nos. 4 (above mile 2) and 5, dredged material shall not be discharged further than 3,000 feet from the centerline of the channel or closer than 1,000 feet.

All requirements will be complied with. Long-term approval of dredging plans was deferred until a final Environmental Statement has been filed with the Council on Environmental Quality.

9.40 Channel to Palacios.

The USF&WS issued a final report on 11 July 1972. Recommendations in the report include a provision for openings between disposal areas on adjacent shorelines and a back-side limit for disposal areas of 1,500 feet. These recommendations were accepted.

9.41 Public notice No. IWW-M-15 describing the proposed action and soliciting comments was issued 10 February 1975, as required by Federal dredging regulations (33 CFR 209.145). Three responses to the public notice have been received. The U.S. Fish and Wildlife Service (USF&WS) noted that its previous recommendations had been adopted and made the additional request that the vicinity of all disposal areas be investigated for oyster reefs within 3 months prior to dredging and that the Corps of Engineers designate discharge points on contract plans to avoid damaging such oyster reefs as may be located. The National Marine Fisheries Service (NMFS) also noted that its previous recommendations had been adopted and additionally recommended that the bay bottom in and adjacent to disposal areas be investigated for oyster beds within 6 months prior to dredging. NMFS also recommended that disposal

plans be adjusted to protect any oyster beds located during the surveys. The recommended surveys for oyster beds will be conducted by staff biologists, and disposal plans will be adjusted on a case by case basis to protect significant oyster beds. However, the recommendation from USF&WS to predesignate discharge points is not feasible from a contractual standpoint. The response received from Mr. Kendall Laughlin, student, SMU Law School, commented on both the public notice and the Environmental Statement. Mr. Laughlin commented primarily on procedures addressed in the Federal dredging regulations and on what information he believed should be presented in the public notice. He had no comments concerning how adverse effects might be further mitigated.

9.42 In a letter dated 9 June 1971, EPA made several recommendations, all of which were complied with. In a letter dated 13 June 1975, EPA approved the dredging and dredged material disposal plans under 33 CFR 209.145 for one year subject to the following restrictions:

a. Disposal areas 12, 13, and 14 shall not be used. Definition of these areas shall be delayed until the location and density of all oyster reefs within one-half mile of the disposal areas are identified.

b. The Statement of Findings be amended to include plans for fulfilling conditions as described in proposed Guidelines 40 CFR 230-5(b)(4).

The recommendations will be complied with. Compliance with 40 CFR 230 is discussed in paragraph 1.04. Long-term approval of dredging was deferred until a final Environmental Statement is filed with the Council on Environmental Quality.

9.43 Tributary Channel to Port Mansfield.

The USF&WS issued a final coordination report on 13 March 1972. Recommendations in the report included construction of toe levees, restrictions on the placement of material, and provisions for openings between disposal areas. These recommendations were accepted.

9.44 Public notice No. IWW-M-2 was issued 1 October 1974 for the Channel to Port Mansfield. Three responses to

the notice were received. The response from the Willacy County Navigation District was favorable. The USF&WS and NMFS reiterated the recommendations listed in the formal coordination report of 13 March 1972. All of the recommendations are being complied with.

9.45 In coordinating the proposed maintenance dredging of the Channel to Port Mansfield, the Texas Historical Commission indicated that the existing channel was creating an adverse effect on what is thought to be one of three 1554 shipwrecks. The Commission stated "Wave activity, somewhat altered by the north jetty construction and the channel, appears to be displacing materials from the shipwreck," and recommended recovery as the only means of preserving the significance of the shipwreck. In commenting on the proposed disposal of dredged materials north of the north jetty as a beach nourishment activity, the Commission stated there would be no adverse effects to the shipwreck or to the Mansfield Cut Underwater Archeological District. A letter (not dated) from the Advisory Council on Historic Preservation gave approval in accordance with 36 CFR Part 800 for the proposed beach nourishment. The Council also noted that the existing project was having an adverse effect on the 1554 shipwreck and requested the Corps of Engineers further investigate the matter. Further investigation will be accomplished.

9.46 In a letter dated 9 June 1971, EPA made several recommendations, all of which were accepted. In a letter dated 4 February 1974, EPA approved the dredging and dredged material disposal plans under 33 CFR 209.145 for one year, subject to the following restrictions:

a. All material dredged from the channel west of GIWW connecting channels shall be placed in the fully confined disposal area No. 8. A controlled discharge structure shall be used to minimize return of suspended solids to the bay.

b. Openings between disposal areas shall be maintained such that, in the segment of the channel between the eastern limit of disposal area No. 4 and the

western limit of disposal area No. 6, no more than 50 percent of the longitudinal section parallel to the channel is blocked. Openings shall be maintained at sufficient depths to allow maximum possible flow between disposal areas.

c. Levees or sediment curtains shall be utilized to prevent the deposition of dredged material in the open area between disposal areas Nos. 6 and 7.

d. Dredged material placed in disposal area No. 3 shall be fully contained. Effluent shall be returned to the ship channel through a control structure.

In a letter dated 9 October 1975 (Vol. I, page E-1) EPA modified recommendation b. to read as follows:

"Openings between disposal areas shall be maintained to allow maximum circulation between the disposal areas."

All requirements will be complied with. Long-term approval of dredging was deferred until a final Environmental Statement is filed with the Council on Environmental Quality.

9.47 Tributary Channel to Offatts Bayou. This project was completed in December 1973, and coordination of maintenance dredging disposal plans will be initiated in the future. Dredging has not been scheduled.

9.48 Channel to Rockport. This tributary has not previously required Federal maintenance and none is scheduled. Should the need arise, appropriate coordination measures will be taken.

9.49 Coordination of Draft Statement. Draft copies of this Environmental Statement were circulated to interested local, State, and Federal agencies on 31 October 1974 with a request for review and comment. Comments received are summarized and responded to below, and copies of the replies are attached as Appendix A.

a. ENVIRONMENTAL PROTECTION AGENCY. (Attachment A-1)

Comment: "In discussing the environmental setting of the project area, the statement divides the GIWW into

three physiographic reaches. Although the statement identifies generally the terrestrial, aquatic and meteorological conditions in these areas, we believe the statement could be strengthened by discussing specifically any sensitive or unique biologically productive areas that might be affected by channel maintenance activities. For example, a discussion of the ecological aspects of the freshwater reservoir located adjacent to disposal area No. 13 (Plate 10, Port Arthur to High Island) could be included in the statement. This information would be helpful in evaluating the effects of dredged material placement on this reservoir."

Response: Information of this type has been added to the statement (paragraphs 2.13, 2.28, and 2.42).

Comment: "Tables 13 and 14 contained sediment and water quality data for Texas City Channel, Offatts Bayou, Chocolate Bayou, Corpus Christi Bay, Port Bolivar to High Island, Matagorda Ship Channel, Freeport Ship Channel, and Jones Bay. We believe the statement would be strengthened by including additional water and sediment quality data that would be representative of the three physiographic reaches of the GIWW as discussed in the statement. It would also be helpful to identify areas where polluted spoil may exist as the result of existing waste discharges."

Response: The data shown are intended to provide a representative sampling of the water and sediment quality for the entire GIWW. The only area where no data are reported is the reach from Corpus Christi Bay to Port Isabel. Because of the absence of a pollution source, this reach is not expected to be polluted. Information with regard to the locations where polluted material may exist has been incorporated into the statement (paragraphs 2.109 and 2.112).

Comment: "It is commendable that containment levee systems will be utilized on land to clarify the dredged spoil before discharge of the supernatant into the receiving stream. However, we would suggest that where it has been determined or suspected the sediment is polluted, a short-term monitoring program be implemented to measure

pollutants discharged into the receiving stream. This information would be useful in evaluating any potential adverse effects that may be generated from supernatant discharges."

Response: The proposed monitoring program is described in the statement (paragraphs 1.33 through 1.36).

Comment: "We recognize that the proposed maintenance dredging project will be a continuing action to include several dredging cycles. The information in the statement mostly depicts existing water and sediment quality for the first dredging cycle. Therefore, we would suggest that sufficient sediment sampling be accomplished immediately prior to each dredging cycle to locate polluted material. Polluted spoil should not be deposited in the ocean disposal site until a joint EPA-Corps evaluation is completed to determine the projected effect on water quality and to define monitoring requirements. From the mechanical analysis in Table 17, it appears that the materials from the Port Mansfield Channel are not polluted for the first dredging cycle."

Response: Concur. The statement has been revised to reflect this comment (paragraph 1.35 and 1.36).

Comment: "The statement notes that the GIWW has grown consistently and has contributed substantially to the regional and national economy. Also, the statement mentions that there are several related non-Federal channels, slips and berths that are essential to the Federal navigation project. Installation and maintenance of each non-Federal facility is controlled by means of the Corps of Engineers' permit program.

Although it is stated, 'Quantification of the fragmentary environmental effects of irregular maintenance of all these non-Federal facilities in relation to the Federal project is not practicable', the statement could include a qualitative evaluation of the cumulative effects from non-Federal channel activities."

Response: Paragraphs 4.76 - 4.79 (previously 1.34 - 1.37) state that the environmental effects of the

maintenance of these non-Federal channels are the same as for maintenance dredging and disposal for the Federal project, but the same disposal areas are not necessarily involved and the times of dredging would probably not coincide. The sections discussing these non-Federal facilities have been moved into section 4 in an effort to clarify the description of the impact of these non-Federal facilities. In addition, the public notices shown in Volume III contain estimates of non-Federal dredging activities in the various project reaches.

Comment: "Also, the statement would be strengthened by including a discussion of the possible secondary environmental impacts that might be generated from the Federal and non-Federal maintenance activities. For example, the project could stimulate increased industrial, commercial, and residential growth in the Texas Coastal Zone. Although this growth may be beneficial from an economic standpoint, such development could also be environmentally adverse in those land resource areas already heavily stressed from air, water, noise and solid waste pollution. It would be helpful to identify such 'key' areas, and discuss the potential long-term secondary effects of the project on these areas. Also, the secondary impacts of potential development in unique or highly productive coastal areas should be considered in the statement. The statement would be strengthened by providing information on possible mitigative measures such as land use plans, zoning codes and regulations which could help in maintaining long-term environmental quality in the Texas Coastal Zone."

Response: Although the purpose of maintaining the existing waterway is not to prompt additional development, it is recognized that the continued existence of the waterway may contribute to such development. A discussion of this possibility has been included in paragraphs 4.16 and 4.80.

Comment: "These comments classify your Draft Environmental Impact Statement as LO-2. Specifically, we have no objection to the maintenance of the GIWW. However,

additional information is needed in order to evaluate fully the impacts of the project on water quality and the long-term secondary environmental effects. The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act."

Response: All information requested has been included in the statement to some degree. Where it has been found impracticable to obtain precise data, estimates have been made and are included in the statement.

b. UNITED STATES DEPARTMENT OF COMMERCE. (Attachment A-5)

Comment: "The various segments of the Gulf Intracoastal Waterway (GIWW) main channel have received names designating the area traversed by the channel. The segments of the GIWW discussed in paragraphs 1.08 through 1.23 (pages 4-9) are referred to as Port Arthur to High Island; High Island to Port Bolivar; Port Bolivar to Oyster Creek; Oyster Creek to Colorado River; Colorado River to Port O'Connor; Port O'Connor to Live Oak Point, Texas; Live Oak Point to Aransas Pass; Aransas Pass to Encinal Peninsula; Encinal Peninsula to Lower Laguna Madre; and Lower Laguna Madre to Port Isabel, Texas. However, throughout the remainder of the text, these segments have been re-grouped and are referred to as Port Arthur Canal to High Island; High Island to Port Bolivar; Galveston Bay to Matagorda Bay; Matagorda Bay to San Antonio Bay; San Antonio Bay to Corpus Christi Bay; Corpus Christi Bay to Mud Flats; and Port Isabel to Mud Flats. The final environmental impact statement (FEIS) would be greatly improved by including a discussion of this re-grouping of GIWW segment names. Therefore, we recommend that a section be added to the FEIS explaining which segments of the main channel of the GIWW have been re-grouped and re-named (e.g., the segments Port Bolivar to Oyster Creek, Oyster Creek to Colorado River, and Colorado River to Port O'Connor have been re-grouped and re-named the Galveston Bay to Matagorda Bay segment)."

Response: Paragraph 2.47 has been revised to indicate that the subdivision of the project used thereafter is the one used for coordination purposes. The relationship of dredging reaches to coordination reaches has been explained.

Comment: "Pages 15-41. This section could be greatly improved by incorporating the environmental discussions contained in the many reports submitted pursuant to the Fish and Wildlife Coordination Act (16 U.S.C., 661 et seq.) by the U.S. Fish and Wildlife Service that are attached to the draft environmental impact statement. In this regard, care should be taken to ensure that the environmental impact statement remains an essentially self-contained instrument, capable of being understood by the reader without the need for undue cross reference."

Response: Paragraphs 2.45 through 2.97 of the draft statement (2.48 through 2.101 in the final statement) are essentially summaries of the environmental discussions contained in the USF&WS reports. The paragraphs also contain information not provided in the USF&WS reports. In addition, supplements in Volume III of the final Environmental Statement contain information furnished in the USF&WS reports.

Comment: "The numerous studies of Texas estuaries contained in the Texas Parks and Wildlife Department's Coastal (or Marine) Fisheries Annual Project Reports, issued since 1959, should also be extensively utilized in developing the biological background of the various GIWW reaches discussed in this section. Other studies that would be helpful include an ecological survey of the Arroyo Colorado (Bryan, 1971); a study of penaeid shrimp in the lower Laguna Madre (Stokes, 1973); biological and hydrographic studies of East Bay (Reid, 1955, 1957; and studies in Galveston Bay on fishes (Bechtel and Cope-land, 1970; Parker, 1971), brown shrimp (Parker, 1970), and hydrography (Pullen, Trent, and Adams, 1971)."

Response: The majority of these publications were reviewed during preparation of the draft statement. The remainder have been subsequently reviewed. Generally,

these reports contain information of such a technical nature that inclusion of the reference data or information would result in the statement becoming unnecessarily complex and difficult to understand. Some of the information contained in these reports is used in the statement in the form of uncited general statements. This was done only in instances where the information has subsequently become common knowledge not subject to challenge. As a result of review of the above cited publications not previously reviewed, some information has been added to the statement (paragraphs 2.35, 2.109, and 2.101). In addition, much of the information used in the preparation of this statement is from a Corps of Engineers contract study prepared by Coastal Ecosystems Management, Inc. titled Environmental Resources Inventory and Evaluation of Deep Port Impacts Along the Texas Gulf Coast. This report contains substantial information pertinent to areas along the Texas coast.

Comment: "The environmental setting section could also be improved by including a discussion of the organochlorine residues observed in estuarine fishes and molluscs from Arroyo Colorado, Laguna Madre, San Antonio Bay, and Matagorda Bay by Butler, Childress, and Wilson (1972); and in molluscs from Galveston, Tres Palacios, San Antonio, Aransas, and Red Fish Bays, as well as the lower Laguna Madre and Arroyo Colorado, by Butler (1973)."

Response: A discussion of the pesticide problem has been added in paragraph 2.109.

Comment: "6.25 DISPOSAL IN MARSH AREAS WITH THE USE OF CONTAINMENT LEVEES"

Page 77. This paragraph contains the statement, "Transport of material across miles of marsh lands would result in damages to probably as many acres of marsh as will be affected by the proposed plan, and would therefore be probably as environmentally detrimental."

The method of transport is not discussed, although it can readily be assumed that pipeline transport across marshland is implied. Pipelines placed across marshlands can cause extensive damage, and their use should be held to the minimum required to accomplish transport of dredged materials.

However, marshes can and do recover from this type of impact, whereas any tidal marsh that has been segregated from the bay by levees built for spoil confinement is usually permanently lost to the estuarine ecosystem. Thus, pipeline transport of dredged spoil materials across marshes to confined spoil areas on high ground is much less damaging to the marine environment than is spoil placement in the marsh."

Response: The method of transport has been clarified. The text has been revised to include a more detailed description of the problems involved with the transport of material by pipeline across marshy areas (paragraphs 6.25 and 6.26).

Comment: "9.06 COORDINATION OF DISPOSAL PLANS.

Pages 86-89. Our comments regarding minimizing 'the need for undue cross reference' (Section 2, pages 15-41), also apply to this section. In addition, the final environmental impact statement should contain an up-to-date discussion of coordination that includes the recommendations submitted by the National Marine Fisheries Service in response to public notices recently issued in accordance with provisions of established Federal Regulations, Title 33, CFR 209.145."

Response: The discussions contained on these pages are summaries of the problems encountered during the coordination of disposal plans. The discussions referenced have been rewritten for clarification, and discussion of coordination accomplished under 33 CFR 209.145 has been added. A discussion of the responses to the public notices has also been added to Volume III.

Comment: "Table 4. DISTRIBUTION OF COMMON COMMERCIAL FISH SPECIES ALONG THE TEXAS COAST WITH SEASONAL OCCURRENCES AND ABUNDANCES

The use of scientific nomenclature should be included with the common names. Moreover, the common names of fishes mentioned in the text should agree with the common

names used in Table 4 (e.g., on page 21, paragraph 2.25, the name 'speckled trout' is used, whereas in Table 4 this species is referred to as 'spotted seatrout'; and on page 24, paragraph 2.35, the name 'red fish' is used, whereas Table 4 properly lists this species as 'red drum'). The names 'speckled trout' and 'red fish' are alternate local common names not listed by the American Fisheries Society in its 'A List of Common and Scientific Names of fishes from the United States and Canada, (Third Edition, 1970).

Other important commercial fish species that should be included in the list in Table 4 are the Atlantic croaker, *Micropogon undulatus*, and the spot, *Leiostomus xanthurus*."

Response: Scientific nomenclature has been added to Table 4. An effort was made to purge the text of inaccuracies in nomenclature, and the Atlantic croaker and spot have been added to Table 4.

c. UNITED STATES DEPARTMENT OF THE INTERIOR.
(Attachment A-9)

Comment: "The statement should provide information related to continued use of the spoil areas adjacent to the Gulf Intracoastal Waterway. Rates at which the disposal areas within the containment levees are being built up and will continue to be built up and their adequacy for future use with projected maintenance dredging should be discussed. These rates could be determined based on the area within the levees, the frequency of dredging, and the amount of material dredged."

Response: The requested information has been added to the statement (Table 18).

Comment: "The relationship of these disposal areas to the adjacent lands and marshes also should be discussed. Questions such as 'to what extent do the disposal areas act as a barrier to the movement of water onto or away from the adjacent land and marsh areas?' should be discussed. The potential for further restriction as spoil accumulates from repeated dredging, and the environmental impacts of

such restriction, warrant major consideration. Impedance of drainage or obstruction of water exchange will have severe long-range impacts on the ecology of adjacent terrain."

Response: It is not known whether the existing disposal areas have in any way acted as a barrier to the movement of water onto or away from adjacent land and marsh areas. All rivers and major bayous, creeks, and streams pass between disposal areas. With regard to land disposal areas, construction of the levees, as requested by the U.S. Fish and Wildlife Service, would have the greatest effect. Continued disposal in leveed areas will not further restrict water movement. Mitigation measures are taken when restriction of water movement is considered important. A discussion of these potential effects has been added to the statement (Paragraph 4.67).

Comment: "PROJECT DESCRIPTION"

It would be pertinent to consider in this section the requirements for the installation of pipelines which must cross the Gulf Intracoastal Waterway. With the rapid expansion of oil and gas activity in offshore waters, it is expected that the number of pipeline crossings will increase. The coming need for additional pipelines may require that special provisions be made in maintenance dredging plans, particularly spoil disposal plans, for pipeline rights-of-way.

As a result of tracts leased offshore Texas during OCS lease sales 34 and 36, and the leases which may result from proposed lease sale 37, the expected cumulative production may require the construction of new pipelines to transport oil and gas production from points of origin to onshore facilities. To preclude environmental consequences of random and incremental proliferation of offshore and onshore pipeline siting in this area, most of which is a frontier area, the Department of Interior has proposed that pipeline infrastructure requirements be developed in a planned, orderly and comprehensive manner.

A special stipulation was included in all leases resulting from sale 34 and will be included in leases resulting

from the proposed sale which requires any pipelines between a structure on the OCS and an onshore facility to be placed in certain designated areas or corridors through the submerged lands of the OCS.

In order to fulfill the requirements of the pipeline stipulation, a pipeline management study will be initiated in the Western Gulf of Mexico to determine, in a macro sense, the least environmentally hazardous areas in which to require the placement of lines. The study will also include a macro identification of the least environmentally hazardous areas for the location of onshore support and processing facilities. The basic goal of this study is to develop an effective planning and management tool, which along with other decision input and locational schemes for leased tracts, and for a broader area should future sales involve adjacent or interposed tracts.

The study will be conducted in two phases over a period of two and one-half years. The first phase will identify macro-corridors using existing data pertaining to the environmental setting of the area."

Response: Although not directly related to the Environmental Statement on maintenance dredging of the GIWW, some discussion of future pipeline requirements has been added to Paragraph 2.114.

Comment: "ENVIRONMENTAL SETTING

This section should contain a few paragraphs dealing specifically with mineral resources that are now being recovered in the vicinity of the waterway. The importance of the waterway to the safe, efficient, and economical recovery and transportation of these mineral commodities also should be detailed. Paragraph 2.111, 'Economic Summary,' is not sufficiently detailed to explain this important effect of the Gulf Intracoastal Waterway."

Response: This information has been added in paragraphs 2.118 through 2.122.

Comment: "Pages 17 and 18, paragraphs 2.10 and 2.11. The 'Current Fisheries Statistics, 1973 Texas Monthly

Landings,' prepared by the Department of Commerce, are available. The 1973 annual summary for Texas landings is in press and should be available shortly. You may wish to update this paragraph and also paragraphs 2.25 and 2.37 on the basis of these publications to reflect more recent conditions."

Response: Fisheries statistics have been updated.

Comment: "Page 18, paragraph 2.11. The mullet should be included as one of the most important fishes. Although it is not an important sport species, it contributes significantly to the commercial catch of Reach 1."

Response: The mullet has been included as one of the important fish.

Comment: "Page 18, paragraph 2.13. The listing of the American peregrine falcon is probably erroneous. The arctic peregrine falcon is more likely to occur in Reach 1. In Texas, the American peregrine falcon is found in the southwestern part of the State."

Response: Reference to the American peregrine falcon has been changed to arctic peregrine.

Comment: "Page 25, paragraph 2.39. The prairie falcon is not on the official list of endangered species (refer to the U.S. Department of the Interior publication 'United States List of Endangered Fauna,' dated May 1974). Reference to this falcon should be deleted from this paragraph and from Table 8."

Response: Reference to the prairie falcon has been deleted.

Comment: "Page 31, paragraph 2.71. If the period of dredging specified in this paragraph is adhered to and the notification procedure prior to the issuance of contracts for maintenance dredging as requested by the U.S. Fish and Wildlife Service (page A91) is fulfilled, there should be no adverse effect on Padre Island National Seashore."

Response: This information has been added to the statement (Paragraph 3.01).

Comment: "RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

The proposed action will not adversely affect any proposed unit of the National Park Service nor any site eligible for registration as a National Historic, Natural or Environmental Education Landmark."

Response: This information has been added to the statement (Paragraph 3.01).

Comment: "ENVIRONMENTAL IMPACT OF PROPOSED ACTION

The draft environmental statement does not specifically address the proposed project's impacts on mineral resources, but does cite beneficial impacts on the transportation of mineral raw materials and manufactured goods. It also states that the existing project has facilitated resource development and has not adversely affected the recovery of mineral resources (predominantly oil and gas) in the area. The limited width (125 feet) and shallow depth (12 feet) of the existing waterway do not preclude mineral resource extraction in the immediate vicinity. Similarly, maintenance dredging to preserve or restore these dimensions in the waterway should not produce any adverse effects on mineral resource recovery. No proposed disposal site conflicts with existing mineral extraction operations, and it is not anticipated that present disposal plans will deter future mineral exploration or extraction."

Response: A discussion of the proposed project's impacts on mineral resources has been added to Paragraph 4.12.

Comment: "Pages 44 and 45, paragraph 4.08. We question that the importance of disposal islands as bird nesting areas stems primarily from the development of woody plants. On the spoil islands and South Bird Island within the Padre Island National Seashore, bare soil, grasses, and herbaceous plants are preferred nesting habitat."

Response: The paragraph has been revised based on this comment.

Comment: "Page 65, paragraph 4.68. We suggest rewording the last sentence to eliminate the inference that damages which might occur to historical and archeological resources in spite of reasonable precautions taken do not justify the economic and social disadvantages of failure to maintain the channels. This is a broad judgmental conclusion not supported by facts and one which seems to apply cost-benefit calculations to potential losses of cultural resources."

Response: The judgmental conclusion is supported by the facts presented throughout the statement concerning the economic importance of the waterway. Loss of the 19 billion dollars per year that would result from failure to maintain the channels would adversely affect the state's economy and would severely curtail transportation of fuels and crude oil.

Comment: "Page 65, paragraph 4.69. 'Possible' should be substituted for 'practicable' in the penultimate sentence. A practicable and economic but entirely unacceptable solution would be to ignore the preservation mandate."

Response: Similarly, a possible, but impracticable and entirely unacceptable solution, would be to halt all dredging until every existing cultural resource has been located and recovered. All reasonable precautions will be taken and all applicable laws will be complied with.

Comment: "ALTERNATIVES TO THE PROPOSED ACTION

Page 77, paragraph 6.25. The conclusion made in this paragraph that 'Transport of the materials across miles of marsh lands would result in damages to probably as many acres of marsh as will be affected by the proposed plan, and would therefore be probably as environmentally detrimental' should be substantiated. Pipeline transport would be initially damaging but the marsh vegetation would recover."

Response: Detailed analysis of the effects of this alternative has been added to the statement (Paragraphs 6.25 and 6.26)

d. ADVISORY COUNCIL ON HISTORIC PRESERVATION.
(Attachment A-13)

Comment: "The Council notes on page 65 of the DES that 'Advice concerning possible historical resources will be sought from appropriate agencies when new disposal sites are proposed.' The Corps of Engineers is reminded that if, as a result of consultation with these agencies, it is established that the undertaking will result in an effect to a property included in or eligible for inclusion in the National Register of Historic Places, the Corps is required to request Council comments in accordance with the 'Procedures for the Protection of Historic and Cultural Properties' (36 C.F.R. Part 800). Steps to determine eligibility and effect are detailed in Section 800.4 of these procedures."

Response: The Office of the Chief of Engineers recently issued interim regulations providing guidance for compliance with 36 CFR 800. The Galveston District Corps of Engineers will take those steps required by these regulations to insure adequate consideration and protection of cultural resources.

e. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE.
(Attachment A-14)

Comment: "Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U.S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse health effects

that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental health laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned."

Response: All contract plan and specifications require adherence to local, State and Federal environmental laws and regulations.

f. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
(Attachment A-15)

Comment: "The Department of Housing and Urban Development has determined that it will not have comments on the Draft Environmental Impact Statement, 'Gulf Intra-coastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging).'"

g. DEPARTMENT OF TRANSPORTATION. (Attachment A-16)

Comment: The Department of Transportation has reviewed the material submitted. We have no comment to offer nor do we have any objection to the project.

g. DIVISION OF PLANNING COORDINATION, STATE OF TEXAS.
(Attachment A-17) Forwarded comments of various state agencies and summarized their comments. Comments of the various state agencies are as follows:

(1) TEXAS WATER RIGHTS COMMISSION. (Attachment A-20)

Comment: "The staff finds that the referenced document fulfills the requirements of Section 102(2)(C) of the National Environmental Policy Act of 1969, and that affirmation is given that the proposed dredging activities will conform to the Federal Dredging Regulations, 33 CFR 209.145. However, the staff believes that the comprehensive referenced document would be greatly enhanced by inclusion of:

1. A status report and major findings to date of the Corps of Engineers Dredged Materials Study, for which \$3.6 million was appropriated in FY 1974 and \$8.2 million in 1975. (See Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 93rd Congress, Part 1, pages 246-250). The study was described to the Congress as addressing 'the entire problem of dredging and disposal operations' and that it was considered 'probably the most important study that is being accomplished by the Corps of Engineers today.' Page 249 of the said Hearings contains a list of research tasks which were to be completed in FY 1974; page 250 lists research tasks started and continued through FY 1974."

Response: The referenced Dredged Materials Study is still in its preliminary research phases, and, although several interim reports have been published, no major conclusions can be drawn. The research program is relatively long-term in nature, and the initial work has been toward establishment of background information and a data base. Some of the topics on which research is being conducted include: Evaluation of Disposal Sites, Fate of Dredged Material, Effects of Dredging and Disposal on Water Quality, Effects of Dredging and Disposal on Aquatic Organisms, Environmental Impact Studies, Artificial Habitat Creation, and Turbidity Control Research. A discussion of the program has been added as Paragraph 4.45.

Comment: "A discussion of the impacts and applicability of Federal Regulations, 40 CFR 227.6 pertaining to Environmental Protection Agency's criteria for evaluation of permit applications insofar as disposal of dredged material is concerned."

Response: The cited Federal regulations (40 CFR 227.6) pertain only to disposal of dredged material in the open oceans seaward of the baseline. To date, no permit applications for such disposal operations for materials dredged near the GIWW have been received. Only 2 permit applications have been received for ocean disposal of material dredged from other locations along the Texas Gulf Coast, and those applications are currently inactive. If permit applications for ocean disposal of dredged

materials are received, the provisions of 40 CFR 227.6 will be applied.

(2) TEXAS WATER DEVELOPMENT BOARD. (Attachment A-22)

Comment: "The purpose of this statement is to identify and evaluate the environmental impact of continuing maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway and tributary channels. The statement further addresses various reasonable alternatives and mitigation measures taken to reduce possible adverse environmental effects and to enhance economic, social, and environmental values.

In 1828 Congress appropriated funds for constructing the first link of the Gulf Intracoastal Waterway (GIWW), which now extends from Florida to the Rio Grande Valley in Texas. The GIWW intersects all deep-draft ship channels along the Gulf Coast as well as connecting many navigable waterways to shallow-draft ports in Texas, Louisiana, Mississippi, Alabama, and Florida. The Texas Section of the GIWW extends approximately 423 miles from the Sabine River area to Port Isabel, near the Mexican border. It requires a significant amount of maintenance dredging to keep it open to barge and small craft traffic.

A great number of factors are contributory to the shoaling processes within the canal system. Included are: the depth of water in bays, tidal action, type of materials in which the cuts were made, and the influence of cross-channels and streams. The contributing factors do not prevail uniformly throughout the entire length of the Texas Section of the GIWW, but for purposes of this study the Corps has divided the main channel into 19 segments, each of which has its own identifiable characteristics. The requisite cycle of maintenance dredging within individual reaches, ranging from 12 to 60 months, makes possible an orderly program of operations. Tributary channels are also maintained by the Corps, and are programmed for periodic dredging. The quantity of material to be removed from each of the 19 main channel reaches and 12 tributary channels is generally known from previous operations, and ranges from 38,000 cubic yards per year on a 60-month cycle to 1 million cubic yards per year on a 24-month cycle.

Under present stages of development, the GIWW is a vital link in the State and National economy. Millions of tons of shipping pass through the Waterway annually. In some areas it is the only practical means for the transportation of raw materials such as petroleum products. Without the GIWW and its tributary channels there could be no coastal barge traffic because of the extremely shallow depths of water in most of the bays. As stated above, maintenance dredging is an absolute necessity in keeping the channels open for safe traffic. Without dredging the channel would, in time, be completely filled with sediment.

As with any of man's activities, the maintenance dredging operations have both beneficial and adverse effects on the environment. In our opinion, the benefits derived from keeping the GIWW open as an artery of transportation outweigh any foreseeable adverse effects resulting from dredging operations. One of the primary issues addressed in the statement is disposal of the resultant spoil material such that there would be no significant alteration of bay circulation patterns in the ecologically-sensitive areas of the bays. This is a major concern of this agency as we are presently conducting intensive studies to determine the relationships and needs of freshwater to the bays and estuaries of the Texas Coastal Zone. State efforts to provide desirable salinity conditions and nutrient materials in the bays could be adversely affected by silting and/or filling in of marshes, bayous, and natural drainage features. Therefore, location of spoil disposal areas should be considered with regard to maintenance and possible enhancement of the natural drainage and circulation patterns of the estuarine systems. Although some oyster beds and other immobile mollusks will be covered by silt from open water disposal of dredge spoil, the report shows that these organisms will re-establish themselves within a relatively short period after dredging operations are completed. It was also pointed out that during the original construction of the channel across Galveston Bay, open-water disposal of the dredge spoil provided areas of coarser substrates which rapidly developed into live oyster reefs. In summary, the report shows that maintenance dredging and auxiliary channel construction operations can be undertaken in a manner that will satisfy both economic and environmental requirements.

We find that the Corps of Engineers is coordinating its efforts with all interested State, Federal, and local interests in an effort to serve all needs to the maximum possible benefit. It is the opinion of our staff that the Environmental Impact Statement, Maintenance Dredging of the Gulf Intracoastal Waterway, Texas, fulfills the intended purpose, and we are pleased to endorse it as submitted."

(3) GENERAL LAND OFFICE. (Attachments A-25)

Comment: "Thank you for the opportunity to comment on the Draft Environmental Impact Statement for Gulf Intracoastal Waterway maintenance dredging. The statement is extensive and open. Maintenance dredging is obviously a coastal activity which will, by necessity, continue to be required. Because of this continuing nature, it appears that more consideration should be given to the alternatives available for disposition of dredged material. Use of the same disposal methods will result in recurring damage to the marine environment, for as long as the waterway is maintained."

Response: The statement describes the recurring adverse effects of repeated dredging on marine life. Consideration is given to alternative disposal areas and methods during several phases of the planning process. Coordination with EPA, USF&WS, NMFS, TWQB, and TP&WD is a part of this process. Further coordination and consideration of alternatives is accomplished during the public notice and response phase, and many changes in disposal plans have occurred as a result of such coordination. Whenever any agency or individual makes a recommendation concerning changing a disposal plan for mitigation of adverse effects on marine life, the recommendation is carefully evaluated, and, if feasible and beneficial to the environment, is followed.

Comment: "In the section of the Draft Statement entitled '6.0, Alternatives to the Proposed Action.', I feel it would benefit the State if the detailed costs of various methods of removing dredged material from the excavation site were included. Such costs might cover dredging methods now used by the Corps and also by private industry. Such cost figures might consider varying distances

to disposal sites and available or potential methods such as pipelines, hopper dredges, and hopper barges. With such information, the State might be able to determine that disposal off-site in a particular reach of the waterway, given the cost involved, is still more desirable than eliminating or causing damage to a particular marine environment."

Response: Because of the many variables involved, general cost comparisons of this nature are really of little value for planning purposes. Given specific alternatives for specific cases, such cost comparisons could be valuable tools for decision making. The Corps of Engineers must rely on the local sponsors of the project to provide satisfactory disposal sites. Unfortunately, along much of the GIWW, there was no local sponsor until May 1975. This condition existed primarily along the environmentally sensitive remote reaches of the waterway. In order to keep this vital waterway open to navigation, the Corps of Engineers has obtained disposal easements from landowners along those reaches of the waterway where there was no local sponsor. In the past, the Corps of Engineers has had very little latitude with regard to disposal of dredged material in these reaches. With the State of Texas now acting as local sponsor for the main channel, designation of more costly, but less environmentally damaging disposal areas, is possible. Such situations will be evaluated on a case by case basis in the future.

Comment: "The additional cost of off-site disposal in certain reaches of the Waterway might be mitigated by using the dredged material as fill to raise evacuation route roadbeds, by selling fill to available users, or by allowing contractors to remove and sell the material as fill."

Response: All specific recommendations of this nature could be evaluated on a case by case basis. It is agreed that many uses could be made of the dredged material removed from the project waterway. This practice would not only make use of this available resource, but would maintain the capacity of existing disposal areas, thereby

minimizing future disposal area requirements. Unfortunately, this practice has not proved to be economically feasible in the past. It is hoped that improved technology can make future use of this resource more attractive.

(4) PARKS AND WILDLIFE DEPARTMENT. (Attachments A-27)

Comment: "It is felt that the draft is much too general and, as a result, is misleading in several of its statements and does not adequately present the impact of GIWW activities on the coastal ecosystems."

Response: The final statement includes additional details for each segment of the project. The details are given in Volume III.

Comment: "Where endangered species are mentioned on pages 18, 22, 25 and 43, there are some inaccuracies in that some species listed are not adequately identified or, sometimes species are omitted. Remarks about endangered species should be checked and corrected.

Following is a list of endangered species within the Waterway region by "Reaches".

<u>Common Name</u>	<u>Scientific Name</u>
Florida manatee 1,2,3	(<u>Trichechus manatus</u>)
Red wolf ¹	(<u>Canis rufur</u>)
Ocelot ³	(<u>Felis pardalis</u>)
Right whale ^{1,2,3}	(<u>Eubalaena glacialis</u>)
Sperm whale 1,2,3	(<u>Physeter catodon</u>)
Blue whale 1,2,3	(<u>Balaenoptera musculus</u>)
Finback whale 1,2,3	(<u>Balaenoptera physalus</u>)
Attwater's prairie chicken 1,2	(<u>T. cupido attwateri</u>)

<u>Common Name</u>	<u>Scientific Name</u>
Southern bald eagle 1,2,3	(<u>Haliaeetus leucocephalus</u>)
Brown pelican 1,2,3	(<u>Pelecanus occidentalis</u>)
Eskimo curlew 1,2,3	(<u>Numenius borealis</u>)
Arctic peregrine falcon 1,2,3	(<u>Falco peregrinus tundrius</u>)
American peregrine falcon 1,2,3	(<u>Falco peregrinus anatum</u>)
Whooping crane ²	(<u>Grus americana</u>)
American alligator 1,2,3	(<u>Alligator mississippiensis</u>)
Atlantic ridley 1,2,3	(<u>Lepidochelys kempi</u>)
Hawksbill turtle 1,2,3	(<u>Eretmochelys imbricata</u>)
Leatherback turtle 1,2,3	(<u>Dermochelys coriacea</u>)
Houston toad	(<u>Bufo houstonensis</u>)

1 Occurs in Reach I

2 Occurs in Reach II

3. Occurs in Reach III

The name 'American peregrine falcon' mentioned on pages 22, 25 and in Table 8 should be changed to the Arctic peregrine falcon.

On page 43 (4.03) the endangered birds generally mentioned here should be identified."

Response: Based on the information provided and on specific comments from other agencies, the information concerning endangered species has been revised to reflect the information provided.

Comment: "Page 49. While spoil mounds in certain locations have some benefit to wildlife, the intermittent spoiling, particularly at relatively frequent intervals, modifies some of those benefits. Overall, the spoiling from maintenance dredging of the GIWW and its laterals is more detrimental to fauna than it is beneficial."

Response: The adverse effects on wildlife of dredged material disposal were discussed in paragraphs 4.21 through 4.33 of the draft statement. The opinion given in this comment has been added to the final statement in Paragraph 5.13.

Comment: The greatest benefit of spoil islands to wildlife is to the 'fish-eating' birds, numerous species of which (depending upon the age of the spoil and security of the islands from disturbance and predators) use such islands for rookery, resting and feeding sites.

Skimmers and least terns are more apt to use 'first-season' spoil. Gulls, Louisiana herons and certain terns begin to use second or third-season spoil as vegetation becomes established. Subsequently, great blue herons and reddish egrets are species which use spoil islands. Spoil islands ten or more years old are preferred by species of egrets and herons.

At least two species which may become endangered, the reddish egret and white-faced ibis, use Texas spoil islands. Both require the mid-climax to climax vegetation of older islands and spoiling intervals of less than 8-10 years are detrimental to these birds."

Response: This information has been added to the statement in Paragraphs 4.08 and 4.09.

Comment: "Usage of spoil sites and spoiling operations should, as much as possible, be done to accommodate wildlife which use them."

Response: Concur. Methods of protecting wildlife from adverse effects are used wherever and whenever possible. Methods being utilized include restricting dredging to

certain times of the year in specified areas, placement of material on low areas, rather than higher areas containing climax vegetation, levee construction to reduce encroachment on high quality habitat, and placement of restrictions on disposal of oil, human waste, toxic chemicals, and other detrimental materials.

Comment: "Page 50 (4.24). Texas Parks and Wildlife Department studies have documented instances where siltation has been biologically damaging as far as 5,400 feet from a shell dredge.

Response: A discussion of this information has been added to the statement (Paragraph 4.29).

Comment: "Pages 52 & 53 (4.29). Odum's study indicated higher productivity 'in those areas not smothered with silt' and no repopulation on spoil areas."

Response: Paragraph 4.32 has been modified to include this information.

Comment: "Page 61 (4.54). With respect to the cumulative effect of sediment from dredging on the biological productivities, it is felt by this Department that such effect is (rather than is not) cumulative in many instances since maintenance dredging often continually increases the amount of area covered by silt and diminishes productivity."

Response: This information has been added to Paragraph 4.60.

Comment: "Page 63 (4.62). With reference to this section, social and economic benefits provided by the wetland ecosystems which have been and are intended to be inundated by spoil should be discussed. Social, economic and environmental values of wetlands (or marshes) are reflected in the following abstract from 'The Value of the Tidal Marsh' by James Gosselink, Eugene Odum and R. M. Pope:

'Natural tidal marshes are evaluated in monetary terms. By-product production (fisheries, etc.) on a

per-acre basis yields a value of only about \$100 per year, even when the whole value of the fishery is imported to the marsh. More intensive uses, such as oyster aquaculture, which preserve many of the natural functions of the marsh-estuarine ecosystem, have a potential up to \$1,000 per acre per year. The potential for waste assimilation is much higher, about \$2,500 per acre per year for tertiary treatment. Summation of the noncompeting uses approaches an ecological life-support value of about \$4,000 per acre per year, based on the gross primary productivity (in energy terms) of the natural marsh, using a conversion ratio from energy to dollars based on the ratio of Gross National Product to national energy consumption. When these annual social values of \$2,500-\$4,000 are income capitalized at 5 per cent interest the estimated total social values are \$50,000-\$80,000 per acre. Some estuaries, such as the Potomac or the Hudson, are now performing waste assimilation work of even greater value, but such estuaries are overloaded to the point of degradation. Analysis based on the total value of the life support role of a natural tidal marsh-estuary suggests that a strategy of optimization in land use planning should replace, or supplement, reliance on the pricing system which is inadequate for preservation of natural systems that increase in value with the intensity of adjacent development."

Response: The quoted abstract has been added to the statement (Paragraph 2.03).

Comment: "There is now a primary data-based set of monetary values available for resource planners at federal, state and local levels for equitable estimations of fish and wildlife values. Those values are set out in the publication by Horvath, Joseph C. 1974. 'Economic Survey of Southeastern Wildlife and Wildlife-oriented Recreation'. Trans. of the 39th North American Wildlife and Natural Resource Conference. pp. 187-194."

Response: This publication has been ordered and will be used for future analyses.

Comment: "Page 67 & 68 (5.07). The high degree to which our irreplaceable, finite amount of marshland

has been diminished has long been critical and this Department is opposed to the loss of any additional marshlands."

Response: Efforts toward mitigation, elimination, and minimization of such adverse effects are discussed throughout the text, including details given in Volume III.

Comment: "Pages 79 & 80 (6.33). Where the use of hopper dredges is not feasible, the engineering know-how of the Corps and the expertise of principal biological entities should be coordinated to devise feasible methods for handling spoil in the least environmentally detrimental manner. Neither is it economically feasible to continue degrading and obliterating our extremely valuable wetlands."

Response: Determining feasible methods for disposing of dredged material in the least environmentally detrimental manner is the primary purpose of the coordination efforts described in the statement. Volume III describes additional efforts made to protect marshlands and wildlife habitat. It is believed that even better protective measures can now be taken since the State of Texas has assumed local sponsorship of the waterway. The Corps of Engineers will have greater latitude in the future in establishing disposal areas.

Comment: "Page 86 (9.06). The citation in this paragraph that 'the coordinated disposal plans are in compliance with all recommendations made by the U.S. Fish and Wildlife Service and the EPA', conflicts with statements made in paragraphs 9.07 a,b,c,d,e,f, and h. The Fish and Wildlife Service recommendations are not always being followed."

Response: The quoted statement refers to those reaches and tributary channels on which coordination is complete. Paragraph 9.07 of the draft statement referred to those reaches and tributary channels on which coordination was incomplete at the time the statement was issued. The subparagraphs described areas where difficulties have been encountered in complying with some recommendations.

The final statement contains substantial additional coordination information throughout Section 9 and in Volume III.

Comment: "Page 88, paragraph f. It should be said here that one of the five active Southern bald eagle nests in Texas is located on the Pat Welder Wildlife Range on the north side of the Victoria Channel. Dredging activities should be restricted in this area from November 15 to mid-May of each year."

Response: This information has been added to the statement in Paragraphs 2.14 and 2.93. Protective measures to be taken are discussed in Volume III in the Channel to Victoria supplement. Protection of the eagle nest has been fully coordinated with the Texas Parks and Wildlife Department.

(5) TEXAS AIR CONTROL BOARD. (Attachment A-31)

Comment: "In regard to the Draft Environmental Statement, Gulf Intracoastal Waterway, Texas Section, we anticipate that potential air quality problems may be caused by this operation. Objectionable odors (mercaptans, hydrogen sulfide) may result from dredging of sediments containing high concentrations of organic matter.

A problem of this nature occurred in Region 5 at Key Allegro, Aransas County. In that incident, an odor nuisance was created and property damage was caused to several residences by a dredge working in the area. Paint damage was observed on at least five houses. An analysis by an independent lab verified the hydrogen sulfide damage.

In light of this incident, we suggest that caution be exercised in this project. If hydrogen sulfide odors are detected, dredging should be discontinued until winds are blowing away from residential or commercial establishments."

Response: Although such problems are not anticipated, they are possible as discussed in Paragraph 4.64 of the statement. If a problem develops, consideration will

be given to relocation of the dredge to an area where residential and commercial establishments will not be affected.

(6) DEPARTMENT OF AGRICULTURE. (Attachment A-32)

Comment: "There are a few places which we believe could be improved with some additional consideration and rewriting. First, the statement in section 4.06 that '...outdoor recreation (opportunities) for most Texans have been materially increased...' is clearly an overstatement. Most Texans do not use this area. Such overstatements detract from the credibility of the E. S. and should be rectified."

Response: The statement in question refers to the standard of living enjoyed by most Texas residents. The opportunities that exist result from the ability of people to pay for the recreation, whether the recreation is boating on the GIWW or hiking in a State Park. This has been clarified in the statement.

Comment: "Section 4.13 lists the influx of '...hundred of new industrial and business establishments...' as a benefit of the project. This statement has two flaws. First, it is not documented and secondly, many, such as environmentalists and proponents of limited economic and population growth, view such growth as adverse impacts rather than beneficial. It might be less controversial to document the influx as an unevaluated effect. Then list the increased employment, purchasing power, incomes, etc. as benefits."

Response: The wording of this paragraph has been changed slightly to emphasize that the benefit is derived from the increased employment, etc. Paragraphs 4.16 and 4.80 have been added to discuss the possible adverse effects of this secondary growth.

Comment: "Section 4.35 indicates that the islands formed by deposition of dredged material form good habitats for birds and are often used by hunters, fishermen, campers and others. The environmental impact of this use, including surface damage, uncollected trash, fires and other items of general practice should be discussed and evaluated."

Response: The use of these islands by such sportsmen is not sufficiently intense to result in substantial amounts of debris. In addition, that debris which is left behind is usually removed by high tides or other natural phenomena. Therefore, the abuse of these areas by others is not considered to be a significant adverse effect.

(7) TEXAS WATER QUALITY BOARD. (Attachment A-33)

Comment: "This agency requests that sediment analyses be performed in all areas to be dredged, prior to the project commencement. The samples should be collected far enough in advance for analysis results to be utilized during dredging, if required. If sediment analysis reveals concentrations of metals in excess of EPA, guidelines, the Corps should seriously consider land disposal, using proper levees for containment and weir structures for decanting. This Agency should be notified before each project is begun in order that we may monitor the effects on water quality in each area."

Response: In those areas where polluted sediment is suspected and where unconfined disposal is planned, a program of the type recommended will be initiated (Paragraphs 1.33 through 1.36).

(8) TEXAS HIGHWAY DEPARTMENT. (Attachment A-34)

Comment: "Reference is made to your memorandum of November 12 transmitting for our review and comments one copy of the above-cited draft environmental statement. We have reviewed this material and believe that the proposed work covered by this environmental statement will have no appreciable affect on the highways under our jurisdiction. We appreciate the opportunity of reviewing this environmental statement."

(9) BUREAU OF ECONOMIC GEOLOGY. (Attachment A-35)

Comment: "We have no negative comments on these projects. Thank you for the opportunity to respond."

(10) SOIL AND WATER CONSERVATION BOARD. (Attachment A-36)

Comment: We offer no comments on this project.

(11) TEXAS HISTORICAL COMMISSION. (Attachment A-37)

Comment: "Where maintenance dredging will not exceed the measurements of the original channel, no measures, other than assuring minimal siltation of known submerged cultural resources, are necessary.

Where the channel will be enlarged or deepened as part of a maintenance operation, underwater magnetometer surveys may be necessary in areas thought to have a high density of resources.

Response: No enlargement or deepening is anticipated for maintenance dredging.

Comment: "Existing spoil areas should be used for depositing material resulting from the dredging operation. When new areas are earmarked for spoiling, magnetometer surveys of these areas may be indicated."

Response: For the most part, existing disposal areas will be used. Any changes, additions, or relocation of disposal areas will require a public notice, and the Texas Historical Commission will have the opportunity to comment.

i. CITY OF TEXAS CITY. (Attachment A-38)

Comment: "As you know the Intracoastal Waterway of Texas is the life line between Petro Chemical Plants along the Texas Coast as well as other freight.

It is absolutely essential that Intracoastal Waterway as well as Main and Tributary Channels be maintained at adequate width and depth to handle the ever increasing size of cargo carrying barges.

On behalf of the Commission and the citizens of Texas City we would like to urge the acceptance and approval of the statement and recommend the construction/maintenance to greater width and depth at the earliest possible time."

j. GALVESTON COUNTY NAVIGATION DISTRICT NO. 1.
(Attachment A-39)

Comment: "Galveston County Navigation District No. 1, after careful study considers that the statement, in two chapters, outlines only beneficial effects to the future dredging of the Gulf Intracoastal Waterway, Texas Section."

k. BRAZOS RIVER HARBOR NAVIGATION DISTRICT OF BRAZORIA COUNTY. (Attachment A-40)

Comment: "The draft environmental statement on the Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels with your covering letter of November 4, 1974 has been reviewed. It appears adequate regarding our area and we have no other comments to make on the subject."

l. BROWNSVILLE NAVIGATION DISTRICT. (Attachment A-41)

Comment: "One economic benefit that might be expanded is the amount of Mexican cargo moved via the Intra-Coastal thru Brownsville:

<u>Domestic Internal Tonnage in the Year</u>	<u>Inbound</u>	<u>Outbound</u>
1971	332,301	913,158
1972	400,947	991,704
1973	566,864	852,557

Handling of this tonnage provides jobs for the citizens of both countries; provides the U.S. with a favorable trade balance and with many raw materials that our industry needs."

Response: This information has been added as Section 2.123.

Comment: "No appreciable environment impact was found by the study. I have worked in the Brownsville-Port Isabel area for nearly twenty years and can see no bad effect on the environment from any maintenance dredging of the canals or channels."

Fishermen friends ask, 'When will the dredge return? Fishing is good at the dredge.'

I strongly favor the program of maintenance dredging."

m. HOUSTON-GALVESTON AREA COUNCIL. (Attachment A-42)

Comment: "Spoil disposal should be placed so as not to block fish passes, marshy areas, and tidal flats as well as natural entrances to channels, inlets, bayous, and inland lakes. These are particularly significant in the Chocolate Bayou Channel, Matagorda Bay, West Bay, and Colorado River Channels. In the cases where these situations may arise it is suggested that the spoil be placed behind levees above mean high tide and situated so that runoff from the spoil area is minimized."

Response: Concur. Protection of such critical areas is normally accomplished in the coordination of disposal plans with other agencies. All feasible mitigation measures, including depositing materials behind levees, are utilized to minimize adverse effects.

Comment: "Special care should be taken to avoid dispersal of dredged material in those areas where bottom deposits are above acceptable levels in oxygen demand materials or heavy metals."

Response: Recent extensive testing by many different organizations and agencies has demonstrated that there is no correlation between concentrations of oxygen demand materials and heavy metals in sediments and adverse effects on water quality. The proposed water quality monitoring programs should establish whether or not special precautions are needed when dredging certain areas.

Comment: "All wastes, such as gasoline, oil, and sanitary wastes, should not be discharged directly into the water without proper treatment to acceptable levels."

Response: Standard dredging contract specifications prohibit all such discharges.

n. NATIONAL AUDUBON SOCIETY. (Attachments A-43)

Comment: "Page 22, Para. 2.27 - In this area Eastern Brown Pelican is a year-round resident in Reach II. Seasoned at present in Reach I and III. Nested 1974 in Reach I and II."

Response: The statement has been changed to reflect this information.

Comment: "Page 30, Para. 2.65 - In this area several Major Heron, Egret, Gull and Tern nesting colonies are located along and near the Intracoastal Waterway. These are of considerably more importance to the respective species than the mentioned mottled duck nesting areas are to that species."

Response: The statement has been changed to reflect this information.

Comment: "Page 30, Para. 2.66 - In way of enlightening the Corps of Engineers, the original dredging of the waterway through the heart of the prime whooping crane wintering range on the Aransas NWR caused serious loss of very limited habitat. The barge traffic through this waterway with cargos of highly toxic industrial chemicals and various petroleum products probably poses the greatest present threat to wintering whooping cranes. Spills of those cargos - which have occurred in and near the refuge - would contaminate food supplies and in the case of several chemicals, could kill a large portion of the whooping crane population outright."

Response: This information has been added to the statement (Paragraph 4.39).

Comment: "Spoil deposition during past maintenance dredging operations has created additional crane habitat which helped mitigate the original losses of habitat. This new habitat resulted from the creation of shallow bays and marshes where the water was originally too deep for whooping crane use. Subsequent depositions, however, have destroyed some of this much needed habitat. Additional

deposition in the shallow bays and marshes of the Aransas NWR area would be very detrimental to whooping crane feeding areas. Upland type areas created by additional deposition are of little value to the whooping cranes and are much less productive than marshes.

The present plan of placing spoil inside levees on higher areas along the waterway in the refuge (see Figs. 49-52) does keep spoil material from flowing into existing marshes and bays. This, however, seems at best a short term solution. We do not know what effect these growing spoil hills will have on whooping crane use of adjacent marshes and bays. The habitat is too limited and the situation too critical to allow much experimentation. Certainly we cannot build spoil mountains.

There does seem a good possibility of using maintenance spoil to create additional marsh and shallow water habitat in several areas on and near the Aransas NWR. The False Live Oak Point area, Dunham Island area, and the area between False Live Oak Island and Rattlesnake Island are possible locations.

Spoil could also be used to rebuild the rapidly eroding and nearby Second Chain of Islands which are very important rookery islands and one of the very few (1-3) recent Texas nesting sites of the endangered Brown Pelican.

Another island in this area which needs additional spoil is Long Reef, an important Reddish Egret and Tern nesting site on the west side of channel between stations 856+000 and 860+000. Creation of additional isolated spoil islands in Aransas, San Antonio and Corpus Christi Bays would be desirable from an ornithological point of view."

Response: Plans for disposal of dredged material in this as well as all other reaches of the waterway are coordinated with the U.S. Fish and Wildlife Service. This agency works with the Texas Parks and Wildlife Service and the National Marine Fisheries Service. Every effort is made to comply with the recommendations of these agencies. Any recommendations made by the U.S. Fish and Wildlife Service for creation of habitat with dredged material would be evaluated on a case by case basis.

Comment: "Page 31, Para. 2.68 - We call your attention to the fact that nesting on these islands extends into July and often into August. There are several important nesting islands south of station 88+500."

Response: The statement has been changed to reflect this information (Paragraph 2.71).

Comment: "Page 43, Para. 4.02 - Reference is made to the Corps' 'careful consideration' of individual disposal actions. Unfortunately this is not always effective - 1974 destruction of marsh and ponds just N. of junction of ICW and Channel to Victoria by filling with spoil was quite unnecessary. On site inspection by Fish and Wildlife Service, Parks and Wildlife, or NAS Biologists is urged."

Response: Every effort is made to conduct required dredging operations in a manner which will minimize undesirable effects. Dredging operations are coordinated with the Fish and Wildlife Service and the Parks and Wildlife Department and on site inspectors are often provided when dredging is to take place in especially sensitive areas. The National Audubon Society has been placed on the mailing list for contract plans and specifications for dredging work, and is welcome to conduct on-site visits to the dredging operations at any time. Such visits should be coordinated through the Galveston District Office of the Corps of Engineers.

Comment: "Page 54, Para. 4.33 - 4.34 - There is considerable room for improvement in design and alignment (sic) of spoil islands. Most spoil areas parallel channels with little apparent regard to direction of prevailing winds or current. Elongate islands aligned (sic) parallel with currents and wind would erode more slowly and thus reduce the amount of spoil washing back into channels and provide more permanent nesting sites for birds.

A point which cannot be over-emphasized is the importance of isolation of rookery islands. Birds have a definite preference for islands separated by wide expanses of water or by deep channels rather than mainland areas or

large islands which have populations of predators such as raccoons and coyotes. Many miles of spoil islands can be created, but if they are not widely separated enough to prevent or limit access by predators, they will not be used extensively as rookery sites."

Response: The referenced disposal islands were in general created during the original dredging of the GIWW. Islands of this type are almost never produced by maintenance dredging operations because of the non-cohesive nature of the typical shoal material. Normally, the relatively small quantities of material removed during maintenance dredging can only be used to temporarily protect existing rookery sites from the effects of erosion.

Comment: "TABLE 5 - Brown Pelican occurs in all three Reaches. Nested in 1974 Reaches I & II.

Your list is probably intended to cover all species which occur in the area, but several species are omitted which are directly affected by maintenance dredging operations which create, destroy or alter their nesting and feeding locations. Many of those species listed would not be affected (white-winged dove, wild turkey, woodpeckers, etc. Tropical kingbird, orchard oriole, ground dove).

Some omitted species are:

Clapper Rail	Royal Tern
Snowy Egret	Sandwich Tern
Great Egret	Fouster's Tern
Louisiana Heron	Laughing Gull
Black-crowned Night Heron	Little Blue Heron"

Response: Table 5 has been changed to include this information.

Comment: "TABLE 7 - Same inadequacies in listings as for birds. Two species which would be most affected by dredging operations are not listed.

Gulf Salt Marsh Snake (*Natrix sipedon clarki*)
Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*)"

Response: These species have been added to Table 7.

Comment: "TABLE 8 - Eastern Brown Pelican nested in 1974 in Matagorda Bay just inside southern limit of Reach I (Sabine to Pt. O'Connor).

Southern Bald Eagle occurs occasionally in Reach II (Pt. O'Connor to Corpus)."

Response: This information has been added to Table 8.

o. JOHNNIE HAMMOND, STUDENT, SMU SCHOOL OF LAW.
(Attachments A-47 through A-49)

Note: Although the letter does not specifically state which Draft Environmental Statement is being commented on; from its content, it can be assumed that the Gulf Intracoastal Waterway, Maintenance dredging (D) EIS is the referenced statement.

Comment: "First, the (D)EIS is so vague and general that any detailed environmental assessment of the maintenance dredging project is virtually impossible. An environmental breakdown of the three Reaches, for example, would have been more informative, and generally more fair to the public at large in learning or discovering the actual effects of dredging in their area."

Response: Section 2 (Environmental Setting) of the statement gives a discussion of environmental setting of the project area by reach. Additional information concerning especially sensitive areas has been added to Section 2. With regard to environmental effect, it is believed that the possible environmental effects of dredging on the various types of habitat are well described in Section 4, and, that with a knowledge of the habitat as described in Section 2, a fairly accurate assessment of the potential adverse effects on any particular area can be made. Vol. 3 of the final (EIS) contains additional information on each specific area of the project.

Comment: "Secondly, without more in depth studies of unique environmental conditions or areas, for example,

the impact on various endangered species listed in Table 8 and pages 18, 22, 25, and 43, the very purpose of impact statement is defeated. The inaccurate listing of the endangered species found along the Texas Coastline (as noted by the Texas Parks and Wildlife Department letter of 12-11-74) is itself evidence of lack of proper consideration of and study into the effects dredging will have on these species. Prohibiting dredging from March to June, the nesting months of many species of birds Cf. 82-68, which is to be highly commended, is the minimal type of protection that the endangered species should merit. Before the remainder of any endangered wildlife is possibly put in a more dangerous position, adequate studies should be required before dredging begins."

Response: A paragraph has been added to the statement to describe the possible effects of dredging on endangered species (Paragraph 4.39).

Comment: "The study might try to pinpoint areas where the wildlife breed, feed, and rest so that dredging might be coordinated with the least detrimental times and places of such habits."

Response: Protection of known important wildlife breeding, feeding, and resting areas is accomplished during coordination of the disposal plans. Protection of every area used by wildlife is not possible because all disposal areas are used to some extent by desirable species. A limited number of suitable dredges are available along the Texas coast, and, in order to accomplish all the dredging required annually, dredging must be accomplished year round. In sensitive areas, areas with high wildlife populations, and areas known to contain endangered species that might be affected, restrictions on the times of dredging are utilized to protect wildlife. Placing similar restriction on all disposal areas is not feasible.

Comment: "Dredging schedules in the Corpus Christi Bay to Port Isabel area seem to never allow vegetation to regrow before dredging begins and covers it again. Although some terns, herons, the redish (sic) egret, and other wildlife do not need the vegetation, some species may require it for feeding, nesting, and resting."

Dredging schedules, then might be geared to permit vegetation regrowth on some disposal sites while other adjacent or nearby sites are being continually recovered."

Response: Vegetation does exist on most of the disposal areas in the cited channel reach. Vegetal growth in this area is exceedingly slow because of high salinities and low rainfall rates. Since the materials dredged will be placed only on the low areas of emergent islands, effects on the large majority of vegetation, which exists primarily on higher areas, will be minimal and insignificant. These damages which might occur would be limited to broken stems and crushed plants caused by placement of the pipelines over the crests of the islands. In this area, where marsh vegetation is virtually non-existent, the low areas of disposal islands normally contain no vegetation other than algae. Along the reach from Corpus Christi Bay to Port Isabel, numerous major bird rookeries exist on disposal islands. In response to public notice No. IWW-M-9 Corpus Christi Bay to Mud Flats (Vol. 3 Page 233) the National Park Service requested dredged material be placed around some disposal islands to increase their size and improve them as rookeries. The Corps of Engineers plans to comply with this recommendation. In addition, heron, ibis, roseate spoonbill, and reddish egret all require climax vegetation of 8 to 10 years of age for nesting according to the Texas Parks and Wildlife Department.

Comment: "Cf. 82.70 page 30. (DEIS) Openings between some existing disposal areas, (1) particularly the area from South Corpus Christi Bay, around channel marker No. 33, or from about the Encinal Peninsula (sic) to South Bird Island, (2) disposal area #208, 206, are inadequate or non-existent. This area has become one continuing stretch of spoil. The existing small channels have been ineffective either through failure to maintain or too small initial openings. A greater number and larger openings, (as suggested by U.S. Fish and Wildlife letter in general) should be constructed and maintained. 82.71 states that the openings will be maintained to prevent damaging compartmentalization for the area from Port Isabel to Mud Flats, but no such statement is made for the

Mud Flats to Corpus Christi Bay area, where it is most desperately (sic) needed."

Response: Paragraph 2.73 states that all recommendations of the U.S. Fish and Wildlife Service will be followed and specifically states that the openings recommended by USF&WS will be dredged. As a matter of record, this reach of the waterway has been maintained since the USF&WS prepared its report in 1971. During this maintenance, the recommended openings were dredged.

Comment: "Although access channels to the area known as the Hole have diminished massive fish kills, extension of these channels into deeper areas of the Hole would provide (sic) even more (sic) protection to fish from evaporation in extreme drought conditions."

Response: As recommended by the USF&WS, the access channels were excavated to the deepest part of the "Hole."

Comment: "Fish habitats in the Mud Flats and sands will need particular care due to the already natural shallowness of the water. Of course, the entire Reach III region, the upper and lower Laguna Madre is shallow and needs special attention. Disposal areas should not block off water and fish passages between the disposal areas. The toe levees, to be constructed (sic) sometime in the future; when spoil becomes 1.5 feet emergent above mean low water mark, should be constructed or refurbished by the time the open water disposal reach that level, not after they reach that level, to prevent further encroachment on already shallow bay bottoms."

Response: As discussed above, openings between disposal areas are being maintained. As discussed in several places in the statement, the construction of open water disposal areas presents extremely difficult engineering problems, and, until the material has become emergent, and can be expected to remain emergent, the construction of levees is usually a fruitless effort.

Comment: "The Baffin Bay area, being a significant and highly productive environmental area, should receive

special attention to prevent siltation into the Bay. Regular water quality checks and possible alternative disposal sites should be considered if water quality checks prove possible harmful effects."

Response: The Baffin Bay area should not be affected in any way by the dredging and disposal operations in the Laguna Madre. The dredging and disposal operations are located sufficiently distant from Baffin Bay so that adverse water quality effects, including siltation, should not affect that area. In addition, there is no known source of pollutants in the affected area, and water quality degradation is not expected.

Comment: "Disposal area #226, part of the Tributary Channel to Harlingen appears as if spoil will be deposited, or allowed to spill promiscuously into one corner of the Laguna Atascosa National Wildlife Refuge. I think before any encroachment into this area, this site should be specifically pointed out to the various agencies involved and cities involved with the refuge, as well as the general public."

Response: As a matter of record, disposal area No. 226 does not extend into the Laguna Atascosa National Wildlife Refuge. Coordination with the agencies involved has resulted in the decision to construct a levee along the back side of this disposal area prior to the next dredging in the area.

Comment: "Finally, more information on the small boat harbor in Port Isabel should be revealed in order to analyze possible secondary environmental impact from increased recreational uses, and possible urban, apartment or resort area development. The massive expansion of such projects in recent years in Port Isabel indicates a need to coordinate any increase in water recreational facilities with planned land-use development."

Response: Maintenance of an existing facility of this nature should cause no appreciable increase in population or urban development. New construction of similar

facilities could encourage such development, but this environmental statement addresses only maintenance.

p. BOB WINN. (Attachments A-50 through A-51)

Comment: "Survey and citation of pertinent literature is weak -- most publications are from out of state and have no direct applicability to the GIWW."

Response: Literature used in preparation of the statement is considered pertinent and adequate. Publications not specifically from the project areas were used because they depict problems very similar to those encountered in our areas. For additional information see response to United States Department of Commerce.

Comment: "Too much reliance is placed upon past programs, procedures, and techniques of dredging and disposal with a consequent lack of validity to such broad statements as Adverse Effects (4.15)."

Response: Comment is not completely understood. All reasonable alternatives have been considered, and the discussion of adverse effects is considered valid and well substantiated.

Comment: "4.21 - 4.26 -- Applicability of remote studies to GIWW sedimentation from dredging disturbance is questionable. The very uniqueness of the GIWW (as previously stated) should require a modicum of specialized study to evaluate existing conditions."

Response: Publications not specifically from the project area were used because they describe and evaluate problems identical with those that will be encountered in maintaining the GIWW. Additional studies of the Texas coastal area are now being conducted by the Corps of Engineers. As discussed in Volume III, studies of virtually all environmentally sensitive disposal areas will be made within 6 months prior to dredging. Existing and planned studies are believed adequate.

Comment: "4.20 -- It would be beneficial if non-levee disposal areas are delineated in order to allow consideration for and development of alternate systems or actual levee-containment barriers to dredge material movement."

Response: Leveed and non-leveed areas are delineated both in Volume II, circulated with the draft statement, and in Volume III, in the public notice maps.

Comment: "4.36 -- Pollutants and their problems are not dealt with in an orderly-systematic fashion. No point source and attendant handling is discussed leaving, therefore, question as to the need of the section -- or is it just filler?"

Response: Point source and attendant handling are not considered since dredging does not add pollutants to the system. The significant question is whether or not dredging and disposal operations will have a significant adverse effect on water quality by resuspending materials found in the sediments. This is a question that can be answered only on a case by case basis by the proposed monitoring study. It is appropriate to note at this point that, to the knowledge of the Galveston District Corps of Engineers, significant water quality degradation caused by dredging and disposal has not been demonstrated to any degree of reliability in any waters of the Texas Coastal Zone. The Corps of Engineers' Dredged Material Research Program, after 2 years of intensive study of this problem, has reported that initial results of the laboratory studies have shown that most heavy metals in sediments are unavailable to the water column and that zinc, mercury, cadmium, and most other heavy metals are immobile and unavailable biologically. This and other information have been added to the discussion of effects of dredging on water quality (Paragraph 4.45).

Comment: "5.10 -- Aesthetic problems are dismissed rather sharply; perhaps an expansion of this section would improve the acceptance to fisherman."

Response: Additional information on aesthetic problems has been added to Paragraph 5.11.

Comment: "6 -- Alternatives -- Although some are offered, there is a general lack of economic justification even though this is a major reason for dredging."

Response: Given specific alternatives for specific cases, precise economic data can be developed for determining feasibility. Considerations such as this are normally made when another agency has recommended relocation or elimination of a given disposal area to preserve valuable or unique habitat. In a general discussion, economic aspects of the various alternatives can be addressed only in relative terms.

Comment: "All biological sections contained in this study are weak."

Response: See response to U.S. Department of Commerce (Page 123) and Texas Parks and Wildlife Department (Page 140).

q. JOSEPH H. FONFARA, STUDENT, SMU SCHOOL OF LAW.
(Attachment A-52)

Comment: "In my opinion, a serious oversight in the Draft Environmental Impact Statement is that the dredging operation presently contemplated will result in a change in the fresh water drainage pattern. If the present proposal is implemented whereby breaks in the barriers between the marshes and fresh water sources may be located at intervals of up to three and four miles, improper water circulation will inhibit movement of crustaceans and fishes to and from the marshlands.

The result of inadequate spacing of these openings will be a decrease in fresh water circulation and an increase in salt water inflow resulting from natural tidal action.

I recommend that openings into the marshlands be located every one-fourth to one-half mile in order to distribute a greater quantity of fresh water in a more uniform manner."

Response: Continued dredging and disposal in the manner described in the statement will not result in any

significant change in the freshwater drainage pattern. Any blockage that could occur has already occurred as a result of previous dredging. As a result of coordination with the U.S. Fish and Wildlife Service, many formerly blocked water passages have been reopened, and it is anticipated that additional openings will be dredged in the future. Such actions are best evaluated on a case by case basis where actual needs can be established. Placing openings at regular intervals would have little or no beneficial effect on water exchange between the bays and marshes unless the openings coincided with natural streams or tributaries. In addition, the long-uninterrupted disposal areas referenced are not located in any manner where freshwater inflow to marshes would be blocked. They are located between marsh areas and saltwater areas. Finally, saltwater marshes are of much greater value to marine productivity than fresh or brackish water marshes.

Comment: "Additionally, I recommend that the Corps of Engineers make every effort to coordinate its dredging activities with the migratory and nesting patterns of birds and waterfowl in significant feeding areas. If this is not done, the noise and activity could cause a substantial diminution in reproduction for that particular year."

Response: The Corps of Engineers always makes every effort possible to comply with recommendations of this nature. It is standard practice to prohibit dredging in many areas along the coast during the bird nesting season. Examples include many islands leased by the Audubon Society, known rookery islands near Padre Island in the upper Laguna Madre, the islands in Corpus Christi Bay that are used by brown pelicans, and several other areas. Dredging is also prohibited near the Aransas Wildlife Refuge when the whooping cranes are there. However, it is not practicable to limit all dredging to certain times of the year. The number of dredges available would not be sufficient to accomplish all required dredging in only 8 months of each year.

r. KENDALL A. LAUGHLIN STUDENT, SIU SCHOOL OF LAW.
(Attachment A-53)

The responses in this section only address comments made on the Draft Environmental Impact Statement for the Gulf Intracoastal Waterway (Texas Section) (Channel to Palacios). Comments on the public notice are addressed in Volume III.

Comment: "My first comment pertains to utilizing the Master Environmental Plan without preparing a more specific plan for this particular area. While it is important to have a master plan a problem arises, in that it will have to be broad and general with regards to the environmental impacts occurring (sic) within this 16.1 mile area. Therefore, I propose before any action is taken by the Corps of Engineers a specific environmental impact statement should be prepared to acquaint the public with the specific environmental consequences of dredging this area."

Response: The final statement is being supplemented by detailed assessments of the various main channel reaches and each tributary channel, including the Channel to Palacios. The environmental aspects of each reach and tributary are being evaluated on a case by case basis after extensive coordination with the public and agencies concerned with environmental issues. Major coordination efforts are directed to the various local, State, and Federal conservation agencies. All feasible actions for mitigation of adverse effects, as recommended by these agencies, are implemented in order to protect and preserve the natural environment to the greatest practicable extent. These coordinated mitigation efforts are addressed in Volume III.

Comment: "Before an 'emergency situation' develops, I suggest that the adverse effects of any dredging should be evaluated. Specifically, evaluations should be made regarding:

The impact of the project upon the natural physical environment and upon damage to the stream bottom;"

Response: There is no stream bottom to be affected, and the U.S. Fish and Wildlife Service, in a report prepared

in cooperation with the National Marine Fisheries Service and the Texas Parks and Wildlife Department, has stated that "...damage to the environment has been minimal..." The Corps of Engineers has implemented all the recommendations made by these agencies to assure that "minimal damage" will continue to be the situation on the Channel to Palacios.

Comment: "The loss of habitat to ambient floral, fauna, recreational, and concomitant ecological loss;"

Response: Loss of habitat is addressed in paragraphs 4.61 - 4.63. The wildlife habitat to be temporarily lost from productivity is limited to the two small disposal areas near developed areas on shore. These areas are not significantly valuable as wildlife habitat because of their close proximity to human habitation and developments.

Comment: "The vegetation loss which functions as a primary habitat for holding sedentary species within the region;"

Response: The temporary vegetation loss will not be significant for the reasons stated above.

Comment: "As the subject area contrasts with surrounding land types it may be viewed as a separate (sic) ecosystem. Hence it too must be considered as it would be severely (sic) disrupted and permanently altered by the project. Therefore, a more thorough (sic) evaluation of this aspect should be made before proceeding."

Response: The project area contrasts with surrounding areas only in the fact that development and previous deposition of dredged material has occurred, reducing the value to wildlife of the land areas to be affected by future maintenance. For this reason, the disposal areas are considered to be the best available areas from an environmental viewpoint,

Comment: "In conjunction with the above, the Final Environmental Impact Statement (GIWW) should cover the impact to the area and the longterm (sic) impacts to the environment."

Response: Additional information of this nature has been added to reflect the comments of various agencies. Page 312 of Vol 3 contains more information for this area.

Comment: "The secondary environmental impacts to on-shore activities should be considered in order to evaluate the potential, perpetual environmental impacts caused by continued dredging. The secondary problems which should be studied consist of such things as future population, and associated items such as crime, public utilities, education, and street, which increased population to the area will bring. Throughout the Draft Environmental Impact Statement (GIW) the economic prosperity associated with continued dredging is stressed but never are the secondary environmental impacts associated with this activity mentioned, much less evaluated."

Response: Continued maintenance of the channel and tributaries covered in this statement is not expected to significantly contribute to the economic growth of the area. On the other hand, if maintenance were not continued the economic benefits derived annually from the GIW would be lost. Some additional information on possible secondary effects has been added to the statement (Paragraph 4.80).

s. GEORGE PARKER, STUDENT, SMU SCHOOL OF LAW.
(Attachment A-55)

Comment: "I recommend that all suggestions made by the United States, Department of the Interior, Fish and Wildlife Service be followed and that no new areas of dumping be used."

Response: All recommendations made by the U.S. Fish and Wildlife Service for mitigation of adverse effects will be followed where practicable. In many instances, such recommendations include the use of new disposal areas.

Comment: "I likewise recommend that no spoil be dumped on any areas listed in the Preliminary Listing, Texas Natural Area Survey."

Response: The Corps of Engineers has been unable to obtain a copy of the cited document from its author Mr. Edward Fritz, law professor, Southern Methodist University Environmental Law Clinic. Since it has not been possible to obtain a copy of the document, the areas listed cannot be determined.

Comment: "In your discussion of alternatives, you have not approached adequacy in considering the alternative of a comprehensive transportation (sic) plan for the Gulf Coast, not even for the Texas Gulf Coast. With the potentiality of a superport off the Texas Coast, it is possible that a plan could be devised for handling all necessary navigation in the Gulf, proper, or at least for reducing the size and draft of barges using the GIWW. Thus, the GIWW would be phased out, or at least the depth could be reduced. A complete phase out would eliminate the girdling effect of the GIWW upon the interchange of fresh and saline waters, so essential to the complete health of the marine nursery. Either a complete phase out or reduction in depth would reduce the amount of spoil which would have to be dumped on land or in estuarine waters and would thus reduce the environmental damages."

Response: No overall transportation plan for the Gulf Coast exists. Since development of overall transportation plans is not within the authorities or responsibilities of the Corps of Engineers, the statement does not address such a plan. If the development of offshore terminals were to result in maintenance of the GIWW project becoming unnecessary, the project would be placed in the inactive category, and maintenance would cease. However, such an eventuality is considered to be highly improbable in the foreseeable future. Even if quantities of crude petroleum shipped over the project channel did substantially decrease, the remaining commerce, in all probability, would more than justify continued maintenance. In any event, the tonnage now carried over the waterway will not be reduced much, if any, during the next 10 to 15 years while offshore terminals are being constructed, and it is this period of time that the statement primarily addresses. In fact, a continued increase has been predicted for the total tonnage carried over the waterway.

With regard to a hypothetical girdling effect on interchange of fresh and saline waters, no adverse effects of such a nature have been documented or theorized by any known authority, and cases where the GIWW channels act as distributaries for freshwater streams and rivers can be cited. In addition, reducing the depth of the channel would not significantly reduce shoaling, and, therefore, would not reduce the quantities of materials to be dredged during maintenance of the shallower waterway.

9.50 Comments Not Received. Comments were requested from the following agencies or organizations but no reply was received.

County Judge, Orange County
County Judge, Jefferson County
County Judge, Chambers County
County Judge, Liberty County
County Judge, Galveston County
County Judge, Harris County
County Judge, Brazoria County
County Judge, Matagorda County
County Judge, Calhoun County
County Judge, Jackson County
County Judge, Victoria County
County Judge, Aransas County
County Judge, Refugio County
County Judge, San Patricio County
County Judge, Nueces County
County Judge, Kleberg County
County Judge, Kenedy County
County Judge, Willacy County
County Judge, Cameron County
County Judge, Hidalgo County
Orange County Navigation and Port District
Beaumont Navigation District
Port of Beaumont Navigation District of Jefferson County
Port of Port Arthur Navigation District of Jefferson County
Chambers-Liberty Counties Navigation District
Galveston Wharves
Port of Houston Authority
Matagorda County Navigation District No. 1
Port of Bay City Authority of Matagorda County, Texas
Jackson County Navigation District

Calhoun County Navigation District
City of Port Lavaca - Port Commission
West Side Calhoun County Navigation District
Victoria County Navigation Commission
Refugio County Navigation District
Aransas County Navigation District No. 1
San Patricio County Navigation District No. 1
Nueces County Navigation District No. 1
Willacy County Navigation District
Arroyo Colorado Navigation District of Cameron and Willacy
Counties
Port Isabel - San Benito Navigation District
City of Orange
City of Beaumont
City of Port Arthur
City of Galveston
City of Houston
City of Baytown
City of Pasadena
City of Liberty
City of Anahuac
City of Freeport
City of Matagorda
City of Palacios
City of Port Lavaca
City of Port O'Connor
City of Victoria
City of Seadrift
City of Rockport
City of Aransas Pass
City of Port Aransas
City of Corpus Christi
City of Port Mansfield
City of Port Isabel
City of Brownsville
City of Harlingen
City of San Benito
City of Raymondville
City of Rio Hondo
Sportsmen's Clubs of Texas
The National Wildlife Federation
Sierra Club

9.51 Other Coordination. A news release describing the project and stating that copies of the draft statement were available to the public on request was issued on 5 November 1975. A copy of the news release is attached in Appendix E. Copies of the statement were requested by and sent to the organizations and individuals listed below.

R. Steven Gisler
University of Texas at Austin
Van Butenschoen
Brazos Port Facts
Texas Committee on Natural Resources
Weston Environmental Consultants
Roger W. Bennett
Betty Speed
Vinson, Elkins, Searls, Connally & Smith
R. W. Rider
Allen G. Hill
Neil D. Whitley
Hilary F. Matthews
State of Florida
Monsanto
Gates Memorial Library
H. Paul Friesema
Moody Memorial Library, Baylor University
U.S. Department of the Interior, Aransas National Wildlife
Refuge

No comments were received from these recipients of the draft statement.

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World Dredging Magazine, July 1973.

TABLES

TABLE 1
GULF INTRACOASTAL WATERWAY, TEXAS SECTION
TRIBUTARY CHANNELS AND DIMENSIONS

TRIBUTARY CHANNEL	FIG. NO.	PROJECT DIMENSIONS		IMPROVED DIMENSIONS	
		Depth in Feet Below M. L. T.	Bottom Width in Feet	LENGTH	
				MILES	FEET
Offatts Bayou Channel	3	12	125	2.3	12,042
South Turnout		12	125	2.4	2,500
San Bernard River Channel	4	9	100	27.9	
Colorado River Channel	4	9	100	15.5	
Turning Basin		9	400	0.1	500
Sifting Basin		9	150	1.0	5,122
Channel to Pecosios	4	2	125	15.1	
Turning Basin No. 1		12	200	0.1	635
Turning Basin No. 2		12	300	0.2	1,130
Connecting Channel		12	150-430	0.1	
Channel to Victoria Main Channel	4				
via East Turnout		9	100	34.8	
Turning Basin		9	300-400	0.1	800-850
West Turnout Channel		9	100	2.8	
Channel to Seadrift via South Turnout Channel	4	9	100	2.0	
Turning Basin		9	200		100
North Turnout Channel from Channel to Victoria		9	100	3.5	
Channel to Rockport	4	9	200	2.1	
Turning Basin		9	475		1,250
Channel to Aransas Pass	5	12	125	6.1	
Turning Basin		12	300	0.4	2,212
Channel to San Diego Harbor		12	125	0.2	
Long Boat Harbor		12	100	0.3	1,300
Channel to Port Mansfield	6				
Entrance Channel		12	350	3.8	
Approach Ch. to Harbor Bridge					
Turning Basin		18	100	0.4	
Hopper Dredge Turning Basin		6	300	0.1	300
Channel across Padre Island and Laguna Madre		14	100	1.7	
Turnout Channels, East Side of Main Channel, G.W.					
North Turnout		12	100	0.6	
South Turnout		12	100	0.6	
Ch. W. Side of Main Ch. G.W. to P.T. of Turnout Channels		14	100	3.3	
Turnout Channels, West Side of Main Channel, G.W.					
North Turnout		12	200	0.6	
South Turnout		12	200	0.6	
Ch. from P.T. of Turnout Channels to Approach Ch. to					
Main Turning Basin		14	125	0.6	
Approach Ch. to Main Basin		14	200	3.1	
Main Turning Basin		14	400	0.2	1,250
Turning Basin Extension		14	100	0.1	500
Small Craft Basin		6	150	0.2	850
Shrimp Basin		12	300	0.1	1,450
Channel to Markingon via South Turnout from Main Ch. G.W.	6	12	125-150	25-30-14	
Turning Basin near Rio Hondo		12	100	0.1	500
North turnout from Main Ch.		12	200	0.7	
Port Isabel Side Channels	6				
Main Channel		12	233-60	1.0	
South Leg		12	125	0.2	
Port Isabel Small Boat Harbor	6				
Entrance Channel		7	75	1.4	7,672
Harbor Channel		6	50	0.3	1,457
Boat Basin		6	100-500	0.2	1,308

TABLE 2
GIWW SECTIONS NORMALLY
DREDGED UNDER A SINGLE CONTRACT

	STATION NUMBER		CHANNEL MILES (Statute)		Length (Miles)
	From	To	From	To	
<u>Gulf Intracoastal</u>					
<u>Waterway, Texas</u>					
Port Arthur to High Island	0+00	1620+00	288.62	319.30	30.68
High Island to Port Bolivar	1620+00	3203+00	319.30	349.28	29.98
Port Bolivar to Oyster Creek	3203+00	* 198+080	349.28	392.22	42.94
Oyster Creek to Colorado River	198+080	452+000	392.22	440.97	48.75
Colorado River to Port O'Connor	452+000	625+000	440.97	472.49	31.52
Port O'Connor to Live Oak Point	625+000	768+114	472.49	499.60	27.11
Live Oak Point to Aransas Pass	768+114	944+500	499.60	533.00	33.40
Aransas Pass to Encinal Peninsula	944+500	** 2+000	533.00	550.01	17.01
Encinal Peninsula to Lower Laguna Madre	2+000	*** 298+856	550.01	614.00	63.99
Lower Laguna Madre to Port Isabel	298+856	8+000	614.00	669.09	55.09
			TOTAL		380.47

* Stationing - System changes in this reach.

** Equation - Station 1021+744.65 = Station 0+000 applies in this reach.

*** Equation - Station 311+000 from Corpus Christi = Station 327+739 from Brownsville applies in this reach

TABLE 3
SHOALING RATES AND FREQUENCY OF DREDGING
GULF INTRACOASTAL WATERWAY, TEXAS SECTION

Project and Reach	Frequency Months	Est. Annual Maintenance Material C.Y.
Port Arthur to High Island	60 mos.	400,000
Main Channel, High Island to Port Bolivar	18 mos.	1,100,000
Main Channel & Alternate Route, Port Bolivar to North Deer Island	24 mos.	500,000
Main Channel, North Deer Island thru Chocolate Bay	24 mos.	750,000
Main Channel, Chocolate Bay to Freeport Harbor	36 mos.	750,000
Main Channel, Freeport Harbor to Cedar Lakes	24 mos.	1,000,000
Main Channel, Cedar Lakes to Colorado River	24 mos.	1,000,000
Main Channel, Colorado River to Matagorda Bay	24 mos.	1,000,000
Tributary Channel in San Bernard River (a)	24 mos	25,000
Tributary Channel in Colorado River	12 mos.	750,000
Main Channel, Matagorda Bay to San Antonio Bay	30 mos	600,000.

TABLE 3 (CONTINUED)

Project and Reach	Frequency Months	Est Annual Maintenance Material C.Y.
Main Channel, Across San Antonio Bay	24 mos.	750,000
Main Channel, San Antonio Bay to Aransas Bay	48 to 72 mos.	300,000
Main Channel, Across Aransas Bay	24 to 48 mos.	100,000
Main Channel, Aransas Bay to Corpus Christi Ship Channel	60 mos	100,000
Main Channel, Corpus Christi Bay to Baffin Bay	24 mos.	750,000
Main Channel, Baffin Bay to Mud Flats	18 mos.	800,000
Trib Channel, Channel to Palacios & Turning Basins	36 mos.	500,000
Trib Channel, Channel to Victoria (Mile 0 to Approx. Mile 14.0)	24 mos.	400,000
Trib Channel, Channel to Victoria (Approx. Mile 14 to Mile 34.6) (a)	42 mos.	60,000
Trib Channel, Channel to Seadrift (a)	24 mos.	125,000
Lydia Ann Channel (a)	60 mos.	60,000
Trib Channel, Channel to Aransas Pass & Basins (a)	60 mos.	55,000

TABLE 3 (CONTINUED)

Project & Reach	Frequency Months	Est. Annual Maintenance Material C.Y.
Main Channel, Mud Flats to Channel to Port Mansfield	15 mos.	540,000
Main Channel, Channel to Port Mansfield to Arroyo, Colo	20 mos.	245,000
Main Channel, Arroyo Colorado to Port Isabel	18 mos.	390,000
Trib Channels, Port Isabel Side Channels and Small Boat Harbor Channel & Basin (a)	60 mos.	38,000
Trib Channel, Channel to Harlingen (a)	12 mos.	530,000
Trib Channel to Port Mansfield (a)	15 mos.	515,000
*Trib Channel, Port Mansfield Entrance Channel	12 mos.	130,000

NOTES:

- (a) Usually combined with work in other selected reaches of the project
- * Hopper Dredging
- C.Y. = Cubic Yards

TABLE 4

DISTRIBUTION OF COMMON COMMERCIAL FISH SPECIES ALONG THE
TEXAS COAST WITH SEASONAL OCCURRENCES AND ABUNDANCES*

Common Name	Habitat-Remarks	Winter	Spring	Summer	Fall
Bluefish - <u>Pomatomus saltatrix</u> offshore; in schools		-	X	X	-
Atlantic bonito - <u>Sarda sarda</u> offshore; blue water		-	-	-	-
Smallmouth buffalo - <u>Ictiobus bubalus</u> freshwater bays		-	X	X	X
Channel catfish - <u>Ictalurus punctatus</u> streams, turbid to clear river and lakes, low salinity bays		-	X	X	X
Gafftopsail catfish - <u>Bagre marinus</u> bays, passes and along beaches, active in currents, all Texas Gulf Coast		X	X	X	X
Cobia - <u>Rachycentron canadum</u> around floating objects, harbors and docks		-	-	X	-
Dolphin - <u>Coryphaena hippurus</u> open water near floating seaweed and driftwood, warm seas		-	-	-	-
Black drum - <u>Pogonias cromis</u> shallow bays, all Texas coast		X	-	X	-
Freshwater drum - <u>Aplodinotus grunniens</u> freshwater lakes, streams, rivers, brackish waters, all of Texas		-	X	X	X
Red drum - <u>Sciaenops ocellata</u> bays, passes, channels		X	X	X	X
Southern flounder - <u>Paralichthys lethostigma</u> sandy, silty bottoms along shores of bays		X	X	X	X

* - present X abundant

TABLE 4 (CONTINUED)

Common Name	Habitat-Remarks	Winter	Spring	Summer	Fall
Warsaw grouper - <u>Epinephelus nigritus</u>	large specimens on snapper banks, small ones in bays near channels	-	-	-	-
Crevalle jack - <u>Caranx hippos</u>	offshore, young in bays, around bridges, pilings	-	-	X	-
Spotted jewfish - <u>Epinephelus itajara</u>	jetties, pilings, old wrecks, inshore coral reefs, entrances to creeks and sloughs	-	-	X	X
Gulf kingfish - <u>Menticirrhus littoralis</u>	feed in sandy bottom bays, Gulf	X	X	X	X
Southern kingfish - <u>Menticirrhus americanus</u>	feed in sandy bottom bays, Gulf	X	X	X	X
King mackerel - <u>Scomberomorus cavalla</u>	reefs, deep clear water			X	-
Spanish mackerel - <u>Scomberomorus maculatus</u>	mouths of harbors and passes, young in surf			X	-
Blue marlin - <u>Makaira nigricans</u>	deep blue water, solitary, Port Isabel			X	-
Gulf menhaden - <u>Brevoortia patronus</u>	Gulf, bays, open water	-	-	X	X
Finescale menhaden - <u>Brevoortia gunteri</u>	Gulf, bays, open water	-	-	X	X
Striped mullet - <u>Mugil cephalus</u>	harbors, beaches, mouths of rivers and bays, school	X	X	X	X

TABLE 4 (CONTINUED)

Common Name	Habitat-Remarks	Winter	Spring	Summer	Fall
Florida pompano - <u>Trachinotus carolinus</u> passes, in surf		-	-	X	X
Sailfish - <u>Istiophorus platypterus</u> far offshore, deepwater			-	X	-
Spotted seatrout - <u>Cynoscion nebulosus</u> bays, Gulf beaches, grassy areas		X	X	X	X
Sheepshead - <u>Arhosargus probatocephalus</u> pilings, jetties, oyster reefs		X	X	X	X
Red snapper - <u>Lutjanus probatocephalus</u> generally on offshore reefs		X	X	X	X
Snook - <u>Centropomus undecimalis</u> mouths of rivers and streams, frequent passes, inlets, cuts, spawn during summer		-	-	X	-
Blackfin tuna - <u>Thunnus atlanticus</u> offshore waters, feed on menhaden, school in offshore waters		-	-	-	-
Bluefin tuna - <u>Thunnus thynnus</u> offshore waters, feed on menhaden, school in offshore water		-	-	-	-
Yellowfin tuna - <u>Thunnus albacares</u> offshore waters, feed on menhaden, school in offshore water		-	-	-	-
Wahoo - <u>Acanthocybium solanderi</u> open ocean and Gulf Stream, deep reefs Freeport - Port Isabel		-	-	-	-
Atlantic croaker - <u>Micropogon undulatus</u> Gulf, bays, open water		X	X	X	X

TABLE 4 (CONTINUED)

Common Name	Habitat-Remarks	Winter	Spring	Summer	Fall
Spot - <u>Leiostomus xanthurus</u>		X	X	X	X
	Bulf, bays, open water				

Source: Pew (1958), Bailey (1970), and Parker, Gallaway, and Moore (1972)

TABLE 5
DISTRIBUTION AND ABUNDANCE OF BIRDS IN THE TEXAS
COASTAL ZONE CONTIGUOUS TO THE GULF INTRACOASTAL WATERWAY

Common Name	Reach	Reach	Reach
	I	II	III
Pied-billed grebe	.	.	.
White pelican	.	.	.
Brown pelican	X	-X	X
Double crested cormorant	.	.	-
Great blue heron	.	.	-
Yellow-crowned night heron	.	-	.
Cattle egret	.	.	.
Reddish egret	-X	-X	.
Wood ibis	.X	.X	-X
White faced ibis	.	.	-
Roseate spoonbill	.X	.X	-X
Snow goose	.	.	.
Blue goose	.	.	.
Mallard duck	.	.	-
Mottled duck	.	.	.
Green winged teal duck	.	.	.
Redhead duck	.	.	.
Canvasback duck	.	.	.
Ruddy duck	.	.	.
Broad-winged hawk	-	.	-
White-tailed hawk	.	.X	.X
Bobwhite	.	.	.
Turkey	.	.	.
Sandhill crane	.	.	.
Whooping crane	.	-X	.
American coot	.	.	.
Snowy plover	.	.	-
Wilson's plover	.	.	.
Common snipe	.	.	-
Long-billed curlew	.	.	.
Whimbrel	-	-	.
Spotted sandpiper	.	.	-
White rumped sandpiper	-	.	-
Herring gull	.	.	.
Ring-billed gull	.	.	.
Gull-billed tern	.	.	.
Common tern	-	-	.

TABLE 5 (CONTINUED)

Common Name	Reach	Reach	Reach
	I	II	III
Clapper rail	.	.-	.-
Snowy egret	.	.	.
Great egret	.	.	.
Louisiana heron	.	.	.
Black-crowned night heron	-	-	.-
Royal tern	-	-	-
Sandwich tern	-	-	-
Forster's tern	.	.	.
Caspian tern	-	.	.
Ground dove	-	-	.
White winged dove	-	-	.
Roadrunner	-	-	-
Ruby-thoated hummingbird	-	.	.
Belted kingfisher	.	-	-
Red-headed woodpecker	.	-	-
Tree swallow	.	.	.
Ivory billed woodpecker	-X	.	.
House wren	-	.	.
Catbird	.	-	-
Brown thrasher	.	-	-
Robin	.	.	.
Wood thrush	.	-	-
Starling	.	.	-
Yellow warbler	.	.	.
House sparrow	.	.	.
Red-winged blackbird	.	.	.
Orchard oriole	.	.	-
Prairie falcon	.	-X	-X
Peregrine falcon	-X	-X	-X
Tropical kingbird	.	-X	-X
Laughing gull	.	.	.
Little blue heron	.	-	.

- Common
. Abundant
X Rare

TABLE 6
 DISTRIBUTION AND ABUNDANCE OF MAMMALS IN THE TEXAS COASTAL
 ZONE CONTIGUOUS TO THE GULF INTRACOASTAL WATERWAY

Common Name	Reach I	Reach II	Reach III
Opossum	.	.	.
Big brown bat	-	-	-
Evening bat	.	.	.
Raccoon	.	.	.
Mink	-	-	.
Striped skunk	.	.	.
Gray fox	-	-	-
Coyote	.	.	.
Red wolf	.X	.	.
Bobcat	-	-	-
Mexican ground squirrel	-	.	.
Eastern gray squirrel	.	.	.
Plains pocket gopher	.	.	.
Beaver	.	.	.
Muskrat	.	.	.
House mouse	.	.	.
California jackrabbit	.	.	.
Swamp rabbit	.	-	.
Javelina	.	-	.
White tailed deer	.	.	.
Nine-banded armadillo	.	.	.
Bottle-nosed porpoise	.	.	.
Wild boar	.	.	.
Nilgai antelope	.	.	-

- Common
 . Abundant
 X Rare

TABLE 7

DISTRIBUTION AND ABUNDANCE OF REPTILES AND AMPHIBIANS IN THE TEXAS COASTAL ZONE CONTIGUOUS TO THE GULF INTRACOASTAL WATERWAY

Common Name	Reach	Reach	Reach
	I	II	III
American alligator	-X	-X	
Snapping turtle	.	.	
Stinkpot	.	.	
Yellow mud turtle			.
Gulf Coast box turtle	.		
Texas slider	.	.	.
Slider	-		
Keeled earless lizard		.	.
Northern fence lizard		.	.
Ground skink	.	.	.
Five-lined skink	.		
Plains blind snake		.	.
Diamond-backed water snake	.	.	.
Glossy water snake	.		
Eastern checkered garter snake		.	.
Mexican hognose snake			.
Eastern coachwhip	.		
Western coachwhip		.	.
Texas rat snake	.	.	.
Texas coral snake	.	.	.
Southern copperhead	.		
Western cottonmouth	.	.	
Western diamondback rattlesnake		.	.
Canebrake rattlesnake	.		
Marbled salamander	.		
Eastern tiger salamander		.	.
Central newt	.		
Black-spotted newt		.	.
Gulf salt marsh snake	.	.	.
Texas diamondback terrapin	-	-	

. Abundant to Common

- Uncommon to Rare

X Endangered

Table 8. Distributions of Rare and Endangered Vertebrate Species in the Texas Coastal Zone

SPECIES Common Name	STATUS	Sabine		Pt. O'Connor		Corpus Christi	
		to	Pt. O'Connor	to	Corpus Christi	to	Corpus Christi
American Alligator	E	X		X		X	
Houston Toad	E	X		X			
Texas Red Wolf	E	X		X			
Eastern Brown Pelican	E			X		X	
Wood Ibis	SU			X		X	
Whooping Crane	E			X		X	
Eskimo Curlew	E	X		X			
Audubon's Caracara	SU	X		X		X	
Northern Aplomado Falcon	SU	X				X	
Ferruginous Hawk	SU					X	
American Osprey	SU			X		X	
Prairie Falcon	T			X		X	
Attwater's Greater Prairie Chicken	E	X		X		X	
Southern Bald Eagle	E	X		X			
American Peregrine Falcon	E	X		X		X	
Western Snowy Plover	SU	X		X		X	
Florida manatee	E	X		X		X	
Ocelot	E						
Right whale	E			X		X	
Sperm whale	E	X		X		X	
Blue whale	E	X		X		X	
Finback whale	E	X		X		X	
Arctic peregrine falcon	E	X		X		X	
Atlantic ridley	E	X		X		X	
Hawksbill turtle	E	X		X		X	
Leatherback turtle	E	X		X		X	

E-Endangered

T-Threatened

SU-Status Undetermined

Table 9. Major Parks and Recreation Areas Along the Texas Coast.

PARKS AND RECREATION AREAS

J. D. Murphree Wildlife Management Area

Sea Rim State Park

Public Beach, Jefferson County

Anahuac National Wildlife Refuge

Chambers County Parks

Galveston County Parks

Public Beach, Galveston County

Galveston Island State Park

Brazoria National Wildlife Refuge

Velasco State Park

Brazoria County Parks

San Bernard National Wildlife Refuge

Public Fishing Pier, Palacios

Port Lavaca Causeway State Park

Public Fishing Piers, Port Lavaca

Indianola Park, Calhoun County

City Park, Port O'Connor

Matagorda Island Bombing and Gunnary Range

City Park, Seadrift

TABLE 9 (CONTINUED)

PARKS AND RECREATION AREAS

Aransas National Wildlife Refuge

Goose Island State Park

Copano Bay State Park

City Parks, Rockport

City Park and Pier, Bayside

Port Aransas Park, Nueces County

San Patricio County Park

Proposed Mustang Island State Park

Corpus Christi City Parks

Nueces County Parks

Kleberg County Parks

Padre Island National Seashore

Cameron County Parks

Laguna Atascosa National Wildlife Refuge

Port Isabel Lighthouse State Park

Brazos Island State Park

TABLE 10. COUNTY AND CITY PARKS ALONG THE TEXAS COAST

PARKS AND RECREATION AREAS BY COUNTY	WATERFRONTAGE	ACREAGE	ACTIVITIES AND FACILITIES
Aransas County	1.0 miles	1/	
Rockport Beach		67 acres	2, 3, 5, 7, 8, 9
Navigation District #2		4 acres	2, 4, 5, 6, 8
Brazoria County	1/	1/	
Quintana-Bryan Beach		157 acres	5, 6
Surfside Beach		304 acres	5, 6
Calhoun County	2.6 miles	378 acres	
Indianola Park	1.0 miles	351 acres	1, 2, 3, 4, 5
City Parks	1/		
Port Lavaca Fishing Pier		18 acres	1, 3, 4, 6, 8
Port O'Connor Park		5 acres	2, 4, 5
Seadrift Bayfront City Park		4 acres	2
Cameron County	1.0 miles	1/	
Isla Blanca Park No. 1		148 acres	1, 2, 3, 4, 5, 7, 8, 9
Andy Lowie Park No. 1		225 acres	1, 2, 3, 4, 5
Access Road and Parking Area No. 1		11 acres	1, 2, 3, 4, 5
Access Road and Parking Area No. 2		14 acres	1, 2, 3, 4, 5
Access Road and Parking Area No. 3		14 acres	1, 2, 3, 4, 5
Access Road and Parking Area No. 4		14 acres	1, 2, 3, 4, 5

TABLE 10 (CONTINUED)

PARKS AND RECREATION AREAS BY COUNTY	WATERFRONTAGE	ACREAGE	ACTIVITIES AND FACILITIES
Chambers County	1,900 feet	1/20 acres	1, 2, 3, 4, 6, 8
Double Bayou Park		26 acres	1, 2, 3, 4, 5, 6, 8
Fort Anahuac Park		12 acres	1, 2, 3, 4, 8
Job Beason Park		1/1 acres	1, 2, 3, 4, 5, 6, 8
McCollum Park			
Galveston County	app 60.0 miles	1/1300 acres	1, 2, 3, 4, 5, 8
Public Beach		35 acres	1, 2, 3, 4, 5
Bay Shore Park		40 acres	1, 2, 3, 4, 5
Pelican Island and Seawolf Park			
Jefferson County (Public Beach)	5.0 miles	75 acres	1, 2, 3, 4, 5, 8
Kleberg County	.7 miles	1/1/25 acres	1, 2, 3, 4, 8
Kleberg County Park		1/1/25 acres	1, 2, 3, 4, 8
Loyola Beach		1/1/25 acres	1, 2, 3, 4, 8
Riviera Beach			
Matagorda County	1,200 feet	1/1/1/4 acres	1, 3, 4
Palacios Park and Fishing Piers			
Nueces County	39,000 feet	1/1/358 acres	1, 2, 4, 5, 7, 8
County Parks		137 acres	1, 2, 4, 5, 7, 8
Padre Island Park		6 acres	3, 8
Port Aransas Park			
Municipal Harbor (Port Aransas)			

TABLE 10 (CONTINUED)

PARKS AND RECREATION AREAS	WATERFRONTAGE	ACREAGE	ACTIVITIES AND FACILITIES
County Fishing Piers (2) (Port Aransas)		3 acres	4, 8
Breakwater Park		1 acre	4, 8
OSO Pier		1 acre	4, 7, 8
Corpus Christi City Park	3.0 miles	$\frac{1}{11}$ acres	4, 5, 7
Bayfront Park		28 acres	4, 6
Cole Park			
Refugio County	1,500 feet	$\frac{1}{4}$ acres	2, 4
Bayside Park and Pier			
San Patricio County	$\frac{1}{1}$	$\frac{1}{4}$ acres	2, 3, 4, 5
County Park			
City Parks	1,200 feet	$\frac{1}{1}$	
Willacy County	800 feet	$\frac{1}{1}$	$\frac{1}{1}$

Table 10. (Continued)

1/ Incomplete

*Codes For Activities and Facilities.

<u>Code Number</u>	<u>Activity or Facility</u>
1	Camping
2	Picnicking
3	Boating and Water Skiing
4	Fishing
5	Swimming and Surfing
6	Playgrounds
7	Concessions (Restaurant, Bait Shops, Etc.)
8	Restrooms
9	Miscellaneous Park Facilities

TABLE 11
COMMON PLANTS IN THE VICINITY OF THE
GULF INTRACOASTAL WATERWAY, TEXAS

<u>Common Name</u>	<u>Common Name</u>	<u>Common Name</u>
Cactus	Bushy sea ox-eye	Alligator weed
Sea oats	Prickly pear	Glasswort
Seacoast bluestem	Lotc bush	Cattails
Guldane paspalum	Huisache	Arrowheads
Marsh hay cordgrass	Guajillo	Oak
Groundsel	Retama	Gum
Beach morning glory	Brush savannah	Cypress
Mesquite	Manatee-grass	Loblolly & shortleaf pine
Live oak	Widgeon-grass	Ash
Switch grass	Shoal-grass	Hickory
Big bluestem	Turtle-grass	Pecan
Seashore saltgrass	Blue-green algae	Cottonwood
Marsh hay cordgrass	Sedges	Cedar
Silver bluestem	Rushes	Elm
Vine mesquite	Cordgrass	Hackberry

TABLE 12
VICINITY OF GULF INTRACOASTAL WATERWAY, TEXAS
HISTORICAL SITES ON THE NATIONAL REGISTER AND

SITES CHOSEN BY THE STATE BOARD OF REVIEW
FOR SUBMISSION TO THE NATIONAL REGISTER

#National Historic Landmark
**National Register
*Submitted to the National Register
and pending approval

<u>County</u>	<u>Site</u>
ARANSAS	Fulton House *Mathis, T.H., House
BRAZORIA	Levi Jordan Plantation Varner-Hogg Plantation
CALHOUN	Indianola District
CAMERON	Brazos Depot Complex #Fort Brown Fort Polk Garcia Pasture Site #Palo Alto Battlefield Port Isabel Lighthouse #Resaca de la Palma Battlefield Stillman House
CHAMBERS	Chambers House Fort Anahuac Historic Indian Village (41CH110) Orcoquisac District Mission/Presidio Complex
COLORADO	Colorado County Courthouse

County

Site

DEWITT

*DeWitt County Courthouse
Grace Episcopal Church
St. John Evangelical Lutheran Church
Stagecoach Inn

GALVESTON

Ansell, Walter C., House
**Ashton Villa, J.M. Brown House
Ball House
Building at 2127 Strand
Boulevard District
Galveston County Museum, Old Moody Bank Building
**Gresham House, Bishop's Palace
Hendly Building
**Old Custom House
**Old Red, University of Texas Medical School
Menard House
Nichols, Gen. E.R., Building
St. Marv's Cathedral
Sealy Building
**Sealy, George, House, The Open Gates
Smith, J F., House
**The Strand Historic District
Trube House
**Trueheart-Adriance Building
Williams-Tucker House
House at 3301 Avenue L
House at 2314 Avenue M
House at 3518 Avenue M
House at 1725 Avenue M
House at 1522 21st Street
House at 1502 Market

GOLIAD

Fannin Battlefield State Park
General Zaragosa Birthplace
#Presidio Nuestra Senora de Loreto de la Bahia
Mission La Bahia
Mission Nuestra Senora del Rosario
Goliad County Courthouse

<u>County</u>	<u>Site</u>
HARRIS	Annunciation Church Cherry House Harris County Boys' School Site Noble House #San Jacinto Battleground and Battleship Texas *1884 Cotton Exchange
JEFFERSON	**French Home Trading Post **McFaddin House #Lucas Gusher, Spindletop Oil Field
KENEDY	#King Ranch
LAVACA	*Lavaca County Courthouse and Jail **Lay-Bozka House
LIBERTY	Chambers, Thomas Jefferson, House Historic Indian Village (41LB4)
SAN PATRICIO	*McGloin House
VICTORIA	*Fort Saint Louis Mission Creek Dam Site McNamara-O'Connor House
WALLER	*Liendo Plantation
WILLACY, KENEDY, and KLEBERG	Padre Island (including the National Seashore)

TABLE 13
SEDIMENT SAMPLE RESULTS

GULF INTRACOASTAL WATERWAY, TEXAS SECTION

Date	Sampled Station	Location	Depth Ft	Moisture Content % dry wt.	Total Solids % by wt	Volatile Solids % by wt	Total*		Chemical*				Classi- fication	
							Kjeldahl Nitrogen mg/kg	Oil & Grease mg/kg	Oxygen Demand mg/kg	Hg mg/kg	Mercury* Pb mg/kg	Zinc* Zn mg/kg		
EPA Criteria of 1/11/71 **														
Texas City Channel to North Deer Island (Main Channel and Alternate Route)														
5/22/72	3310+00	☐	12.6	68	60	3.6	1,300	9,200	15,000	0.52	26	60	sandy clay	
5/22/72	3850+00	☐	13.2	47	68	2.7	590	4,200	8,700	0.21	22	49	sandy clay	
5/23/72	3360+00	1,300' N	0.6	77	57	2.5	680	8,500	12,000	0.53	16	46	sandy clay	
5/22/72	3410+00	2,750' N	7.0	79	56	4.4	800	5,800	22,000	0.30	34	66	sandy clay	
5/22/72	3425+00	☐	15.5	87	54	7.6	1,000	3,100	19,000	0.32	54	83	sandy clay	
5/22/72	3452+00	3,600' S	6.5	53	65	3.5	830	1,600	14,000	0.35	28	51	sandy clay	
5/22/72	3482+00	☐	12.5	35	74	2.0	420	1,100	15,000	0.16	20	30	sandy clay	
5/23/72	3516+00	1,300' N	4.4	40	71	2.6	540	1,400	12,000	0.22	28	39	sandy clay	
5/22/72	3556+00	☐	14.0	91	52	4.7	920	5,500	20,000	0.27	44	77	sandy clay	
5/24/72	M-6+200	☐	14.3	83	54	4.1	930	3,500	21,000	0.17	56	74	sandy clay	
5/23/72	M-4+000	1,500' S	6.9	58	63	3.2	630	4,600	12,000	0.24	26	72	sandy clay	
5/24/72	M-1+000	☐	8.8	84	54	4.5	760	4,000	19,000	0.35	43	72	silty clay	
5/23/72	M-1+800	1,700' N	4.4	51	66	3.2	590	230	13,000	0.38	23	55	silty clay	
5/24/72	M-4+000	☐	11.4	120	45	6.2	1,200	550	27,000	0.47	73	110	clay	
5/23/72	M-5+800	2,500' S	4.9	40	72	2.5	380	250	11,000	0.21	20	92	sandy clay	
5/23/72	11+000	1,000' N	4.3	53	65	3.7	500	240	11,000	1.32	33	87	sandy clay	
5/24/72	12+200	☐	17.0	120	46	6.4	1,100	660	23,000	0.50	68	120	sandy clay	
5/23/72	15+500	900' S	1.6	32	76	3.9	420	310	2,700	0.17	26	57	sandy clay	
5/24/72	19+200	☐	15.1	91	52	4.7	920	770	12,000	0.21	29	130	sandy clay	
5/23/72	22+000	2,600' N	6.5	110	47	6.1	1,200	1,400	22,000	0.32	77	140	sandy clay	
5/23/72	23+000	1,200' S	0.8	33	76	2.1	360	980	4,800	0.18	22	54	sandy clay	
5/24/72	26+500	☐	12.4	41	73	3.4	470	2,100	3,700	0.18	37	58	sandy clay	

* Weights are on dry basis

** Proposed criteria for limiting open water disposal of dredged material

TABLE 13 (CONT'D)

Date	Sampled Station	Station Location	Depth Ft	Moisture Content % dry wt	Total Solids % by wt	Volatile Solids % by wt	Total*		Chemical*				Zinc* Zn mg/kg	Classification
							Kjeldahl Nitrogen mg/kg	Oil & Grease mg/kg	Oxygen Demand mg/kg	Mercury* mg/kg	Lead* mg/kg			
Offatts Bayou														
11/2/72	13+30	ϕ	7.0	63	62	6.0	550	760	15,000	0.37	31	43	sandy clay	
11/2/72	40+50	45' W	8.0	42	70	2.5	450	680	13,000	0.20	14	29	sandy clay	
11/2/72	44+50	780' W	2.1	43	70	2.8	430	580	11,000	0.44	3.6	87	sandy clay	
11/2/72	75+70	ϕ	7.3	42	71	5.2	530	550	12,000	0.15	41	41	sandy clay	
11/2/72	11+00W	ϕ	2.4	94	52	5.4	840	950	24,000	0.31	17	54	sandy clay	
Chocolate Bayou														
11/71	21+00	0	-	-	-	3.84	550	360	16,800	0.1	1.0	65	-	
11/71	55+00	7,000' E	-	-	-	3.19	510	170	17,300	0.1	1.0	30	-	
11/71	64+00	0	-	-	-	3.55	1,090	300	16,800	0.2	1.0	37	-	
11/71	64+00	3,000' W	-	-	-	3.07	70	40	20,200	0.3	1.0	32	-	
11/71	136+00	0	-	-	-	7.74	860	380	27,200	0.1	1.0	44	-	
11/71	205+00	0	-	-	-	3.44	510	190	19,800	0.3	10.0	31	-	
11/71	205+00	3,000' SW	-	-	-	3.36	310	200	18,200	0.1	7.0	34	-	
11/71	258-00	0	-	-	-	3.90	540	370	13,400	0.1	4.0	42	-	
11/71	370-00	0	-	-	-	4.55	590	530	28,100	0.1	6.0	46	-	
Corpus Christi Bay														
7/5/73	Disposal Area		-	22	82	2.4	460	700	2,000	0.22	22	160	sandy clay	
7/5/73	Disposal Area		-	24	81	3.6	410	720	6,100	0.16	23	190	sandy clay	
7/5/73	983+000	ϕ	9	79	56	6.3	1,200	840	7,900	0.25	41	57	sandy clay	
7/5/73	987+000	ϕ	10	82	55	5.9	1,300	1,200	14,000	0.12	44	54	sandy clay	
7/5/73	995+000	ϕ	9.5	90	52	6.7	2,200	710	16,000	0.18	60	75	sandy clay	

TABLE 13 (CONT'D)

Date	Sampled Station	Location	Depth Ft	Moisture Content % dry wt	Total Solids % by wt	Volatile Solids % by wt	Total*		Chemical*				Classification
							Kjeldahl Nitrogen mg/kg	Oil & Grease mg/kg	Oxygen Demand mg/kg	Mercury mg/kg	Lead mg/kg	Zn mg/kg	
Port Bolivar to High Island													
8/7/72	3170+00	□	7.8	61	62	3.0	590	340	22,000	3.5	20	54	sandy clay
8/8/72	3160+00	1,600' N	6.9	51	66	2.4	390	540	12,000	1.1	20	32	sandy silt
8/7/72	3090+00	□	12.8	43	70	2.1	430	360	12,000	0.83	10	31	sandy clay
8/8/72	3060+00	1,500' N	8.9	41	71	2.2	350	310	16,000	1.0	10	35	sandy clay
8/7/72	3030+00	□	14.8	46	68	1.7	390	400	9,600	0.38	7.8	23	silty sand
8/7/72	2990+00	□	14.8	52	66	1.7	470	270	8,700	0.28	10	22	sandy silt
8/8/72	2990+00	1,000' N	7.9	35	74	1.0	270	310	5,400	0.17	5.0	11	silty sand
8/7/72	2920+00	□	14.8	33	75	1.1	510	350	5,000	0.18	4.1	11	silty sand
8/7/72	2560+00	□	14.8	59	63	2.9	560	220	28,000	0.37	15	38	sandy clay
8/8/72	2540+00	1,000' N	1.8	40	71	1.0	540	200	7,000	0.13	4.6	18	silty sand
8/7/72	2500+00	□	12.8	58	64	2.8	590	330	20,000	0.16	21	44	sandy clay
8/7/72	2162+00	□	8.8	104	49	5.0	1,300	620	38,000	0.16	26	62	sandy silt
8/7/72	2080+00	□	8.8	86	54	4.5	920	510	24,000	1.7	24	60	clay
8/8/72	2070+00	1,000' N	0.8	41	71	1.0	350	200	7,700	0.17	5.3	15	silty sand

TABLE 13 (CONT'D)

Date Sampled	Location	Depth Ft	Volatile Solids % by wt.	Chemical				Oil & Grease mg/kg	Mercury Hg mg/kg	Lead Pb mg/kg	Zinc Zn mg/kg
				Oxygen Demand mg/kg	Total Nitrogen mg/kg	Kjeldahl Nitrogen mg/kg	Total				
8/23/71	Matagorda Ship Channel, 3,000' SE of GIWW	36.5	1.0	1,400	84	52	0.02	20	15		
8/23/71	Matagorda Ship Channel 10,000' NW of GIWW	36.5	5.6	17,000	530	193	0.15	36	37		
7/27/71	Freeport Ship Channel 2,300' SE of GIWW	37.0	4.9	29,200	4,600	720	0.90	23	49		
7/27/71	Freeport Ship Channel 1,800' SW of GIWW	34.0	4.7	35,300	7,000	630	-	23	59		
6/13/72	Jones Bay, 300' NW of GIWW & Private Channel	2.1	2.5	15,000	380	780	0.18	14	22		

TABLE 14
RESULTS OF TESTS OF WATER

GULF INTRACOASTAL WATERWAY, TEXAS SECTION

Date	Sampled Station	Location	Water Temp °C	Conduc-tivity μmhos/cm	Total Solids mg/l	Volatile Solids mg/l	Total Kjeldahl Nitrogen mg/l	Oil & Grease mg/l	Chemical Oxygen Demand mg/l *	Mercury Hg μg/l	Lead Pb mg/l	Zinc Zn mg/l	Chloride Cl mg/l
EPA Criteria of October 1973 (Proposed)													
High Island to Port Bolivar													
8/07/72	3170+00	☐	29.4	45,500	37,000	6,100	1.0	12	68	10	0.05	0.65	19,000
8/08/72	3160+00	1,600' N	30.2	46,700	36,000	6,400	1.1	12	73	5.2	0.45	0.48	19,000
8/07/72	3090+00	☐	29.5	44,700	35,000	5,700	1.4	12	82	2.5	0.45	0.40	18,000
8/08/72	3060+00	1,500' N	30.5	45,000	36,000	5,300	1.3	16	73	1.8	0.40	0.31	18,000
8/07/72	3030+00	☐	29.5	45,500	27,000	4,200	1.5	31	100	3.7	0.40	0.28	14,000
8/07/72	2990+00	☐	30.0	38,400	24,000	3,900	1.6	10	154	3.1	0.35	0.33	12,000
8/08/72	2490+00	1,000' N	30.2	45,500	30,000	4,900	1.3	58	96	3.8	0.28	0.22	16,000
8/07/72	2920 00	☐	30.5	37,000	25,000	3,800	1.3	10	65	4.1	0.28	0.21	13,000
8/07/72	2560+00	☐	31.5	35,100	26,000	7,000	2.9	14	140	1.0	0.25	0.70	12,000
8/08/72	2540+00	1,000' N	NA	NA	25,000	5,600	2.8	14	70	0.88	0.22	0.31	11,000
8/07/72	2500+00	☐	NA	NA	22,000	5,800	1.7	14	47	0.65	0.20	0.30	10,000
8/07/72	2160+00	☐	NA	NA	25,000	7,500	1.8	14	52	0.49	0.25	0.26	10,000
8/07/72	2090+00	☐	NA	NA	18,000	5,100	1.7	14	74	2.5	0.25	0.27	8,200
8/08/72	2070+00	1,000' N	NA	NA	22,000	4,300	1.9	14	78	0.80	0.32	0.36	11,000
Texas City Channel to North Deer Island (Main Channel and Alternate Route)													
5/22/72	3310+00	☐	26.0	34,800	21,000	5,000	0.4	75	0	2.1	0.34	1.5	9,500
5/22/72	3850+00	☐	25.7	31,800	33,000	15,000	0.4	23	12	3.0	0.30	1.0	10,000
5/23/72	3360+00	1,300' N	26.0	31,000	31,000	14,000	0.4	46	68	20.0	0.37	0.54	10,000
5/22/72	3410+00	2,750' N	26.2	31,500	24,000	7,100	0.6	76	45	61.0	0.26	2.1	10,000
5/22/72	3425+00	☐	25.6	33,300	26,000	7,300	0.4	54	27	21.0	0.20	0.76	11,000

* EPA test method manual states: "When the chloride level exceeds 1,000 mg/l, the minimum accepted value for the COD will be 250 mg/l. COD levels which fall below this test value are highly questionable because of the high chloride correction which must be made."

TABLE 14 (CONT'D)

Date	Sampled Station	Location	Water Temp OC	Conduc- tivity μ mhos/cm	Total Solids mg/l	Total Volatile Solids mg/l	Total Kjeldahl Nitrogen mg/l	Oil & Grease mg/l	Chemical Oxygen Demand mg/l*	Mercury Hg μ g/l	Lead Pb mg/l	Zinc Zn mg/l	Chloride Cl mg/l
5/22/72	3452+00	3,600' S	25.6	35,800	27,000	7,300	0.4	52	58	19.0	0.32	1.7	11,000
5/22/72	3482+00	ϕ	26.0	35,500	30,000	9,900	0.5	32	53	24.0	0.13	1.2	12,000
5/23/72	3536+00	1,300' N	26.0	35,100	24,000	5,200	0.2	55	79	11.0	0.13	0.33	11,000
5/22/72	3556+00	ϕ	25.5	34,300	24,000	4,800	0.5	25	0	490.0	0.34	0.93	11,000
5/24/72	M-6+200	ϕ	25.2	41,200	42,000	16,000	0.4	120	44	36.0	0.15	1.4	16,000
5/23/72	M-4+000	1,500' S	27.0	33,700	43,000	24,000	0.3	32	22	9.0	0.10	0.32	11,000
5/24/72	M-1+000	ϕ	25.6	41,800	33,000	7,100	0.3	120	38	27.0	0.26	1.8	15,000
5/23/72	M 1+800	1,700' N	26.0	37,700	26,000	5,900	0.4	55	55	18.0	0.15	0.21	12,000
5/24/72	M 4+000	ϕ	25.6	36,800	32,000	7,700	0.5	61	71	26.0	0.22	2.0	14,000
5/23/72	M 5+800	2,500' S	26.4	35,000	30,000	9,600	0.4	57	60	22.0	0.09	0.31	12,000
5/23/72	11+000	1,000' N	26.4	34,400	22,000	4,700	0.3	64	68	15.	0.26	0.23	10,000
5/24/72	12+200	ϕ	26.2	36,100	28,000	5,100	0.5	64	71	18.	0.17	2.6	12,000
5/23/72	15+500	900' S	26.6	31,300	22,000	3,600	0.4	70	60	21	0.19	0.34	12,000
5/24/72	19+200	ϕ	26.5	32,300	23,000	4,000	0.3	78	3	20	0.16	2.3	11,000
5/23/72	22+000	2,600' N	26.6	24,800	17,000	2,800	0.3	80	0	17	0.21	0.35	8,200
5/23/72	23+000	1,200' S	27.5	32,000	22,000	3,800	0.3	100	0	20	0.16	0.29	11,000
5/24/72	26+500	ϕ	26.7	36,100	23,000	3,800	0.3	120	0	11	0.10	2.3	11,000
<u>Chocolate Bayou</u>													
11-71	21.00	0	-	-	-	2,300	0.6	16.0	180	0.1	0.2	1.6	12,450
11-71	55.00	7,000' E	-	-	-	2,280	1.1	9.7	234	0.1	0.1	0.7	11,950
11-71	64.00	0	-	-	-	1,990	0.4	13.7	254	0.1	0.2	0.7	10,600
11-71	64.00	3,000' W	-	-	-	3,940	0.1	16.0	95	0.1	0.1	0.3	10,900
11-71	136.00	0	-	-	-	3,360	0.7	9.6	118	0.1	0.1	0.1	9,760
11-71	205.00	0	-	-	-	2,970	0.5	13.6	71	0.1	0.1	0.1	8,970
11-71	205+00	3,000' SW	-	-	-	2,680	0.5	10.8	101	0.1	0.1	0.2	9,220
11-71	258.00	0	-	-	-	2,350	1.0	14.8	110	2.8	0.1	0.2	8,290
11-71	320.00	0	-	-	-	2,120	0.9	3.6	121	0.1	0.1	0.1	7,290

TABLE 14 (CONT'D)

Date	Sampled Station	Location	Water Temp C	Conduc- tivity μ mhos/cm	Total Solids mg/l	Total Volatile Solids mg/l	Total Kjeldahl Nitrogen mg/l	Oil & Grease mg/l	Chemical Oxygen Demand mg/l *	Mercury HG μ g/l	Lead Pb mg/l	Zinc Zn mg/l	Chloride Cl mg/l
Offatts Bayou													
11/2/72	13+30	ϕ	21.5	24,500	30,000	5,800	0.74	24	73	1.8	0.27	0.33	14,000
11/2/72	40+50	45' W	21.5	37,700	28,000	5,900	0.70	28	40	1.7	0.40	0.17	13,000
11/2/72	44+50	780' W	22.0	32,000	31,000	6,500	0.70	22	67	2.3	0.22	0.19	15,000
11/2/72	75+70	ϕ	21.5	24,500	29,000	5,800	0.67	24	86	2.7	0.17	0.17	14,000
11/2/72	11+00W	ϕ	21.5	37,700	30,000	5,400	0.70	22	76	3.4	0.32	0.23	14,000
Corpus Christi Bay													
7/5/73	983+000	ϕ	-	-	31,000	6,500	2.2	9.7	130	10.0	0.65	3.3	15,000
7/5/73	987+000	ϕ	-	-	33,000	7,200	0.2	8.9	220	8.2	0.63	0.36	15,000
7/5/73	995+000	ϕ	-	-	34,000	9,300	1.2	8.9	200	13.0	0.59	0.19	16,000

Table 15. Approximate average annual area of Texas Bay bottoms covered with dredged materials from the Gulf Intracoastal Waterway and Tributaries

Bay System	Avg Annual Volume C.Y.	Bay System ^{1/} Area Acres	Min ^{2/} Coverage Acres	Max ^{3/} Coverage Acres	Min %	Max %
Galveston	885,000	343,437	275	550	0.08	0.16
Matagorda	475,000	281,959	150	300	0.05	0.1
San Antonio	1,225,000	132,326	380	760	0.27	0.55
Aransas	500,000	143,383	150	300	0.10	0.21
Corpus Christi	10,000	124,232	30	60	0.024	0.048
Laguna Madre	3,805,000	478,531	1,675	2,350	0.25	0.49

^{1/}Ref - Corps of Engineers, 1973

^{2/}Assumes average depth of materials of 2 feet

^{3/}Assumes average depth of materials of 1 foot

TABLE 16

MARSH AREAS TO BE AFFECTED BY DISPOSAL OF
DREDGED MATERIAL FROM THE GULF INTRACOASTAL WATERWAY

Reach or Location	Total Acreage*	Acreage in Disposal Areas	Percentage in Disposal Areas
1. Port Arthur to High Island	89,000	1,400	1.6
2. High Island to Port Bolivar	27,300	325	1.2
3. Port Bolivar to Oyster Creek	43,700	330	0.75
4. Oyster Creek to Colorado River and Colorado River Marsh	35,900	1,600	4.5
5. Colorado River to Port O'Connor	17,700	320	1.8
6. Port O'Connor to Live Oak Point and Matagorda Ship Channel area	10,400	114	1.1
7. Live Oak Point to Aransas Pass, including Matagorda, St. Joseph, and Harbor Islands	37,600	375	1.0
8. Aransas Pass to Encinal Peninsula, including Mustang Island	14,100	-0-	-0-
9. Encinal Peninsula to Port Isabel	**	-0-	-0-

* Acreages are given only for those marsh areas bordering the GIWW unless otherwise stated.

** Marsh areas in these reaches are limited to very small isolated areas. Acreages are not significant. The source of primary productivity in this area is submerged aquatic vegetation.

TABLE 17

PORT MANSFIELD ENTRANCE AND JETTY CHANNEL - MECHANICAL
ANALYSIS OF MATERIALS TO BE DEPOSITED IN OFFSHORE WATERS

Station	% by Dry Weight Sand or Larger	MIL-STD-619B Classification	Date Sampled
-3+000	96	Sand (SP)	1973
-3+000	99	Sand (SP)	1972
-3+000	95	Sand (SP)	1970
-2+000	98	Sand (SP)	1972
-1+450	96	Sand (SP)	1973
-1+000	94	Sand (SP-SM)	1973
-1+000	51	Sand, Clayey (SC)	1972
-0+500	93	Sand (SP-SM)	1973
0+000	67	Sand, Silty (SM)	1973
0+500	43	Clay, Sandy (CL)	1972
0+600	92	Sand (SP-SM)	1970
1+000	92	Sand (SP-SM)	1973
1+000	47	Clay, Sandy (CL)	1969
1+500	94	Sand (SP-SM)	1969

Samples were taken directly from hopper dredge bins and are representative of the materials being dumped.

TABLE 18

LIFE EXPECTANCY IN YEARS OF THE
 CONFINED DISPOSAL AREAS ALONG THE MAIN
 CHANNEL AND TRIBUTARIES OF THE GIWW

Disposal Area No. <u>1</u> /	Life Expectancy	Disposal Area No. <u>1</u> /	Life Expectancy
GIWW MAIN CHANNEL		GIWW MAIN CHANNEL (CONTINUED)	
1-27	100	117	15-20
28	31	127	10
29	6	129	10
30	8	131	10
31	9	155	10
32	22	238	10
33	20	241	Indefinite
34	21		
35	7	CHANNEL TO	
36	24	ARANSAS PASS	
37	13	2	20
39	15	5	10
40	14	6	3
42	16		
44	144	SAN BERNARD RIVER	
64	33	4	39
65	24	6	55
70	31		
71	33	COLORADO RIVER CHANNEL	
72	35	2	16
73	17	3	12
74	31	6	25
77	35	7	50
78	28	8	46
83	20	9	36
84	82		
86	40	CHANNEL TO PORT MANSFIELD	
87	42	4	7
88	35	8	4
89	95		
90	44		
99	14		
107	37		
108	54		
109	16		

TABLE 18 (CONT'D)

<u>Disposal</u> <u>Area No. 1/</u>	<u>Life</u> <u>Expectancy</u>
---------------------------------------	----------------------------------

CHANNEL TO PALACIOS

15	10-15
16	15

CHANNEL TO VICTORIA

17	25
18	15-20
19	5-10
20	5-10
21	5-10
22	25
23	25
24	15-20

CHANNEL TO HARLINGEN

7	70
8	65
9	18
10	8
11	40
12	22
13	36
14	25
15	41
16	37
17	23
18	50
19	26
20	36
21	20
22	10
23	8

1/ Disposal areas for the entire Texas sector of the GIWW main channel are numbered sequentially from Port Arthur to Port Isabel

TABLE 19

LISTING OF PUBLIC NOTICES ISSUED FOR
GIWW MAIN CHANNEL AND TRIBUTARIES

Public Notice No.	Reach	Date Issued
LWW-M-1	Colorado River Channel	1 October 1974
LWW-M-2	Tributary Channel to Port Mansfield	1 October 1974
LWW-M-3	Galveston Bay to Matagorda Bay	8 October 1974
LWW-M-4	Port Isabel to Mud Flats	15 October 1974
LWW-M-5	Tributary Channel to Harlingen Via Arroyo Colorado	21 October 1974
LWW-M-6	Tributary Channel to Aransas Pass	21 October 1974
LWW-M-7	Tributary Channel to Victoria	1 November 1974
LWW-M-8	High Island to Galveston Bay	22 October 1974
LWW-M-9	Corpus Christi Bay to Mud Flats	13 November 1974
LWW-M-10	Matagorda Bay to San Antonio Bay	28 November 1974
LWW-M-11	San Bernard River Channel	13 December 1975
LWW-M-12	Port Arthur Canal to High Island	2 January 1975
LWW-M-13	San Antonio Bay to Corpus Christi Bay	21 January 1975
LWW-M-14	Tributary Channel to Offatts Bayou	Not Issued
LWW-M-15	Channel to Palacios	10 February 1975
LWW-M-16	Channel to Rockport	Not Issued

APPENDIX A

Responses Received on
the Draft Environmental Statement

APPENDIX A

INDEX

<u>Page</u>	<u>Description</u>
A-1	Environmental Protection Agency
A-5	United States Department of Commerce
A-9	United States Department of the Interior
A-13	Advisory Council on Historic Preservation
A-14	Department of Health, Education, and Welfare
A-15	Department of Housing and Urban Development
A-16	Department of Transportation
A-17	Office of the Governor, Division of Planning Coordination
A-20	Texas Water Rights Commission
A-22	Texas Water Development Board
A-25	General Land Office
A-27	Texas Parks and Wildlife Department
A-31	Texas Air Control Board
A-32	Texas Department of Agriculture
A-33	Texas Water Quality Board
A-34	Texas Highway Department
A-35	Bureau of Economic Geology
A-36	Texas State Soil and Water Conservation Board
A-37	Texas Historical Commission
A-38	City of Texas
A-39	Galveston County Navigation District No. 1
A-40	Brazos River Harbor Navigation District of Brazoria County
A-41	Port of Brownsville
A-42	Houston-Galveston Area Council
A-43	National Audubon Society
A-47	Johnnie Hammond, Student, SMU, School of Law
A-50	Bob Winn
A-52	Joseph H. Fonfara, Student, SMU, School of Law
A-53	Kendall A. Laughlin, Student, SMU, School of Law
A-55	George Parker, Student, SMU, School of Law

ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

January 7, 1975

OFFICE OF THE
REGIONAL ADMINISTRATOR

Colonel Don S. McCoy
District Engineer
Galveston District
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

We have reviewed your Draft Environmental Impact Statement, Maintenance Dredging, Gulf Coast Intracoastal Waterway, Texas Section (Main Channel and Tributary Channels). The project consists of maintaining the Texas Section of the Gulf Intracoastal Waterway (between the Sabine-Neches Waterway near Louisiana to the town of Port Isabel near the Mexican Border). Channel dimensions are generally a 12-foot depth and a 125-foot bottom width. Tributary channels include Offatts Bayou, Chocolate Bayou, the San Bernard River Channel, Colorado River Channel and Floodway, Channel to Palacios, Channel to Victoria, Channel to Seadrift, Channel to Harlingen, and the Port Isabel Side Channel and Small Boat Harbor. Dredging is accomplished by hydraulic pipeline dredge except for the Port Mansfield Entrance Channel which is normally maintained by hopper dredge.

The following comments are for your consideration in finalizing the statement:

1. In discussing the environmental setting of the project area, the statement divides the GIWW into three physiographic reaches. Although the statement identifies generally the terrestrial, aquatic and meteorological conditions in these areas, we believe the statement could be strengthened by discussing specifically any sensitive or unique biologically productive areas that might be affected by channel maintenance activities. For example, a discussion of the ecological aspects of the freshwater reservoir located adjacent to disposal area No. 13 (Plate 10, Port Arthur to High Island) could be included in the statement. This information would be helpful in evaluating the effects of dredged material placement on this reservoir.

2. Tables 13 and 14 contained sediment and water quality data for Texas City Channel, Offatts Bayou, Chocolate Bayou, Corpus Christi Bay, Port Bolivar to High Island, Matagorda Ship Channel, Freeport Ship Channel and Jones Bay. We believe the statement would be strengthened by including additional water and sediment quality data that would be representative of the three physiographic reaches of the GIWW as discussed in the statement. It would also be helpful to identify areas where polluted spoil may exist as the result of existing waste discharges.

3. It is commendable that containment levee systems will be utilized on land to clarify the dredged spoil before discharge of the supernatant into the receiving stream. However, we would suggest that where it has been determined or suspected the sediment is polluted, a short-term monitoring program be implemented to measure pollutants discharged into the receiving stream. This information would be useful in evaluating any potential adverse effects that may be generated from supernatant discharges.

4. We recognize that the proposed maintenance dredging project will be a continuing action to include several dredging cycles. The information in the statement mostly depicts existing water and sediment quality for the first dredging cycle. Therefore, we would suggest that sufficient sediment sampling be accomplished immediately prior to each dredging cycle to locate polluted material. Polluted spoil should not be deposited in the ocean disposal site until a joint EPA-Corps evaluation is completed to determine the projected effect on water quality and to define monitoring requirements. From the mechanical analysis in Table 17, it appears that the materials from the Port Mansfield Channel are not polluted for the first dredging cycle.

5. The statement notes that the GIWW has grown consistently and has contributed substantially to the regional and national economy. Also, the statement mentions that there are several related non-Federal channels, slips and berths that are essential to the Federal navigation project. Installation and maintenance of each non-Federal facility is controlled by means of the Corps of Engineers' permit program.

Although it is stated, "Quantification of the fragmentary environmental effects of irregular maintenance of all these non-Federal facilities in relation to the Federal project is not practicable", the statement could include a qualitative evaluation of the cumulative effects from non-Federal channel activities. Also, the statement would be strengthened by including a discussion of the possible secondary environmental impacts that might be generated from the Federal and non-Federal maintenance activities. For example, the project could stimulate increased industrial, commercial, and residential growth in the Texas Coastal Zone. Although this growth may be beneficial from an economic standpoint, such development could also be environmentally adverse in those land resource areas already heavily stressed from air, water, noise and solid waste pollution. It would be helpful to identify such "key" areas, and discuss the potential long-term secondary effects of the project on these areas. Also, the secondary impacts of potential development in unique or highly productive coastal areas should be considered in the statement. The statement would be strengthened by providing information on possible mitigative measures such as land use plans, zoning codes and regulations which could help in maintaining long-term environmental quality in the Texas Coastal Zone.

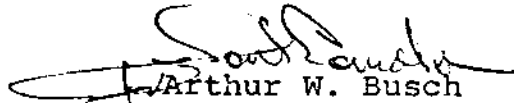
These comments classify your Draft Environmental Impact Statement as LO-2. Specifically, we have no objection to the maintenance of the GIWW. However, additional information is needed in order to evaluate fully the impacts of the project on water quality and the long-term secondary environmental effects. The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the attachment. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and on the adequacy of the impact statement at the draft stage, whenever possible.

We appreciate the opportunity to review the Draft Environmental Impact Statement. Please send us two copies of the

Final Environmental Impact Statement at the same time it is sent to the Council on Environmental Quality.

Sincerely yours,


Arthur W. Busch
Regional Administrator

Enclosure.



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

January 29, 1975

Colonel Don S. McCoy
District Engineer - Galveston District
Corps of Engineers
U. S. Department of the Army
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

The draft environmental impact statement "Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging)," which accompanied your letter of December 26, 1974, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

GENERAL COMMENTS

The various segments of the Gulf Intracoastal Waterway (GIWW) main channel have received names designating the area traversed by the channel. The segments of the GIWW discussed in paragraphs 1.08 through 1.23 (pages 4 - 9) are referred to as Port Arthur to High Island; High Island to Port Bolivar; Port Bolivar to Oyster Creek; Oyster Creek to Colorado River; Colorado River to Port O'Connor; Port O'Connor to Live Oak Point, Texas; Live Oak Point to Aransas Pass; Aransas Pass to Encinal Peninsula; Encinal Peninsula to Lower Laguna Madre; and Lower Laguna Madre to Port Isabel, Texas. However, throughout the remainder of the text, these segments have been re-grouped and are referred to as Port Arthur Canal to High Island; High Island to Port Bolivar; Galveston Bay to Matagorda Bay; Matagorda Bay to San Antonio Bay; San Antonio Bay to Corpus Christi Bay; Corpus Christi Bay to Mud Flats; and Port Isabel to Mud Flats. The final environmental impact statement (FEIS) would be greatly improved by including a discussion of this re-grouping of GIWW segment names. Therefore, we recommend that a section be added to the FEIS explaining which segments of the main channel of the GIWW have been re-grouped and re-named (e.g., the segments Port Bolivar to Oyster Creek, Oyster Creek to Colorado River, and Colorado River to Port O'Connor have been re-grouped and re-named the Galveston Bay to Matagorda Bay segment).



SPECIFIC COMMENTS

2. ENVIRONMENTAL SETTING

Pages 15-41. This section could be greatly improved by incorporating the environmental discussions contained in the many reports submitted pursuant to the Fish and Wildlife Coordination Act (16 U.S.C., 661 et seq.) by the U. S. Fish and Wildlife Service that are attached to the draft environmental impact statement. In this regard, care should be taken to ensure that the environmental impact statement remains an essentially self-contained instrument, capable of being understood by the reader without the need for undue cross reference.

The numerous studies of Texas estuaries contained in the Texas Parks and Wildlife Department's Coastal (or Marine) Fisheries Annual Project Reports, issued since 1959, should also be extensively utilized in developing the biological background of the various GIWW reaches discussed in this section. Other studies that would be helpful include an ecological survey of the Arroyo Colorado (Bryan, 1971); a study of penaeid shrimp in the lower Laguna Madre (Stokes, 1973); biological and hydrographic studies of East Bay (Reid, 1955, 1957; and studies in Galveston Bay on fishes (Bechtel and Copeland, 1970; Parker, 1971), brown shrimp (Parker, 1970), and hydrography (Pullen, Trent, and Adams, 1971). The environmental setting section could also be improved by including a discussion of the organo-chlorine residues observed in estuarine fishes and molluscs from Arroyo Colorado, Laguna Madre, San Antonio Bay, and Matagorda Bay by Butler, Childress, and Wilson (1972); and in molluscs from Galveston, Tres Palacios, San Antonio, Aransas, and Red Fish Bays, as well as the lower Laguna Madre and Arroyo Colorado, by Butler (1973).

6. ALTERNATIVES TO THE PROPOSED ACTION

6.25. DISPOSAL IN MARSH AREAS WITH THE USE OF CONTAINMENT LEVEES

Page 77. This paragraph contains the statement, "Transport of material across miles of marsh lands would result in damages to probably as many acres of marsh as will be affected by the proposed plan, and would therefore be probably as environmentally detrimental."

The method of transport is not discussed, although it can readily be assumed that pipeline transport across marshland is implied. Pipelines placed across marshlands can cause extensive damage, and their use should be held to the minimum required to accomplish transport of dredged materials. However, marshes can and do recover from this type of impact, whereas any tidal marsh that has been segregated from the bay by levees built for spoil confinement is usually permanently lost to the estuarine ecosystem. Thus, pipeline transport of dredged spoil material across marshes to confined spoil areas on high ground is much less damaging to the marine environment than is spoil placement in the marsh.

9. COORDINATION WITH OTHERS

9.06 COORDINATION OF DISPOSAL PLANS

Pages 86-89. Our comments regarding minimizing "the need for undue cross reference" (Section 2, pages 15-41), also apply to this section. In addition, the final environmental impact statement should contain an up-to-date discussion of coordination that includes the recommendations submitted by the National Marine Fisheries Service in response to public notices recently issued in accordance with provisions of established Federal Regulations, Title 33, CFR 209.145.

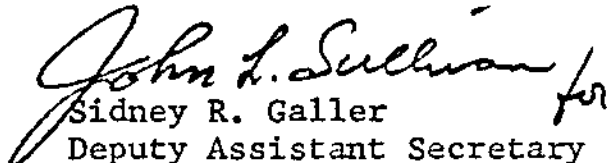
Table 4. DISTRIBUTION OF COMMON COMMERCIAL FISH SPECIES ALONG THE TEXAS COAST WITH SEASONAL OCCURRENCES AND ABUNDANCES

The use of scientific nomenclature should be included with the common names. Moreover, the common names of fishes mentioned in the text should agree with the common names used in Table 4 (e.g., on page 21, paragraph 2.25, the name "speckled trout" is used, whereas in Table 4 this species is referred to as "spotted seatrout"; and on page 24, paragraph 2.35, the name "red fish" is used, whereas Table 4 properly lists this species as "red drum"). The names "speckled trout" and "red fish" are alternate local common names not listed by the American Fisheries Society in its "A List of Common and Scientific Names of fishes from the United States and Canada, (Third Edition, 1970).

Other important commercial fish species that should be included in the list in Table 4 are the Atlantic croaker, Micropogon undulatus, and the spot, Leiostomus xanthurus.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,


Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Attachment



United States Department of the Interior

OFFICE OF THE SECRETARY
SOUTHWEST REGION

Room 4030, 517 Gold Avenue SW.
Albuquerque, New Mexico 87101

ER 74/1398

JAN 6 . 1975

District Engineer
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

This responds to your letter of November 4, 1974, addressed to Mr. Bruce Blanchard, Director, Office of Environmental Project Review, which requested evaluation and comment on a draft environmental statement for Maintenance Dredging of the Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels.

The draft environmental statement covers a wide range of environmental influences and is generally satisfactory. There are several minor areas where improvements are indicated and one topic in particular deserves greater coverage.

The statement should provide information related to continued use of the spoil areas adjacent to the Gulf Intracoastal Waterway. Rates at which the disposal areas within the containment levees are being built up and will continue to be built up and their adequacy for future use with projected maintenance dredging should be discussed. These rates could be determined based on the area within the levees, the frequency of dredging, and the amount of material dredged. The relationship of these disposal areas to the adjacent lands and marshes also should be discussed. Questions such as "to what extent do the disposal areas act as a barrier to the movement of water onto or away from the adjacent land and marsh areas?" should be discussed. The potential for further restriction as spoil accumulates from repeated dredging, and the environmental impacts of such restriction, warrant major consideration. Impedance of drainage or obstruction of water exchange will have severe long-range impacts on the ecology of adjacent terrain.

PROJECT DESCRIPTION

It would be pertinent to consider in this section the requirements for the installation of pipelines which must cross the Gulf Intracoastal Waterway. With the rapid expansion of oil and gas activity in offshore waters, it is expected that the number of pipeline crossings will increase. The coming need for additional pipelines may require that special provisions be made in maintenance dredging plans, particularly spoil disposal plans, for pipeline rights-of-way.

As a result of tracts leased offshore Texas during OCS lease sales 34 and 36, and the leases which may result from proposed lease sale 37, the expected cumulative production may require the construction of new pipelines to transport oil and gas production from points of origin to onshore facilities. To preclude environmental consequences of random and incremental proliferation of offshore and onshore pipeline siting in this area, most of which is a frontier area, the Department of Interior has proposed that pipeline infrastructure requirements be developed in a planned, orderly and comprehensive manner.

A special stipulation was included in all leases resulting from sale 34 and will be included in leases resulting from the proposed sale which requires any pipelines between a structure on the OCS and an onshore facility to be placed in certain designated areas or corridors through the submerged lands of the OCS.

In order to fulfill the requirements of the pipeline stipulation, a pipeline management study will be initiated in the Western Gulf of Mexico to determine, in a macro sense, the least environmentally hazardous areas in which to require the placement of lines. The study will also include a macro identification of the least environmentally hazardous areas for the location of onshore support and processing facilities. The basic goal of this study is to develop an effective planning and management tool, which along with other decision input and locational schemes for leased tracts, and for a broader area should future sales involve adjacent or interposed tracts.

The study will be conducted in two phases over a period of two and one-half years. The first phase will identify macro-corridors using existing data pertaining to the environmental setting of the area.

ENVIRONMENTAL SETTING

This section should contain a few paragraphs dealing specifically with mineral resources that are now being recovered in the vicinity of the waterway. The importance of the waterway to the safe, efficient, and economical recovery and transportation of these mineral commodities also should be detailed. Paragraph 2.111, "Economic Summary," is not sufficiently detailed to explain this important effect of the Gulf Intracoastal Waterway.

Pages 17 and 18, paragraphs 2.10 and 2.11. The "Current Fisheries Statistics, 1973 Texas Monthly Landings," prepared by the Department of Commerce, are available. The 1973 annual summary for Texas landings is in press and should be available shortly. You may wish to update this paragraph and also paragraphs 2.25 and 2.37 on the basis of these publications to reflect more recent conditions.

Page 18, paragraph 2.11. The mullet should be included as one of the most important fishes. Although it is not an important sport species, it contributes significantly to the commercial catch of Reach 1.

Page 18, paragraph 2.13. The listing of the American peregrine falcon is probably erroneous. The arctic peregrine falcon is more likely to occur in Reach 1. In Texas, the American peregrine falcon is found in the southwestern part of the State.

Page 25, paragraph 2.39. The prairie falcon is not on the official list of endangered species (refer to the U. S. Department of the Interior publication "United States List of Endangered Fauna," dated May 1974). Reference to this falcon should be deleted from this paragraph and from Table 8.

Page 31, paragraph 2.71. If the period of dredging specified in this paragraph is adhered to and the notification procedure prior to the issuance of contracts for maintenance dredging as requested by the U. S. Fish and Wildlife Service (page A91) is fulfilled, there should be no adverse effect on Padre Island National Seashore.

RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

The proposed action will not adversely affect any proposed unit of the National Park Service nor any site eligible for registration as a National Historic, Natural or Environmental Education Landmark.

ENVIRONMENTAL IMPACT OF PROPOSED ACTION

The draft environmental statement does not specifically address the proposed project's impacts on mineral resources, but does cite beneficial impacts on the transportation of mineral raw materials and manufactured goods. It also states that the existing project has facilitated resource development and has not adversely affected the recovery of mineral resources (predominantly oil and gas) in the area. The limited width (125 feet) and shallow depth (12 feet) of the existing waterway do not preclude mineral resource extraction in the immediate vicinity. Similarly, maintenance dredging to preserve or restore these dimensions in the waterway should not produce any adverse effects on mineral resource recovery. No proposed disposal site conflicts with existing mineral extraction operations, and it is not anticipated that present disposal plans will deter future mineral exploration or extraction.

Pages 44 and 45, paragraph 4.08. We question that the importance of disposal islands as bird nesting areas stems primarily from the development of woody plants. On the spoil islands and South Bird Island within the Padre Island National Seashore, bare soil, grasses, and

herbaceous plants are preferred nesting habitat.

Page 65, paragraph 4.68. We suggest rewording the last sentence to eliminate the inference that damages which might occur to historical and archeological resources in spite of reasonable precautions taken do not justify the economic and social disadvantages of failure to maintain the channels. This is a broad judgmental conclusion not supported by facts and one which seems to apply cost-benefit calculations to potential losses of cultural resources.

Page 65, paragraph 4.69. "Possible" should be substituted for "practicable" in the penultimate sentence. A practicable and economic but entirely unacceptable solution would be to ignore the preservation mandate.

ALTERNATIVES TO THE PROPOSED ACTION

Page 77, paragraph 6.25. The conclusion made in this paragraph that "Transport of the materials across miles of marsh lands would result in damages to probably as many acres of marsh as will be affected by the proposed plan, and would therefore be probably as environmentally detrimental" should be substantiated. Pipeline transport would be initially damaging but the marsh vegetation would recover.

Sincerely,



Willard Lewis
Special Assistant to the Secretary

**Advisory Council
On Historic Preservation**

1522 K Street N.W. Suite 430
Washington D.C. 20005

Colonel Don S. McCoy
District Engineer
Corps of Engineers, Galveston District
U.S. Department of the Army
P. O. Box 1229
Galveston, Texas 77550

DEC 9 1974

Dear Colonel McCoy:

This is in response to your request of November 4, 1974 for comments on the draft environmental statement (DES) for Maintenance Dredging, Gulf Intracoastal Waterway, Main Channel and Tributary Channels, Texas Section. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your DES appears substantively adequate.

However, the Council notes on page 65 of the DES that "Advice concerning possible historical resources will be sought from appropriate agencies when new disposal sites are proposed." The Corps of Engineers is reminded that if, as a result of consultation with these agencies, it is established that the undertaking will result in an effect to a property included in or eligible for inclusion in the National Register of Historic Places, the Corps is required to request Council comments in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800). Steps to determine eligibility and effect are detailed in Section 800.4 of these procedures.

Should you have any questions or require any additional assistance, please contact Michael H. Bureman of the Advisory Council staff at P. O. Box 25085, Denver, Colorado 80225, telephone number (303) 234-4946.

Sincerely yours,



John D. McDermott
Director, Office of Review
and Compliance

A-13



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGIONAL OFFICE

1114 COMMERCE STREET
DALLAS, TEXAS 75202

November 20, 1974

OFFICE OF
THE REGIONAL DIRECTOR

Our Reference: EI# 1174-438

Don S. McCoy
Colonel, CE
District Engineer
DOA/COE, Galveston District
P. O. Box 1229
Galveston, Texas 77550

SWGED-E

RE: Gulf Intracoastal Waterway, Tex. Section
Main Channel & Tributary Channels
(Maintenance Dredging)

Dear Col. McCoy:

Pursuant to your request, we have reviewed the Environmental Impact Statement for the above project proposal in accordance with Section 102(2) (C) of P. L. 91-190, and the Council on Environmental Quality Guidelines of April 23, 1971.

Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U. S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse health effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental health laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Very truly yours,

William F. Crawford
Environmental Impact Coordinator



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL OFFICE
1100 COMMERCE STREET
DALLAS, TEXAS 75202

December 23, 1974

REGION VI

IN REPLY REFER TO:

6ME

Your Reference:
SWGED-E

Colonel Don S. McCoy
District Engineer
Galveston District
Corps of Engineers
Department of the Army
P.O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

The Department of Housing and Urban Development has determined that it will not have comments on the Draft Environmental Impact Statement, "Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging)."

Sincerely,


Travis Wm. Miller
Environmental Clearance Officer

A-15



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

• 3 JAN 1975

Colonel Don S. McCoy
District Engineer
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

This is in response to your letter of 4 November 1974 addressed to the DOT Coordinator for Water Resources concerning a draft environmental statement for Maintenance Dredging-Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributaries.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W. E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
by direction of the Commandant



DOLPH BRISCOE
GOVERNOR

OFFICE OF THE GOVERNOR
DIVISION OF PLANNING COORDINATION

JAMES M. RO
DIRECTOR

January 28, 1975

Colonel Don S. McCoy
District Engineer
Galveston District, Corps of
Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

The Draft Environmental Impact Statement (DEIS), "Gulf Intracoastal Waterway Texas Section, Main Channel and Tributary Channels (Maintenance Dredging)" prepared by the Department of Army, Corps of Engineers has been reviewed by the Governor's Division of Planning Coordination and interested State agencies.

Review participants have submitted the following comments and recommendations that warrant your consideration:

1. The Texas Water Rights Commission (TWRC) commented that the DEIS fulfills the requirements of the National Environmental Policy Act of 1969 and affirmed that the proposed dredging activities conform to Federal Dredging Regulations, 33 CFR 209.145. However, TWRC proposed that the environmental statement should include a status report and major findings to date of the Corps of Engineers Dredged Material Study. (See Hearings before the Subcommittee of appropriations, House of Representatives, 93rd Congress, Part 1, pages 246-250.) TWRC also proposed that the DEIS include a discussion of the impacts and applicability of Federal Regulation, 40 CFR 227.6 pertaining to the Environmental Agency's criteria for evaluation of permit application for the disposal of dredged materials.
2. The Texas Water Development Board (TWDB) expressed the opinion that the benefits derived from keeping the Gulf Intracoastal Waterway open as an artery of transportation outweigh any foreseeable adverse effects resulting from dredging operations. TWDB stated that the location of spoil disposal areas should be considered with regard to maintenance and possible enhancement of the natural drainage and circulation patterns of the estuarine systems. The TWDB noted that the Corps of Engineers are coordinating its efforts with interested State, federal and local interests and that the DEIS fulfills the intended purpose and endorsed it as submitted.

A-17

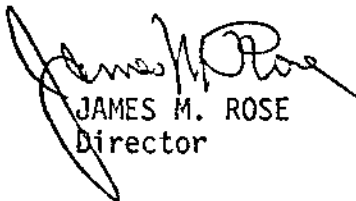
3. The General Land Office (GLO) stated that because of the continuing requirement for this dredging operation, that an evaluation of costs for various off-site disposal areas be made to determine whether such costs would be justified in the elimination of damage to the marine environment. GLO suggested various uses of spoil materials to offset the additional cost of off-site disposal.
4. The Texas Parks and Wildlife Department (TP&WD) provided extensive comment on the effects of this operation on the Texas Coastal ecosystems and made numerous related suggestions for consideration and inclusion in the DEIS. TP&WD expressed concern for the effects of spoil disposal on the available wetlands and urged the devising of feasible methods for handling spoil in the least environmentally detrimental manner. The detailed suggestions of TP&WD are enclosed for your consideration.
5. The Texas Air Control Board expressed concern for potential air quality problems and suggested that should hydrogen sulfide odors be detected, dredging should be discontinued until winds are blowing away from residential or commercial establishments.
6. The Texas Department of Agriculture (TDA) stated that the DEIS appears to raise all the pertinent issues and is well written. However, TDA noted certain unsupported assertions related to benefits of increased recreational activities and the influx of new business and industrial establishments. It was suggested that the DEIS properly document or clarify the benefits stated.
7. The Texas Water Quality Board (TWQB) requested that sediment analyses be performed in all areas prior to dredging. TWQB proposed that if the analyses reveal concentrations of metals in excess of EPA guidelines, the Corps should seriously consider land disposal, using proper levees for containment and weir structures for decanting. The TWQB specifically requested that it be notified before each project begins so that the effects on water quality in each area can be monitored.
8. The Texas Highway Department stated that the proposed work would have no appreciable effects on highways under their jurisdiction.

Enclosed are comments from the review participants. The comments are submitted with the constructive intent of aiding your planning efforts and should be reviewed in their entirety.

Colonel Don S. McCoy
Page 3

The Division of Planning Coordination noted that this DEIS gives careful consideration to minimizing environmental degradation, preserving the renewable characteristics of the coastal region environment and providing a comprehensive appraisal of the tradeoffs involved in keeping open the main and tributary channels of the waterway. This Division recognizes the importance of the Gulf Intracoastal Waterway to the economy of Texas and other coastal states and of the need for the maintenance of that waterway as an essential mode of transportation. If we can be of further assistance, please let us know.

Sincerely,



JAMES M. ROSE
Director

JMR/dgs
Enclosures

cc: Mr. Joe D. Carter, TWRC
Mr. Harry P. Burleigh, TWDB
The Honorable Bob Armstrong, GLO
Mr. Clayton T. Garrison, TP&WD
Mr. Charles R. Barden, TACB
The Honorable John C. White, TDA
Mr. Hugh C. Yantis, TWQB
Mr. B. L. DeBerry, THD
Dr. W. L. Fisher, Bureau of Economic Geology
Mr. Harvey Davis, Texas State Soil & Water Conservation Board

TEXAS WATER RIGHTS COMMISSION

STEPHEN F. AUSTIN STATE OFFICE BUILDING

COMMISSIONERS

JOE D. CARTER, CHAIRMAN
475-2453

DORSEY B. HARDEMAN
475-4325

BURKE HOLMAN
475-2451

December 18, 1974

A. E. RICHARDS
EXECUTIVE SECRETARY
475-2453
AUDREY STRICKLAND
SECRETARY
475-4325

Brigadier General James M. Rose
Director, Division of Planning Coordination
Office of the Governor
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Attention: Mr. Wayne N. Brown

Re: U.S. Corps of Engineers, Galveston District -- Draft Environmental Statement (DES) -- Maintenance Dredging, Gulf Intracoastal Waterway (GIWW), Texas Section, Main Channel and Tributary Channels, October 30, 1974.

Dear General Rose:

By letter of November 12, you requested State agency review and comments on the referenced DES pertaining to the Federally-funded, periodic maintenance dredging of the approximate 423-mile, 12-foot deep, 125-foot long GIWW channel (Texas portion) extending along the coast between the Texas-Louisiana and the Texas-Republic of Mexico borders, and about 15 related GIWW tributary and intersecting channels.

The staff finds that the referenced document fulfills the requirements of Section 102(2)(C) of the National Environmental Policy Act of 1969, and that affirmation is given that the proposed dredging activities will conform to the Federal Dredging Regulations, 33 CFR 209.145. However, the staff believes that the comprehensive referenced document would be greatly enhanced by inclusion of:

1. A status report and major findings to-date of the Corps of Engineers Dredged Materials Study, for which \$3.6 million was appropriated in FY 1974 and \$8.2 million in 1975. (See Hearings before the Subcommittee of the

General James M. Rose
December 18, 1974
Page 2

Committee on Appropriations, House of Representatives, 93rd Congress, Part 1, pages 246-250). The study was described to the Congress as addressing "the entire problem of dredging and disposal operations" and that it was considered "probably the most important study that is being accomplished by the Corps of Engineers today." Page 249 of the said Hearings contains a list of research tasks which were to be completed in FY 1974; page 250 lists research tasks started and continued through FY 1974.

2. A discussion of the impacts and applicability of Federal Regulations, 40 CFR 227.6 pertaining to Environmental Protection Agency's criteria for evaluation of permit applications insofar as disposal of dredged material is concerned.

The above comments are presented with constructive intent to assist in the enhancement of the referenced vital document. If you have any questions write to or telephone the undersigned (512)475-2678.

Sincerely yours,

TEXAS WATER RIGHTS COMMISSION



By: Alfred J. D'Arezzo, Ph. D., (C.E.)
Special Analyst for Environment and
Interagency Coordination

AJD:ll

TEXAS WATER DEVELOPMENT BOARD

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EXECUTIVE DIRECTOR

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475-3571

1700 NORTH CONGRESS AVENUE

December 9, 1974

IN REPLY REFER

TWDBP-O

General James M. Rose, Director
Division of Planning Coordination
Office of the Governor
P.O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Jim:

Please refer to your memorandum dated November 12, 1974 transmitting for review and comments the Corps of Engineers' Draft Environmental Statement "Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging)."

The purpose of this statement is to identify and evaluate the environmental impact of continuing maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway and tributary channels. The statement further addresses various reasonable alternatives and mitigation measures taken to reduce possible adverse environmental effects and to enhance economic, social, and environmental values.

In 1828 Congress appropriated funds for constructing the first link of the Gulf Intracoastal Waterway (GIWW), which now extends from Florida to the Rio Grande Valley in Texas. The GIWW intersects all deep-draft ship channels along the Gulf Coast as well as connecting many navigable waterways to shallow-draft ports in Texas, Louisiana, Mississippi, Alabama, and Florida. The Texas Section of the GIWW extends approximately 423 miles from the Sabine River area to Port Isabel, near the Mexican border. It requires a significant amount of maintenance dredging to keep it open to barge and small craft traffic.

A great number of factors are contributory to the shoaling processes within the canal system. Included are: the depth of water in bays, tidal action, type of materials in which the cuts were made, and the influence of cross-channels and streams. The contributing factors do not prevail uniformly throughout the entire length of the Texas Section of the GIWW, but for purposes of this study the Corps has divided the main channel into 19 segments, each of which has its own identifiable characteristics. The requisite cycle of maintenance dredging within individual reaches, ranging from 12 to 60 months, makes possible an orderly program of operations. Tributary channels are also maintained by the Corps, and are programmed for periodic dredging. The quantity of material to be removed from each of the 19 main channel reaches and 12 tributary channels is generally known from previous operations, and ranges from 38,000 cubic yards per year on a 60-month cycle to 1 million cubic yards per year on a 24-month cycle.

Under present stages of development, the GIWW is a vital link in the State and National economy. Millions of tons of shipping pass through the Waterway annually. In some areas it is the only practical means for the transportation of raw materials such as petroleum products. Without the GIWW and its tributary channels there could be no coastal barge traffic because of the extremely shallow depths of water in most of the bays. As stated above, maintenance dredging is an absolute necessity in keeping the channels open for safe traffic. Without dredging the channel would, in time, be completely filled with sediment.

As with any of man's activities, the maintenance dredging operations have both beneficial and adverse effects on the environment. In our opinion, the benefits derived from keeping the GIWW open as an artery of transportation outweigh any foreseeable adverse effects resulting from dredging operations. One of the primary issues addressed in the statement is disposal of the resultant spoil material such that there would be no significant alteration of bay circulation patterns in the ecologically-sensitive areas of the bays. This is a major concern of this agency as we are presently conducting intensive studies to determine the relationships and needs of freshwater to the bays and estuaries of

General James M. Rose

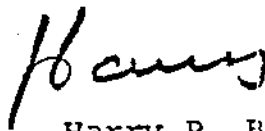
December 9, 1974

Page 3

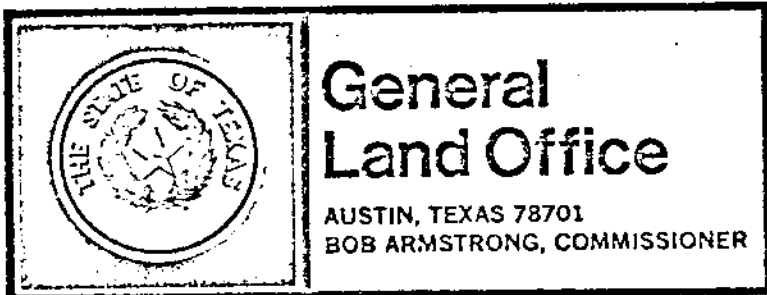
the Texas Coastal Zone. State efforts to provide desirable salinity conditions and nutrient materials in the bays could be adversely affected by silting and/or filling in of marshes, bayous, and natural drainage features. Therefore, location of spoil disposal areas should be considered with regard to maintenance and possible enhancement of the natural drainage and circulation patterns of the estuarine systems. Although some oyster beds and other immobile mollusks will be covered by silt from open water disposal of dredge spoil, the report shows that these organisms will re-establish themselves within a relatively short period after dredging operations are completed. It was also pointed out that during the original construction of the channel across Galveston Bay, open-water disposal of the dredge spoil provided areas of coarser substrates which rapidly developed into live oyster reefs. In summary, the report shows that maintenance dredging and auxiliary channel construction operations can be undertaken in a manner that will satisfy both economic and environmental requirements.

We find that the Corps of Engineers is coordinating its efforts with all interested State, Federal, and local interests in an effort to serve all needs to the maximum possible benefit. It is the opinion of our staff that the Environmental Impact Statement, Maintenance Dredging of the Gulf Intracoastal Waterway, Texas, fulfills the intended purpose, and we are pleased to endorse it as submitted.

Sincerely,



Harry P. Burleigh



PLANNING DIVISION
December 11, 1974

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
Division of Planning Coordination
P.O. Box 12428
Capitol Station
Austin, Texas 78711

SUBJECT: DRAFT ENVIRONMENTAL STATEMENT: GULF INTRACOASTAL WATERWAY,
TEXAS SECTION, MAIN CHANNEL AND TRIBUTARY CHANNELS (MAINTENANCE
DREDGING)

Dear Mr. Brown:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for Gulf Intracoastal Waterway maintenance dredging. The statement is extensive and open. Maintenance dredging is obviously a coastal activity which will, by necessity, continue to be required. Because of this continuing nature, it appears that more consideration should be given to the alternatives available for disposition of dredged material. Use of the same disposal methods will result in recurring damage to the marine environment, for as long as the waterway is maintained.

In the section of the Draft Statement entitled "6.0, Alternatives to the Proposed Action.", I feel it would benefit the State if the detailed costs of various methods of removing dredged material from the excavation site were included. Such costs might cover dredging methods now used by the Corps and also by private industry. Such cost figures might consider varying distances to disposal sites and available or potential methods such as pipelines, hopper dredges, and hopper barges. With such information, the State might be able to determine that disposal off-site in a particular reach of the waterway, given the cost involved, is still more desirable than eliminating or causing damage to a particular marine environment.

Page 2

Mr. Wayne N. Brown, Chief

December 11, 1974

The additional cost of off-site disposal in certain reaches of the Waterway might be mitigated by using the dredged material as fill to raise evacuation route roadbeds, by selling fill to available users, or by allowing contractors to remove and sell the material as fill.

Sincerely,



Bob Armstrong
Commissioner

BAds

TEXAS
PARKS AND WILDLIFE DEPARTMENT

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Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

The Texas Parks and Wildlife Department has reviewed the draft environmental statement on the Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging). We offer the following comments.

It is felt that the draft is much too general and, as a result, is misleading in several of its statements and does not adequately present the impact of GIWW activities on the coastal ecosystems.

Where endangered species are mentioned on pages 18, 22, 25 and 43, there are some inaccuracies in that some species listed are not adequately identified or, sometimes species are omitted. Remarks about endangered species should be checked and corrected.

Following is a list of endangered species within the Waterway region by "Reaches".

<u>Common Name</u>	<u>Scientific Name</u>
Florida manatee ^{1,2,3}	(<u>Trichechus manatus</u>)
Red wolf ¹	(<u>Canis rufus</u>)
Ocelot ³	(<u>Felis pardalis</u>)
Right whale ^{1,2,3}	(<u>Eubalaena glacialis</u>)
Sperm whale ^{1,2,3}	(<u>Physeter catodon</u>)
Blue whale ^{1,2,3}	(<u>Balaenoptera musculus</u>)

<u>Common Name</u>	<u>Scientific Name</u>
Finback whale ^{1,2,3}	(<u>Balaenoptera physalus</u>)
Attwater's prairie chicken ^{1,2}	(<u>T. cupido attwateri</u>)
Southern bald eagle ^{1,2,3}	(<u>Haliaeetus leucocephalus</u>)
Brown pelican ^{1,2,3}	(<u>Pelecanus occidentalis</u>)
Eskimo curlew ^{1,2,3}	(<u>Numenius borealis</u>)
Arctic peregrine falcon ^{1,2,3}	(<u>Falco peregrinus tundrius</u>)
American peregrine falcon ^{1,2,3}	(<u>Falco peregrinus anatum</u>)
Whooping crane ²	(<u>Grus americana</u>)
American alligator ^{1,2,3}	(<u>Alligator mississippiensis</u>)
Atlantic ridley ^{1,2,3}	(<u>Lepidochelys kemp</u>)
Hawksbill turtle ^{1,2,3}	(<u>Eretmochelys imbricata</u>)
Leatherback turtle ^{1,2,3}	(<u>Dermochelys coriacea</u>)
Houston toad	(<u>Bufo houstonensis</u>)

-
- 1 Occurs in Reach I
 - 2 Occurs in Reach II
 - 3 Occurs in Reach III

The name "American peregrine falcon" mentioned on pages 22, 25 and in Table 8 should be changed to the Arctic peregrine falcon.

On page 43 (4.03) the endangered birds generally mentioned here should be identified.

Page 49. While spoil mounds in certain locations have some benefit to wildlife, the intermittent spoiling, particularly at relatively frequent intervals, modifies some of those benefits. Overall, the spoiling from maintenance dredging of the GIWW and its laterals is more detrimental to fauna than it is beneficial.

The greatest benefit of spoil islands to wildlife is to the "fish-eating" birds, numerous species of which (depending upon the age of the spoil and security of the islands from disturbance and predators) use such islands for rookery, resting and feeding sites.

Skimmers and least terns are more apt to use "first-season" spoil. Gulls, Louisiana herons and certain terns begin to use second or third-season spoil as vegetation becomes established. Subsequently, great blue herons and reddish egrets are species which use spoil islands. Spoil islands ten or more years old are preferred by species of egrets and herons.

At least two species which may become endangered, the reddish egret and white-faced ibis, use Texas spoil islands. Both require the mid-climax to climax vegetation of older islands and spoiling intervals of less than 8-10 years are detrimental to these birds.

Usage of spoil sites and spoiling operations should, as much as possible, be done to accommodate wildlife which use them.

Page 50 (4.24). Texas Parks and Wildlife Department studies have documented instances where siltation has been biologically damaging as far as 5,400 feet from a shell dredge.

Pages 52 & 53 (4.29). Odum's study indicated higher productivity "in those areas not smothered with silt" and no repopulation on spoil areas.

Page 61 (4.54). With respect to the cumulative effect of sediment from dredging on the biological productivities, it is felt by this Department that such effect is (rather than is not) cumulative in many instances since maintenance dredging often continually increases the amount of area covered by silt and diminishes productivity.

Page 63 (4.62). With reference to this section, social and economic benefits provided by the wetland ecosystems which have been and are intended to be inundated by spoil should be discussed. Social, economic and environmental values of wetlands (or marshes) are reflected in the following abstract from "The Value of the Tidal Marsh" by James Gosselink, Eugene Odum and R. M. Pope:

"Natural tidal marshes are evaluated in monetary terms. By-product production (fisheries, etc.) on a per-acre basis yields a value of only about \$100 per year, even when the whole value of the fishery is imputed to the marsh. More intensive uses, such as oyster aquaculture, which preserve many of the natural functions of the marsh-estuarine ecosystem, have a potential up to \$1,000 per acre per year. The potential for waste assimilation is much higher, about \$2,500 per acre per year for tertiary treatment. Summation of the noncompeting uses approaches an ecological life-support value of about \$4,000 per acre per year, based on the gross primary productivity (in energy terms) of the natural marsh, using a conversion ratio from energy to dollars based on the ratio of Gross National Product to national energy consumption. When these annual social values of \$2,500-\$4,000 are income capitalized at 5 per cent interest the estimated total social values are \$50,000-\$80,000 per acre. Some estuaries, such as the Potomac or the Hudson, are now performing waste assimilation work of even

greater value, but such estuaries are overloaded to the point of degradation. Analysis based on the total value of the life support role of a natural tidal marsh-estuary suggests that a strategy of optimization in land use planning should replace, or supplement, reliance on the pricing system which is inadequate for preservation of natural systems that increase in value with the intensity of adjacent development."

There is now a primary data-based set of monetary values available for resource planners at federal, state and local levels for equitable estimations of fish and wildlife values. Those values are set out in the publication by Horvath, Joseph C. 1974. "Economic Survey of Southeastern Wildlife and Wildlife-oriented Recreation". Trans. of the 39th North American Wildlife and Natural Resource Conference. pp. 187-194.

Page 67 & 68 (5.07). The high degree to which our irreplaceable, finite amount of marshland has been diminished has long been critical and this Department is opposed to the loss of any additional marshlands.

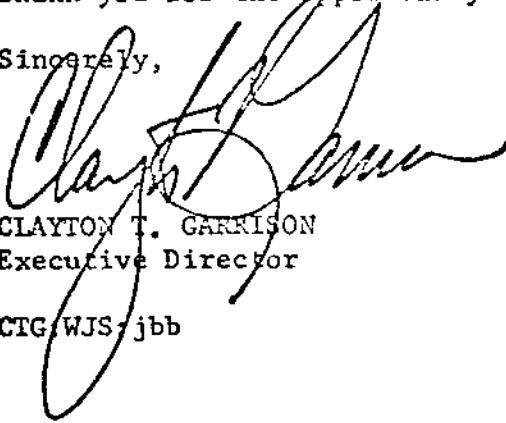
Pages 79 & 80 (6.33). Where the use of hopper dredges is not feasible, the engineering know-how of the Corps and the expertise of principal biological entities should be coordinated to devise feasible methods for handling spoil in the least environmentally detrimental manner. Neither is it economically feasible to continue degrading and obliterating our extremely valuable wetlands.

Page 86 (9.06). The citation in this paragraph that "the coordinated disposal plans are in compliance with all recommendations made by the U. S. Fish and Wildlife Service and the EPA", conflicts with statements made in paragraphs 9.07 a,b,c,d,e,f, and h. The Fish and Wildlife Service recommendations are not always being followed.

Page 88, paragraph f. It should be said here that one of the five active Southern bald eagle nests in Texas is located on the Pat Welder Wildlife Range on the north side of the Victoria Channel. Dredging activities should be restricted in this area from November 15 to mid-May of each year.

Thank you for the opportunity to comment on this statement.

Sincerely,



CLAYTON T. GARRISON
Executive Director

CTG/WJS:jbb



TEXAS AIR CONTROL BOARD

PHONE 512/451-5711
8520 SHOAL CREEK BOULEVARD

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JOE C. BRIDGEFARMER,

November 21, 1974

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
Division of Planning Coordination
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

In regard to the Draft Environmental Statement, Gulf Intracoastal Waterway, Texas Section, we anticipate that potential air quality problems may be caused by this operation. Objectionable odors (mercaptans, hydrogen sulfide) may result from dredging of sediments containing high concentrations of organic matter.

A problem of this nature occurred in Region 5 at Key Allegro, Aransas County. In that incident, an odor nuisance was created and property damage was caused to several residences by a dredge working in the area. Paint damage was observed on at least five houses. An analysis by an independent lab verified the hydrogen sulfide damage.

In light of this incident, we suggest that caution be exercised in this project. If hydrogen sulfide odors are detected, dredging should be discontinued until winds are blowing away from residential or commercial establishments.

Sincerely yours,

Bill Stewart, P.E.
Director
Control and Prevention

ccs: Mr. Robert Guzman, Regional Supervisor, Harlingen
Mr. Tom Palmer, Regional Supervisor, Corpus Christi
Mr. Lloyd Stewart, Regional Supervisor, Houston
Mr. Howard Baker, Regional Supervisor, Beaumont



EDMUND L. NICHOLS
Assistant Commissioner
November 18, 1974

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

This is in response to your letter of November 12, 1974 requesting comments on the Draft Environmental Statement Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging).

We have reviewed this draft environmental statement and concur in its conclusions. This statement appears to raise all the pertinent issues and is well written.

There are a few places which we believe could be improved with some additional consideration and rewriting. First, the statement in section 4.06 that "...outdoor recreation [opportunities] for most Texans have been materially increased..." is clearly an overstatement. Most Texans do not use this area. Such overstatements detract from the credibility of the E. I. S. and should be rectified.

Section 4.13 lists the influx of "...hundreds of new industrial and business establishments..." as a benefit of the project. This statement has two flaws. First, it is not documented and secondly, many, such as environmentalists and proponents of limited economic and population growth, view such growth as adverse impacts rather than beneficial. It might be less controversial to document the influx as an un-evaluated effect. Then list the increased employment, purchasing power, incomes, etc. as benefits.

Section 4.35 indicates that the islands formed by deposition of dredged material form good habitats for birds and are often used by hunters, fishermen, campers and others. The environmental impact of this use, including surface damage, uncollected trash, fires and other items of general practice should be discussed and evaluated.

Sincerely,


Edmund L. Nichols

ELN:am

A-32

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CHAIRMAN

FRANK H. LEWIS
VICE CHAIRMAN

CLYDE JOHNSON

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CLAYTON T. GARRISON

TEXAS WATER QUALITY BOARD



J. E. PEAVY, MD

BEN RAMSEY

HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

PH. (512) 475-2651

1700 NORTH CONGRESS AVE. 78701
P.O. BOX 13246 CAPITOL STATION 78711
AUSTIN, TEXAS

January 8, 1975

Re: Draft Environmental Statement,
Gulf Intracoastal Waterway,
Texas Section

General James M. Rose, Director
Division of Planning Coordination
Office of the Governor
P. O. Box 12428, Cap. Sta.
Austin, Texas 78711

Dear General Rose:

The staff of the Texas Water Quality Board has completed a review of the draft environmental statement for the maintenance dredging project for the Gulf Intracoastal Waterway referenced above, and the following comments are offered concerning the project.

This agency requests that sediment analyses be performed in all areas to be dredged, prior to the project commencement. The samples should be collected far enough in advance for analysis results to be utilized during dredging, if required. If sediment analysis reveals concentrations of metals in excess of EPA guidelines, the Corps should seriously consider land disposal, using proper levees for containment and weir structures for decanting. This Agency should be notified before each project is begun in order that we may monitor the effects on water quality in each area.

We appreciate the opportunity to review this project. If we can be of further assistance, please let us know.

Very truly yours,

Emory G. Long, Director
Administrative Operations Division

A-33

... Districts 6, 7, 11, and 12



COMMISSION

REAGAN HOUSTON, CHAIRMAN
DZWITT C. GREER
CHARLES E. SIMONS

TEXAS HIGHWAY DEPARTMENT
111TH AND BRAZOS
AUSTIN, TEXAS 78701

STATE HIGHWAY ENGINEER
B. L. DEBERRY

November 19, 1974

IN REPLY REFER TO
FILE NO. D-5
File 290

Draft Environmental Statement
Gulf Intracoastal Waterway, Texas Section, Main
Channel and Tributary Channels (Maintenance
Dredging)

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
Division of Planning Coordination
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Sir:

Reference is made to your memorandum of November 12 transmitting for our review and comments one copy of the above-cited draft environmental statement. We have reviewed this material and believe that the proposed work covered by this environmental statement will have no appreciable affect on the highways under our jurisdiction. We appreciate the opportunity of reviewing this environmental statement.

Sincerely yours

B. L. DeBerry
State Highway Engineer

By: *Marcus L. Yancey Jr.*

Marcus L. Yancey, Jr.
Assistant State Highway Engineer



THE UNIVERSITY OF TEXAS AT AUSTIN
BUREAU OF ECONOMIC GEOLOGY
AUSTIN, TEXAS 78712

December 2, 1974

University Station, Box X
Phone 512-471-1534

Mr. Wayne N. Brown, Chief
Division of Planning Coordination
P. O. Box 12428
Austin, Texas 78711

Dear Mr. Brown:

The staff of the Bureau of Economic Geology has reviewed the following draft environmental impact statements:

- (1) City of Houston's Easthaven regional treatment plant
- (2) Wichita County-U.S. 82-277 and Spurr 447
- (3) Clear Creek and Clear Lake, Texas-maintenance dredging
- (4) Gulf Intercoastal Waterway, Texas section-maintenance dredging
- (5) Freeport Hurricane Flood Protection, Freeport and vicinity Texas

We have no negative comments on these projects. Thank you for the opportunity to respond.

Sincerely,

W. L. Fisher
Director

WLF/w1



TEXAS STATE SOIL AND WATER CONSERVATION BOARD

1018 First National Building
Temple, Texas 76501
AREA CODE 817, 773-2250

December 6, 1974

Mr. Wayne N. Brown, Chief
State Planning & Development
Division of Planning Coordination
P.O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

Your office has forwarded a draft environmental statement prepared by the Department of the Army, Galveston District, Corps of Engineers concerning maintenance dredging of the Gulf Intracoastal Waterway, Texas Section.

We offer no comments on this project.

Sincerely yours,

A handwritten signature in cursive script that reads "Harvey Davis".

Harvey Davis
Executive Director

HD/lc



Texas Historical Commission
Box 12276, Capitol Station
Austin, Texas 78711
Truett Latimer
Executive Director

March 18, 1974

Mr. D.T. Graham
Chief, Engineering Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

RE: E.I.S. Concerning Maintenance Dredging: GIWN From The Sabine-
Neches Waterway at Port Arthur to Port Isabel, Texas.

Dear Mr. Graham:

In response to your request concerning the above-referenced project area, we have examined our files and discussed this matter with Mr. Carl Clausen, Marine Archeologist and offer the following comments:

1. Where maintenance dredging will not exceed the measurements of the original channel, no measures, other than assuring minimal siltation of known submerged cultural resources, are necessary.
2. Where the channel will be enlarged or deepened as part of a maintenance operation, underwater magnetometer surveys may be necessary in areas thought to have a high density of resources.
3. Existing spoil areas should be used for depositing material resulting from the dredging operation. When new areas are earmarked for spoiling, magnetometer surveys of these areas may be indicated.

Thank you for the opportunity to comment on this matter. If we may be of further assistance, please advise.

Sincerely,

Truett Latimer,
Executive Director

By

Alton K. Briggs
Archeologist

AKB:pc



OFFICE OF THE MAYOR
CITY OF TEXAS CITY
PORT OF INDUSTRIAL OPPORTUNITY

EMMETT F. LOWRY
MAYOR

November 15, 1974

Colonel Don S. McCoy
District Engineer
Galveston District
Corps of Engineers
P.O.Box 1229
Galveston, Texas

Dear Colonel McCoy:

This is to acknowledge with thanks your letter of November 4, 1974, and a draft environmental statement, "Gulf Intracoastal Waterway, Texas Section (Maintenance Dredging)."

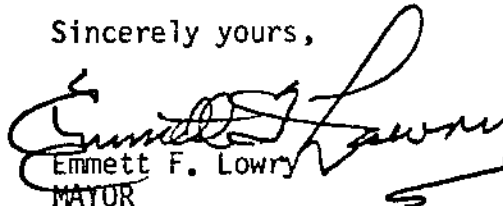
You and your staff are to be congratulated on the thoroughness of the statement.

As you know the Intracoastal Waterway of Texas is the life line between Petro Chemical Plants along the Texas Coast as well as other freight.

It is absolutely essential that Intracoastal Waterway as well as Main and Tributary Channels be maintained at adequate width and depth to handle the ever increasing size of cargo carrying barges.

On behalf of the Commission and the citizens of Texas City we would like to urge the acceptance and approval of the statement and recommend the construction/maintenance to greater width and depth at the earliest possible time.

Sincerely yours,


Emmett F. Lowry
MAYOR

EFL:dm

GALVESTON COUNTY NAVIGATION DISTRICT NO. 1

622 22ND STREET

GALVESTON, TEXAS 77550

GEORGE C. BOLLER
Chairman Of The Board
HERBERT E. SCHMIDT
Secretary-General Manager
HENRY S. COLTZER
Treasurer

25 November 1974

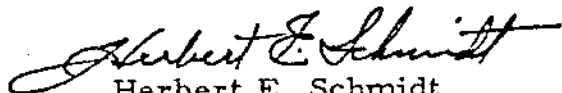
District Engineer
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

This is to acknowledge receipt of your letter of 4 November 1974 forwarding draft environmental statement "Gulf Intracoastal Waterway, Texas Section, Main Channel and Tributary Channels (Maintenance Dredging)".

Galveston County Navigation District No. 1, after careful study considers that the statement, in two chapters, outlines only beneficial effects to the future dredging of the Gulf Intracoastal Waterway, Texas Section.

Very truly yours,



Herbert E. Schmidt
Secretary-General Manager
Galveston County Navigation District No. 1

HES:mr

cc: Mr. George C. Boller, Chairman
Mr. Henry S. Coltzler, Treasurer
Mr. Adrian F. Levy, Sr., Attorney

BRAZOS RIVER HARBOR NAVIGATION DISTRICT
OF
BRAZORIA COUNTY

NAVIGATION AND CANAL COMMISSIONERS

MARCUS WEEMS, CHAIRMAN, WEST COLUMBIA, TEXAS
A. M. WISE, SECRETARY, BRAZORIA, TEXAS
A. O. EVANS, JR., FREEPORT, TEXAS
ROBERT W. MCADA, JR., LAKE JACKSON, TEXAS
G. L. ROUSE, ANGLETON, TEXAS
J. T. SUGGS, LAKE JACKSON, TEXAS

P. O. BOX 615
FREEPORT, TEXAS 775
TELEPHONE
(713) 233-2667

December 20, 1974


Department of the Army
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Attn: Col. Don S. McCoy, District Engineer

Dear Sir:

The draft environmental statement on the Gulf Intra-coastal Waterway, Texas Section, Main Channel and Tributary Channels with your covering letter of November 4, 1974 has been reviewed. It appears adequate regarding our area and we have no other comments to make on the subject.

Sincerely,



Marcus Weems
Chairman

MW/wlv



PORT OF BROWNSVILLE

P. O. BOX 3070
BROWNSVILLE ★ TEXAS
78520

December 2, 1974

BOARD OF COMMISSIONERS:
YONJ TARZA, JR., CHAIRMAN
JAM PATSELL, SECRETARY
M. J. FOM, JR., MEMBER
AL CISNEROS
GENERAL MANAGER AND
DIRECTOR OF THE PORT

Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Re: Draft EIS - Intra-Coastal Dredging

Gentlemen:

After reading the draft Environmental Impact Statement on the maintenance dredging of the Intra-Coastal Canal, I found very little to add to that very comprehensive study.

One economic benefit that might be expanded is the amount of Mexican cargo moved via the Intra-Coastal thru Brownsville:

<u>Domestic Internal Tonnage in the Year</u>	<u>Inbound</u>	<u>Outbound</u>
1971	332,301	913,158
1972	400,947	991,704
1973	566,864	852,557

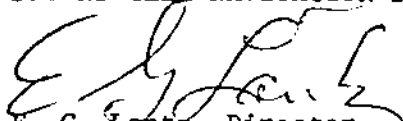
Handling of this tonnage provides jobs for the citizens of both countries; provides the U.S. with a favorable trade balance and with many raw materials that our industry needs.

No appreciable environment impact was found by the study. I have worked in the Brownsville-Port Isabel area for nearly twenty years and can see no bad effect on the environment from any maintenance dredging of the canals or channels.

Fishermen friends ask, "When will the dredge return? Fishing is good at the dredge."

I strongly favor the program of maintenance dredging.

Very truly yours,
BROWNSVILLE NAVIGATION DISTRICT


E. G. Lantz, Director
Engineering and Planning

EGL:ng

A-41

TELEPHONE (512) 631-4592

H-GAC HOUSTON-GALVESTON AREA COUNCIL

6 January 1975

Colonel Don S. McCoy, CE
District Engineer
P. O. Box 1229
Galveston, Texas 77550

Re: 412-17005
Maintenance Dredging
Gulf Intercoastal Waterway
Draft Environmental Statement

Dear Sir:

The Project Review Committee of the Houston-Galveston Area Council has reviewed the Draft Environmental Statement on the proposed maintenance dredging of the Gulf Intercoastal Waterway. We greatly appreciate the opportunity to comment on matters which affect the environment of our region. Many of the projects which occur in our region have an impact upon our planning for the region.

The following comments are offered by the H-GAC staff in an effort to avoid any unnecessary environmental damage:

1. Spoil disposal should be placed so as not to block fish passes, marshy areas, and tidal flats as well as natural entrances to channels, inlets, bayous, and inland lakes. These are particularly significant in the Chocolate Bayou Channel, Matagorda Bay, West Bay, and Colorado River Channels. In the cases where these situations may arise it is suggested that the spoil be placed behind levees above mean high tide and situated so that runoff from the spoil area is minimized.
2. Special care should be taken to avoid dispersal of dredged material in those areas where bottom deposits are above acceptable levels in oxygen demand materials or heavy metals.
3. All wastes, such as gasoline, oil, and sanitary wastes, should not be discharged directly into the water without proper treatment to acceptable levels.

Again, we appreciate the opportunity to comment on the draft environmental statement. If we can be of further assistance to you, please do not hesitate to contact me.

Cordially, regards -

Royal Hatch
ROYAL HATCH
Executive Director

RH:nr

P.O. BOX 22777
3701 WEST ALABAMA

A-42

713-627-3200
HOUSTON, TEXAS 77027



NATIONAL AUDUBON SOCIETY

2507 ROGGE LANE, AUSTIN, TEXAS 78723 - PHONE (512) 928-2047

January 17, 1975

Colonel Don S. McCoy
District Engineer
Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

RE: COMMENTS ON DRAFT ENVIRONMENTAL STATEMENT - MAINTENANCE
DREDGING GULF INTRACOASTAL WATERWAY, TEXAS SECTION,
CORPS OF ENGINEERS, 1974, VOL. I - TEXT

Dear Colonel McCoy:

We are sending our comments to you relative to your draft Environmental Statement on the maintenance dredging Gulf Intracoastal Waterway, Texas Section. Unfortunately we were delayed in our reply. Nevertheless, we hope that our comments will be seriously considered in the formulation of the final impact statement and plans for the dredging of this section of the Texas coast.

The following comments are the result of studies by our full-time staff research biologist, David Blankinship of Rockport. They reflect the concern of the National Audubon Society for rare and endangered species in this area and its general ecology. Our specific comments are as follows:

REFERENCE TO RARE & ENDANGERED SPECIES REACH II

Page 22, Para. 2.27 - In this area Eastern Brown Pelican is a year-round resident in Reach II. Seasoned at present in Reach I and III. Nested 1974 in Reach I and II.

REFERENCE TO SHORE & WADING BIRDS SAN ANTONIO TO CORPUS CHRISTI BAY

Page 30, Para. 2.65 - In this area several Major Heron, Egret, Gull and Tern nesting colonies are located along and near the Intracoastal Waterway. These are of considerably more importance to the respective species than the mentioned mottled duck nesting areas are to that species.

Colonel Don S. McCoy
Page Two
January 17, 1975

THIS SECTION PROVIDES A VERY INADEQUATE COMMENT
ON EFFECTS OF DREDGING ON THE ARANSAS N.W.R.

Page 30, Para. 2.66 - In way of enlightening the Corps of Engineers, the original dredging of the waterway through the heart of the prime whooping crane wintering range on the Aransas NWR caused serious loss of very limited habitat. The barge traffic through this waterway with cargos of highly toxic industrial chemicals and various petroleum products probably poses the greatest present threat to wintering whooping cranes. Spills of those cargos - which have occurred in and near the refuge - would contaminate food supplies and in the case of several chemicals, could kill a large portion of the whooping crane population outright.

Spoil deposition during past maintenance dredging operations has created additional crane habitat which helped mitigate the original losses of habitat. This new habitat resulted from the creation of shallow bays and marshes where the water was originally too deep for whooping crane use. Subsequent depositions, however, have destroyed some of this much needed habitat. Additional deposition in the shallow bays and marshes of the Aransas NWR area would be very detrimental to whooping crane feeding areas. Upland type areas created by additional deposition are of little value to the whooping cranes and are much less productive than marshes.

The present plan of placing spoil inside levees on higher areas along the waterway in the refuge (see Figs. 49-52) does keep spoil material from flowing into existing marshes and bays. This, however, seems at best a short term solution. We do not know what effect these growing spoil hills will have on whooping crane use of adjacent marshes and bays. The habitat is too limited and the situation too critical to allow much experimentation. Certainly we cannot build spoil mountains.

There does seem a good possibility of using maintenance spoil to create additional marsh and shallow water habitat in several areas on and near the Aransas NWR. The False Live Oak Point area, Dunham Island area, and the area between False Live Oak Island and Rattlesnake Island are possible locations.

Spoil could also be used to rebuild the rapidly eroding and nearby Second-Chain of Islands which are very important rookery islands and one of the very few (1-3) recent Texas nesting sites of the endangered Brown Pelican.

Another island in this area which needs additional spoil is Long Reef, an important Reddish Egret and Tern nesting site on the west side of channel between stations 855+000 and 860+000. Creation of additional isolated spoil islands in Aransas, San Antonio and Corpus Christi Bays would be desirable from an ornithological point of view.

Colonel Don S. McCoy
Page Three
January 17, 1975

CORPUS CHRISTI BAY TO MUD FLATS

Page 31, Para. 2.68 - We call your attention to the fact that nesting on these islands extends into July and often into August. There are several important nesting islands south of station 88+500.

ENVIRONMENTAL IMPACT OF PROPOSED ACTION COORDINATION

Page 43, Para. 4.02 - Reference is made to the Corps' "careful consideration" of individual disposal actions. Unfortunately this is not always effective - 1974 destruction of marsh and ponds just N. of junction of ICW and Channel to Victoria by filling with spoil was quite unnecessary. On site inspection by Fish and Wildlife Service, Parks and Wildlife, or NAS Biologists is urged.

ADVERSE EFFECTS OF SPOIL ISLANDS

Page 54, Para. 4.33 - 4.34 - There is considerable room for improvement in design and alignment of spoil islands. Most spoil areas parallel channels with little apparent regard to direction of prevailing winds or current. Elongate islands aligned parallel with currents and wind would erode more slowly and thus reduce the amount of spoil washing back into channels and provide more permanent nesting sites for birds.

A point which cannot be over-emphasized is the importance of isolation of rookery islands. Birds have a definite preference for islands separated by wide expanses of water or by deep channels rather than mainland areas or large islands which have populations of predators such as raccoons and coyotes. Many miles of spoil islands can be created, but if they are not widely separated enough to prevent or limit access by predators, they will not be used extensively as rookery sites.

OUR COMMENTS RELATING TO TABLES

TABLE 5 - Brown Pelican occurs in all three Reaches. Nested in 1974 Reaches I & II.

Your list is probably intended to cover all species which occur in the area, but several species are omitted which are directly affected by maintenance dredging operations which create, destroy or alter their nesting and feeding locations. Many of those species listed would not be affected (white-winged dove, wild turkey, woodpeckers, etc. Tropical kingbird, orchard oriole, ground dove).

Colonel Don S. McCoy
Page Four
January 17, 1975

Some omitted species are:

Clapper Rail	Royal Tern
Snowy Egret	Sandwich Tern
Great Egret	Fouster's Tern
Louisiana Heron	Laughing Gull
Black-crowned Night Heron	Little Blue Heron

TABLE 7 - Same inadequacies in listings as for birds. Two species which would be most affected by dredging operations are not listed.

Gulf Salt Marsh Snake (*Natrix sipedon clarki*)
Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*)

TABLE 8 - Eastern Brown Pelican nested in 1974 in Matagorda Bay just inside southern limit of Reach I (Sabine to Pt. O'Connor).

Southern Bald Eagle occurs occasionally in Reach II (Pt. O'Connor to Corpus).

We appreciate this opportunity to comment on the draft environmental statement for the maintenance dredging of the Texas Section of the Intracoastal Waterway. We may add to these comments when the final draft is prepared.

Generally we feel that the statement is lacking in its consideration and knowledge of some of the endangered species and affects of spoil disposal on their habitat, but we appreciate the opportunity to call this to the attention of the Corps of Engineers.

Sincerely,

John L. Franson
John L. Franson

Southwest Regional Representative

David R. Blankinship

David R. Blankinship
Staff Biologist

cc: Council on Environmental Quality
Environmental Protection Agency - Dallas
Fish and Wildlife Service, Dept. of Interior - Albuquerque
NOAA, Marine Fisheries Service - St. Petersburg
Texas Water Quality Board
Texas Parks and Wildlife Department
General Land Office, Texas
National Audubon Society - Charles H. Callison



SOUTHERN METHODIST UNIVERSITY

Environmental Law Clinic
Telephone: 214-692-2855

SCHOOL OF LAW
DALLAS, TEXAS 75275
February 2, 197

Col. Don S. McCoy, C. E.
Army Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, Texas 77550

Dear Col. McCoy:

Being from the Corpus Christi area and familiar with that area southward to Port Isabel, I have reviewed the Draft Environmental Impact Statement, specifically Reach III, and would like to make some comments thereon.

First, the (D)EIS is so vague and general that any detailed environmental assessment of the maintenance dredging project is virtually impossible. An environmental breakdown of the three Reaches, for example, would have been more informative, and generally more fair to the public at large in learning or discovering the actual effects of dredging in their area.

Secondly, without more in depth studies of unique environmental conditions or areas, for example, the impact on various endangered species listed in Table 8 and pages 18, 22, 25, and 43, the very purpose of impact statement is defeated. The inaccurate listing of the endangered species found along the Texas Coastline (as noted by the Texas Parks and Wildlife Department letter of 12-11-74) is itself evidence of lack of proper consideration of and study into the effects dredging will have on these species. Prohibiting dredging from March to June, the nesting months of many species of birds Cf. 82-68, which is to be highly commended, is the minimal type of protection that the endangered species should merit. Before the remainder of any endangered wildlife is possibly put in a more dangerous position, adequate studies should be required before dredging begins.

The study might try to pinpoint areas where the wildlife breed, feed, and rest so that dredging might be coordinated with the least detrimental times and places of such habits.

Specific Comments on Public Notices IWW-M-9 and IWW-M-4:

- 1.) Dredging schedules in the Corpus Christi Bay to Port Isabel area seem to never allow vegetation to regrow before dredging begins and covers it again. Although some terns, herons, the redish egret, and other wild-life do not need the vegetation, some species may require it for feeding, nesting, and resting. Dredging schedules, then might be geared to permit vegetation regrowth on some disposal sites while other adjacent or nearby sites are being continually recovered.
- 2.) Cf. 82.70 page 30. (DEIS) Openings between some existing disposal area (1) particularly the area from South Corpus Christi Bay, around channel marker No. 33, or from about the Encinal Pennsula to South Bird Island, (2) disposal area #208, 206, are inadequate or non-existent. This area has become one continuing stretch of spoil. The existing small channels have been ineffective either through failure to maintain or too small initial openings. A greater number and larger openings, (as suggested by U.S. Fish & Wildlife letter in general) should be constructed and maintained. 82.71 states that the openings will be maintained to prevent damaging compartmentalization for the area from Port Isabel to Mud Flats, but no such statement is made for the Mud Flats to Corpus Christi Bay area, where it is most desparately needed.

And further, as suggested by the EPA letter of Jan. 7, 1975, a short term monitoring program should be implemented to measure pollutants discharged into the receiving streams.
- 3.) Although access channels to the area known as the Hole have diminished massive fish kills, extension of these channels into deeper areas of the Hole would provide even more protection to fish from evaporation in extreme drought conditions.
- 4.) Fish habitats in the Mud Flats and sands will need particular care due to the already natural shallowness of the water. Of course, the entire Reach III region, the upper and lower Laguna Madre is shallow and needs special attention. Disposal areas should not block off water and fish passages between the disposal areas. The toe levees, "to be constructed sometime in the future" when spoil becomes 1.5 feet emergent above mean low water mark, should be constructed or refurbished by the time the open water disposal reach that level, not after they reach that level, to prevent further encroachment on already shallow bay bottoms.
- 5.) The Baffin Bay area, being ^a significant and highly productive environmental area, should receive special attention to prevent siltation into the Hay. Regular water quality checks and possible alternative disposal sites should be considered if water quality checks prove possible harmful effects.

- 6.) Disposal area #226, part of the Tributary Channel to Harlingen appears as if spoil will be deposited, or allowed to spill promiscuously into one corner of the Laguna Atascosa National Wildlife Refuge. I think before any encroachment into this area, this site should be specifically pointed out to the various agencies involved and cities involved with the refuge, as well as the general public.
- 7.) Finally, more information on the small boat harbor in Port Isabel should be revealed in order to analyze possible secondary environmental impact from increased recreational uses, and possible urban, apartment or resort area development. The massive expansion of such projects in recent years in Port Isabel indicates a need to coordinate any increase in water recreational facilities with planned land-use development.

Thank you for the opportunity to comment on this project. I request that that this letter be made a part of the record and all future Corps publications pertaining to Environmental Impact Statements and all public notices on Maintenance Dredging at Reach III.

Please acknowledge receipt of this letter.

Sincerely yours,



Johnnie Hammonds
Student

JH:ef

Col. Don S. McCoy
District Engineer
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Comments

Draft Environmental Impact Statement,
Maintenance Dredging GIWW, Texas Section

1. Survey and citation of pertinent literature is weak -- most publications are from out of state and have no direct applicability to the GIWW.
2. Too much reliance is placed upon past programs, procedures, and techniques of dredging and disposal with a consequent lack of validity to such broad statements as Adverse Effects (4.15).
3. 4.20 -- It would be beneficial if non-levee disposal areas are delineated in order to allow consideration for and development of alternate systems or actual levee/containment barriers to dredge material movement.
4. 4.21 - 4.26 -- Applicability of remote studies to GIWW sedimentation from dredging disturbance is questionable. The very uniqueness of the GIWW (as previously stated) should require a modicum of specialized study to evaluate existing conditions.
5. 4.36 -- Pollutants and their problems are not dealt with in an orderly/systematic fashion. No point source and attendant handling is discussed leaving, therefore, question as to the need of the section -- or is it just filler?
6. 5.10 -- Aesthetic problems are dismissed rather sharply; perhaps an expansion of this section would improve the acceptance to fisherman.
7. 6. -- Alternatives -- Although some are offered, there is a general lack of economic justification even though this is a major reason for dredging.
8. All biological sections contained in this study are weak.

Conclusion:

There is a general lack of forcefulness to the study. This in turn can lead to a general lack of credibility. Perhaps the situation has developed because "we have always done it this way, so why change?" A necessity for hard facts is evidenced by the lack of back-up statistics that will demonstrate the need and aesthetic compability of this dredging operation with an environmentally sound program.

Respectfully,



Bob Winn

BW/bk



SOUTHERN METHODIST UNIVERSITY

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Telephone: 214-692-2855

SCHOOL OF LAW
DALLAS, TEXAS 75275
March 11, 1975

Col. Don S. McCoy, C.E.
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Col. McCoy:

I wish to offer the following comments and request that they be made part of the record for the Environmental Impact Statement entitled, "Maintenance Dredging Gulf Intracoastal Waterway Texas Section."

In my opinion, a serious oversight in the Draft Environmental Impact Statement is that the dredging operation presently contemplated will result in a change in the fresh water drainage pattern. If the present proposal is implemented whereby breaks in the barriers between the marshes and fresh water sources may be located at intervals of up to three and four miles, improper water circulation will inhibit movement of crustaceans and fishes to and from the marshlands.

The result of inadequate spacing of these openings will be a decrease in fresh water circulation and an increase in salt water inflow resulting from natural tidal action.

I recommend that openings into the marshlands be located every one-fourth to one-half mile in order to distribute a greater quantity of fresh water in a more uniform manner.

Additionally, I recommend that the Corps of Engineers make every effort to coordinate its dredging activities with the migratory and nesting patterns of birds and waterfowl in significant feeding areas. If this is not done, the noise and activity could cause a substantial diminution in reproduction for that particular year.

I appreciate the opportunity to comment on this project and hope that you will consider my comments carefully.

Sincerely yours,

Joseph H. Fonfara
Joseph H. Fonfara
Student

A-52

JHF:ef



SOUTHERN METHODIST UNIVERSITY

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Telephone: 214-692-2855

SCHOOL OF LAW
DALLAS, TEXAS 75275
March 5, 1975

Col. Don S. McCoy, C. E.
Department of the Army
Galveston, District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

RE: Public Notice No. IWW-M-15,
Dated 10 February 1975.

Dear Col. McCoy:

The aforementioned Public Notice advises that an area extending from Matagorda Bay to the City of Palacios may be subject to dredging operations within the near future. This same notice states that the Draft Environmental Impact Statement for the entire main channel and tributaries of the G. I. W. W. (Texas Section) covers IWW-M-13.

My first comment pertains to utilizing the Master Environmental Plan without preparing a more specific plan for this particular area. While it is important to have a master plan a problem arises, in that it will have to be broad and general with regards to the environmental impacts occurring within this 16.1 mile area. Therefore, I propose before any action is taken by the Corps of Engineers a specific environmental impact statement should be prepared to acquaint the public with the specific environmental consequences of dredging this area.

Before an "emergency situation" develops, I suggest that the adverse effects of any dredging should be evaluated. Specifically, evaluations should be made regarding:

1. The impact of the project upon the natural physical environment and upon damage to the stream bottom;
2. The loss of habitat to ambient floral, fauna, recreational, and concomitant ecological loss;

3. The vegetation loss which functions as a primary habitat for holding sedentary species within the region, and finally;
4. As the subject area contrasts with surrounding land types it may be viewed as a separate ecosystem. Hence it too must be considered as it would be severely disrupted and permanently altered by the project. Therefore, a more through evaluation of this aspect should be made before proceeding.

My next comment pertains to the opening sentence of the paragraph entitled Environmental Statement. Why is it that whenever environmental considerations are discussed the economic and social benefits preclude the discussion of environmental effects? The National Environmental Policy Act of 1969 (P. L. 91-190) speaks toward the environment ^{AL} not social and economic consequences. The economic and social consequences ^{AL} should not be included within an Environmental Statement paragraph. What occurs by doing this is the comparing of social and economic consequences to the environmental effects of the proposed action. Again NEPA was not intended to present a forum for comparing these but rather for assessing the environmental impact. Therefore, I suggest that in the future, the Corps of Engineers refrain from commenting as to the economic and social consequences in the area entitled Environmental Statement. Due to

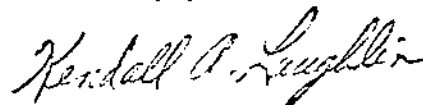
Due to the large number of Disposal areas further information should be given in the Public Notice concerning the environmental impact.

In conjunction with the above, the Final Environmental Impact Statement (GIWW) should cover the impact to the area and the longterm impacts to the environment. The secondary environmental impacts to onshore activities should be considered in order to evaluate the potential, perpetual environmental impacts caused by continued dredging. The secondary problems which should be studied consist of such things as future population, and associated items such as crime, public utilities, education, and streets, which increased population to the area will bring. Throughout the Draft Environmental Impact Statement (GIWW) the economic prosperity associated with continued dredging is stressed but never are the secondary environmental impacts associated with this activity mentioned, much less evaluated.

It is requested that these comments be made a part of the record and all future publications pertaining to the Draft Environmental Impact Statement and all public notices on this project.

Please acknowledge receipt of this letter.

Sincerely yours,



Kendall A. Laughlin
Student



SOUTHERN METHODIST UNIVERSITY

Environmental Law Clinic
Phone - 214 692 2855

SCHOOL OF LAW
DALLAS, TEXAS 75275

January 9, 1975

Col. Don S. McCoy
District Engineer
Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Dear Col. McCoy:

I request an extension to February 6 the deadline for filing comments on the Draft Environmental Statement on all segments of the maintenance dredging project known as Maintenance Dredging, Gulf Intracoastal Waterway, Texas Section.

I also object to any dredging or spoil-dumping on any part of the foregoing project prior to the filing of the final Environmental Impact Statement required by the National Environmental Policy Act.

I recommend that all suggestions made by the United States, Department of the Interior, Fish and Wildlife Service be followed and that no new areas of dumping be used. I likewise recommend that no spoil be dumped on any areas listed in the Preliminary Listing, Texas Natural Area Survey. If given an extension of time I shall comment in greater detail on these areas and other subjects. All measures needed to ensure a well coordinated plan which will result in minimal adverse effects on the environment are a must.

In your discussion of alternatives, you have not approached adequacy in considering the alternative of a comprehensive transportation plan for the Gulf Coast, not even for the Texas Gulf Coast. With the potentiality of a superport off the Texas Coast, it is possible that a plan could be devised for handling all necessary navigation in the Gulf, proper, or at least for reducing the size and draft of barges using the GIWW. Thus, the GIWW would be phased out, or at least the depth could be reduced. A complete phase out would

eliminate the girdling effect of the GIWW upon the interchange of fresh and saline waters, so essential to the complete health of the marine nursery. Either a complete phase out or reduction in depth would reduce the amount of spoil which would have to be dumped on land or in estuarine waters, and would thus reduce the environmental damages.

I request that this letter be made a part of the record and all future Corps publications pertaining to the Environmental Impact Statement and all Public Notices on the GIWW. The opportunity to comment on this maintenance project is appreciated.

Sincerely yours,



George Parker
Student

APPENDIX B

Disposal Area Coordination Letters

APPENDIX B

Disposal Area Coordination Letters

Main Channel

<u>Channel Reach</u>	<u>Page</u>
Port Arthur Canal to High Island	B-1
High Island to Port Bolivar	B-21
Galveston Bay to Matagorda Bay	B-38
Matagorda Bay to San Antonio Bay	B-60
San Antonio Bay to Corpus Christi Bay	B-76
Corpus Christi Bay to Mud Flats	B-94
Port Isabel to Mud Flats	B-115

Tributary Channels

<u>Channel</u>	
Chocolate Bayou	B-136
San Bernard River	B-164
Colorado River	B-176
Channel to Palacios	B-192
Channel to Victoria	B-205
Channel to Port Mansfield	B-224
Channel to Harlingen	B-238

SWCCO-N

12 March 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway between Fort Arthur Canal and High Island in Jefferson, Chambers and Galveston Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 1 May 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dwg. File No.
IHW 1101-237
(in 9 sheets)

WELDON H. GOSSEL
Chief, Construction-Operations Division

Copies furnished:
Bureau of Sport Fisheries
and Wildlife
Div. of Basin Studies
402 U.S. Court House
Ft. Worth, Tex. 76102 (w/incls in trip)

Mr. J. Hoagland
Nat'l. Marine Fisheries Svc
Biological Laboratories
4700 Avenue U
Galveston, Tex. 77550
(w/incl)

SWCCO-M

12 March 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Fort Arthur Canal and High Island in Jefferson, Chambers and Galveston Counties, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 1 May 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupe)
Dwg. File No.
IWW 1101-237
(in 9 sheets)

WELDON M. GAMBL
Chief, Construction-Operations Division



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

February 14, 1972

District Engineer
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter dated March 12, 1971, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between the Port Arthur Canal and High Island in Jefferson, Chambers, and Galveston Counties, Texas.

This letter is our report on the plan, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received concurrence from these agencies as indicated in the enclosed copies of letters from Executive Director, James U. Cross, dated October 5, 1971, and from former Regional Director, R. T. Whiteleather, dated October 12, 1971.

We have reviewed the proposed plan of spoil disposal for the reaches of the Gulf Intracoastal Waterway from the Port Arthur Canal at about Corps of Engineers Stations 0+00, to just east of State Highway 124 at Corps of Engineers Station 1615+50 as charted on 9 sheets of map No. IWW 1101-237, dated February 1971.

The designated spoil areas would lie on the south side of the Gulf Intracoastal Waterway between Stations 10+00 and 322+00, 964+00 and 1031+50, 1156+75 and 1488+50, and 1588+25 and 1615+50. The designated spoil areas would be on the north side of the waterway between Stations 319+00 and 956+50, 1009+25 and 1154+50, and 1487+00 and 1584+50.

Several disposal areas contain partial levees to prevent spillage of spoil material into bayous or openings flowing into the waterway. These areas include Salt Bayou between Stations 202+00 and

208+00, Spindletop Gully between Stations 880+50 and 892+00, the North Prong of Mud Bayou between Stations 1532+50 and 1533+50, an opening between Stations 1466+00 and 1468+50, and the west shoreline of Mud Bayou at Station 1588+25.

Other openings in the designated spoil areas, ranging from 150 feet to 900 feet in width, are located between Stations 483+00 and 485+00, 533+00 and 535+00, 576+00 and 577+50, 594+50 and 596+25, 643+00 and 647+00, 734+00 and 739+00, 798+00 and 807+00, 1082+00 and 1086+00, 1309+25 and 1311+25, and 1466+50 and 1468+50.

In most areas, the spoil material would be permitted to spill promiscuously beyond the point of discharge into tidal and freshwater marshes, lakes, and bayous.

This reach of the Gulf Intracoastal Waterway was cut through low-lying lands which comprised principally tidal or freshwater marshes, streams, and lakes. Spoil material from previous dredgings was placed on both sides of the waterway and has cut off most of the marshes from tidal influence. The J. D. Murphree Wildlife Management Area (formerly Big Hill Bayou Wildlife Management Area), administered by the Texas Parks and Wildlife Department, lies north and adjacent to the waterway between Stations 95+00 and 322+00.

Tidal streams and adjacent marshes which have not been cut off by spoil material or other obstacles provide high quality habitat used by many species of fishes and crustaceans for feeding, breeding, and nursery areas. The tidal marshes also contribute important nutrients to the waters. Some of the water areas cut off from tidal influence and other waters with low salinities provide feeding, nursery, and breeding habitat for many species of freshwater fishes.

Important species of fishes and crustaceans using the project area include spotted seatrout, red drum, black drum, Atlantic croaker, sheepshead, flounder, menhaden, striped mullet, spot, gar, bowfin, gizzard shad, channel catfish, blue catfish, yellow bass, largemouth bass, white crappie, bluegill and other sunfish, white shrimp, brown shrimp, and blue crab. Sport fishing and crabbing is intensive wherever public access is available for bank fishing and is slight elsewhere. There is little commercial fishing in this reach of the waterway.

Wildlife habitat in the project area consists of the tidal and freshwater marshes and streams, adjacent lakes, low-lying uplands,

and the spoil banks. Some of the finest marsh habitat in the State of Texas occurs along this reach of waterway.

The marshes, streams, and lakes provide feeding, resting, and nesting habitat for many species of waterfowl and other birds as well as important habitat for the American alligator, mink, otter, nutria, and muskrat. The low-lying uplands and the spoil banks are habitat for mourning doves, raccoons, opossums, rabbits, skunks, coyotes, and red wolves.

Small to moderate populations of mourning doves, raccoons, opossums, mink, otters, American alligators, and red wolves use the marshes and designated spoil areas. Populations of rabbits, nutria, and muskrats are fairly large. While mink, otters, and red wolves occur in few to moderate numbers, their density in this reach is among the highest in the State. Hunting is slight for game species in general. However, rabbit hunting is fairly intensive. Trapping occurs in moderate amounts for mink and otter, and to a greater extent for muskrat and nutria. The amount of hunting and trapping is expected to remain the same in the future.

Important species of waterfowl in the project area include the Canada goose, snow goose, white-fronted goose, mallard, pintail, mottled duck, American widgeon, gadwall, green-winged teal, blue-winged teal, shoveler, lesser scaup, canvasback, ring-necked duck, ruddy duck, and coot. Most of the waterfowl use is by migrants during the winter months. The marshes, including those adjacent to existing spoil banks, are prime nesting habitat for the mottled duck which is a resident species. Waterfowl hunting is popular and is expected to remain so in the future.

Many other birds use the project area for nesting, feeding, resting, and cover. Among these are grebes, mergansers, herons, egrets, bitterns, ibises, roseate spoonbills, rails, gallinules, gulls, terns, plovers, sandpipers, and common snipe.

Several species of wildlife in the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States." The American alligator and red wolf are listed as endangered species while the reddish egret and the roseate spoonbill are listed as peripheral.

Spoil placement from previous maintenance dredging has resulted in the loss and deterioration of valuable marsh habitat. Spoil in

many places has blocked off the marshes adjacent to the waterway, preventing any tidal influx and the ingress and egress of juvenile fishes and crustaceans which use the marshes as nursery habitat.

Without additional safeguards, maintenance dredging could cause further loss and deterioration of valuable fish and wildlife habitat. Spoil only partially contained would spill onto irreplaceable marsh habitat as well as physically displace valuable shallow streams and lakes. Work conducted while mottled ducks are nesting could destroy the nests and drive the birds away from the area. The peak nesting period for these birds is from early March to late May.

We have compared the proposed spoil disposal plan with spoil areas used in the past as shown on recent aerial photographs and nautical charts of the area. Based on this information and information supplied by biologists of the Texas Parks and Wildlife Department and the National Marine Fisheries Service, several modifications and changes of the plan are proposed.

To prevent further destruction and deterioration of fish and wildlife habitat and losses of fish and wildlife resources, extreme care should be taken to place dredged material within designated spoil areas. Spoil material should be contained so that spillage onto marshes would be highly unlikely, and if it does occur the spillage could be easily detected and promptly halted.

North of the waterway, approximately between Stations 630+00 and 827+00, lies an abandoned freshwater reservoir of about 8,000 acres. This reservoir is actually a marsh that has been leveed. The reservoir varies in depth from about six inches to four feet and provides invaluable fish and wildlife habitat. The entire reservoir provides feeding and breeding habitat for waterfowl, shore and wading birds, numerous furbearers, and freshwater fish. In addition, this 8,000-acre reservoir supports the largest concentration of American alligators in Texas. Monetary values of the reservoir are significant in that the reservoir is leased for waterfowl hunting for \$:00 per gun and also for fur trapping. In order to protect this valuable fish and wildlife habitat, no spoil should be placed north of the waterway between Stations 630+00 and 827+00. Spoil instead should be placed south of the waterway possibly between Stations 630+00 and 790+00 and 810+00 and 850+00.

In order to protect valuable marsh habitat, no spoil should be placed south of the waterway between Stations 1010+00 and 1031+50.

Prior to any maintenance dredging, existing levees should be refurbished and new levees should be constructed and subsequently refurbished on the ends and at a distance of 1,650 feet from the centerline of the channel for each spoil area between Stations 60+00 and 1615+50.

Drainage of all spoil areas should be controlled by weirs to retain the solids within the confined areas, and whenever possible drainage should be directed into the Gulf Intracoastal Waterway. Where ditches are required to drain spoil areas, these ditches should be inspected frequently and kept free of sediment buildup to prevent spillage of the dredged effluent into marsh areas.

To retain water circulation and permit the ingress and egress of fishes and crustaceans into the streams, lakes, and their adjacent marshes, all existing openings entering the waterway should be kept open and maintained at their natural widths and depths. These openings would include Salt Bayou, Seth Slough, Barnes Slough, Oil Well Slough, Mud Bayou, and North Prong Mud Bayou.

Frequent inspection of spoil disposal operations should be made of leveed spoil areas to prevent accidental spillage of dredged materials outside of the levees.

Prior to the issuance of contracts for maintenance dredging in this reach of the waterway, the Corps of Engineers should notify the Regional Director, Texas Parks and Wildlife Department, La Porte, Texas, of the proposed work to permit him to review the dredging program.

It is recommended that:

1. No spoil material be placed north of the waterway between Corps of Engineers Stations 630+00 and 827+00 and south of the waterway between Stations 1010+00 and 1031+50
2. Spoil be placed south of the waterway between Stations 630+00 and 790+00, and 810+00 and 850+00.
3. Prior to any maintenance dredging operation, existing levees be refurbished and new levees be constructed and subsequently refurbished on the ends and at a distance of 1,650 feet from the centerline of the channel for each spoil area between Stations 60+00 and 1615+50.

4. Drainage of all spoil areas be controlled by weirs and whenever possible this drainage be directed into the Gulf Intracoastal Waterway.
5. Where ditches are required to drain spoil areas, these ditches be inspected frequently and kept free of sediment buildup to prevent spillage of the dredged effluent into marsh areas.
6. All existing drainages, such as streams and bayous, entering the Gulf Intracoastal Waterway be kept open and maintained at their natural widths and depths.
7. Spoil disposal operations be inspected frequently to prevent accidental spillage of dredged material outside of the leveed spoil areas.
8. Prior to the issuance of contracts for maintenance dredging in the project area, the Corps of Engineers notify the Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the proposed work to permit review of the dredging program.

Should it become necessary to change the location or size of any disposal area, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the proposed plan for disposal of spoil from maintenance dredging of the Gulf Intracoastal Waterway from Port Arthur Canal to High Island, Texas, is appreciated.

Sincerely yours,



Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Rec., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Region, Albuquerque, N. Mex.
- (2) Field Supervisor, BSFW, Div. of River Basin Studies, Fort Worth, Tex.

TEXAS
PARKS AND WILDLIFE DEPARTMENT

COMMISSIONERS

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CHAIRMAN, AUSTIN

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MEMBER, SAN ANTONIO

JACK R. STONE
MEMBER, WELLS



JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

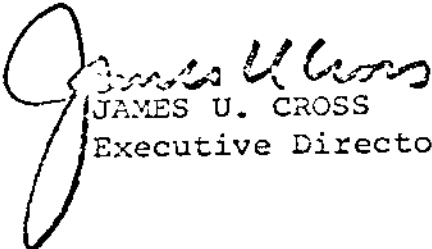
October 5, 1971

Mr. William M. White
Acting Regional Director
United States Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

The Review Draft report dated September 22, 1971, on plan for spoil disposal, Gulf Intracoastal Waterway, Port Arthur Canal to High Island, has been reviewed by this Department. We concur in the report as presented.

Sincerely,


JAMES U. CROSS
Executive Director



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

Date: October 12, 1971

Reply to
Attn of: FSE21

National Marine Fisheries Service
144 First Avenue South
St. Petersburg, Florida 33701

Subject: BSWF draft report, Spoil disposal, Gulf IWW, Port Arthur Canal to
High Island, Texas (COE)

To: Regional Director
Bureau of Sport Fisheries & Wildlife
Albuquerque, New Mexico 87103

Reference is made to Mr. William M. White's letter dated
September 22, 1971, transmitting a copy of subject draft report
and requesting our review and comments.

We have reviewed this report and concur with your findings and
recommendations.


R. T. WHITELEATHER
Regional Director

DANNENBAUM ENGINEERING CORPORATION

CONSULTING ENGINEERS

P. O. Box 22292, 3915 ESSEX LANE, HOUSTON, TEXAS 77027

AREA CODE 713 - NA 2-8011

July 13, 1972

Colonel Nolan C. Rhodes, District Engineer
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel Rhodes:

On behalf of my clients, Horizon Corporation and Planet Oil, I want to thank you for the cooperation we have received from your staff and for the alternatives that we have been provided for consideration in relation to the disposal of maintenance spoil material on their property. After careful consideration, a review of the physical conditions on the site, we have decided that it would be preferable at this time to have the dredged material deposited on the north side where the government presently has perpetual disposal rights rather than granting new disposal rights on the south side.

It is my understanding from my previous conversation with Mr. Glenn Reynolds that as part of this operation on the north side the government would maintain the existing levee immediately adjacent to the canal, and similarly would construct new levees on the north side of the disposal area at a distance not to exceed the 1,650 feet from the centerline as mentioned in your letter so that the spoil material would not be allowed to cover the entire fresh water reservoir. In this connection we would also appreciate your so locating disposal areas on the north side so as not to block the present existing cattle pass which is immediately adjacent and to the east of the levee on the fresh water reservoir.

In the future we would appreciate the opportunity to discuss with your staff the possibility of transferring and redefining some of the disposal areas, but for this present operation plan to take place in the immediate future we feel that the location on the north side would be preferable.

Page Two

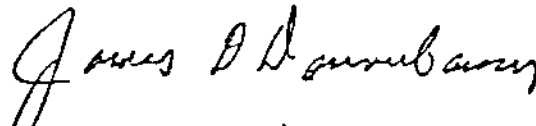
Colonel Nolan C. Rhodes, District Engineer
Department of the Army
Galveston District, Corps of Engineers

July 13, 1972

We certainly appreciate your patience in allowing us the time to work out this matter; and as I am sure you understand, when two large corporations are partners in a venture of this sort some time is required for coordination and decision making.

Sincerely yours,

DANNENBAUM ENGINEERING CORPORATION


James D. Dannenbaum, P. E.
President

JDD/pjk

XC: Mr. Glenn Reynolds ✓
Mr. George R. Rothen
Mr. Frank A. Schultz
Mr. William G. Webb
Mr. Joseph Timan
Mr. Sidney Nelson
Mr. Russell Wilde
Mr. L. E. Steele

SWGCO-M

22 February 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to your report dated 14 February 1972 concerning disposal plans for maintenance dredging operations in the Gulf Intracoastal Waterway between the Port Arthur Canal and High Island in Jefferson, Chambers and Galveston Counties, Texas which was forwarded by letter referenced KB, dated 17 February 1972 from Mr. William M. White.

Since we have no disposal easements on the south side of the Gulf Intracoastal Waterway between Stations 630+00 and 327+00 we have attempted a trade with the owners who control the lands on both sides of the waterway. Our negotiations however have shown that they do not want any material deposited south of the waterway. It is therefore necessary that we exercise our perpetual disposal rights on the north side. Where considered practicable, we plan to construct back levees for the disposal areas to a maximum distance of 1,650 feet north of the waterway centerline; however, in those areas in the reservoir where the water depth will not permit stable construction of back levees, these structures will be located closer to the waterway. The land owners are agreeable to this plan.

Our next maintenance dredging work in this area which is scheduled for advertisement in the fourth quarter of FY 1973, will include the construction of leveed disposal areas across portions of the fresh water reservoir.

Sincerely yours,

NOLAN C. RHODES
COLONEL, CE
DISTRICT ENGINEER

SWCCO-M

8 June 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to your report dated 14 February 1972 concerning disposal plans for maintenance dredging operations in the Gulf Intracoastal Waterway between the Port Arthur Canal and High Island in Jefferson, Chambers and Galveston Counties, Texas, which was forwarded by letter referenced RB, dated 17 February 1972, from Mr. William M. White. Reference is also made to a reply thereto, letter SWCCO-M dated 22 February 1973, wherein you were advised that we could not comply with your recommendation to place dredged material on the south side of the waterway, between channel Stations 630-00 and 827-00, because our negotiations with the landowner to trade our perpetual disposal right from the north side to the south side of the channel were unsuccessful.

Pursuant to some landowners objections to our contracted disposal operations on their properties between GIWW, Mile 303 and High Island, Texas, we have recently coordinated a plan with other landowners for disposal of dredged materials on their properties in another reach between GIWW, Mile 303 and Port Arthur Canal. Some landowners objected to the proposed plan for disposal of dredged materials on their lands. Our plans were revised and the deviations from the approved coordinated plan are reflected on the attached drawing, File No. IWW 1101-239, Sheets 1 through 11 of 11. This drawing was issued with the attached Invitation for Bids on 5 June 1973 with bid opening scheduled for 22 June 1973.

SWGCO-M

8 June 1973

Mr. W. O. Nelson, Jr.

A revised plan reflecting deviations negotiated with landowners along the channel from CIW, Mile 308 to High Island, Texas, will be furnished when updated in the near future.

Sincerely yours,

2 Incls

1. Specifications
2. Dwg., File No.
IWW 1101-239 (11 sheets)

NOLAN C. RHODES
Colonel, CE
District Engineer

Copy furnished:

Mr. John G. Degani
Bureau of Sport Fisheries
and Wildlife
Fort Worth, Texas 76102
w/incls in dupe

B. Cy furnished:

Pt. Arthur A.O.
wo/incls.

ENVIRONMENTAL PROTECTION AGENCY

Water Quality Office
1402 Elm Street, Third Floor
Dallas, Texas 75202

May 10, 1971

Your Ref: SWGCO-M

District Engineer
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Attention: Mr. Welden M. Gamel, Chief
Construction-Operations Division

Dear Sir:

Reference is made to your letter of March 12, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Port Arthur Canal and High Island in Jefferson, Chambers and Galveston Counties, Texas. The drawings were also submitted to The Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

1. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the Intracoastal Waterway.
2. The dredging operations should be performed in a manner that will reduce turbidity to the lowest practicable level.
3. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters to adjacent waters.
4. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.
5. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

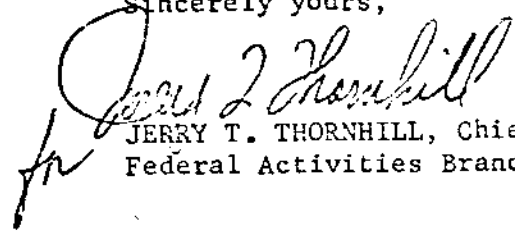
Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely yours,


JERRY T. THORNHILL, Chief
Federal Activities Branch

cc: Texas Water Quality Board
Attn: Mr. Hugh C. Yantis, Jr.
Executive Director

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
VICE-CHAIRMAN
LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



J. E. PEAVY, M.D.
RON JONES
BYRON TUNNELL
HUGH C. YANTIS, J.
EXECUTIVE DIRECTOR

1108 LAVACA ST 475-2651
AUSTIN, TEXAS 78701

April 1, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal Plan
for Gulf Intracoastal Waterway
Maintenance (Port Arthur Canal
to High Island)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your March 16, 1971 request for a review of the Corps of Engineers' Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Port Arthur Canal and High Island in Jefferson, Chambers, and Galveston Counties, Texas. You also requested our comments concerning water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the

Mr. Richard A. Vanderhoof

Page 2

April 1, 1971

field, but it has to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

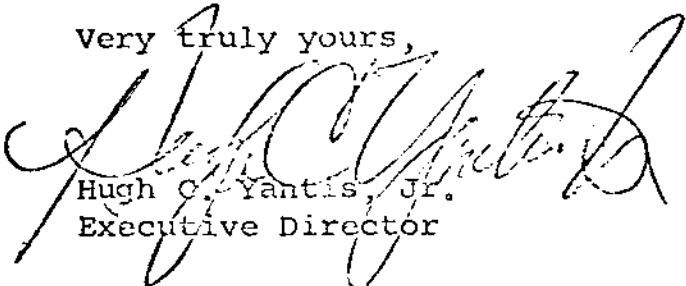
It is suggested that you secure Texas Parks and Wildlife Department approval of this project, since it involves the disturbance of the bottom of the Intracoastal Waterway.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline, or other fuels capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

cc: Texas Water Quality Board Districts 6 & 7
Corps of Engineers, Galveston District
Texas Parks & Wildlife Department

SWGCO-M

10 December 1970

Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for re-coordination are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway between High Island and Fore Bolivar in Chambers and Galveston Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 31 January 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Log. File No.
HW 1001-237
(in 5 sheets)

CHARLES F. BAKER
Chief, Construction-Operations
Division

Copy furnished:
Bureau of Sport Fisheries
and Wildlife
Division of Data Studies
401 U.S. Court House
Fort Worth, Texas 76102
(w/incls in trip)

SW000-M

10 December 1970

Regional Director
Bureau of Sport Fisheries
and Wildlife

Copy furnished: (cont'd.)
Mr. J. Hooplani
National Marine Fisheries Service
Biological Laboratories
4700 Avenue U
Galveston, Texas 77550

SWGCO-M

15 December 1970

Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between High Island and Port Bolivar in Chambers and Galveston Counties, Texas.

It is requested that this plan be coordinated with Texas Water Quality Board and that approval and/or comments be furnished not later than 31 January 1971.

This plan is being re-coordinated with fish and wildlife agencies.

Sincerely yours,

1 Incl (in dup)
Dwg. File No.
IWW 1101-237
(in 5 sheets)

CHARLES F. BAEHR
Chief, Construction-Operations
Division



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

September 10, 1971

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Charles F. Baehr's letter of December 10, 1970, referenced SWGCC-M, enclosed for our review drawings depicting plans for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway between High Island and Port Bolivar in Chambers and Galveston Counties, Texas.

This letter is our report on the plan, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service. It has received concurrence from the Texas Parks and Wildlife Department as indicated in the enclosed copy of the letter from the Interim Executive Director, Ron Jones, dated March 18, 1971.

We have reviewed the proposed plan of spoil disposal for the reach of the Gulf Intracoastal Waterway from State Highway No. 124, at about Corps of Engineers Station 1620+00, to the tip of Port Bolivar Peninsula at Corps of Engineers Station 3200+00 as charted on five sheets of map No. IAW 1103-237, dated October 1970.

Most of the waterway in the study area is cut through land except for several short reaches which lie at the edge of East Bay. The proposed designated spoil areas are on either side of the waterway within the study area.

Between Stations 1620+00 and 1963+60, the designated spoil areas are partially or entirely leveed. Except for two small areas, the spoil areas are south of the waterway.

Beyond Station 1963+60 to the terminus of the study at Station 3200+00, all but two designated spoil areas are north of the waterway. One of these areas is in bay water at the entrance to Horseshoe Lake at about Station 3200+00. The other is on land in the Port Bolivar community. Only one other designated spoil area lies entirely in bay water. It lies north of the waterway in Galveston Bay between Stations 3134+00 and 3190+00.

Several spoil areas are designed to permit spillage of dredged materials into bay waters. These areas are located in Galveston Bay between Stations 2818+00 and 2860+00, and 2880+00 and 3009+00; and in East Bay between Stations 2000+60 and 2018+00, 2060+00 and 2107+00, 2175+00 and 2180+00, 2472+00 and 2490+00, and 2495+40 and 2590+00.

The project channel traverses important fish and wildlife habitat in the study area. It crosses tidal marshes, tidal streams, low-lying uplands, and small portions of East Bay.

The bay areas in the vicinity of the project channel have shallow water depths of less than 3 feet below mean low tideline and contain submerged aquatic vegetation. The bay areas and tidal marshes and streams provide high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery habitat. The tidal marshes also furnish important nutrients to the bays. Roll-over Pass, a man-made opening linking East Bay to the Gulf of Mexico, is important for the migration of fishes and crustaceans to and from both areas.

Important species of fishes and crustaceans using the work area include spotted seatrout, sand seatrout, red drum, black drum, Atlantic croaker, anchovy, menhaden, sea catfish, spot, flounder, striped mullet, brown shrimp, white shrimp, and blue crab. Oysters also are common throughout East Bay. Sport fishing is very heavy in East Bay while commercial fishing is light for finfishes and heavy for shrimp and oysters.

Wildlife habitat in the project area consists of the bays, tidal marshes, tidal streams, low-lying uplands, and the spoil banks and mounds.

The bay areas, tidal marshes, and tidal streams provide feeding, resting, and nesting habitat for many species of waterfowl and other birds while the tidal marshes and streams also provide important habitat for the American alligator, mink, otter, nutria,

and muskrat. The low-lying uplands and the spoil banks and mounds provide habitat for mourning doves, raccoons, opossums, rabbits, coyotes, and red wolves.

Light to moderate populations of mourning doves, raccoons, opossums, rabbits, minks, otters, American alligators, coyotes, and red wolves are found in the project area. Populations of nutria and muskrats are fairly large. Hunting is light for all game species and is expected to remain so in the future. Trapping is fairly intense for muskrats and moderate to light for minks, otters, and nutria.

Important species of waterfowl in the project area include the Canada goose, white-fronted goose, snow goose, pintail, shoveler, gadwall, American widgeon, blue-winged teal, green-winged teal, mottled duck, fulvous tree-duck, redhead, canvasback, lesser scaup, ring-necked duck, ruddy duck, and coot. Most of the waterfowl use is by migrants during the late fall and winter months. The mottled duck is a resident species while the fulvous tree-duck is found primarily during the summer and early fall months. Waterfowl hunting is important.

Many other birds use the project area for nesting, feeding, resting, and cover. Among these are pelicans, herons, egrets, bitterns, ibises, roseate spoonbills, rails, gallinules, gulls, terns, plovers, sandpipers, common snipe, and peregrine falcons.

Several species of wildlife in the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States." The red wolf, brown pelican, peregrine falcon, and American alligator are listed as endangered species while the reddish egret and the roseate spoonbill are listed as peripheral species.

Without proper safeguards, the placement of spoil in the work area could cause the loss and deterioration of fish and wildlife habitat. In some areas, spoil could spill onto irreplaceable marsh habitat, while in others, it could fill in shallow vegetated water areas.

To prevent destruction and deterioration of fish and wildlife habitat and losses of fish and wildlife resources, extreme care should be taken to place and contain spoil materials from dredging within designated spoil areas in a manner that holds spillage into bay waters and onto marshes to a minimum, and capable of being detected easily and halted quickly should it occur.

To accomplish this objective, the length of some designated spoil areas should be reduced. In other areas, spoil materials should not be deposited. In some areas, existing levees should be refurbished and, in others, new levees should be constructed.

The designated spoil areas between Stations 2495+40 and 2590+00, 2610+00 and 2860+00, and 2880+00 and 3009+00 should be reduced in length to 2500+00 and 2590+00, 2610+00 and 2850+00, and 2900+00 and 3009+00, respectively, to prevent spoil from entering bay waters.

Prior to maintenance dredging operations, existing levees should be refurbished and other levees should be constructed to confine spoil materials within designated spoil areas, except in the reaches from Stations 2060+00 and 2107+00, 2500+00 and 2590+00, 2900+00 and 3009+00, and 3015+00 and 3190+00.

Drainage of designated spoil areas on land should be controlled by weirs to retain the solids within the confined areas. Drainage from these areas should be into the Gulf Intracoastal Waterway. In instances where the only possible way to drain the spoil area is through the rear or side levee of a designated spoil area, ditches should be constructed and maintained along the levee to enable the effluent passing over the weir to drain directly back into the Gulf Intracoastal Waterway. During dredging operations, the ditch should be monitored often enough and kept sufficiently free of sediment buildup so that flow of dredged effluent into the adjacent marshes will be unlikely.

Between Stations 2060+00 and 2107+00, 2500+00 and 2590+00, 2900+00 and 3009+00, and 3015+00 and 3190+00, dredged materials should be placed at the water's edge. When any part of the bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,350 feet from the centerline of the channel, toe levees should be constructed and subsequently refurbished before each dredging operation on the ends and 1,350 feet from the centerline of the channel on the emergent bank to prevent spillage of materials beyond that point and to preserve the ecology of the bay. Until the spoil bank in each of the above designated spoil areas becomes continuous and emergent at 1.5 feet above mean low tide at a distance of 1,350 feet from the centerline of the channel, the points of discharge should be relocated frequently to permit uniform buildup of spoil materials equally distant from the centerline of the channel.

In the reach between Stations 3015+00 and 3190+00 only, a bulkhead levee may be constructed instead at a distance of 2,300 feet from

the centerline of the channel. This levee should tie into the peninsula at the ends of the designated spoil areas. Dredged materials deposited within this area would be contained long enough for the heavier materials to settle out.

Daily policing of spoil disposal operations at leveed spoil areas should be made to reduce the possibility of accidental spillage of dredged materials outside of these areas.

Spoil should not be placed in bay waters south of the waterway at the entrance to Horseshoe Lake at about Station 3200+00. Neither should spoil materials be permitted to spill into bay waters between Stations 2000+60 and 2018+00, 2175+00 and 2180+00, 2472+00 and 2490+00, 2495+40 and 2500+00, 2818+00 and 2850+00, and 2880+00 and 2900+00.

Care should be taken to prevent spoil from spilling onto marshes from designated spoil areas on the south side of the waterway between Stations 1620+00 and 1963+60 and north of the waterway between Stations 2180+00 and 2310+00, 2355+00 and 2472+00, and 2610+00 and 2820+00. Care also should be taken to prevent spoil materials from spilling into pass openings. These openings, centered at about Stations 1837+00, 1878+00, 2353+00, 2492+00, 2605+00, and 2870+00, should be maintained to permit normal water circulation.

Prior to the issuance of contracts for maintenance dredging in this reach of the waterway, the Corps of Engineers should notify the Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the proposed work to permit him to review the dredging program.

It is recommended that:

1. Spoil materials be placed and contained only within designated spoil areas and drainage of these areas be done as specified in this report.
2. The designated spoil area between Corps of Engineers Stations 2495+40 and 2590+00, 2610+00 and 2860+00, and 2880+00 and 3009+00 be reduced in length to 2500+00 and 2590+00, 2610+00 and 2850+00, and 2900+00 and 3009+00, respectively, to prevent spillage of materials into bay waters.

3. Prior to maintenance dredging of the area, existing levees be refurbished and other levees be constructed to confine spoil materials within designated spoil areas, except in reaches between Corps of Engineers Stations 2060+00 and 2107+00, 2500+00 and 2590+00, 2900+00 and 3009+00, and 3015+00 and 3190+00.
4. Drainage of designated spoil areas on land be controlled by weirs and that drainage be into the Gulf Intracoastal Waterway.
5. Where ditches are required along levees to drain designated spoil areas on land, these ditches be monitored frequently and kept free of sediment buildup to prevent spillage of the dredged effluent into marsh areas.
6. Dredged materials be placed at water's edge between Corps of Engineers Stations 2060+00 and 2107+00, 2500+00 and 2590+00, 2900+00 and 3009+00 and 3015+00 and 3190+00 when any part of the bank becomes emergent at 1.5 feet above mean sea level at a distance of 1,350 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished before each dredging operation on the ends and 1,350 feet from the centerline of the channel and this levee should tie into the peninsula at the ends of the designated spoil areas.
7. Until the spoil bank in each designated spoil area, as listed in Recommendation No. 6, becomes continuous and emergent at 1.5 feet above mean low tide at a distance of 1,350 feet from the centerline of the channel, the points of discharge be relocated frequently to permit uniform buildup of spoil materials equally distant from the centerline of the channel, except between Stations 3015+00 and 3190+00 if a bulkhead levee is constructed at a distance of 2,300 feet from the centerline of the channel.
8. Spoil disposal operations be policed daily to reduce the possibility of accidental spillage of dredged materials outside of the leveed spoil areas.
9. No spoil be placed in bay waters south of the waterway at the entrance of Horseshoe Lake at about Corps of Engineers Station 3200+00.

10. Spoil materials not be permitted to spill into bay waters between Corps of Engineers Stations 2000+60 and 2018+00, 2175+00 and 2180+00, 2472+00 and 2490+00, 2495+40 and 2500+00, 2818+00 and 2850+00, and 2880+00 and 2900+00, where this may occur.
11. Spoil materials not be permitted to spill onto marsh areas south of the waterway between Corps of Engineers Stations 1620+00 and 1963+60 and north of the waterway between Stations 2180+00 and 2310+00, 2355+00 and 2472+00, and 2610+00 and 2820+00.
12. Spoil materials not be permitted to spill into pass openings centered at about Corps of Engineers Stations 1837+00, 1878+00, 2353+00, 2492+00, 2605+00, and 2870+00 to permit normal water circulation.
13. The Corps of Engineers notify the Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the time schedule of the proposed work to permit him to review the dredging program.

Should it be necessary to change the location or size of any disposal area or openings between designated spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the Corps of Engineers proposed plan to dispose spoil from maintenance dredging of the Gulf Intracoastal Waterway from High Island to Port Bolivar is appreciated.

Sincerely yours,



W. O. Nelson, J.
Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Texas
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Florida
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Texas
- (2) Regional Director, Bureau of Outdoor Recreation, Denver, Colorado
- (2) Regional Director, Water Quality Office, EPA - Reg. VI, Dallas, Texas
- (1) Field Representative, USDI, SW Region, Albuquerque, New Mexico
- (1) Field Representative, Nat'l Audubon Soc., Austin, Texas
- (1) Director, Sanctuary Dept., Nat'l Audubon Soc., Sharon, Connecticut
- (2) Field Supervisor, BSFW, Div. of River Basin Studies, Fort Worth, Texas

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PARKS AND WILDLIFE DEPARTMENT

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RON JONES
INTERIM EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

March 18, 1971

Mr. W. O. Nelson, Jr.
Acting Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Re: RB

Dear Mr. Nelson:

This is in response to your letter of March 1, 1971 and the attached Review Draft of a report concerning the Corps of Engineers plan for spoil disposal, Gulf Intracoastal Waterway, High Island to Port Bolivar, Texas.

We have reviewed this draft and concur with the report as presented.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Ron Jones".

Ron Jones
Interim Executive Director

RJ:KCJ:ga

cc: Mr. John Degani, BSEW, Fort Worth, Texas

KB 76

NAME OF AGENCY
NATIONAL MARINE FISHERIES SERVICE

PRECEDENCE
ACTION:
INFO:
TYPE OF MESSAGE
 SINGLE BOOK
 MULTI-ADDRESS

ACCOUNTING CLASSIFICATION

CLASSIFICATION
STANDARD FORM 14 REV. MARCH 15, 1957
GSA REGULATION 2-4-301-00
14-004
TELEGRAPHIC MESSAGE
OFFICIAL BUSINESS
U. S. GOVERNMENT

THIS BLOCK FOR USE OF COMMUNICATIONS UNIT

START MESSAGE ADDRESS HERE

GSA FTS ATL

BCF ST PB
3/19/71 10:00 7319

REGIONAL DIRECTOR
BUREAU SPORTS FISHERIES & WILDLIFE
ALBUQUERQUE,
NEW MEXICO

REFERENCE YOUR DRAFT REPORT DATED MARCH 1, 1971 ON SPOIL
DISPOSAL PLANS FOR GULF INTRACASTAL WATERWAY, HIGH ISLAND
TO PORT BOLIVAR, TEXAS.

WE HAVE REVIEWED AND CONCUR WITH FINDINGS AND RECOMMENDATIONS
OF THIS REPORT.

E. J. BRAKKE
ACTING REGIONAL DIRECTOR

END MW

B-33

PAGE NO. NO. OF PAGES

NAME AND TITLE OF ORIGINATOR (Typed)
E. L. ARNOLD *E. L. Arnold*

ORIGINATOR'S TEL. NO.

DATE AND TIME PREPARED
3/19/71 8:20 AM

I certify that this message is official business, is not personal, and is in the interest of the Government.
E. J. Brakke
Signature

SECURITY CLASSIFICATION

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, 3rd. Floor
Dallas, Texas 75202

February 1, 1971

Your Ref: SWGCO-M

Mr. Weldon M. Gamel
Chief, Construction - Operations Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Dear Mr. Gamel:

Reference is made to Mr. Charles F. Baehr's letters of December 15 and 31, 1970 forwarding plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway at the following locations:

1. Port Isabel to Mud Flats in Cameron, Willacy and Kenedy Counties, Texas
2. High Island to Port Bolivar in Chambers and Galveston Counties, Texas
3. Corpus Christi Bay to Mud Flats in Nueces, Kleberg and Kenedy Counties, Texas.

These projects have been coordinated with the Texas Water Quality Board and have been reviewed in accordance with Executive Order 11507.

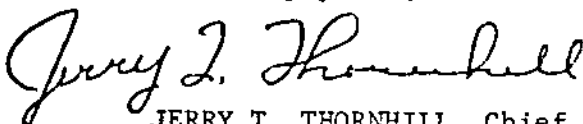
Our review has been made almost exclusively on the information furnished in the referenced spoil disposal areas plans. It has not been feasible to make a detailed study, or sediment analyses including inspections and evaluations in the field. The following recommendations are provided for your guidance in the above maintenance dredging operations:

1. The Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service should be contacted regarding the dredging operations and spoil disposal locations and procedures for protection of wildlife, fowls and aquatic life. Disturbances of bay bottoms on state - owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shell fishing.

2. Whenever it appears that the bottom might be polluted, you should request the dredger to provide an analysis of the material. The Environmental Protection Agency should perform the analyses on Corps - conducted dredging, projects.
3. The dredging operations should be performed with the minimum production of turbidity in the waters where the work is taking place.
4. Spoils should be placed in approved locations in such a manner as to minimize the run off of the spoil or highly turbid waters into adjacent waters.
5. The discharge of petroleum products or other hazardous materials capable of causing water pollution arising from the dredging operations should be prohibited.
6. Sanitary wastes that are generated during the operations should be retained for disposal on shore in approved secondary treatment facilities.

Your cooperation and assistance in the water pollution control program is very much appreciated.

Sincerely yours,



JERRY T. THORNHILL, Chief
Federal Activities Coordination

cc: Texas Water Quality Board
Attn: Mr. Joe P. Teller, Deputy Director
Regional Director
Bureau Sports Fisheries and Wildlife, Albuquerque, New Mexico

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TEXAS WATER QUALITY BOARD



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HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST 475-2651
AUSTIN, TEXAS 78701

January 21, 1971

RE: Proposed Maintenance Dredging Operatio
in the Gulf Intracoastal Waterway Between
Port Isabel and Mud Flats, Mud Flats and
Corpus Christi, and High Island and
Port Bolivar, Request for Comments

Mr. Jerry T. Thornhill, Chief
Federal Activities Coordinator
Environmental Protection Agency
1402 Elm Street, Third Floor
Dallas, Texas 75202

Dear Mr. Thornhill:

This is in response to your December 17, 1970 and January 4, 1971 requests for our comments in regard to water quality considerations on the proposed maintenance dredging in the Gulf Intracoastal Waterway between the above mentioned points.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications and requirements following, that the activity you have proposed will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. In making these comments, we limit them to those things under the jurisdiction of this agency according to the various statues which this agency administers. Disturbances of bay bottoms on state-owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shellfishing from other than a water quality stand-point. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study including inspections and evaluations in the field but we have to the extent possible with available staff obtained the views of those within the agency who might have pertinent information.

Mr. Jerry T. Thornhill, Chief
January 21, 1971
Page 2

The following are our comments and recommendations:

1. The work should be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil should be placed in spoil areas approved by the Texas Parks and Wildlife Department and in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters. The Texas Parks and Wildlife Department should be contacted in regard to the possible effects, if any, on wildlife, fowls, and aquatic life.
3. The discharge of oil, gasoline, or other fuels or materials capable of causing pollution arising from the operations should be prohibited.
4. Sanitary waste should be retained for disposal onshore in some legal manner.

We appreciate your cooperation in this matter and if we can be of additional assistance, please let us know.

Very truly yours,

Joe P. Tella
for

Hugh C. Yantis, Jr.
Executive Director

ccs: Texas Water Quality Board District 7 and 11
Corps of Engineers
Texas Parks and Wildlife Department

EWOCO-11

3 March 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-170, inclosed for recordation are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria and Matagorda Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 31 March 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl.
Dwg. File No.
I&W 1125-02
(in 13 sheets)

E. D. McGENEE
Acting-Chief
Construction-Operations Division

Copy furnished:
Bureau of Sport Fisheries
and Wildlife
Division of Basin Studies
402 U. S. Court House
Fort Worth, Texas 76102
(w/incls in trip)

Mr. J. Hoogland
Nat'l. Marine Fisheries Svc
Biological Laboratories
4700 Avenue U
Galveston, Texas 77550

B-38

EWGCO-M

3 March 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for silt disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria and Matagorda Counties, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 31 March 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupes)
Dwg. File No.
IHW 1125-92
(in 13 sheets)

E. D. McGENEE
Acting-Chief
Construction-Operations Division



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

April 13, 1972

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. E. D. McGehee, by letter dated March 3, 1971, referenced SWGCO-M, enclosed for our review drawings depicting plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria, and Matagorda Counties, Texas.

This letter is our report on the plan, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received concurrence from these agencies as indicated in the enclosed copies of letters from Executive Director James U. Cross, dated October 5, 1971, and Acting Regional Director E. J. Brakke, dated September 22, 1971, respectively.

We have reviewed the proposed plan of spoil disposal for the reaches of the Gulf Intracoastal Waterway from the Texas City Channel at about Corps of Engineers Station 3290+00, west to Matagorda Bay at Corps of Engineers Station 554+000, including an alternate side channel in Galveston Bay from the Pelican Island Bridge to the main waterway near the Galveston Causeway as charted on 18 sheets of map No. IWW 1125-92, dated February 1971.

The designated spoil areas to the east of the Galveston Causeway would be on alternate sides of the channels in Galveston Bay and on Pelican Island. West of the causeway, the designated spoil areas for the most part would alternate from one side of the channel to the other side. The areas would be south of the waterway between Stations 14+000 and 27+000, 38+000 and 84+300, 162+200 and 181+000, 226+000 and 266+000, and 272+500 and 540+000. The spoil areas would be north of the channel between Stations 28+170 and 35+200, 84+300 and 162+000, 181+000 and 226+000, and 540+000 and

554+500. The spoil areas would be on both sides of the channel between Stations 266+000 and 272+500, and 335+300 and 340+000.

Several designated spoil areas are partially or entirely leveed including Stations 84+300 to 104+000, 120+500 to 124+000, 145+500 to 149+800, 152+200 to 161+800, 181+000 to 208+000, 222+000 to 226+000, 232+000 to 266+000, 335+500 to 340+000, and 441+000 to 454+000. In some of these leveed areas and in other reaches of the waterway, the spoil material would be permitted to spill promiscuously beyond the points of discharge into bay waters and tidal marshes except into openings between designated spoil areas.

The Gulf Intracoastal Waterway from Galveston Bay to Matagorda Bay traverses high quality fish and wildlife habitat. It crosses tidal marshes, tidal streams, and low-lying uplands. It also crosses or lies adjacent to portions of Galveston Bay, West Bay, Chocolate Bay, Bastrop Bay, Christmas Bay, Drum Bay, Cedar Lakes, Matagorda Bay, and numerous small lakes. Located in the project area are the Brazoria National Wildlife Refuge, from Corps of Engineers Station 145+500 to Station 191+000; the San Bernard National Wildlife Refuge, from Station 276+000 to Station 295+000; and North Deer Island in West Bay, from Station 26+000 to Station 32+000, which is administered by the National Audubon Society.

With the exception of portions of Galveston Bay and Matagorda Bay which have depths generally ranging from 5 to 12 feet below the mean low tideline, the bay areas in the vicinity of the project area have shallow waters with depths less than 4 feet below the mean low tideline. Most of the shallow water areas contain submerged aquatic vegetation. The bays, tidal marshes, and streams provide high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery habitat. The tidal marshes also provide important nutrients to the bays. Numerous tidal streams and bayous, which intersect the project channel, are important as migratory routes for fishes and crustaceans moving to and from upper reaches of the bays, tidal lakes, and marshes.

Important species of fishes and crustaceans using the project area include spotted seatrout, sand seatrout, red drum, black drum, Atlantic croaker, anchovy, sheepshead, menhaden, sea catfish, spot, flounder, striped mullet, brown shrimp, white shrimp, and blue crab. Oysters are found throughout the bays. Sport fishing is intense throughout the project area while commercial fishing is important in Galveston Bay, West Bay, and Matagorda Bay and light elsewhere in the project area.

Wildlife habitat consists of the bays, tidal marshes, tidal streams, low-lying uplands, and the spoil banks. The bays, tidal marshes, and tidal streams provide feeding, resting, and nesting habitat for many species of waterfowl and other birds while the tidal marshes and streams also provide important habitat for the American alligator, mink, nutria, and muskrat. The low-lying uplands and the spoil banks provide habitat for mourning doves, raccoons, opossums, rabbits, skunks, coyotes, and red wolves. Hunting is light for mourning doves and rabbits and is expected to remain so in the future. Trapping is moderate to light for raccoons, nutrias, and muskrats.

Important species of waterfowl in the project area include the Canada goose, white-fronted goose, snow goose, pintail, shoveler, gadwall, American widgeon, blue-winged teal, green-winged teal, mottled duck, fulvous tree duck, redhead, canvasback, lesser scaup, ring-necked duck, ruddy duck, and coot. Most of the waterfowl use is by migrants during the winter months. The mottled duck is a resident species while the fulvous tree duck is found primarily during the summer and early fall months. Waterfowl hunting is very important.

Many other birds use the project area for nesting, feeding, resting, and cover. Among these are pelicans, grebes, mergansers, cormorants, herons, egrets, bitterns, ibises, roseate spoonbills, rails, gallinules, gulls, terns, plovers, sandpipers, common snipe, and peregrine falcons.

Several species of wildlife in the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States." The American alligator, red wolf, brown pelican, and peregrine falcon are listed as endangered species, while the reddish egret and the roseate spoonbill are listed as peripheral.

Without adequate safeguards, the placement of spoil materials in the work area could destroy or greatly reduce the quality of fish and wildlife habitat. The spoil materials could spill onto marsh and shallow vegetated water areas and destroy the vegetation. It could interfere with water circulation and hinder the movement of fishes and crustaceans. It could create turbidity of bay waters and limit the growth of underwater vegetation. It could settle on oysters and suffocate them.

Placement of spoil from previous maintenance dredgings has resulted in the loss and deterioration of valuable marsh and shallow-water habitat. In some areas, it also has interfered with water circulation and prevented or hindered the passage of fishes and crustaceans within the bays as well as within tidal lakes, streams, and marshes.

To prevent further destruction and deterioration of fish and wildlife habitat, losses of fishery resources, and restriction of water circulation, spoil material should be placed in designated spoil areas with the following modifications. No spoil should be placed on either side of the channel from Corps of Engineers Station 25+600 to North Deer Island and on the north side of the waterway between Stations 161+800 and 162+400. Furthermore, no spoil should be placed on the south side of the waterway between Stations 3350+00 and 3400+00 in Galveston Bay, and between Stations 77+000 and 84+300, 165+000 and 169+000, 267+000 and 294+700, 302+000 and 310+000, 343+800 and 347+000, 354+000 and 370+000, and 383+500 and 397+000 along the waterway.

Losses of fish habitat would be reduced and water exchange would be increased by placing the spoil material on the north side of the waterway between Stations 3419+00 and 3439+00 in Galveston Bay, and between Stations 77+000 and 84+300, 165+000 and 169+000, 272+500 and 274+500 (sheet 10), PI 277+500 and 278+000 (Monument No. 695), 278+800 and 284+000, 285+750 and 294+500, 302+000 and 310+000, 343+800 and 347+000, 354+000 and 370+500, 383+500 and 389+000, 391+000 and 397+000 along the waterway.

Any openings entering the waterway should be maintained at their present widths and depths. These openings would include Greens Bayou, an unnamed stream entering the waterway at Station 132+000, Alligator Slough, Bastrop Bayou, Nick's Cut, an unnamed stream entering the waterway at Station 278+100, Cedar Lake Bayou on both sides of the waterway, an unnamed stream north of the waterway at about Station 301+000, and Culver Cut. Protective measures also should be taken to prevent any spoil material from flowing into Alligator Lake and Cow Trap Lakes (Bayou) on both sides of the waterway.

In addition, openings should be provided and maintained for water circulation and for the passage of fishes and crustaceans to and from the bays, tidal lakes, streams, and marshes. A portion of Carancahua Bayou south of the waterway at Station 64+000 and of Cow Bayou north of the waterway at Station 89+100 has filled in with sediment. These two areas should be reopened and maintained at their natural widths and depths.

Openings of a minimum distance of 100 feet in width and 4 feet in depth should be provided and maintained between spoil banks centered at Stations 276+000, 349+750, 376+650, and 403+000.

Preceding any maintenance dredging, existing levees should be refurbished. Between Corps of Engineers Stations 181+179 and 193+200, the spoil material should be placed and contained within the existing levees.

To protect marsh habitat along the west shoreline of Pelican Island, toe levees should be constructed on the island similar to the levee plan depicted on Corps of Engineers map, File No. GALV 301-340, dated March 1971. The levees should be refurbished prior to the placement of any spoil material on Pelican Island.

Toe levees also should be constructed and subsequently refurbished prior to each dredging operation on the ends and at a maximum distance of 750 feet from the centerline of the channel south of the waterway between Stations 312+000 and 318+000, and 337+000 and 338+500. Toe levees also should be constructed and subsequently refurbished for each dredging operation on the ends and at a maximum distance of 1,000 feet from the channel centerline north of the waterway between Stations 124+000 and 131+000, 135+000 and 139+000, PI 277+500 and 278+000 (Monument Nos. 691 to 695), 278+800 and 284+000, 290+500 and 294+500, 302+000 and 310+000, and 354+000 and 371+000.

Dredged materials should be placed in designated spoil areas either on existing emergent land or on the shoreline south of the waterway between Stations 162+500 and 165+000, 169+000 and 172+000, 173+000 and 181+000, 266+250 and 267+250, 295+200 and 302+000, 335+000 and 337+000, 338+500 and 343+500, and 347+000 and 349+000. When any part of the bank becomes emergent at 1.5 feet above the mean low tideline at a distance of 1,200 feet from the centerline of the channel, toe levees should be constructed and subsequently refurbished prior to each dredging operation on the ends and 1,200 feet from the centerline of the channel.

Dredged materials also should be placed in designated spoil areas either on existing emergent land or on the shoreline until some part of the bank becomes emergent at 1.5 feet above the mean low tideline at distances of 1,350 feet from the centerline of the channel north of the waterway between Stations 77+000 and 84+300, 104+580 and 106+850, 119+250 and 120+500, 132+500 and 135+000, 165+000 and 169+000, 272+500 and 274+500, and 343+800 and 347+000;

and south of the waterway from Stations 43+212 and 77+345, 375+200 and 412+000, and 460+000 and 534+000. Toe levees should be constructed and subsequently refurbished prior to each dredging operation on the ends and 1,350 feet from the centerline of the channel.

Drainage of leveed areas should be controlled by weirs. The effluent should be drained directly into the Gulf Intracoastal Waterway so that no spoil would spill onto marshes and into shallow water.

In open water, measures should be taken to minimize the amount of spoil materials flowing beyond the designated spoil areas. Moving the points of discharge laterally and frequently along the crest of the bank would tend to build up the bank evenly back from the waterway.

Spoil discharged in the open waters of Galveston Bay, West Bay, Chocolate Bay, and Matagorda Bay should be discharged slightly over the crests of existing spoil banks. When any part of a bank becomes emergent at 1.5 feet above the mean low tideline at a distance of 2,000 feet from the centerline of channel in Galveston Bay, and 1,500 feet from the channel centerline in West Bay, Chocolate Bay, and Matagorda Bay, toe levees should be constructed and subsequently refurbished prior to each dredging operation on the ends and back side of the designated spoil area.

To further protect important marsh- and shallow-water habitat, daily policing of the spoil disposal operations should be conducted to aid in prevention of accidental spillage of spoil materials outside of the leveed spoil area.

Disturbance to fish and wildlife habitat would be lessened if no change is made in the location or size of spoil disposal areas or openings for water circulation. Should it become necessary to change the location or size of any spoil disposal area or opening, the revised plan should be submitted to the Bureau of Sport Fisheries and Wildlife sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the affected area.

Prior to issuance of contracts for maintenance dredging, the Corps of Engineers should notify the following persons of the time schedule for the proposed work: Regional Director, Texas Parks and Wildlife Department, La Porte, Texas, Gulf Coast Refuge Complex Supervisor, Victoria, Texas; and Field Representative, National Audubon Society, Austin, Texas.

It is recommended that:

1. No spoil be placed on either side of the channel between Corps of Engineers Station 25+600 and North Deer Island.
2. No spoil be placed north of the waterway between Corps of Engineers Stations 161+800 and 162+400.
3. No spoil be placed south of the waterway between Corps of Engineers Stations 3350+00 and 3400+00 in Galveston Bay, and between Stations 77+000 and 84+300, 165+000 and 169+000, 267+000 and 294+700, 302+000 and 310+000, 343+800 and 347+000, 354+000 and 370+000 and 383+500 and 397+000 along the waterway.
4. Spoil be placed north of the waterway between Corps of Engineers Stations 3419+00 and 3439+00 in Galveston Bay, and between Stations 77+000 and 84+300, 165+000 and 169+000, 272+500 and 274+500, Pi 277+500 and 278+000 (Monument No. 695), 278+800 and 284+000, 285+750 and 294+500, 302+000 and 310+000, 343+800 and 347+000, 354+000 and 370+500, 383+500 and 389+000, and 391+000 and 397+000 along the waterway.
5. Openings entering the waterway be maintained at their present widths and depths.
6. No spoil material be allowed to run into Alligator Lake and Cow Trap Lakes (Bayou).
7. Carancahua Bayou south of the waterway at Corps of Engineers Station 64+000 and Cow Bayou north of the waterway at Station 89+100 be reopened and maintained at their natural widths and depths.
8. Openings of a minimum distance of 100 feet in width and 4 feet in depth be provided and maintained between spoil banks centered at Corps of Engineers Stations 276+000, 349+750, 376+650, and 403+000.
9. Prior to each maintenance dredging, existing levees be refurbished.
10. Between Corps of Engineers Stations 181+179 and 193+200 spoil material be placed and contained within existing levees.

11. Toe levees be constructed on Pelican Island similar to the levee plan depicted on Corps of Engineers map File No. GALV 301+340, dated March 1971. The levee be refurbished prior to the placement of any spoil on the island.
12. Toe levees be constructed and subsequently refurbished prior to each dredging operation on the ends and at a maximum distance of 750 feet south of the channel centerline between Corps of Engineers Stations 312+000 and 318+000, and 337+000 and 338+500.
13. Toe levees be constructed and subsequently refurbished prior to each dredging operation on the ends and at a maximum distance of 1,000 feet north of the centerline of the channel between Corps of Engineers Stations 124+000 and 131+000, 135+000 and 139+000, Pi 277+500 and 278+000 (Monument Nos. 691 to 695), 278+800 and 284+000, 290+500 and 294+500, 302+000 and 310+000, and 354+000 and 371+000.
14. Dredged materials be placed in designated spoil areas either on existing emergent land or on the shoreline south of the waterway between Corps of Engineers Stations 162+500 and 165+000, 169+000 and 172+000, 173+000 and 181+000, 266+250 and 267+250, 295+200 and 302+000, 335+000 and 337+000, 338+500 and 343+500, and 347+000 and 349+000. When any part of a bank becomes emergent at 1.5 feet above the mean low tideline at a distance of 1,200 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished prior to each dredging operation on the ends and 1,200 feet from the channel centerline for that bank.
15. Dredged materials be placed in designated spoil areas either on existing emergent land or on the shoreline north of the waterway between Corps of Engineers Stations 77+000 and 84+300, 104+580 and 106+850, 119+250 and 120+500, 132+500 and 135+000, 165+000 and 169+000, 272+500 and 274+500, and 343+800 and 347+000, and south of the waterway between Corps of Engineers Stations 43+212 and 77+345, 375+200 and 412+000, and 460+000 and 534+000. When any part of the bank becomes emergent at 1.5 feet above mean low tideline, toe levees be constructed and subsequently refurbished prior to each dredging operation on the ends and 1,350 feet from the centerline of the channel.

16. Drainage of leveed areas be controlled by weirs and the effluent be drained directly into the Gulf Intracoastal Waterway.
17. In open water, the points of discharge be moved laterally and frequently to permit the buildup of emergent banks equally distant from the waterway.
18. Spoil in open waters be placed slightly over the crests of existing spoil banks. When any part of the bank becomes emergent at 1.5 feet above mean low tideline at a distance of 2,000 feet from the centerline of the channel in Galveston Bay and 1,500 feet from the channel centerline in the open waters of West Bay, Chocolate Bay, and Matagorda Bay, toe levees be constructed and subsequently refurbished prior to each dredging operation on the ends and back side of the emergent spoil banks.
19. Daily policing of the dredging operations be conducted to aid in prevention of accidental spillage of spoil materials outside of the leveed areas.
20. Locations and size of designated spoil areas and openings for water circulation not be changed without submitting revised plans to the Bureau of Sport Fisheries and Wildlife sufficiently in advance so that coordination and subsequent agreement can be made prior to contracting for maintenance dredging of the affected area.
21. Prior to issuance of contracts for maintenance dredging, the Corps of Engineers notify the following persons of the time schedule for the proposed work: Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto, La Porte, Texas 77571; Gulf Coast Refuge Complex Supervisor, Bureau of Sport Fisheries and Wildlife, P. O. Box 2506, Victoria, Texas, 77901; and Field Representative, National Audubon Society, P. O. Box 9585, Austin, Texas 78757.

The opportunity to comment on the proposed plan for disposal of spoil from maintenance dredging of the Gulf Intracoastal Waterway from Galveston Bay to Matagorda Bay is appreciated.

Sincerely yours,

William M. White
Acting Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wildlife Dept., Austin, Texas
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Florida
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Texas
- (2) Regional Director, Bureau of Outdoor Recreation, Denver, Colorado
- (2) Regional Administrator, EPA - Region VI, Dallas, Texas
- (1) Director, Sanctuary Dept., Nat'l Audubon Society, Sharon, Connecticut
- (1) Field Representative, Nat'l Audubon Society, Austin, Texas
- (1) Field Representative, USDI, SW Region, Albuquerque, New Mexico
- (2) Field Supervisor, BSW, Div. of River Basin Studies, Fort Worth, Texas



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

September 22, 1971

National Marine Fisheries Service
144 First Avenue South
St. Petersburg, Florida 33712

Topic:
Code: FSE21

Subject: Spoil disposal, Gulf Intracoastal Waterway, Galveston Bay to Matagorda Bay, Texas. Draft of BSEW report

To: Regional Director
Bureau of Sport Fisheries and Wildlife
Albuquerque, New Mexico

Reference is made to Mr. William M. White's memorandum dated September 3, 1971, transmitting a copy of subject draft report and requesting our review and comments.

We have reviewed this report and concur with your findings and recommendations.

E. J. Brakke
E. J. BRAKKE
Acting Regional Director

TEXAS
PARKS AND WILDLIFE DEPARTMENT

COMMISSIONERS

PEARCE JOHNSON
CHAIRMAN, AUSTIN

HARRY JERSIG
MEMBER, SAN ANTONIO

JACK R. STONE
MEMBER, WELLS



JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

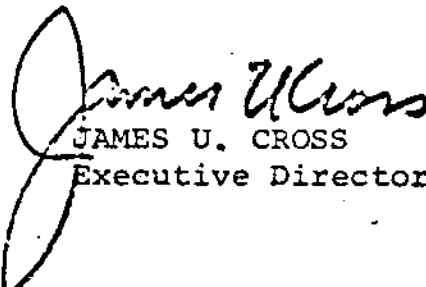
October 5, 1971

Mr. William M. White
Acting Regional Director
United States Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

We have considered the Review Draft dated September 3, 1971, regarding plan for spoil disposal, Gulf Intracoastal Waterway, Galveston Bay to Matagorda Bay and concur in the report as presented.

Sincerely,


JAMES U. CROSS
Executive Director

19 April 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
& Wildlife
P. O. Box 1326
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Mr. William B. White's letter report of 13 April 1972 made recommendations on maintenance dredging the Gulf Intracoastal Waterway from Galveston Bay to Matagorda Bay. In our letter of 26 April 1972 we said that we would try to follow these recommendations in spite of the fact that the report was not fully coordinated with us.

We are now experiencing considerable difficulty in obtaining some of the alternate disposal areas that you recommended. As you know, we do not have a local sponsor for the project and must depend on county governments to provide new areas.

As mentioned to your Fort Worth representative on 18 April we have, to date, been unable to obtain easements for disposal areas on the north side of the channel between Stations 77+000 and 84+300 (see recommendations 3 and 4 in Mr. White's report). Nevertheless, bad shoals force us to dredge selected reaches between North Deer Island and Bastrop Bayou as soon as possible. Consequently, we plan to award a contract for this work in June. In this reach between Stations 77+000 and 84+300 the material will be deposited over the crest of the existing mounds and allowed to flow into West Bay. Additionally, the back levee for disposal areas between Station 124+000 and Bastrop Bay will be established 1,350 feet from the center line of the channel or along the shores of natural streams or lakes

SWCCO-M
Mr. W. O. Nelson, Jr.
Regional Director

19 April 1973

in lieu of 1,000 feet from the center line of the channel as specified in your recommendation No. 13. Except as stated above, the remaining plan for disposal of dredged materials conforms with your recommendations.

We appreciate your excellent cooperation and regret that we are unable to follow your recommendations in this case. We shall continue our efforts to obtain the desired disposal areas for future use.

Sincerely yours,

Copy furnished:
Mr. John G. Degani
Bureau of Sport Fisheries
& Wildlife
Fort Worth, Texas 76102

WILSON M. GAREL
Chief, Construction-
Operations Division

Area Engineer
Fort Point Area Office

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE
1402 Elm Street, 3rd. Floor
Dallas, Texas 75202

April 12, 1971

District Engineer
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Attn: Mr. Weldon M. Gamel, Chief
Construction-Operations Division

Dear Sir:

Reference is made to your letter of March 3, 1971 forwarding drawings for spoil disposal areas in connection with maintenance dredging operations in the Gulf Intra-coastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria and Matagorda Counties, Texas. This project has been reviewed in accordance with Public Law 91-224. The drawings were also submitted to the Texas Water Quality Board and their recommendations have been incorporated with those of this office as follows:

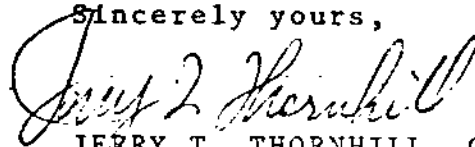
1. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of bay bottoms in state-owned lands, and possible interference with shellfish and other aquatic life habitats from other than a water quality standpoint.
2. The dredging operations should be performed in a manner with the minimum production of turbidity.
3. Spoil must be placed and contained in approved disposal areas in such a manner as to minimize the runoff of the spoil or highly turbid waters into adjacent waters.
4. The discharge of oil, gasoline or other fuels or hazardous materials during these dredging operations must be prohibited.
5. Sanitary wastes must be retained for on-shore treatment conforming to Federal and State regulations.

Wherever it appears that the bottom sediment might be polluted, we recommend that representative samples be obtained for an analysis of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center.

This review has been made almost exclusively on the information furnished on the drawings as it has not been feasible to make either field investigations or evaluations.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely yours,



JERRY T. THORNHILL, Chief
Federal Activities Branch

cc: Texas Water Quality Board
Attn: Mr. Hugh C. Yantis, Jr.
Executive Director

JORDON FULCHER
CHAIRMAN
ERRY L. BROWNLEE
VICE-CHAIRMAN
DAVID E. CLEMENS
ACK W. FICKESSEN

TEXAS WATER QUALITY BOARD



J. E. PEAVY, M.D.
J. R. SINGLETON
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

March 25, 1971

RE: Corps of Engineers, Galveston District
Spoil Disposal Plan for Gulf
Intracoastal Waterway Maintenance
Galveston Bay to Matagorda Bay

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your March 8, 1971 request for a review of the Galveston Engineer District plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria and Matagorda Counties, Texas. You also requested our comments concerning water quality implications of the spoil disposal plan.

Insofar as can be accomplished in a matter of this kind, we believe it is established subject to the qualifications following that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but we have to the extent possible with available staff, obtained the views of those within the agency who might

Mr. Richard A. Vanderhoof
Page 2
March 25, 1971

have pertinent information.

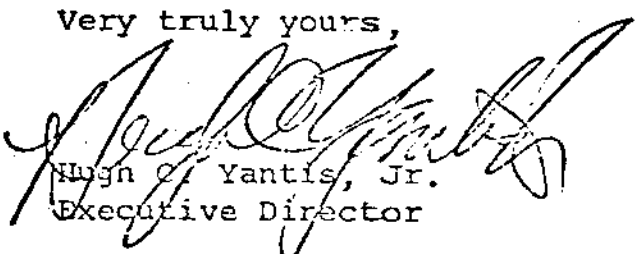
It is suggested that you secure Texas Parks & Wildlife Department approval of this project, since it involves the disturbance of bay bottoms on state-owned lands. The Parks and Wildlife Department would also rule in regard to possible interference with shellfishing from other than a water quality standpoint.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline, or other fuels or materials capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please feel free to call on us.

Very truly yours,


Hugh C. Yantis, Jr.
Executive Director

cc: Water Quality Board District Offices 7 and 8
Corps of Engineers
Texas Parks and Wildlife Department

26 April 1972

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to Mr. William M. White's letter report of 13 April 1972 concerning disposal plans for maintenance dredging operations in the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay in Galveston, Brazoria, and Matagorda Counties, Texas.

It appears that your final report was issued without full coordination with this office. By letter of 8 December 1971 we advised you that it would be some time before we could furnish our comments on your draft report. Time is needed to ascertain whether local interests can acquire areas on the north side of the waterway where you recommend the disposal of the dredged materials. In view of the fact that we cannot at this time be assured that new areas can be acquired, we are unable to concur in your report.

Further, we feel that some of the disposal area back limits are too stringent from the standpoint of our mutual long range goal to provide for confinement during each dredging project. This is particularly evident with respect to your recommendations 12 and 13. Therefore, we must abstain from concurrence with any of your recommended limits on distances from the centerline of the channel.

Since we are unable to concur with your final report, it is recommended that you so notify the other recipients of the report. We are taking the liberty of furnishing a copy of this letter to Region VI of the Environmental Protection Agency so that they will be immediately aware that we do not concur in the report and that we probably cannot follow all of your recommendations. However, pending our final comments on

SWCO-M

26 April 1972

Mr. W. O. Nelson, Jr.

your report, you can be assured that we will follow your recommendations where practicable from the standpoints of availability of disposal areas, economics and engineering feasibility. In this connection please refer to our above mentioned letter of 8 December concerning your draft report.

Your past and continued excellent cooperation in the mutual resolution of disposal plans for maintenance dredging activities is appreciated.

Sincerely yours,

NOLAN C. RHODES
COLONEL, CE
DISTRICT ENGINEER

Copy furnished:
Regional Director
Region VI
Environmental Protection Agency
Dallas, Texas 75201

28 March 1967

Regional Director
Fish and Wildlife Service
U. S. Department of the Interior
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

There is inclosed a drawing which shows the current plan for disposal of spoil in the reach of the Gulf Intracoastal Waterway between Matagorda Bay and San Antonio Bay. The plan shows that the material is being deposited along the southerly side of the waterway in accordance with the plan approved by your agency in letter of 22 December 1961 which also advised of the concurrence in the plan by the Texas Game and Fish Commission.

Representatives of the Chamber of Commerce at Port O'Connor and other interested parties in that area have expressed concern that the present method of spoil disposal may be encroaching on the shallow feeding grounds for fish and waterfowl and have requested that consideration be given to disposing of the spoil on land on the northerly side of the waterway. The original plan for construction of the waterway provided for spoil disposal on the southerly side of the canal and this method has been followed in all maintenance operations through the years. No land-side areas were acquired and none are now available upon which to deposit the dredged spoil. Dredging in this reach of the waterway is infrequently performed at about a three to four year interval. While a complete change in the spoil disposal pattern from bay-side areas to on-shore spoil disposal areas is not practicable, some modification in the disposal plan in the interests of preserving the fish and wildlife habitat may be possible.

It is requested that the present plan for spoil disposal along this reach of channel be reviewed and affirmed or that you furnish comments as to modifications to the plan of disposal which you feel may be of some benefit to the fish and wildlife resources.

SWGOD-C

28 March 1967

Regional Director
Fish and Wildlife Service
Albuquerque, New Mexico 87103

A similar letter is being sent to the Texas Parks and Wildlife Department. In accordance with your usual procedures, it is requested that your review be coordinated with that agency.

Sincerely yours,

1 Incl
Dwg., File No.
IWM 1150-684 (Sheet 2 of 6)

CHARLES F. BAER
Chief, Construction-Operations Division

Copies furnished:

Field Supv., Div. of River
Basin Studies

Bureau of Sport Fisheries and Wildlife
402 U. S. Court House
Fort Worth, Texas 76102

Biological Laboratory
U. S. Bureau of Commercial Fisheries
Building 302, Fort Crockett
Galveston, Texas 77550

1 SEP 1970

Regional Director
Federal Water Quality Administration
U. S. Department of the Interior
1402 Elm Street
Dallas, Texas 75202

Dear Sir:

There are inclosed two sets of drawings showing in red the current plan of spoil disposal for the reach of the Gulf Intracoastal Waterway between Matagorda Bay and San Antonio Bay in Calhoun County, Texas. In compliance with the requirements of the Federal Water Pollution Control Act, as amended by Public Law 91-224, your review, concurrence and/or comments on the spoil disposal plan are requested.

Locations of the spoil areas and water exchange openings between the spoil banks conform with the recommendations of the U. S. Fish and Wildlife Service, Albuquerque, New Mexico, in its report of 29 July 1970, two copies of which are inclosed. In areas where we show spoil disposal in open waters, no control of the spoil is proposed at this time. When the spoil banks become emergent and attain widths of approximately 1200 feet, the system of toe levees and effluent control structures, as outlined in the report, will then be expanded to confine the spoil.

Also inclosed are the environmental control technical provisions which we are including in our contracts for dredging work. Your comments and recommendations on these technical provisions are requested.

It is understood that your office will coordinate and obtain the approval of the Texas Water Quality Board for our spoil disposal plans. We are now in the process of reviewing our spoil disposal practices on all of our existing projects which require periodic maintenance dredging. As we formulate our plans for controlling the disposal of material which may be polluted, they will be coordinated with you prior to implementation.

Sincerely yours,

- 3 Incl (dupe)
1. Two sets of Drawings
2. BSF&W ltr 29 Jul 70
3. Proposed Tech Provisions

EDWIN F. COFFEE, JR.
MAJOR, CE
DEPUTY DISTRICT ENGINEER

B-62



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

July 29, 1970

District Engineer
Corps of Engineers, U.S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

This letter constitutes a revision of the Bureau of Sport Fisheries and Wildlife's reports of December 22, 1961, and January 23, 1970, on the maintenance dredging of a portion of the Gulf Intracoastal Waterway, Main Channel, Matagorda Bay to San Antonio Bay, Texas, between Corps of Engineers Stations 626+500 and 720+000. The revised report also includes a reach of the waterway between Corps of Engineers Stations 720+000 and 766+000.

This report was prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and has been coordinated with the Bureau of Commercial Fisheries. The Texas Parks and Wildlife Department has concurred in the views expressed herein as shown by the enclosed copy of a letter dated July 3, 1970, signed by Mr. J. R. Singleton, Executive Director.

The Gulf Intracoastal Waterway is a shallow draft navigation channel which extends from Apalachee Bay, Florida, to Brownsville, Texas. In Texas, the waterway extends from the Sabine River to the Brownsville Ship Channel, paralleling the Texas coast for a distance of 423 miles. The channel has a minimum depth of 12 feet and a minimum bottom width of 125 feet.

Maintenance dredging of the waterway is required periodically to provide an adequate channel depth for navigation. Spoil taken from the channel has been placed adjacent to the waterway. Spoil has been placed on designated spoil disposal areas in previous dredging operations to the north of the channel between Corps of Engineers Stations 766+000 and 732+000 and to the south of the channel between Stations 731+300 and 626+500. Maintenance dredging occurs in these reaches about every three years. About 30,000 cubic yards of material are taken per mile of channel during each dredging operation.

In San Antonio Bay between Stations 766+000 and 732+000, the spoil banks are mostly submerged. Three openings of 2,000 feet each have been provided and maintained within this reach, centered at Stations 742+200, 750+500, and 759+500.

In Espiritu Santo Bay between Stations 731+300 and 626+500, the spoil banks are emergent, and vary in width from 600 to 2,000 feet. Originally, 12 openings of 1,600 feet each were provided between banks and one opening of 2,000 feet was provided for the Air Force Ferry Channel. Spoil deposition and runoff as well as wind and wave erosion have filled in all but four of these openings which are centered at Stations 715+400, 692+600, 657+000, and 633+546. An opening between Barroom Bay and Matagorda Bay near the South Jetty at Port O'Connor also has been filled in.

The Corps of Engineers is determining the most feasible plan to dispose of spoil from maintenance dredging of the Gulf Intracoastal Waterway, Main Channel, San Antonio Bay to Matagorda Bay. The plans under investigation are: (1) to place spoil on designated spoil areas used in previous dredging operations; and (2) a modification of this procedure to include the placement of spoil on a 1,500- to 2,000-foot strip north of the waterway between Stations 640+000 and 702+000 (channel mile 475-482) and on previously used spoil areas on either side of this reach between Corps of Engineers Stations 626+500 and 766+000. Spoil areas between Stations 640+000 and 702+000 would be compartmentized with openings between sections to permit draining of interior lands. Drainage structures would be constructed in the compartmentized sections. These compartmentized sections could be used for extended periods for spoil disposal by constructing stair-levees to retain materials. About 2,400 surface acres would lie in the 1,500- to 2,000-foot strip north of the waterway.

The project channel traverses important fish and wildlife habitat in Barroom, Espiritu Santo, Shoalwater, and San Antonio Bays as well as on adjoining tidal flats and marshes and low-lying uplands.

The greater portion of the bay lies to the south of the waterway. A large part of the tidal flats, marshes, and coastal plains in the project area is north of the channel.

Barroom, Espiritu Santo, and Shoalwater Bays are shallow in depth, varying from a few inches to about 4 feet in the project area. Shoalwater Bay is especially suited as nursery habitat for fishes and crustaceans. Dense growths of submerged and emergent vegetation

occupy much of these shallow areas. Oyster reefs occur in the western parts of Barroon and Shoalwater Bays. The San Antonio Bay reach of the waterway is in deeper water, varying from 3 to 6 feet. Vegetation in this area is sparse. Some oyster reefs are present near Turnstake Island and in the far western portion of the bay.

The coastal plain is flat and interspersed with numerous shallow water-filled depressions. These depressions are frequently fringed with growths of cordgrass. Some of these depressions have fresh water, others are brackish, and still others are tidal.

Fishes and crustaceans use the shallow bay areas and tidal marshes as breeding, feeding, and nursery grounds. The deeper bay areas, especially around oyster reefs, are used primarily as feeding grounds. Such estuarine-dependent species as red drum, black drum, spotted seatrout, sand seatrout, flounder, Atlantic croaker, striped mullet, sheepshead, gafftopsail catfish, blue crab, and brown and white shrimp use this habitat during periods throughout their life cycle. The production of about 900 pounds of catchable-sized fishes and crustaceans per acre annually can be attributed to the bays and tidal marshes of the proposed work area.

Wildlife habitat in the project area consists of bay areas, tidal flats, tidal marshes, and coastal plains and their shallow water-filled depressions.

The coastal plains support populations of white-tailed deer, bobwhites, mourning doves, waterfowl, wading birds, and shorebirds. The tidal flats and marshes and the bay areas support primarily populations of waterfowl, wading birds, and shorebirds.

The shallow vegetated bay areas, the tidal flats and marshes, and the shallow water-filled depressions on the coastal plains are used by ducks for feeding. The deeper parts of the bays are used by ducks for resting. Geese use the cordgrass areas associated with the shallow water-filled depressions in the coastal plains as feeding grounds. The freshwater depressions provide drinking water for all species of wildlife.

Important species of waterfowl in the project area are pintail, mallard, American widgeon, blue-winged teal, green-winged teal, lesser scaup, redhead, canvasback, bufflehead, mottled duck, Canada goose, snow goose, blue goose, and American coot. Mottled duck and blue-winged teal are resident species and use the water-filled depressions and the surrounding coastal plains areas for

nesting. About 3,000,000 waterfowl use-days occur in the project area annually. About one-third of this use occurs north of the waterway.

Hunting is light for all game species in the project area north of the waterway. Much of this area is in private ownership and hunting is restricted by landowners to their friends. South of the waterway, hunting is for waterfowl only and occurs in moderate to heavy amounts. Without the project, these amounts of hunting are expected to occur in the foreseeable future.

The project area supports many shorebirds and wading birds, including ibises, egrets, herons, gulls, terns, pelicans, stilts, and the rare peripheral roseate spoonbill. The birds use the shallow vegetated portions of the bays, the tidal marshes, and the shallow water-filled depressions for feeding. Some of these birds nest in the area.

Placement of spoil on either side of the waterway would result in losses of fish and wildlife habitat. The extent of these losses would depend upon the amount of habitat destroyed, the characteristics of the habitat, and the kinds of animals displaced.

It is estimated that past maintenance dredging of the Intracoastal Waterway in the subject reach has filled in about 100 acres of shallow bay waters annually by spoil deposition, siltation, and erosion of spoil banks. These areas were responsible for the annual production of about 90,000 pounds of catchable-sized fishes and crustaceans. The area also received significant amounts of use by waterfowl, shorebirds, and wading birds.

By following a plan to use designated spoil areas used in previous dredging operations, destruction of fish and wildlife habitat would continue.

The second plan under investigation considers placement of spoil to the north of the waterway on the 1,500- to 2,000-foot strip between Stations 640+000 and 702+000 as well as on previously used spoil areas in the remaining reaches between Stations 626+500 and 766+000. By placing the spoil north of the waterway, unique habitat used by fishes and crustaceans would be eliminated. The area provides nursery and feeding areas for small fishes and crustaceans. Wildlife in the area include white-tailed deer, bobwhite, mourning dove, waterfowl, and several species of shorebirds and wading birds including the rare peripheral roseate spoonbill. The area also provides

nutrients to enrich the adjacent bay waters. Placing spoil on previously used spoil banks between Stations 640+000 and 702+000 south of the waterway would also be damaging to the fish and wildlife habitat but to a lesser extent than in the area north of the waterway.

No feasible means for mitigation of fish and wildlife losses would be possible if spoil were placed north of the waterway between Stations 640+000 and 702+000. It would be extremely difficult to prevent the filling in of the tidal flats and marshes, shallow water-filled depressions, and the coastal plains associated with these areas.

Losses of fish and wildlife habitat from placement of spoil on the south side of the waterway could be minimized by the construction of simplified toe levees with water drainage structures to retain the spoil on existing spoil banks. These low embankments could be constructed of stabilized spoil material in such a way that the hydraulic dredge discharge would be allowed to pond inside the levee long enough for the silt to settle out. The water would then be allowed to flow into the bay through the water drainage structure.

In the reaches between Stations 635+000 and 643+000 and between Stations 657+700 and 766+000, the toe levees should be constructed on existing spoil banks at a maximum distance of 1,200 feet from the waterway centerline. Where the spoil banks have not reached a point 1,200 feet from the waterway centerline, construction of the toe levees could be delayed until the spoil banks have reached that point.

In the reaches between Stations 627+500 and 635+000 and between Stations 643+000 and 656+200 the spoil banks have extended to a point over 1,500 feet from the channel centerline. In these reaches, the toe levees should be constructed at a maximum distance of 1,500 feet from the waterway centerline.

All of the toe levees should be constructed so spoil is not allowed to run unrestricted bayward of the stipulated distances from the waterway centerline. During each successive maintenance dredging, the toe levees and the water drainage structures should be renovated or reconstructed to retain the spoil within the stipulated distances.

Presently, two narrow water areas lying between the spoil banks of the Gulf Intracoastal Waterway and Dewberry Island and Long Island provide for important water circulation and for ingress and egress of aquatic organisms to Shoalwater Bay. These channel-like areas

become very narrow and shallow adjacent to Corps of Engineers Stations 657+000 and 692+000 where access channels enter the waterway. At both locations, spoil banks of the access channels and spoil banks of the Gulf Intracoastal Waterway cause restriction of the channel-like water areas. At these points, the narrow water areas could be subjected to shoaling and eventual obliteration from spoil placement and toe levee erosion. Here, the simplified toe levees should be placed on the existing spoil banks well above the mean high tideline so that erosion of the levee and subsequent sedimentation of the openings would be minimal. Toe levee placement above the mean high tideline should extend along the existing spoil bank for about 1,000 feet at these locations.

Existing openings between waterway spoil banks should be maintained to permit the present levels of water circulation and for ingress and egress of aquatic organisms to the bay areas, marshes, and waterways. In San Antonio Bay, these openings are centered at Stations 759+500, 750+500, and 742+200. In Espiritu Santo, Shoalwater, and Barroom Bays, these openings are centered at Stations 715+400, 692+600, 657+000, and 633+546.

It is recommended that:

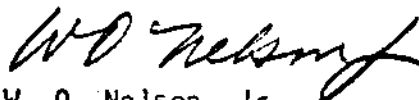
1. Spoil from the maintenance dredging between Corps of Engineers Stations 626+500 and 766+000 be placed in the existing spoil disposal areas.
2. In the reaches between Corps of Engineers Stations 635+000 and 643+000 and between Stations 657+700 and 766+000 simplified toe levees with adequate drainage structures to retain the spoil on existing banks be constructed on emergent spoil banks at a maximum distance of 1,200 feet from the waterway centerline.
3. In the reaches between Corps of Engineers Stations 627+500 and 635+000 and between Stations 643+000 and 656+200 simplified toe levees with adequate drainage structures to retain the spoil on existing banks be constructed at a maximum distance of 1,500 feet from the waterway centerline.
4. Extreme care be taken to insure that toe levee placement on the spoil banks located near Corps of Engineers Stations 657+000 and 692+200 not encroach upon nor be allowed to erode into the narrow channels leading into Shoalwater Bay.

5. Openings be preserved between the spoil banks in San Antonio Bay, centered at Corps of Engineers Stations 759+500, 750+500, and 742+200, and in Espiritu Santo, Shoalwater, and Barroom Bays, centered at Corps of Engineers Stations 715+400, 692+600, 657+000, and 633+546.

Adoption of these recommendations would keep losses of fish and wildlife habitat to a minimum. Since these recommendations constitute loss preventative measures, no benefits to fish and wildlife would accrue.

We appreciate this opportunity to review your plans for maintenance dredging and spoil disposal on the main channel of the Gulf Intra-coastal Waterway between San Antonio and Matagorda Bay and to suggest updated measures to minimize fish and wildlife resource losses.

Sincerely yours,



W. O. Nelson, Jr.
Acting Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Tex. Parks and Wild. Dept., Austin, Tex.
- (1) Dr. Clarence Cottam, Director, Welder Wild. Foundation, Sinton, Tex.
- (2) Regional Director, BCF, Reg. 2, St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., BCF, Galveston, Tex.
- (2) Regional Director, FWQA, So. Cent. Reg., Dallas, Tex.
- (2) Regional Director, BOR, Mid-Cont. Reg., Denver, Colo.
- (1) Regional Coordinator, USDI, SW Reg., Houston, Tex.
- (2) Field Supvr., BSW, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT



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JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

July 3, 1970

Mr. W. O. Nelson, Jr.
Acting Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

This is in response to your letter of June 25, 1970 and the attached review draft of a report concerning the Corps of Engineers plans for maintenance dredging of the Gulf Intracoastal Waterway Main Channel, Matagorda Bay to San Antonio Bay, Texas.

We have reviewed this draft and concur with the report as presented.

Yours sincerely,

J. R. Singleton
J. R. Singleton
Executive Director

JRS:KCJ:db

cc: Mr. John Degani, Division of River Basin Studies
BSFW, Fort Worth, Texas

RECEIVED

JUL 12 1971 July 9, 1970

Regional Director, RFPAM
Albuquerque, New Mexico

Regional Director, DOT
St. Petersburg, Florida

Gulf Intracoastal Waterway, Main Channel, Matagorda Bay
to San Antonio Bay, Texas (CE)—Draft of revised EEFM report

Reference is made to Mr. W. O. Nelson's memorandum dated June 25, 1970, transmitting a copy of subject draft report and requesting our review and comments.

We have reviewed this report and recommend that for greater clarity the fourth line on page 8 be changed to read "...areas in the remaining reaches between Stations 626+500 and 706+000." Also lines 11 through 13 should read "placing spoil on previously used spoil banks between Stations 620+000 and 702+000 south of the waterway would also be damaging to the fish and wildlife habitat, but to a lesser extent than in the area lying to the north."

The remainder of the draft report as written meets with our approval.

R. T. Whiteleather

EIArnold, Jr. :kh



7

UNITED STATES
DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

SOUTH CENTRAL REGION
1402 ELM STREET, 3RD FLOOR
DALLAS, TEXAS 75202

November 3, 1970

Your Ref: SWGCO-M

District Engineer
Department of the Army
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Attn: Maj. Edwin F. Coffee, Jr.
Deputy District Engineer

Dear Sir:

Reference is made to your letter of September 1, 1970 forwarding drawings, environmental control measures and recommendations of the Bureau of Sport Fisheries and Wildlife for maintenance dredging of the Gulf Intra-coastal Waterway between Matagorda Bay and San Antonio Bay in Calhoun County, Texas. This project has been coordinated with the Texas Water Quality Board and has been reviewed in accordance with Public Law 91-224.

This review has been made almost exclusively on the information furnished as it has not been feasible to make field investigations, sediment analyses and evaluations. The environmental control measures section of the specifications appear to be adequate for the water pollution control measures and protection of the water quality and uses. It is recommended that the dredged spoil be placed in the manner and locations described by the U. S. Fish and Wildlife Service and approved by the Texas Parks and Wildlife Department. It is further recommended that the following criteria be used as guidelines in your dredging operations:

When concentrations, in sediments, of one or more of the following pollution parameters exceed the limits expressed below, the sediment will be considered polluted and, therefore, unacceptable for dumping in U. S. waters:

<u>1. Sediments in Fresh Waters</u>	<u>Conc. % (dry wt. basis)</u>
Volatile Solids	8.0
Chemical Oxygen Demand (COD)	6.0
Organic Nitrogen	0.15
Oil-Grease	0.15
Mercury	0.0001

<u>2. Sediments in Marine or Saline Waters</u>	<u>Conc. % (dry wt. basis)</u>
*Volatile Solids	8.0
Organic Nitrogen	0.15
Oil - Grease	0.15
Mercury	0.0001

* to be verified by COD and Total Organic Carbon (TOC) analyses

We shall be looking forward to coordinating the water pollution control measures regarding the spoil disposal practices of your future maintenance dredging operations as indicated in your referenced letter.

Your cooperation and assistance in the water pollution control program is very much appreciated.

Sincerely yours,



JERRY T. THORNHILL, Chief
Federal Activities Coordination

cc: Texas Water Quality Board
Attn: Mr. Joe P. Teller, Deputy Director

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JERRY L. BROWNLEE
VICE-CHAIRMAN

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TEXAS WATER QUALITY BOARD



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BEN RAMSEY

J. R. SINGLETON

HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

October 23, 1970

RE: Corps of Engineers Maintenance
Dredging in Gulf Intracoastal Waterway
between Matagorda Bay and San Antonio
Bay, Calhoun County, Texas
Request for Comments

U. S. Department of the Interior
Federal Water Quality Administration
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

Attention: Mr. Jerry T. Thornhill, Chief,
Federal Activities Coordination

Gentlemen:

This is in response to the September 3, 1970 request for comments on the proposed Corps of Engineers maintenance dredging project in the Gulf Intracoastal Waterway between Matagorda Bay and San Antonio Bay, Calhoun County, Texas.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications and requirements following, that the activity proposed will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. In making this certification, we limit the certification to those things under the jurisdiction of this agency according to the various statutes which this agency administers. Our review of this matter has been almost exclusively a review of the information furnished to us. It has not been feasible to make a detailed study including inspections and evaluations in the field, but we have, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

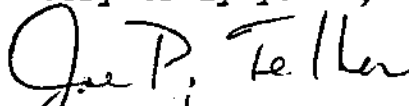
Department of the Interior

2

It is our recommendation that attention be given to the following requirements in the preparation of contract documents for subject project:

1. The work must be done with the minimum production of turbidity in the waters where the work is taking place.
2. The spoil must be placed in the manner and locations described in the recommendation made by the U. S. Fish and Wildlife Service which were approved by the Texas Parks and Wildlife Department.
3. The discharge of oil, gasoline or other fuels or materials capable of causing pollution arising from the operations is prohibited.
4. Sanitary waste must be retained for disposal onshore in some legal manner.

Very truly yours,


Hugh C. Yantis, Jr.
Executive Director

ccs: TWQB District 8
Corps of Engineers ✓
Texas Parks and Wildlife Department

SWCCO-M

29 March 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay (Station 768+000 to Station 978+450 respectively), in Calhoun, Aransas and Nueces Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 1 May 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dwg., File No.
IHW 1150-783 (in
14 sheets)

WELDON H. CAMEL
Chief, Construction-Operations Division

Copies furnished:
Bureau of Sport Fisheries and Wildlife
Division of Basin Studies
Room 7A25G
819 Taylor St.
Fort Worth, Texas 76102 w/incl. in trip.

Mr. J. Hoogland
Nat'l. Marine Fisheries, Inc.
Biological Laboratories
4700 Ave U
Galveston, Texas 77550 w/incl.

SWCCO-M

29 March 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay (Station 763+000 to Station 973+450 respectively), in Calhoun, Aransas and Nueces Counties, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 1 May 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupe)
Dwg., File No.
IHW 1150-733 (in
14 sheets)

WELDON H. CANEL
Chief, Construction-Operations Division

B-77



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RB

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

October 11, 1974

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter dated March 29, 1971, referenced SWGCO-M, enclosed for our review and comments drawings depicting the plan for spoil disposal during maintenance dredging of the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay in Calhoun, Aransas, and Nueces Counties, Texas. Included are a portion of the main channel, the Lydia Ann Channel, and the Aransas Channel.

We have reviewed the plan for spoil disposal as shown on drawings, sheets 1 to 14, Corps of Engineers File No. IWW 1150-783, dated March 1971. This letter is our report on the plan, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service, and has received concurrence from these agencies as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison, dated June 7, 1973, and Acting Regional Director E. J. Brakke, dated June 13, 1973, respectively.

Each channel is identified on the drawings with a separate series of Corps of Engineers Station Numbers. The main channel extends from Station 766+000 in San Antonio Bay southwest to Station 978+200 in Corpus Christi Bay. The Lydia Ann Channel branches from the main channel at Station 890+500 and proceeds south to the Port Aransas Pass Turning Basin at Station 951+400. The Aransas Channel originates at the Turning Basin with Station 0+00 and proceeds northwesterly to Aransas Pass at Station 304+60. Spoil from the channels would be discharged into disposal areas used in previous maintenance dredging operations. These areas lie adjacent to their respective channels and are identified in Table 1, enclosed.



B-78

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Fish and wildlife habitat, which would be affected by spoil disposal, includes portions of San Antonio Bay, Ayres Bay, Mesquite Bay, Carlos Bay, Aransas Bay, Redfish Bay, and Corpus Christi Bay, as well as the tidal flats, spoil islands, and tidal marshes which border or subdivide these bays.

The bay waters are relatively clear and support large beds of shoalgrass, turtlegrass, and associated flora. They provide brackish-water habitat for spotted seatrout, red drum, black drum, sheepshead, flounder, croaker, bay anchovy, menhaden, shrimps, and blue crab. Numerous oyster reefs occur adjacent to the main channel of the waterway, primarily in Aransas Bay. Most of these reefs are productive in years of abundant rainfall. Sport and commercial fishing is intensive in the project area.

The tidal flats are sparsely vegetated with patches of glasswort, saltgrass, and saltflat grass, (Monanthochloe). Spoil islands also may be vegetated, but many have a barren surface of sand and shell. There are a few tidal marshes fringing the barrier islands and the shores of the bays. Needlerush and cordgrass are common here. The flats and marshes and the shallower portions of the bays are important as breeding and nursery habitat for fishes and crustaceans.

Many species of shore and wading birds inhabit the project area. Herons, egrets, pelicans, ibises, cranes, and the roseate spoon-bill use the area for resting, feeding, and nesting. Two species, the brown pelican and the whooping crane, are classified as endangered ("United States List of Endangered Fauna", May 1974). Three other species, the reddish egret, wood ibis, and the roseate spoon-bill, are listed as peripheral in the Fish and Wildlife Service Publication No. 114, "Threatened Wildlife of the United States."

Waterfowl are seasonally abundant. Important species include the redhead, pintail, widgeon, scaup, teals, shoveler, baldpate, canvas-back, and Canada, snow, and blue geese. Large numbers of redheads and pintails feed on the submerged grass beds. The mottled duck, a resident species, is known to nest on densely vegetated islands in the bays adjoining and south of the Aransas National Wildlife Refuge. The numerous duck blinds which dot the bays and flats are evidence of the intensive hunting which the area receives.

A section of the main channel between Stations 772+000 and 830+000 cuts through the southern margin of the Aransas National Wildlife Refuge creating several narrow islands south of the channel. The world's only population of wild whooping cranes winters on the refuge and on the islands. These birds are of great economic importance to this coastal area by virtue of the tourism which they engender. Their aesthetic value is priceless.

Dredging operations will be carried out near two bird sanctuaries administered by the National Audubon Society. One is located on the Second Chain of Islands in Ayres Bay below Station 791+000 of the main channel; the other is located on Harbor Island southwest of the Lydia Ann Channel at about Station 937+000.

During previous maintenance operations, four openings have been maintained between the main channel and the open waters of San Antonio, Ayres, and Mesquite Bays south of the Aransas National Wildlife Refuge. Two of the openings centered on Stations 785+300 and 806+700, permit navigation from the main channel into the bays. The other two openings lie to the east and west of Rattlesnake Island at Stations 789+600 and 799+500, respectively. These allow the escape of fresh water during floods and interconnect the bays with nursery areas north of the main channel.

Spoil deposition in the past has caused considerable damage to the grass beds, tidal flats, and tidal marshes, adjoining project channels. Emergent spoil mounds have displaced habitat. Less obvious has been the extensive siltation of bay bottoms with resultant suffocation of bottom-living fauna, the food supply for many fishes and crustaceans. Spoil is a source of turbidity for a long time after deposition in the bays. This creates an unfavorable habitat for oysters, birds, and sight-feeding fish.

Spoil areas have lateral and proximal limits for points of discharge, but spoil from previous maintenance operations has been indiscriminately distributed within each spoil area and allowed to flow away from the spoil area unrestricted. As a result, lateral encroachment of spoil into openings between spoil areas has tended to fill the openings and create a long, almost continuous bank of spoil from what was originally a series of spoil areas.

To minimize further destruction and deterioration of fish and wildlife habitat, spoil disposal plans should be modified on the basis of measures specifically described in the recommendations set forth at the conclusion of this report. Several of the previously used spoil areas would require modification. In some cases, spoil should be initially confined to emergent land by levees, and drainage of these areas controlled by spillways and directed into areas where waste water would cause the least damage. Other spoil areas should be leveed to contain additional spoil using borrow material from within the spoil areas for levee construction. The four openings between the main channel and the open bay south of the refuge should be maintained at their natural widths and depths.

Continued use of certain existing spoil disposal areas would increase damages to the estuary. Displacement of habitat and siltation would be more extensive. Lateral encroachment of spoil into openings between spoil areas would further reduce the flow of water and movement of marine life through the openings. In some areas, such as Redfish Bay, spoil from previous dredging operations has resulted in deterioration of the bay as nursery habitat for fishes and crustaceans. To prevent further damage, several existing spoil areas should no longer be used. Spoil from any further dredging in Redfish Bay should be placed on land rather than in the bay.

Many of the existing emergent spoil islands have stabilized through compaction and vegetation. These are used extensively by coastal birds. Addition of new spoil would modify these islands and reduce the suitability of many of them as nesting habitat. The more important islands should be avoided and spoil areas relocated.

The enclosed Table I includes a list of spoil disposal areas as described in the project plan, and as modified for the protection of fish and wildlife.

Dredging of certain areas should be allowed only during periods when the operations would not disturb whooping cranes, nesting mottled ducks, and other nesting birds. It is especially important that the endangered whooping cranes not be disturbed during their wintering stay at the Aransas National Wildlife Refuge. Work conducted below the refuge from early March to late May, when mottled ducks are nesting, also could destroy the duck nests and drive the birds away. Other important areas are the two bird sanctuaries administered by the National Audubon Society on the Second Chain of Islands and on Harbor Island. These sanctuaries are used by large numbers of birds for nesting during the spring and early summer. Dredging should be scheduled near these areas when nesting birds would not be disturbed.

Where the possibility of bottom pollution exists in the channels to be dredged, samples should be taken and analyzed. Placement of highly polluted materials in open water should be avoided. Alternative measures would consist of the placement of spoil on existing emergent spoil banks or on land disposal areas using levees or other structures to prevent spoil escapement.

Spoil disposal operations should be adequately supervised to assure that environmental criteria as set forth are adhered to by the contractor.

In order to reduce recurring problems of uncontrolled spoil dispersal, all future dredging plans should be formulated to phase out

within the next six years the practice of depositing unretained spoil in water having a natural depth of 4 feet or less. Plans should provide for complete leveeing of these areas regardless of the size of the emergent bank.

Specific measures to protect the fish and wildlife resources of the project area are set forth in the recommendations listed below:

1. Spoil area No. 1 be modified to coincide with the emergent land (land above mean high water) on the island northwest of the main channel between Stations 770+000 and 772+500.
2. Spoil area No. 2 be modified to coincide with the emergent land on the island southeast of the main channel between Stations 773+400 and 782+000.
3. Spoil area No. 4 be modified to coincide with the emergent land on Rattlesnake Island southeast of the main channel between Stations 790+400 and 796+000.
4. Spoil area No. 7 be modified to coincide with the emergent land on Bludworth Island southeast of the main channel between Stations 807+000 and 831+200.
5. Spoil area No. 8 be modified to coincide with emergent land on Dunham Island southeast of the main channel between Stations 832+800 and 839+500.
6. Spoil area No. 9 be modified so that proximal points of discharge lie along a line 500 feet from the centerline of the channel. Lateral limits would remain the same.
7. Spoil area No. 38 be relocated to the east of the Lydia Ann Channel. It would retain its lateral limits and proximal points of discharge.
8. Spoil deposited in areas Nos. 1, 2, 4, 7, and 8, be confined to these areas with toe levees prior to each dredging operation to minimize spillage of large amounts of silt into the bays. Waste water should drain over a spillway constructed on the channel side of the islands.
9. Spoil area No. 27 be reduced in size to coincide with the emergent spoil bank at the junction of the main channel and the Aransas Channel. Spoil should be confined to this area with levees. Decanted water should spill into the main channel over a spillway.

10. When spoil material in areas Nos. 9, 25, and 26, emerges above mean high water along lines defining the lateral limits of the spoil areas, or along a line 1,200 feet from the centerline of the channel, toe levees be constructed along these lines to contain all additional spoil.
11. When spoil material in areas Nos. 10 through 16, and 35 through 38, emerges above mean high water along lines defining the lateral limits of the spoil or along a line 1,500 feet from the centerline of the channel, toe levees be constructed along these lines to contain all additional spoil.
12. When spoil material in area No. 30 emerges above mean high water along lines defining the lateral limits of the spoil area or along a line 1,000 feet from centerline of the channel, toe levees be constructed on the ends and along the east side to contain all additional spoil.
13. Toe levees in Recommendations Nos. 10, 11, and 12, be refurbished before each dredging operation.
14. Until such time as the spoil disposal areas in Recommendations Nos. 10, 11, and 12, become continuous and emergent above mean high water along lines defining the lateral limits of the spoil areas and along a line 1,000, 1,200, and 1,500 feet from the centerline of the channels, the points of discharge be relocated frequently to permit a uniform buildup of spoil along these lines.
15. Spoil area No. 18 be backleveed to prevent spillage of spoil into Aransas and Redfish Bays. The levee should begin at the proximal point of discharge at Station 904+000 and extend in a southerly direction for 3,200 feet, following the existing emergent spoil bank. It should then turn back and extend toward the channel to a distance of 1,350 feet from the centerline of the channel at which point the levee should turn southwesterly and parallel the channel, terminating at Station 909+500.
16. Four openings between the main channel and the open bay should be retained at their existing depths and widths. These openings are centered on Stations 785+300, 789+600, 799+500, and 806+700.
17. Spoil areas Nos. 3, 5, and 6, no longer be used.

18. Spoil areas Nos. 19 through 24, 29, and 31 through 34, no longer be used. Easements should be obtained to place subsequent spoil from the main channel on dry emergent land on the north side of the channel between Stations 910+000 and 934+000, 945+200 and 950+000, and 956+000 and 978+200.
19. Spoil Areas Nos. 40 through 44 no longer be used. Spoil should be placed on the north side of the Aransas Channel on emergent land between Stations 16+00 and 50+00, 290+00 and the GIW, and between the GIW and Aransas Pass Turning Basin. Spoil should be confined to these areas by levees. Waste water should be spilled by weir into the borrow ditches paralleling State Highway No. 361. Spoil also should be placed on emergent land south of the channel between Stations 50+00 and 80+00, 140+00 and 158+00, and on Stedman Island. Spoil should be sufficiently contained by levees in these areas to prevent damage to adjacent marsh, grass, and tidal flat habitat. Waste water should be returned by control weirs to drainage ditches paralleling State Highway No. 361. The spoil disposal area between Stations 140+00 and 158+00 should be limited to an emergent 40-acre tract adjacent to the channel.
20. Dredging operations between Stations 768+000 and 844+000 of the main channel be carried out only during the period between May 15 and October 15 to prevent disturbance of whooping cranes and nesting mottled ducks.
21. No dredging be carried out during the period April 1 to July 15 between Stations 788+000 and 795+000 of the main channel and Stations 925+500 and 932+000 of the Lydia Ann Channel. The former is a section of the main channel northwest of the Second Chain of Islands sanctuary. The latter is a section of the Lydia Ann Channel southeast of the Harbor Island Sanctuary. These sanctuaries are heavily used by nesting birds during this period.
22. In areas where open water disposal of spoil is proposed, representative sediment samples should be taken to determine the extent of bottom pollution. If analysis indicates that the extent of pollution exceeds criteria established by the Environmental Protection Agency, open water disposal should not be attempted without complete containment of spoil materials. Maximum use should be made of existing emergent spoil banks and available land disposal areas, using levees as necessary to prevent spoil escapement.
23. Frequent policing of spoil disposal operations at leveed spoil areas be made to reduce the possibility of accidental spillage of dredged materials outside of these areas.

24. All future dredging plans be formulated to phase out in the next six years the practice of depositing unretained spoil in waters having a natural depth of 4 feet or less. Plans should provide for complete leveeing of these areas regardless of the size of the emergent bank.
25. Prior to the issuance of contracts for maintenance dredging in the project area, the Corps of Engineers notify the following fish and wildlife agency representatives of the proposed work to permit review of the dredging program:

Regional Director of Coastal Fisheries, Region V
 Texas Parks and Wildlife Department
 Post Office Box 1117
 Rockport, Texas 78382

Field Supervisor
 U. S. Fish and Wildlife Service
 U. S. Custom House, Room 327
 Galveston, Texas 77550

Area Supervisor
 Environmental Assessment Division
 National Marine Fisheries Service
 4700 Avenue U
 Galveston, Texas 77550

26. The following also should be notified prior to the issuance of contracts pertaining to the dredging of that segment of the Gulf Intracoastal Waterway on and in the vicinity of the Aransas National Wildlife Refuge:

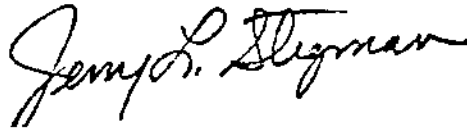
Refuge Manager
 Aransas National Wildlife Refuge
 Post Office Box 68
 Austwell, Texas 77950

Zone Supervisor
 Gulf Coastal Refuges
 Post Office Box 2506
 Victoria, Texas 77901

Should it become necessary to change the location or size of any spoil disposal area, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on this maintenance dredging project is appreciated.

Sincerely yours,



Deputy Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Envr. Assnt. Div., NMFS, Galveston, Tex.
- (1) Regional Director, Bur. of Outdoor Recreation, Albuquerque, N. Mex.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N. Mex.
- (1) Director, Sanctuary Dept., Nat'l Audubon Soc., Sharon, Conn.
- (1) SW Regional Repr., Nat'l Audubon Soc., Austin, Tex.
- (2) Field Supervisor, FWS, Div. of River Basin Studies, Fort Worth, Tex.

Table 1. Spoil Disposal Areas as Designated in the Project Plan and as Modified for Fish and Wildlife (spoil area limits are designated by Corps of Engineers station numbers and direction from the channel is shown where translocation is proposed)

Spoil Area No.		Spoil Areas with Project Plan	Spoil Areas with Modified Plan
<u>Main Channel</u>			
1	768+000 to 773+600		770+000 to 772+500
2	774+600 to 784+400		773+400 to 782+000
3	786+000 to 788+800		
4	790+400 to 797+500		790+400 to 796+000
5	800+100 to 802+100		
6	803+700 to 805+800		
7	807+400 to 831+200		807+000 to 831+200
8	832+800 to 839+500		832+800 to 839+500
9	841+000 to 843+200		841+000 to 843+200
10	844+800 to 853+100		844+800 to 853+100
11	854+700 to 859+700		854+700 to 859+700
12	861+300 to 867+800		861+300 to 867+800
13	869+400 to 875+200		869+400 to 875+200
14	876+800 to 882+000		876+800 to 882+000
15	883+600 to 889+500		883+600 to 889+500
16	892+000 to 896+000		892+000 to 896+000
17	894+600 to 899+500		894+600 to 899+500
18	904+000 to 909+500		904+000 to 909+500
19	911+000 to 913+000 (South)		910+000 to 934+000 (North)
20	914+500 to 917+000 (South)		910+000 to 934+000 (North)
21	918+500 to 921+500 (South)		910+000 to 934+000 (North)
22	923+000 to 925+000 (South)		910+000 to 934+000 (North)
23	926+500 to 928+500 (South)		910+000 to 934+000 (North)
24	930+000 to 932+000 (South)		910+000 to 934+000 (North)
25	934+000 to 936+000		934+000 to 936+000
26	938+000 to 940+000		938+000 to 940+000
27	941+500 to 944+100*		(See Recommendation No. 9)
28	941+600 to 944+100		941+600 to 944+100
29	945+700 to 950+000 (South)		945+200 to 950+000 (North)
30	951+000 to 954+500		951+000 to 954+500
31	956+000 to 962+200 (South)		956+000 to 978+200 (North)
32	964+000 to 966+000 (South)		956+000 to 978+200 (North)
33	968+000 to 969+500 (South)		956+000 to 978+200 (North)
34	971+500 to 976+000 (South)		956+000 to 978+200 (North)
<u>Lydia Ann Channel</u>			
35	894+600 to 905+000		894+000 to 905+000
36	907+000 to 914+000		907+000 to 914+000
37	916+000 to 921+000		916+000 to 921+000
38	923+000 to 930+000 (West)		923+000 to 930+000 (East)
39	948+000 to 950+000		948+000 to 950+000
<u>Aransas Channel</u>			
40	20+00 to 100+00 (North)		16+00 to 50+00 (North)
41	120+00 to 178+00 (North)		50+00 to 80+00 (South)
42	198+00 to 206+00 (North)		140+00 to 153+00 (South)
43	219+00 to 222+00 (North)		Stedman Island (South)
44	230+00 to 247+00 (North)		290+00 to GIWW (North)
GIWW to Aransas Pass Turning Basin (North)			

* Area also used for disposal of spoil from the Aransas Channel.

TEXAS
PARKS AND WILDLIFE DEPARTMENT



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SAN ANTONIO

June 7, 1973

Mr. Wm. M. White
Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

Reference is made to the Bureau of Sport Fisheries and Wildlife report dated May 9, 1973, concerning the Corps of Engineers' plan for spoil disposal in conjunction with maintenance dredging of the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay, Texas.

A staff review of the report has been completed. The Department concurs with the report with the following comment:

Spoil area 30 which includes Stations 951+000 to 954+000 should be leveed on the ends and east side to prevent material from flowing into Redfish Bay.

We appreciate having had the opportunity of coordinating our comments with your agency.

Sincerely,

A handwritten signature in cursive script, appearing to read "Clayton T. Garrison".

CLAYTON T. GARRISON
Executive Director

CTG:BM:wj



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
144 First Avenue South
St. Petersburg, Florida 33701

June 13, 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries & Wildlife
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

By letter dated May 9, 1973, Mr. William M. White requested our review of and comment on your draft report concerning the Corps of Engineers plans for spoil disposal in connection with maintenance dredging of the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay, Texas.

We have reviewed the draft report and concur in the findings and recommendations. Our review was limited to those parts relating to marine fisheries, including habitat.

In recommendation #25, please request that prior to the issuance of contracts and maintenance dredging in the project area, the Corps of Engineers also notify the Area Supervisor, Water Resources Division, National Marine Fisheries Service, 4700 Avenue U, Galveston, Texas 77550, of the proposed work to permit review of the dredging program.

The opportunity provided by your staff to participate in the preparation of this report is appreciated.

Sincerely yours,

for HAROLD B. ALLEN
Acting Regional Director

ENVIRONMENTAL PROTECTION AGENCY

Water Quality Office
1402 Elm Street, Third Floor
Dallas, Texas 75202

May 18, 1971

Your Ref: SWGCO-M

District Engineer
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Attention: Mr. Weldon M. Gamel
Chief, Construction-Operations Division

Dear Sir:

Reference is made to your letter of March 29, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay in Calhoun, Aransas, and Nueces Counties, Texas. The drawings were also submitted to the Texas Water Quality Board and their recommendations to protect the water quality and uses have been incorporated with those of this office as follows:

1. This project should be thoroughly coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays, possible interference with aquatic life and waterfowl habitats and aquatic feeding areas. The Aransas National Wildlife Refuge, which is adjacent to this project, harbors multitudes of rare and endangered species of wildlife including the extremely rare whooping crane.
2. The dredging and disposal operations should be performed with the minimum production of turbidity in the waters where the work is taking place.
3. Spoil must be placed and contained in approved spoil disposal areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.

4. The discharge of oil, gasoline or other fuels capable of causing water pollution arising from these operations must be prohibited.
5. Sanitary wastes must be retained for adequate onshore treatment that conforms to Federal and State requirements.

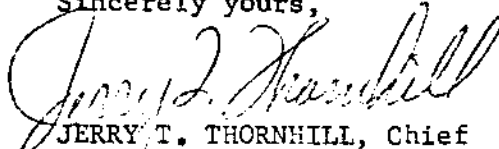
Wherever it appears the bottom may be polluted, we recommend that representative samples be obtained and preserved for analyses of the material. Please advise this office if this condition exists, so that we can make arrangements at our Robert S. Kerr Research Center in Ada, Oklahoma for the laboratory analyses.

This review has been made almost exclusively on the information furnished on your drawings. It has not been feasible to make a detailed study, including field investigations and evaluations.

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known. Also, we are not aware if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely yours,


JERRY T. THORNHILL, Chief
Federal Activities Branch

cc: Texas Water Quality Board
Attn: Mr. Hugh C. Yantis, Jr.
Executive Director

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
VICE-CHAIRMAN
LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



J. E. PEAVY, M.D.
RON JONES
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

April 28, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal Plan
For Gulf Intracoastal Waterway
Maintenance (San Antonio Bay
to Corpus Christi Bay)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your April 5, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between San Antonio Bay and Corpus Christi Bay in Calhoun, Aransas and Nueces Counties, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff,

Mr. Richard A. Vanderhoof
Page 2
April 28, 1971

obtained the views of those within the agency who might have pertinent information.

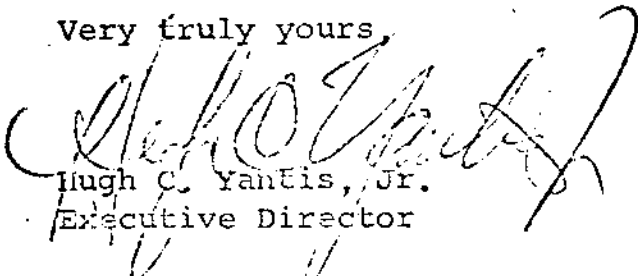
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,


Hugh C. Yantis, Jr.
Executive Director

ccs: TWQB Districts 9 and 11
Corps of Engineers, Galveston District
Texas Parks and Wildlife Department

BWGCO-M

31 December 1970

Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for re-coordination are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway, Corpus Christi Bay to Mud Flats in Nueces, Kleberg and Kenedy Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 1 March 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

✓ Incl
Dwg File No.
IWW 1175-169
(in 19 sheets)

E. D. McGENE
Acting Chief,
Construction-Operations Division

✓ Copy furnished:
Bureau of Sport Fisheries
and Wildlife
Division of Basin Studies
7A25G 819 Taylor Street
Fort Worth, Texas 76102
(w/incls in trip)

SWGCO-M

31 December 1970

✓ Regional Director
Bureau of Sport Fisheries
and Wildlife

✓ Copy furnished: (cont'd.)
Mr. J. Hoogland
National Marine Fisheries Service
Biological Laboratories
4700 Avenue U
Galveston, Texas 77550

SWGCO-M

31 December 1970

Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Corpus Christi Bay and Mud Flats in Nueces, Kleberg and Kenedy Counties, Texas.

It is requested that this plan be coordinated with Texas Water Quality Board and that approval and/or comments be furnished not later than 1 March 1971.

This plan is being re-coordinated with fish and wildlife agencies.

Sincerely yours,

1 Incl (in dup)
Dwg. File No.
IWW 1175-169
(in 19 sheets)

E. D. McGENEE
Acting Chief,
Construction-Operations Division



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

August 20, 1971

District Engineer
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. E. D. McGehee's letter of December 31, 1970, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway, Corpus Christi Bay to Mud Flats in the Laguna Madre in Nueces, Kleberg, and Kenedy Counties, Texas, and requested our views on the proposal.

This letter is our report on the proposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service. It has received the concurrence of the Texas Parks and Wildlife Department as indicated in the enclosed copy of the letter from James U. Cross, Executive Director, dated May 20, 1971.

We have reviewed the proposed plan of spoil disposal for the reach of the Gulf Intracoastal Waterway from Corpus Christi Bay at Corps of Engineers Station 0+000 to the Mud Flats in Laguna Madre at Corps of Engineers Station 300+000 as charted on 19 sheets of map No. IWW 1175-169, dated November 1970.

The proposed designated spoil areas are on either side of the channel. They lie on the east side of the waterway between Stations 0+000 to 77+800; 84+500 to 88+500; 95+700 to 99+300; 106+500 to 110+700; 117+800 to 132+500; 139+300 to 143+700; 156+000 to 171+000; and 179+000 to 310+000. They lie on the west side of the channel between Stations 79+000 to 83+300; 90+000 to 94+500; 100+500 to 105+100; 111+800 to 116+500; 133+900 to 137+800; 144+800 to 155+000; and 172+000 to 177+800.

B-97



The designated spoil areas in open water vary from approximately 300 to 15,000 feet in length. Openings between designated spoil areas vary from 800 to 4,000 feet. The proposed 4,000-foot openings and others have had spoil deposited within their reaches in previous dredgings.

It is proposed to deposit the spoil in open water in designated spoil areas which lie 800 feet to 1,500 feet from the edge of the waterway, except in openings between spoil banks. The spoil would be permitted to spill promiscuously beyond these points.

An alternative proposal for the disposal of spoil in open water would be to deposit it along a line 1,500 feet from the centerline of the channel, except in openings between spoil banks. The spoil would spill promiscuously beyond this point, except into openings between spoil banks. The bulk of the material would settle out within 300 to 500 feet from the points of discharge.

When the spoil banks become emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, toe levees would be constructed for each dredging operation on the ends and land sides of the designated spoil areas. In locations where spoil banks are 1.5 feet above mean low tide at a distance of 1,500 feet or greater from the centerline of the channel, toe levees would be constructed for each dredging job about 1,500 feet from the centerline of the channel.

Important fish and wildlife habitat occurs in the upper Laguna Madre, which for the most part has shallow waters. Dense growths of submerged vegetation are found throughout most of the shallow waters. The submerged vegetation provides high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery habitat. Important species of fishes and crustaceans using the area include Atlantic croaker, black drum, red drum, flounder, striped mullet, pompano, sea catfish, spotted seatrout, sheepshead, blue crab, and shrimp.

Sport fishing is heavy in the upper Laguna Madre. Elsewhere it is moderate to light. About 400,000 man-days of sport fishing annually occur in the area.

Commercial fishing also is important in the area. During the two-year period 1968-69, about 700,000 pounds of finfishes valued at \$150,000; 5.8 million pounds of shrimp valued at \$9.2 million; and 326,000 pounds of blue crab valued at \$30,000, were taken by

commercial fishermen annually in the upper Laguna Madre and in the Gulf of Mexico in areas adjacent to the upper Laguna Madre-Corpus Christi Bay area. Most of these shrimp were nurtured in the shallow waters of the upper Laguna Madre-Corpus Christi Bay Area.

Wildlife habitat in the project area consists of bay waters, tidal flats, and spoil banks. The spoil banks have populations of coyotes, rabbits, bobwhites, mourning doves, waterfowl, wading birds and shorebirds. The tidal flats and bay waters support populations of waterfowl, wading birds, and shorebirds. The shallow vegetated bay areas and tidal flats are used by waterfowl for feeding while the deeper portions of the bay are used for resting.

Important species of waterfowl in the area include Canada goose, snow goose, gadwall, American widgeon, pintail, green-winged teal, blue-winged teal, mottled duck, redhead, canvasback, lesser scaup, bufflehead, ruddy duck, and coot.

Many other birds use the project area for resting, feeding, and nesting. Among these are pelicans, cormorants, gulls, terns, herons, egrets, ibises, roseate spoonbills, mergansers, grebes, common snipes, plovers, sandpipers, avocets, curlews, black-necked stilts, and peregrine falcons.

Several species of birds in the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States". The brown pelican and the peregrine falcon are listed as endangered species; the masked duck, wood ibis, reddish egret, and roseate spoonbill are listed as peripheral species.

South Bird Island, about 1,500 feet east of Station 83+000, a National Audubon Society Sanctuary, and all islands and spoil banks north of Station 88+500 to the Causeway are used heavily by many species of birds. They nest in these areas during the months of March through June.

The principal hunting in the area is for waterfowl. It is very heavy in the vicinity of Corpus Christi and light to moderate in other areas of the upper Laguna Madre.

We have compared the proposed spoil disposal plan with spoil areas used in the past as shown on recent aerial photographs and nautical charts of the area. Based on this information and information provided by biologists of the Texas Parks and Wildlife Department and

the National Marine Fisheries Service, we approve the plan as submitted except as discussed below.

Placement of spoil from previous maintenance dredging in the upper Laguna Madre has had much to do with the loss and deterioration of fish and wildlife habitat. In some areas it has interfered with water circulation. It has prevented and hindered the passage of fishes and crustaceans within the bay. In places it has destroyed highly valuable fish and wildlife habitat and has threatened the destruction of more habitat.

The distance between proposed designated spoil areas in open water on the same side of the waterway varies from 700 feet to 4,000 feet. It may be inferred that the depth of the openings is to the natural bay bottom because of the distances between spoil areas. Such is not the case, however. Placement of spoil from previous dredgings has in many instances partially filled or completely filled the reach between designated spoil areas so that inadequate or actually no openings exist between spoil banks.

To prevent further destruction and deterioration of fish and wildlife habitat, losses of fishery resources, and restriction of water circulation in the upper Laguna Madre, spoil in open water should be placed within designated spoil areas. Additionally, the depth in openings between spoil banks should be provided and maintained at the elevation of or lower than the natural bay bottom.

The spoil disposal plan should take advantage of areas where spoil has been placed in previous dredgings. The plan should be designed to permit open water areas of at least 1,000 feet and preferably 2,000 feet between spoil banks on the same side of the channel. The spoil areas should be designed to prevent promiscuous spilling of dredged materials over the bay bottom.

Your letter of March 12, 1971, designated a number of openings of 1,000 and 2,000 feet and even a 3,000- and a 3,200-foot opening. All of these openings are distances between designated spoil areas and do not reflect open water distances between designated spoil areas.

Without removing spoil, it might be possible to provide a 2,000-foot open water area centered at Station 6+500 between designated spoil areas. The 2,000-foot openings could possibly be provided centered at Stations 122+000, 127+400, and 195+900 by the removal of small amounts of spoil. Elsewhere, openings of 1,000, 2,000, 3,000, and 3,200 feet, as listed in your letter, would require the removal of substantial amounts of spoil materials.

Revised 8/30/71

Your letter of March 12, 1971, suggested means which would prevent spilling of dredged materials beyond the designated spoil areas. For emergent banks at 1.5 feet above mean low tide and 1,500 feet or greater from the centerline of the channel, toe levees would be constructed for each dredging operation on the ends and 1,500 feet from the centerline of the channel for each designated spoil area. At other designated spoil areas, when the banks become emergent at 1.5 feet above mean low tide 1,500 feet from the centerline of the channel, toe levees also would be constructed for each dredging operation on the ends and land side of each designated spoil area. We believe that this measure would reduce habitat destruction.

It is suggested that prior to each dredging operation existing toe levees be refurbished. We also suggest that until the spoil bank in open water in each designated spoil area becomes continuous and emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, the points of discharge should be relocated frequently to permit uniform build-up of spoil materials equally distant from the centerline of the channel.

There are areas where placement of spoil from previous dredgings have filled in open water rendering the areas useless for water exchange and fish passage. These spoil areas may now be continuous. They lie between Stations 41+000 and 46+500; 196+300 and 205+000; and 207+000 and 215+700. However, a 2,000-foot opening should be provided centered at Station 206+000 to provide water circulation and fish passage.

The proposed plan provides for a continuous spoil area between Stations 170+000 and 194+200, a distance of about 3 miles. A 2,000-foot opening should be provided through the designated spoil area centered at Station 185+000 to permit exchange of water and movement of fish.

You have advised us that 2,000-foot openings would be constructed through the spoil banks centered at Stations 185+000 and 206+000 during your next maintenance dredging in the area.

Losses of fish habitat would be reduced and water exchange would be increased by relocation of the designated spoil areas at the following Stations:

- a. 71+600 to 77+800 change to 71+600 to 77+500
- b. 95+700 to 99+300 change to 95+700 to 101+300
- c. 106+500 to 110+700 change to 104+500 to 110+700
- d. 139+300 to 143+700 change to 137+900 to 142+300
- e. 150+900 to 155+000 change to 150+700 to 155+000
- f. 156+000 to 171+000 change to 156+000 to 169+000

You have advised us that these relocations would be made.

Fish habitat would be preserved by avoiding placement of spoil in the reaches between the following Stations:

- a. 46+500 to 49+500
- b. 77+500 to 77+800
- c. ~~100+500 to 105+100~~ 101+300 to 104+500
- d. 142+300 to 143+700
- e. 144+800 to 148+900
- f. 149+900 to 150+200
- g. 169+000 to 171+000

Also you have advised us that no additional spoil would be placed on these reaches of the waterway.

If need be, the sandbar across from the waterway in the vicinity of Stations 145+000 to 153+000 may be used for the placement of spoil. The spoil should be retained on the sandbar and not permitted to return to the bay.

One portion of the upper Laguna Madre east of the waterway and south of Station 210+500 is a very shallow area for fishes. It is known as "the hole". During low water a small pool remains between Stations 234+500 and 254+700. It does not have connection to the bay or channel waters. About 100,000 pounds of game fishes perish in this area annually for lack of access. About every five years, a massive kill of about one million pounds of game fishes occurs in the area.

It would be beneficial to construct and maintain a channel to "the hole" from the waterway to permit exchange of water and more important to permit egress of fish during critically low water periods.

An existing opening and channel occur through the spoil bank at Station 233+300. The channel extends eastward about 1.3 miles and then angles northward. Extending the channel southward to the deepest part of "the hole" would provide water exchange and fish

egress during low water periods. Similar-type benefits to fish would result by constructing a 200-foot-wide channel from the waterway centered about Station 245+000 to the deepest part of "the hole".

The area between the John F. Kennedy Causeway (Station 26+800) and Station 88+500 is especially important as nesting habitat for numerous species of wading birds and shorebirds. To protect these species, no dredging should be permitted in this reach of the waterway during the major nesting period of the birds, March through June.

Prior to the issuance of contracts for maintenance dredging in this reach of waterway, the Corps of Engineers should notify the Regional Director, Texas Parks and Wildlife Department, Rockport, Texas; the Field Representative, National Audubon Society, Austin, Texas; and the Superintendent of Padre Island National Seashore, Corpus Christi, Texas, of the proposed work to permit review of the dredging program.

It is recommended that:

1. Existing spoil areas be used except as noted in this report.
2. Spoil disposal plan be designed to permit open water areas of at least 1,000 feet and preferably 2,000 feet between designated spoil areas, where possible.
3. Openings of 2,000 feet between spoil banks be provided and maintained centered at Corps of Engineers Stations 6+500, 122+000, 127+400, 185+000, 195+900, and 206+000.
4. Toe levees be constructed for each dredging operation on the ends and 1,500 feet from the centerline of the channel when the spoil banks are emergent at 1.5 feet above mean low tide and are 1,500 feet or greater from the centerline of the channel.
5. Spoil in open water be placed slightly over crests of existing spoil banks. When any part of the bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished before each dredging operation on the ends and land side of the spoil area.
6. Until the spoil bank in each designated spoil area becomes continuous and emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, the points of discharge be relocated frequently to permit

uniform build-up of spoil materials equally distant from the centerline of the channel.

7. Designated spoil areas be relocated at the following Corps of Engineers Stations:

71+600 to 77+800 change to 71+600 to 77+500
 95+700 to 99+300 change to 95+700 to 101+300
 106+500 to 110+700 change to 104+500 to 110+700
 139+300 to 143+700 change to 137+900 to 142+300
 150+900 to 155+000 change to 150+700 to 155+000
 156+000 to 171+000 change to 156+000 to 169+000

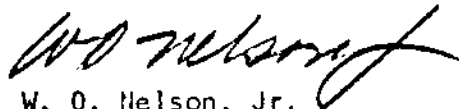
8. No spoil be deposited in the areas between Corps of Engineers Stations 46+600 to 49+500, 77+500 to 77+800, ~~100+500 to 101+300~~ ¹⁰⁴⁺⁵⁰⁰ to 105+100, 142+300 to 143+700, 144+800 to 148+900, 149+900 to 150+200, and 169+000 to 171+000.

9. A channel connecting the waterway to "the hole" be constructed and maintained during the next maintenance dredging in the area. The channel could be located at an existing opening and channel through the spoil bank centered at Station 233+300 or constructed at about Station 245+000. Either channel should be about 200 feet wide and extend to the deepest part of "the hole".
10. No dredging be permitted between Corps of Engineers Stations 26+800 and 88+500 from March through June during the major nesting period for shorebirds and wading birds.
11. Prior to issuance of contracts for the dredging, the Corps of Engineers notify the following persons of the time schedule for the work:
- a. Regional Director, Texas Parks and Wildlife Department, P. O. Box 1117, Rockport, Texas 78382.
 - b. Field Representative, National Audubon Society, P. O. Box 9585, Austin, Texas 78757.
 - c. Superintendent, Padre Island National Seashore, P. O. Box 8560, Corpus Christi, Texas 78412.

The opportunity to comment on the proposed plan for disposal of spoil from maintenance dredging of the Gulf Intracoastal Waterway

from Corpus Christi Bay to the Mud Flats is appreciated. Should it become necessary to change the location or size of any disposal area or openings between designated spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

Sincerely yours,



W. O. Nelson, Jr.
Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wildlife Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Recreation, Denver, Colo.
- (2) Regional Director, Water Quality Office, EPA - Region VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Regional Director, National Park Service, SW Reg., Santa Fe, N. Mex.
- (2) Superintendent, Padre Island Nat'l Seashore, Corpus Christi, Tex.
- (1) Field Representative, Nat'l Audubon Soc., Austin, Tex.
- (1) Director, Sanctuary Dept., Nat'l Audubon Soc., Sharon, Conn.
- (2) Field Supervisor, BSWF, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT

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JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

May 20, 1971

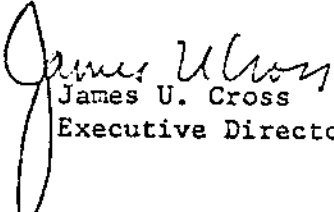
Mr. W. O. Nelson, Jr.
Regional Director
U. S. Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

This is in response to your letter of May 10, 1971 and the attached review draft of a report concerning the Corps of Engineers plan for spoil disposal, Gulf Intra-coastal Waterway, Corpus Christi Bay to Mud Flats, Texas.

We have reviewed this draft and concur with the report as presented.

Sincerely,


James U. Cross
Executive Director

JUC:KCJ:ga

cc: Mr. Tom Moore, Regional Director, Texas Parks and Wildlife
Department, Rockport, Texas

May 25, 1971

St. Petersburg, Florida

FP216

Spoil Disposal, Gulf ISW, Corpus Christi Bay to Mud Flats, Texas (COE)
Draft of BSW report

Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Reference is made to your memorandum dated May 10, 1971, transmitting a copy of subject draft report and requesting our review and comments.

We have reviewed this report and suggest that recommendation #5, page 13, be re-worded as follows:

"Spoil in open water be placed on crests of existing spoil banks. When any part of a bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, the point of discharge be relocated and toe levees be constructed and subsequently be refurbished for each dredging operation on the ends and land side of that bank so that no spoil becomes emergent at 1.5 feet above mean low tide beyond the designated distance."

We concur with the rest of the report, as written.

R. T. WHITELEATHER
Regional Director

FP216:EL:am:ol:bg

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, 3rd. Floor
Dallas, Texas 75202

February 1, 1971

Your Ref: SWGCO-M

Mr. Weldon M. Gamel
Chief, Construction - Operations Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Dear Mr. Gamel:

Reference is made to Mr. Charles F. Baehr's letters of December 15 and 31, 1970 forwarding plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway at the following locations:

1. Port Isabel to Mud Flats in Cameron, Willacy and Kenedy Counties, Texas
2. High Island to Port Bolivar in Chambers and Galveston Counties, Texas
3. Corpus Christi Bay to Mud Flats in Nueces, Kleberg and Kenedy Counties, Texas.

These projects have been coordinated with the Texas Water Quality Board and have been reviewed in accordance with Executive Order 11507.

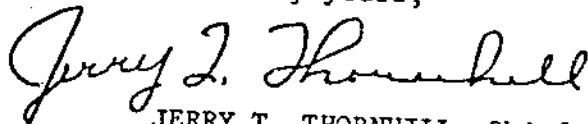
Our review has been made almost exclusively on the information furnished in the referenced spoil disposal areas plans. It has not been feasible to make a detailed study, or sediment analyses including inspections and evaluations in the field. The following recommendations are provided for your guidance in the above maintenance dredging operations:

1. The Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service should be contacted regarding the dredging operations and spoil disposal locations and procedures for protection of wildlife, fowls and aquatic life. Disturbances of bay bottoms on state - owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shell fishing.

2. Whenever it appears that the bottom might be polluted, you should request the dredger to provide an analysis of the material. The Environmental Protection Agency should perform the analyses on Corps - conducted dredging, projects.
3. The dredging operations should be performed with the minimum production of turbidity in the waters where the work is taking place.
4. Spoils should be placed in approved locations in such a manner as to minimize the run off of the spoil or highly turbid waters into adjacent waters.
5. The discharge of petroleum products or other hazardous materials capable of causing water pollution arising from the dredging operations should be prohibited.
6. Sanitary wastes that are generated during the operations should be retained for disposal on shore in approved secondary treatment facilities.

Your cooperation and assistance in the water pollution control program is very much appreciated.

Sincerely yours,



JERRY T. THORNHILL, Chief
Federal Activities Coordination

cc: Texas Water Quality Board
Attn: Mr. Joe P. Teller, Deputy Director
Regional Director
Bureau Sports Fisheries and Wildlife, Albuquerque, New Mexico

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CHAIRMAN

JERRY L. BROWNLEE
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TEXAS WATER QUALITY BOARD



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J. R. SINGLETON

BYRON TUNNELL

HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651

AUSTIN, TEXAS 78701

January 21, 1971

RE: Proposed Maintenance Dredging Operation
in the Gulf Intracoastal Waterway Between
Port Isabel and Mud Flats, Mud Flats and
Corpus Christi, and High Island and
Port Bolivar, Request for Comments

Mr. Jerry T. Thornhill, Chief
Federal Activities Coordinator
Environmental Protection Agency
1402 Elm Street, Third Floor
Dallas, Texas 75202

Dear Mr. Thornhill:

This is in response to your December 17, 1970 and January 4, 1971 requests for our comments in regard to water quality considerations on the proposed maintenance dredging in the Gulf Intracoastal Waterway between the above mentioned points.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications and requirements following, that the activity you have proposed will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. In making these comments, we limit them to those things under the jurisdiction of this agency according to the various statues which this agency administers. Disturbances of bay bottoms on state-owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shellfishing from other than a water quality standpoint. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study including inspections and evaluations in the field but we have to the extent possible with available staff obtained the views of those within the agency who might have pertinent information.

Mr. Jerry T. Thornhill, Chief

January 21, 1971

Page 2

The following are our comments and recommendations:

1. The work should be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil should be placed in spoil areas approved by the Texas Parks and Wildlife Department and in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters. The Texas Parks and Wildlife Department should be contacted in regard to the possible effects, if any, on wildlife, fowls, and aquatic life.
3. The discharge of oil, gasoline, or other fuels or materials capable of causing pollution arising from the operations should be prohibited.
4. Sanitary waste should be retained for disposal onshore in some legal manner.

We appreciate your cooperation in this matter and if we can be of additional assistance, please let us know.

Very truly yours,

Joe P. Tella
for

Hugh C. Yantis, Jr.
Executive Director

ccs: Texas Water Quality Board District 7 and 11
✓ Corps of Engineers
Texas Parks and Wildlife Department

SUCCO-M

15 February 1972

**Mr. Arthur W. Busch
Director; Region VI
Environmental Protection Agency
Federal Activities Coordination
1600 Patterson, Suite 1100
Dallas, Texas 75201**

Dear Mr. Busch:

Reference is made to our letter SUCCO-M dated 31 December 1970 and your reply of 1 February 1971 concerning recoordination pursuant to P.L. 91-190 of maintenance dredging operations in the Gulf Intracoastal Waterway between Corpus Christi Bay and Mud Flats in Matcos, Kleberg and Karnley Counties, Texas. Forwarded under separate cover are three sets of drawings of the final plans for the disposal of dredged materials as re-coordinated with governmental fish and wildlife agencies.

A copy of the Bureau of Sport Fisheries and Wildlife Report dated 20 August 1971, which conforms with the approved plans, is inclosed for your information. We plan to periodically re-coordinate our maintenance dredging operations; however in order to accomplish the task required by P.L. 91-190 within established time limits, it is requested that suggested revisions be kept to a minimum during the next five years.

Your continued cooperation will be appreciated.

Sincerely yours,

- 2 Incls**
1. BSP&W report
2. Dwg File No. (fwd sep)
XM 1175-169 (trip)
(in 12 sheets)

HOLAN C. HEDDES
Coleseal, CE
District Engineer

Copy furnished: w/e Incl
Regional Director
Bureau of Sport Fisheries
and Wildlife
Albuquerque, New Mexico 87103

bcc: Area Engr
Corpus Christi A.O.

B-112

ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

February 23, 1972

Colonel Nolan C. Rhodes
District Engineer
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel Rhodes:

We have reviewed the final plans for your proposed maintenance dredging in the Gulf Intracoastal Waterway between Corpus Christi Bay and Mud Flats in Nueces, Kleberg, and Kenedy Counties, Texas.

This office concurs with the final plans as they reflect the EPA's recommendations provided to you February 1, 1971. In review of the Bureau of Sport Fisheries and Wildlife comments and recommendations, a discrepancy was found. The BSW recommended that no spoil be discharged between 144 + 800 and 148 + 900. Your plans indicate spoil is to be discharged between 145 + 000 and 149 + 000. The plans comply with the BSW requests, except for the noted discrepancy. Resultant effect on water quality should not be significant, however, and it does not affect our concurrence.

Your cooperation and assistance in the water pollution control program is appreciated.

Sincerely yours,



Dean S. Mathews, P. E.

Director

Air and Water Programs Division

SWCCO-M

8 March 1972

Mr. Arthur W. Busch
Director, Region VI
Environmental Protection Agency
Federal Activities Coordination
1600 Patterson, Suite 1100
Dallas, Texas 75201

Dear Mr. Busch:

Reference is made to our SWCCO-M letter dated 15 February 1972 regarding maintenance dredging operations in the Gulf Intracoastal Waterway between Corpus Christi Bay and Mud Flats in Nueces, Kleberg and Sandoz Counties, Texas.

The disposal area between stations 145+000 and 149+000 on the easterly side of the channel was inadvertently shown in open waters. Based on discussions between fish and wildlife representatives and representatives of this office, dredged material is to be retained on land between these stations. Sheet 9 of 18 has been revised accordingly and it is requested that this revised sheet be inserted in lieu of the original sheet 9 in the sets of drawings furnished by the letter referenced above.

Sincerely yours,

1 Incl
Dwg File No.
DW 1175-169 (trip)
(Sh. 9 of 18)

E. D. McGENRE
Acting Chief,
Construction-Operations Division

Copy furnished w/o Incl
Regional Director
Bureau of Sport Fisheries
and Wildlife
Albuquerque, New Mexico 87103

SWOCO-M
Regional Director
Bureau of Sport Fisheries
and Wildlife

14 December 1970

Copy furnished: (encl'd.)
W. T. [unclear]
Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for re-coordination are drawings showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway, Port Isabel to Mud Flats in Cameron, Willacy and Kenedy Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 31 January 1971. These plans are also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dwg. File No.
IWW 1175-163
(in 4 sheets)

CHARLES F. BAEHR
Chief, Construction-Operations
Division

Copy furnished:
Bureau of Sport Fisheries
and Wildlife
Division of Basin Studies
7A253 819 Taylor Street
Fort Worth, Texas 76102
(w/incls in trip)

SWCO-M

14 December 1970

Regional Director
Bureau of Sport Fisheries
and Wildlife

Copy furnished: (cont'd.)
Mr. J. Hoogland
National Marine Fisheries Service
Biological Laboratories
4700 Avenue U
Galveston, Texas 77550

8WGCO-M

15 December 1970

Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments are drawings showing our plan for spoil disposal in connection with maintenance dredging operations in Gulf Intracoastal Waterway, Port Isabel to Mud Flats in Cameron, Willacy and Kenedy Counties, Texas.

It is requested that this plan be coordinated with Texas Water Quality Board and that approval and/or comments be furnished not later than 31 January 1971.

This plan is being re-coordinated with fish and wildlife agencies.

Sincerely yours,

1 Incl (in dup)
Dwg. File No.
IWW 1175-168
(in 4 sheets)

CHARLES F. BAHR
Chief, Construction-Operations
Division



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RB

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

May 29, 1975

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Continuing coordination between our agencies, the Texas Parks and Wildlife Department and the National Marine Fisheries Service regarding the disposal of spoil in a site adjacent to the entrance Channel to Harlingen, Texas, and the Gulf Intracoastal Waterway, plus the location of a cut proposed to increase water circulation in an area west of the GIWW, necessitates the updating of the Fish and Wildlife Service report on maintenance dredging of the GIWW, Port Isabel to Mud Flats, Texas, dated July 13, 1971.

The changes entail a revision of the first full paragraph on page 5, addition of a paragraph on page 5, revision of Recommendation No. 4A, and the addition of Recommendation No. 7A.

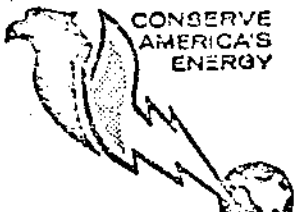
Revised pages incorporating these changes, including an additional page (6a), are enclosed. Please insert them in the copies of reports previously submitted.

Sincerely yours,

Jerry L. Stegman
Acting Regional Director

Enclosures 10

cc: (All w/enclosures as shown)
Executive Director, Texas Parks and Wild. Dept., Austin, Tex. (5)
Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla. (2)
Area Suprv., NMFS, Envr. Assessment Div., Galveston, Tex. (2)
Regional Administrator, EPA, Reg. VI, Dallas, Tex. (2)
Regional Director, BOR, Albuquerque, N. Mex. (1)
Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N. Mex. (2)
Regional Director, NPS, SW Reg., Santa Fe, N. Mex. (1)
Superintendent, Padre Island Nat'l Seashore, Corpus Christi, Tex. (1)
SW Regional Representative, Nat'l Audubon Soc., Austin, Tex. (1)
Director, Sanctuary Dept., Nat'l Audubon Soc., Sharon Conn. (1)
Field Suprv., FWS, Div. of River Basin Studies, Fort Worth, Tex. (2)



B-118

Save Energy and You Serve America!



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

July 13, 1971

District Engineer
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Charles F. Baehr's letter of December 14, 1970, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Port Isabel to Mud Flats in Cameron, Willacy, and Kenedy Counties, Texas, and requested our views on the proposal.

This is our report on the proposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service. It has received the concurrence of the Texas Parks and Wildlife Department as indicated in the enclosed copy of a letter from James U. Cross, Executive Director, dated May 20, 1971.

We have reviewed the proposed plan of spoil disposal for the reach of the Gulf Intracoastal Waterway from the Port Isabel Turning Basin at about Corps of Engineers Station 8+200 to the Mud Flats in the Laguna Madre at about Corps of Engineers Station 300+000 as charted on 4 sheets of map No. IWM 1175-168, dated October 1970.

The proposed designated spoil areas lie on the west side of the waterway from the terminus of the waterway at Station 8+200 to about Station 203+000 south of the entrance Channel to Port Mansfield, except for three small areas on the east side of the waterway, one north of the Port Isabel Causeway, another near Three Islands, and the other near the entrance to the Channel to Harlingen. North of the entrance Channel to Harlingen, from Station 206+000 to Station 327+739, the proposed spoil mounds are on the east side of the waterway.

Port Mansfield

B-119



The spoil would be deposited in open water on designated spoil areas which are from 400 to 1,500 feet from the edge of the waterway. The spoil would be permitted to spill promiscuously beyond that point, except for a short reach at the entrance Channel to Harlingen where levees have been constructed to prevent spoil from returning to that channel.

Openings of 500 feet generally are proposed between spoil banks. Occasional openings of 1,000 to 1,500 feet are proposed where navigation channels pass between spoil banks.

By letter dated February 25, 1971, your office suggested an alternative means of discharging the spoil. The spoil could be discharged in open water along a line 1,200 feet from the centerline of the channel for the reach of waterway from Port Isabel to the Channel to Mansfield and 1,500 feet from the centerline of the channel beyond that point to Station 327+739, opposite Bandera Point.

The spoil would spill promiscuously beyond the points of discharge, except into openings between designated spoil banks and for a short reach at the entrance Channel to Harlingen where a levee has been constructed to prevent spoil from returning to that channel.

When the spoil areas become emergent at about 1.5 feet above mean low tide, toe levees would be constructed for each dredging operation on the ends and land sides of the designated spoil areas. The levees on the ends and land sides would be constructed when continuous emergent land areas are established along the 1,200- or 1,500-foot line of discharge within the designated spoil areas.

Important fish and wildlife habitat occurs in central and lower Laguna Madre, which for the most part has shallow waters. Dense growths of submerged vegetation are found throughout most of these shallow water areas. The submerged vegetation provides high quality habitat used by many species of fishes and crustaceans as feeding, breeding, and nursery habitat. Important species of fishes and crustaceans using the area include Atlantic croaker, black drum, red drum, flounder, striped mullet, pompano, sea catfish, spotted seatrout, sheepshead, blue crab, and shrimp.

Sport fishing is heavy in the lower Laguna Madre in the vicinity of Port Mansfield and Port Isabel. Elsewhere sport fishing is moderate to light. About 275,000 man-days of sport fishing annually occur in central and lower Laguna Madre.

Commercial fishing is important to the economy of the lower Laguna Madre. During the two-year period, 1968-69, about 1,100,000 pounds of finfishes annually, valued at \$213,000, were taken by commercial fishermen from central and lower Laguna Madre. For the same period about 13.6 million pounds of shrimp annually, valued at \$8.2 million, were taken by commercial fishermen in the Gulf of Mexico in areas adjacent to and just south of central and lower Laguna Madre. Most of these shrimp were nurtured in the shallow waters of central and lower Laguna Madre.

Wildlife habitat in the project area consists of spoil banks, bay waters, and tidal flats. The spoil banks have populations of coyotes, rabbits, bobwhites, mourning doves, waterfowl, wading birds, and shorebirds. The tidal flats and bay waters support populations of waterfowl, wading birds, and shorebirds. The shallow vegetated bay areas and tidal flats are used by waterfowl for feeding while the deeper portions of the bay are used for resting.

Important species of waterfowl in the area include Canada goose, snow goose, gadwall, American widgeon, pintail, green-winged teal, blue-winged teal, mottled duck, redhead, canvasback, lesser scaup, bufflehead, ruddy duck, and coot.

The principal hunting in the area is for waterfowl. Hunting is moderate to heavy in the vicinity of Port Mansfield and Port Isabel and light to moderate in other areas of central and lower Laguna Madre.

Many other birds use the project area for nesting, feeding, and resting. Among these are pelicans, cormorants, gulls, terns, herons, egrets, ibises, roseate spoonbills, mergansers, grebes, common snipes, plovers, sandpipers, avocets, curlews, black-necked stilts, and peregrine falcons.

Several species of birds on the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States". The brown pelican and the peregrine falcon are listed as endangered species, while the masked duck, wood ibis, reddish egret, and roseate spoonbill are listed as peripheral species.

Green Island, near Station 138+000, and Three Islands, near Station 102+000, are both National Audubon Society Sanctuaries.

Using recent aerial photographs and nautical charts, we have compared the proposed spoil disposal areas with spoil areas used in the past. Based on this examination and on information provided by biologists of the Texas Parks and Wildlife Department and the National Marine Fisheries Service, several modifications of the plan are proposed.

Past experience has shown that openings of 500 feet between spoil banks, which are unprotected by levees, have proven unsuccessful. Within a short time, most of the openings are filled with materials preventing adequate water circulation and passage of fish. Openings between spoil banks should be at least 1,000 feet wide, and in important critical fish and wildlife areas they should be at least 2,000 feet wide.

You have advised us by letter dated February 25, 1971, that 1,000-foot openings could be provided and maintained centered at Station 2+900 on the Channel to the Small Boat Harbor, and at Stations 30+000, 80+000, 140+000, 165+000, 213+500, 220+000, 230+000, 240+000, 250+000, 260+000, 270+000, 280+000, 290+000, 310+000, and 320+000 on the main channel.

You also advised us that 2,000-foot openings would be provided and maintained at Stations centered at 21+394, 40+000, 54+500, 70+000, 90+000, 153+000, 180+000, and 298+500.

We have considered the proposal to discharge spoil in open water along a line 1,200 feet from the centerline of the channel for the reach of waterway from Port Isabel to the Channel to Mansfield and 1,500 feet from the centerline of the channel above that reach until the spoil banks become emergent at these distances from the centerline of the channel. Then toe levees would be constructed for each dredging job on the ends and land sides of the emergent spoil banks.

Fish and wildlife habitat would be reduced by discharging the spoil in open water slightly over the crests of existing spoil banks. When any part of the bank becomes emergent at 1.5 feet above mean low tide at a distance of about 1,200 feet from the centerline of the channel for the reach of waterway from Port Isabel to the Channel to Port Mansfield or 1,500 feet from the centerline of the channel above that reach, toe levees should be constructed and subsequently refurbished before each dredging operation on the ends and land side of the designated spoil areas to retain dredged materials long enough to permit settling out of the heavier materials. Until the spoil bank in each designated area becomes continuous and emergent at 1.5

feet above mean low tide at the above distances from the centerline of the channel, the points of discharge should be relocated frequently to permit uniform buildup of spoil materials equally distant from the centerline of the channel.

Areas where indiscriminate placement of spoil would destroy valuable fish and wildlife habitat lie on the west side of the waterway between Station 105+000 and the Channel to Harlingen, immediately north of the Channel to Harlingen, and between Station 180+000 and the Channel to Port Mansfield. These areas provide high quality nursery habitats for many species including trout. We have been advised that the spoil area immediately north of the Channel to Harlingen will be completely leveed and the dredged water materials will discharge into the Channel to Harlingen. The other spoil areas should be confined within Stations 105+000 and 123+250, and Stations 180+000 and 200+000.

No spoil should be placed between Station 123+500 and the Channel to Harlingen and Station 200+000 and the Channel to Port Mansfield. Furthermore, between Stations 105+000 and 123+500 and between Stations 180+000 and 200+000, spoil should be confined to an area within 2,000 feet landward from the centerline of the waterway. Spillage of spoil beyond this limit would destroy highly valuable trout nursery areas and could impede water circulation in other nursery areas between the mainland and the designated spoil sites.

Should, by chance, spillage of spoil extend beyond the 2,000-foot distance landward from the centerline of the channel and reduce the existing bottom depths by 3 inches or more, the spilled materials should be removed to restore previous bottom depths so as to permit adequate water circulation and passage of fish. Prior to the removal of spoil materials deposited beyond the 2,000-foot limit from the centerline of the waterway, the Regional Marine Fishery Biologist, Texas Parks and Wildlife Department, Rockport, Texas, and the Laboratory Director, National Marine Fisheries Service, Galveston, Texas, should be advised so as to permit inspection of the area to determine whether the spoil materials should be removed.

Past spoil disposal along the Gulf Intracoastal Waterway south of the entrance Channel to Harlingen has restricted circulation between the open bay and shoreline waters along the refuge. Prevailing winds drive water in a northwest direction toward the shoreline of Horse Island. Circulation in this area is poor, and the slow moving water heats and stagnates. It is suggested that a channel be dredged to this area from about Corps of Engineers Station 125+240. This channel should be about 200 feet wide and 3 feet deep. It would

extend about 1,000 feet from the waterway. Dredged material should be placed on adjacent emergent banks so as not to return to the channel.

Prior to issuance of contracts for maintenance dredging, the Corps of Engineers should notify the following persons of the time schedule for the proposed work: Regional Marine Fishery Biologist, Texas Parks and Wildlife Department, Rockport, Texas; Refuge Manager, Laguna Atascosa National Wildlife Refuge, San Benito, Texas; Field Representative, National Audubon Society, Austin, Texas; and Superintendent, Padre Island National Seashore, Corpus Christi, Texas.

It is recommended that:

1. Openings of 1,000 feet be provided and maintained centered at Corps of Engineers Station 2+900 on the Channel to the Small Boat Harbor and at Stations 30+000, 80+000, 140+000, 165+000, 213+500, 220+000, 230+000, 240+000, 250+000, 260+000, 270+000, 280+000, 290+000, 310+000, and 320+000, on the main channel.
2. Openings of 2,000 feet be provided and maintained centered at Corps of Engineers Stations 21+394, 40+000, 54+500, 70+000, 90+000, 153+000, 180+000, and 298+500.
3. Spoil in open water be placed slightly over crests of existing spoil banks. When any part of the bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,200 feet from the centerline of the channel for the waterway reach from Port Isabel to the Channel to Port Mansfield, or 1,500 feet from the centerline of the channel above that reach, toe levees be constructed and subsequently refurbished before each dredging operation on the ends and land side of the spoil area.
4. Until the spoil bank in each designated spoil area becomes continuous and emergent at 1.5 feet above mean low tide at a distance of 1,200 feet from the centerline of the channel for the waterway reach from Port Isabel to the Channel to Port Mansfield, or 1,500 feet from the centerline of the channel above that reach, the points of discharge be relocated frequently to permit uniform buildup of the spoil materials equally distant from the centerline of the channel.

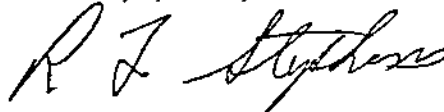
- 4A. The disposal area west of the Gulf Intracoastal Waterway and immediately north of the Channel to Harlingen, centered on Station 132+000, be completely enclosed by leveeing the backside.
5. No spoil be placed on the west side of the waterway between Station 123+500 and the Channel to Harlingen and between Station 200+000 and the Channel to Port Mansfield.
6. Between Stations 105+000 and 123+250 and Stations 180+000 and 200+000 spoil should be confined to an area within 2,000 feet landward from the centerline of the waterway.
7. Spoil material deposited by any means beyond the 2,000-foot limit from the centerline of the waterway between Stations 105+000 and 123+250 and Stations 180+000 and 200+000 which reduces the bottom depth by 3 inches or more, should be removed when determined by the Texas Parks and Wildlife Department and the National Marine Fisheries Service following an on-site inspection that the spoil would impede water circulation and fish passage.
- 7A. A channel 200 feet wide and 3 feet deep be cut from about Corps of Engineers Station 125+240 west about 1,000 feet to a shallow, stagnant water area near Horse Island.

8. Prior to issuance of contracts for maintenance dredging, the Corps of Engineers notify the following of the time schedule for the proposed work:

- a. Regional Director, Texas Parks and Wildlife Department, P. O. Box 1117, Rockport, Texas 78382.
- b. Refuge Manager, Laguna Atascosa National Wildlife Refuge, P. O. Box ~~739, San Benito, Texas 78586~~
2683, Harlingen 50
- c. Field Representative, National Audubon Society, P. O. Box 9585, Austin, Texas 78757.
- d. Superintendent, Padre Island National Seashore, P. O. Box 8560, Corpus Christi, Texas 78412.

The opportunity to comment on the proposed plan for spoil disposal in maintenance dredging of the Gulf Intracoastal Waterway in the lower Laguna Madre is appreciated. Should it become necessary to change the location or size of any disposal area or openings between designated spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

Sincerely yours,



Robert F. Stephens
Acting Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wildlife Department, Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., Nat'l Mar. Fish. Serv., Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Recreation, Denver, Colo.
- (2) Regional Director, EPA, Water Quality Office, Dallas, Tex.

Distribution (Cont.)

- (1) Field Representative, USDI, Southwest Region, Albuquerque, N. Mex.
- (1) Regional Director, NPS, Southwest Region, Santa Fe, N. Mex.
- (1) Superintendent, Padre Island National Seashore, Corpus Christi, Tex.
- (1) Field Representative, National Audubon Society, Austin, Tex.
- (1) Director, Sanctuary Department, National Audubon Soc., Sharon, Conn.
- (1) Field Supervisor, BSW, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT

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JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

May 20, 1971

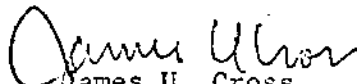
Mr. W. O. Nelson, Jr.
Regional Director
U. S. Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

This is in response to your letter of May 7, 1971 and the attached revised review draft of a report concerning the Corps of Engineers plan for spoil disposal, Gulf Intracoastal Waterway, Port Isabel to Mud Flats, Texas.

We have reviewed this draft and concur with the report as presented.

Sincerely,


James U. Cross
Executive Director

JUC:KCJ:ga

cc: Mr. Tom Moore, Regional Director, Parks and Wildlife
Department, Rockport, Texas

May 24, 1971

St. Petersburg, Florida

FF216

Spoil disposal, Gulf IWW, Port Isabel to Mud Flats, Texas. Draft of BSWW report

Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Reference is made to your memorandum dated May 7, 1971, transmitting a copy of subject draft report and requesting our review and comments.

We have reviewed this report and suggest that recommendation #3, page 10, be re-worded, as follows:

"Spoil in open water be placed on crests of existing spoil banks. When any part of a bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,200 feet from the centerline of the channel for the reach of water from Port Isabel to the channel to Port Mansfield, or 1,500 feet from the centerline of the channel above that reach, the point of discharges be relocated or toe levees be constructed and subsequently refurbished for each dredging operation on the ends and landside of that emergent spoil bank so that no spoil becomes emergent at 1.5 feet above mean low tide beyond the designated distance."

We concur with the rest of the report, as written.

R. T. WHITELEATHER
Regional Director

FF216:ELArnold:bg

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, 3rd. Floor
Dallas, Texas 75202

February 1, 1971

Your Ref: SWGCO-M

Mr. Weldon M. Gamel
Chief, Construction - Operations Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Dear Mr. Gamel:

Reference is made to Mr. Charles F. Baehr's letters of December 15 and 31, 1970 forwarding plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway at the following locations:

1. Port Isabel to Mud Flats in Cameron, Willacy and Kenedy Counties, Texas
2. High Island to Port Bolivar in Chambers and Galveston Counties, Texas
3. Corpus Christi Bay to Mud Flats in Nueces, Kleberg and Kenedy Counties, Texas.

These projects have been coordinated with the Texas Water Quality Board and have been reviewed in accordance with Executive Order 11507.

Our review has been made almost exclusively on the information furnished in the referenced spoil disposal areas plans. It has not been feasible to make a detailed study, or sediment analyses including inspections and evaluations in the field. The following recommendations are provided for your guidance in the above maintenance dredging operations:

1. The Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service should be contacted regarding the dredging operations and spoil disposal locations and procedures for protection of wildlife, fowls and aquatic life. Disturbances of bay bottoms on state - owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shell fishing.

2. Whenever it appears that the bottom might be polluted, you should request the dredger to provide an analysis of the material. The Environmental Protection Agency should perform the analyses on Corps - conducted dredging, projects.
3. The dredging operations should be performed with the minimum production of turbidity in the waters where the work is taking place.
4. Spoils should be placed in approved locations in such a manner as to minimize the run off of the spoil or highly turbid waters into adjacent waters.
5. The discharge of petroleum products or other hazardous materials capable of causing water pollution arising from the dredging operations should be prohibited.
6. Sanitary wastes that are generated during the operations should be retained for disposal on shore in approved secondary treatment facilities.

Your cooperation and assistance in the water pollution control program is very much appreciated.

Sincerely yours,



JERRY T. THORNHILL, Chief
Federal Activities Coordination

cc: Texas Water Quality Board
Attn: Mr. Joe P. Teller, Deputy Director
Regional Director
Bureau Sports Fisheries and Wildlife, Albuquerque, New Mexico

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
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J. E. PEAVY, M.D.
J. R. SINGLETON
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

January 21, 1971

RE: Proposed Maintenance Dredging Operations
in the Gulf Intracoastal Waterway Between
Port Isabel and Mud Flats, Mud Flats and
Corpus Christi, and High Island and
Port Bolivar, Request for Comments

Mr. Jerry T. Thornhill, Chief
Federal Activities Coordinator
Environmental Protection Agency
1402 Elm Street, Third Floor
Dallas, Texas 75202

Dear Mr. Thornhill:

This is in response to your December 17, 1970 and January 4, 1971 requests for our comments in regard to water quality considerations on the proposed maintenance dredging in the Gulf Intracoastal Waterway between the above mentioned points.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications and requirements following, that the activity you have proposed will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. In making these comments, we limit them to those things under the jurisdiction of this agency according to the various statues which this agency administers. Disturbances of bay bottoms on state-owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shellfishing from other than a water quality stand-point. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study including inspections and evaluations in the field, but we have to the extent possible with available staff obtained the views of those within the agency who might have pertinent information.

Mr. Jerry T. Thornhill, Chief
January 21, 1971
Page 2

The following are our comments and recommendations:

1. The work should be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil should be placed in spoil areas approved by the Texas Parks and Wildlife Department and in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters. The Texas Parks and Wildlife Department should be contacted in regard to the possible effects, if any, on wildlife, fowls, and aquatic life.
3. The discharge of oil, gasoline, or other fuels or materials capable of causing pollution arising from the operations should be prohibited.
4. Sanitary waste should be retained for disposal onshore in some legal manner.

We appreciate your cooperation in this matter and if we can be of additional assistance, please let us know.

Very truly yours,

Joe P. Teller
for

Hugh C. Yantis, Jr.
Executive Director

ccs: Texas Water Quality Board District 7 and 11
✓ Corps of Engineers
Texas Parks and Wildlife Department

SWCCO-M

13 January 1972

Director
Region VI
Environmental Protection Agency
Federal Activities Coordination
1600 Patterson, Suite 1100
Dallas, Texas 75201

Dear Sir:

Forwarded under separate cover, pursuant to P.L. 91-190 and your letter of 1 February 1971 are three sets of drawings of the final plans for disposal of dredged material in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between Port Isabel and Mud Flats in Cameron, Willacy and Kinney Counties, Texas, as re-coordinated with governmental fish and wildlife agencies.

A copy of the Bureau of Sport Fisheries and Wildlife Report dated 13 July 1971, which conforms with the approved plans, is inclosed for your information. We plan to periodically re-coordinate our maintenance dredging operations; however in order to accomplish the task required by P.L. 91-190 within established time limits, it is requested that suggested revisions be kept to a minimum during the next five years.

Your continued cooperation will be appreciated.

Sincerely yours,

2 Incls (for copy)

1. BSFSW report

2. Log File No.

INW 1173-163 (trip)
(in 4 sheets)

DULAN C. REEDER
Colonel, CE
District Engineer

Copy furnished: w/o Incl
Regional Director
Bureau of Sport Fisheries
and Wildlife
Albuquerque, New Mexico 87103

bcc: Area Engr
Brownsville A.O.

B-134

ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

January 17, 1972

Colonel Nolan C. Rhodes
District Engineer
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

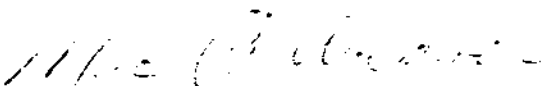
Dear Colonel Rhodes:

We have reviewed the final plans for your proposed maintenance dredging in the Gulf Intracoastal Waterway between Port Isabel and Mud Flats in Cameron, Willacy, and Kenedy Counties, Texas.

This office concurs with the final plans as they reflect the EPA's recommendations provided to you February 1, 1971. We wish to request also your cooperation in assuring that the proposed dredging is performed in accordance with the recommendations of the Bureau of Sport Fisheries and Wildlife Report dated July 13, 1971.

Your cooperation and assistance in the water pollution control program is greatly appreciated.

Sincerely,


Mac A. Weaver, P. E.
Acting Chief, Water Programs Branch
Air and Water Programs Division

1 November 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Reference is made to our letter of 2 July 1971 concerning our plan for disposal of dredged materials in open waters in connection with maintenance dredging operations in Chocolate Bayou, Gulf Intracoastal Waterway, in Brazoria County, Texas. In accordance with paragraph 2 thereof, inclosed are copies of Hoskins Mound Quadrangle, Texas-Brazoria Co., on which we have shown the disposal areas for dredging the landlocked portion of Chocolate Bayou.

The two disposal areas selected are on private property and the dredged materials will be confined with levees and the water effluent will be returned to the waterway by means of spillways and small natural streams and man-made ditches. All material will be placed on land exceeding an elevation of +7', which is not marsh areas or subject to tidal action. The water effluent being returned to the waterway will have less than eight grams of solids per liter and will be the same or better quality than that existing in the waterway.

The initial maintenance dredging activities will be performed in conjunction with widening and deepening of Chocolate Bayou on which an environmental impact statement has been prepared and is in the process of being filed through channels with the Council on Environmental Quality. Your agency, as well as the National Marine Fisheries Service and the Texas Parks and Wildlife Department, commented on the authorized improvements furnishing views on the impact on the environment. Inasmuch as the same disposal operations and areas will be utilized for maintenance and new work dredging, it is believed the assessments by fish and wildlife agencies would be the same for both the maintenance and new work activities.

SWGCO-11
Regional Director

1 November 1971

In view of the foregoing, it appears that your review and coordination with the Texas Parks and Wildlife Department and the National Marine Fisheries Service could be expedited. Your approval and/or comments would be appreciated not later than 1 December 1971, so that we can meet our tentative advertising date of 5 January 1972.

Sincerely yours,

Incl (in dupl)
Hoskins Mound Quad.

WELDON H. GAVEL
Chief, Construction-Operations Division

Copies furnished:
Bur. Sport Fisheries & Wildlife
River Basin Studies
Fort Worth, Texas 76102 (w/Incl in trip)

Nat'l Marine Fisheries Service
Biological Laboratories
Galveston, Texas 77550 (w/Incl.)

bcc:
C, Env. Res. Sec. (wo/Incl)

SWCCO-M

2 July 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for coordination is a drawing showing our plan for spoil disposal in open waters in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, in Braroria County, Texas.

The locations of the spoil areas on land have not been determined by the local sponsor. However, prior to dredging in the landlocked portion, the plan for the proposed spoil areas will be forwarded for coordination.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 30 July 1971 on the reach through open waters. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

- 2 Incls
1. Dwg. File No.
DW 315-25
(in 4 sheets)
2. Technical Provisions

WELDON M. GAMEL
Chief, Construction-Operations Division

Copies furnished:
Bur. Sport Fisheries & Wildlife
River Basin Studies
Ft. Worth, Texas 76102 (w/incls in trip)

Dr. Albert K. Sparks, Lab. Dir.,
Nat'l. Marine Fisheries Svc
Biological Laboratories
Galveston, Texas 77550 (w/incls)

B-138

SWGCO-M

2 July 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in open waters in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, in Brazoria County, Texas.

The locations of the spoil areas on land have not been determined by the local sponsor. However, prior to dredging in the landlocked portion, the plan for the proposed spoil areas will be forwarded for coordination.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 30 July 1971. This plan is being coordinated with fish and wildlife agencies.

Sincerely yours,

- 2 Incls (in trip)
1. Dwg. File No.
 INW 315-25
 (in 4 sheets)
2. Technical Provisions

WELDON M. GAMBL
Chief, Construction-Operations Division

1 November 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Reference is made to our letter of 2 July and your reply of 30 July concerning the disposal of dredged material in connection with maintenance dredging operations in Chocolate Bayou, Gulf Intracoastal Waterway, in Brazoria County, Texas.

Inclosed in accordance with paragraph 2 of our letter of 2 July are copies of Hoskins Mound Quadrangle, Texas-Brazoria Co., on which we have shown the disposal areas for dredging the landlocked portion of Chocolate Bayou. The two areas selected are on private property and the dredged materials will be confined with levees and the water effluent will be returned to the waterway by means of spillways and small natural streams and man-made ditches. All materials will be placed on land exceeding an elevation of +7', which is not marsh areas or subject to tidal action. The water effluent being returned to the waterway will be the same or better quality than that existing in the waterway.

In response to the penultimate paragraph of your letter of 30 July, we have not filed an environmental impact statement on any of our maintenance dredging activities. We are now in the process of preparing such statements and as time and resources permit, we are scheduled to complete the assessments within the next three years. However, an environmental statement has been prepared on the proposed deepening and widening of this project and has been forwarded through channels for filing with the Council on Environmental Quality. The impact of the maintenance activities will be the same as that for the authorized improvements since the same disposal operations and areas will be utilized initially for both maintenance and new work activities.

SWCCO-M
Regional Director

1 November 1971

It is requested the plan for disposal areas in conjunction with the dredging of the landlocked portion of the channel be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 1 December 1971. The plans for disposal operations are also being coordinated with fish and wildlife agencies.

Sincerely yours,

Incl (in trip)
Hoskins Mound Quad.

WELDON M. GABEL
Chief, Construction-Operations Division

bcc: w/Incl.
C, Env. Res. Sec.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

May 22, 1972

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter dated July 2, 1971, referenced SWGCO-M, enclosed for our review drawings depicting plans for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou Channel, in Brazoria County, Texas.

This letter is our report on the proposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received the concurrence of these agencies as indicated in the enclosed copies of letters from Executive Director James U. Cross dated March 23, 1972, and Regional Director, J. W. Gehringer, dated April 5, 1972, respectively. This report covers only the work of dredging and spoiling in that portion of the channel traversing the bays southward of Corps of Engineers' Station 279+00. Spoiling plans have not as yet been formulated for that portion of the channel lying north of Station 279+00.

We have reviewed the proposed plan of spoil disposal for the Chocolate Bayou Channel as charted on four sheets of map No. IWW 315-25, dated June 1971.

The designated spoil areas would lie on the east side of the channel between Corps of Engineers' Stations 110+524.56 (GIWW) and 20+00E, 243+00 and 259+00, and 263+00 and 279+00. Spoil areas would occur on the west side of the channel between Stations 115+600 (GIWW) and 12+00W, 17+00W and 24+00W, 34+00 and 40+00, 45+00 and 50+00, 57+00 and 64+00, 68+00 and 78+00, 83+00 and 91+00, 99+00 and 112+00, 118+00 and 139+00, 155+00 and 169+00, 174+00 and 184+00, 190+00 and 200+00, 205+00 and 214+00, and 219+00 and 236+00.

All spoil disposal areas would be located in open water. They would vary in length from 400 feet to about 3,060 feet and would lie from 400 feet to 800 feet from the centerline of the channel. Discharge points between spoil areas generally would range from 400 feet to 1,600 feet. Spoil would be permitted to flow without obstruction past discharge points into the shallow bay area.

Chocolate Bayou traverses predominantly agricultural areas in its upper reaches and low-lying uplands and tidal marshes in its lower reaches. Chocolate Bay is a shallow estuarine bay with numerous areas of marine vegetation.

The estuarine habitat of Chocolate Bay and the lower portion of Chocolate Bayou is important to many species of fish and crustaceans, several of which are of value to sport and commercial fishermen. The shoreline areas, shallow vegetated bay area, and tidal marshes are important as nursery and feeding areas. However, industrial pollution, siltation, and dredging have degraded much of the fishery habitat. Two major fish kills have occurred in Chocolate Bay since February 1965 and the commercial and sport harvest of oysters is prohibited since coliform bacteria levels exceed standards set by the Texas State Department of Health; however, there is still significant oyster production in the bay.

Important species of fish and crustaceans using the project area include spotted seatrout, sand seatrout, Atlantic croaker, flounder, red drum, black drum, striped mullet, menhaden, sheepshead, blue crab, brown shrimp, and white shrimp.

The quality of the wildlife habitat in the project area also has deteriorated in the past several years. As is the case with the fishery habitat, pollution, siltation, and dredging have been the major factors contributing to the decline of wildlife habitat. However, waterfowl usage of the area has held up because of the availability of feed in adjacent rice fields, marshes, and shallow vegetated bay areas. The principal species of waterfowl using the area are canvasback, redhead, lesser scaup, American widgeon, blue-winged teal, green-winged teal, pintail, mallard, mottled duck, Canada goose, and snow goose.

Other waterbirds use the area for feeding and resting. These include herons, egrets, gulls, roseate spoonbills, grebes, terns, and bitterns. The roseate spoonbill and the reddish egret are listed as peripheral species in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States."

In spite of environmental degradation, the project area retains a high recreational potential because of its proximity to the Houston metropolitan area. To prevent further reduction of water circulation, destruction and deterioration of fish and wildlife habitat, and the consequent decrease in recreational potential, extreme care should be taken in the placement of spoil.

To help insure proper circulation of water and movement of fish and crustaceans, no spoil should be placed in water between Corps of Engineers' Stations 45+00 and 60+00, 75+00 and 85+00, 135+00 and 169+00, and 275+00 and the mainland. Spoil areas lying between 34+00 and 40+00, and 57+00 and 64+00, could be lengthened to include the area from 34+00 to 45+00 and from 60+00 to 75+00, respectively.

Spoiling in the proposed disposal area between Stations 155+00 and 169+00 would result in the filling of shallow bay areas. Therefore, spoil to be placed in the above proposed spoil area should be placed and retained on land above the mean high tide-line so as to avoid altering water circulation patterns and to prevent the filling of shallow bay areas. If land is unavailable for this purpose, the spoil should be placed over the crest of the designated spoil area between Stations 156+00 and 168+00. A toe levee then should be built no further than 900 feet from the channel centerline when the spoil bank becomes emergent at 1.5 feet above the mean low tideline, and the opening between the shore and the existing spoil banks should be maintained at its present width and depth.

A list of the designated spoil areas with changes needed to protect the environment is given in Table 1.

Table 1. Spoil Area Locations as Designated in the Project Plan and as Modified for Fish and Wildlife

Spoil Areas with Project Plan	Spoil Areas with Modified Plan
Sta. 110+524.56 to Sta. 20+00E	Sta. 110+524.56 to Sta. 20+00E
Sta. 115+600 to Sta. 12+00W	Sta. 115+600 to Sta. 12+00W
Sta. 17+00W to Sta. 24+00W	Sta. 17+00W to Sta. 24+00W
Sta. 34+00 to Sta. 40+00	Sta. 34+00 to Sta. 45+00
Sta. 45+00 to Sta. 50+00	
Sta. 57+00 to Sta. 64+00	
Sta. 68+00 to Sta. 78+00	Sta. 60+00 to Sta. 75+00
Sta. 83+00 to Sta. 91+00	Sta. 85+00 to Sta. 91+00
Sta. 99+00 to Sta. 112+00	Sta. 99+00 to Sta. 112+00
Sta. 118+00 to Sta. 139+00	Sta. 118+00 to Sta. 135+00
Sta. 155+00 to Sta. 169+00	Emergent land
Sta. 174+00 to Sta. 184+00	Sta. 174+00 to Sta. 184+00
Sta. 190+00 to Sta. 200+00	Sta. 190+00 to Sta. 200+00
Sta. 205+00 to Sta. 214+00	Sta. 205+00 to Sta. 214+00
Sta. 219+00 to Sta. 236+00	Sta. 219+00 to Sta. 236+00
Sta. 243+00 to Sta. 259+00	Sta. 243+00 to Sta. 259+00
Sta. 263+00 to Sta. 279+00	Sta. 263+00 to Sta. 275+00

When proposed spoil areas become emergent at 1.5 feet above mean low tide, toe levees should be constructed and subsequently refurbished on the ends and back sides before each dredging operation to prevent the unnecessary filling of shallow areas of the bay.

Toe levees should be constructed at the spoil area between Stations 99+00 and 112+00 when any part of the spoil bank becomes emergent at 1.5 feet above mean low tide at a distance of 800 feet from the centerline of the channel.

At the two spoil areas between Stations 115+600 (GIWW) and 12+00W, and 110+524.56 (GIWW) and 20+00E, the toe levees should be constructed when any part of the spoil bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the channel centerline. These spoil areas are located on either side of the Chocolate Bayou Channel at its juncture with the Gulf Intra-coastal Waterway, and the 1,500-foot distance from the centerline is consonant with a recommendation being included in a report now in preparation by this Bureau on the Corps of Engineers' plans for

disposal along the Gulf Intracoastal Waterway between Galveston Bay and Matagorda Bay.

At all other designated or modified spoil areas, the toe levees should be constructed when any part of the spoil banks become emergent at 1.5 feet above mean low tide at a distance of 1,000 feet from the centerline of the dredged channel.

Until the spoil banks lying in open water become continuous and emergent at 1.5 feet above mean low tide when toe levees are to be constructed, the points of discharge should be relocated frequently to permit uniform buildup of spoil equidistant from the centerline of the channel.

Prior to the issuance of contracts for maintenance dredging in the project area, the Corps of Engineers should notify the Regional Director, Texas Parks and Wildlife Department, La Porte, Texas, of the proposed work to permit review of the dredging program.

It is recommended that:

1. No spoil be placed in water between Corps of Engineers' Stations 45+00 and 60+00, 75+00 and 85+00, 135+00 and 169+00, and 275+00 and the mainland.
2. The two proposed spoil areas lying between 34+00 and 40+00, and 57+00 and 64+00, be changed to 34+00 and 45+00, 60+00 and 75+00, respectively.
3. Spoil to be placed in the proposed disposal area between Stations 155+00 and 169+00 instead be placed and retained on land above the mean high tideline. If land is unavailable for this purpose, the spoil be placed over the crest of the designated spoil area between Stations 156+00 and 168+00. A toe levee then be built no further than 900 feet from the channel centerline when the spoil bank becomes emergent at 1.5 feet above the mean low tideline, and the opening between the shore and the existing spoil banks be maintained at its present width and depth.
4. When any part of the spoil bank between Stations 99+00 and 112+00 becomes emergent at 1.5 feet above mean low tide at a distance of 800 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished on the ends and 800 feet from the centerline of the channel before each dredging operation.

5. When any part of the spoil banks between Stations 115+600 (GIWW) and 12+00W, and 110+524.56 (GIWW) and 20+00E, becomes emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished on the ends and 1,500 feet from the centerline of the channel before each dredging operation.
6. When any part of the spoil banks at all other designated or modified spoil areas becomes emergent at 1.5 feet above mean low tide at a distance of 1,000 feet from the centerline of the channel, toe levees be constructed and subsequently refurbished on the ends and 1,000 feet from the centerline of the channel before each dredging operation.
7. Until the spoil banks lying in open water become continuous and emergent at 1.5 feet above mean low tide when the toe levees are to be constructed, the points of discharge be relocated frequently to permit uniform buildup of spoil equidistant from the centerline of the channel.
8. Prior to the issuance of contracts for maintenance dredging in the project area, the Corps of Engineers notify the Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the proposed work to permit review of the dredging program.

Should it become necessary to change the location or size of any spoil disposal area or opening between designated or modified spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on this maintenance project is appreciated.

Sincerely yours,

William M. White

Acting Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Recr., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Region, Albuquerque, N. Mex.
- (2) Field Supervisor, BSFW, Div. of River Basin Studies, Fort Worth, Tex.

TEXAS
PARKS AND WILDLIFE DEPARTMENT



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DALLAS

March 23, 1972

Mr. William M. White
United States Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

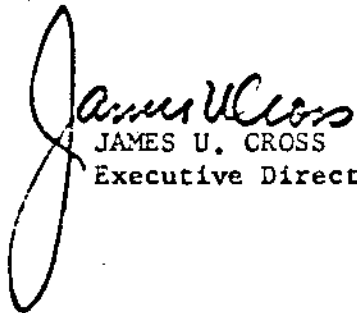
Dear Mr. White:

We have reviewed and concur with the draft report concerning the Corps of Engineers' plans for maintenance dredging for the Gulf Intracoastal Waterway, Chocolate Bayou Channel, Brazoria County, Texas, as presented.

One item perhaps needs clarification. This concerns the elimination of oyster production in the affected area. Refer to page 3, paragraph 2 of your report. Oyster production has not been eliminated in Chocolate Bay; however, oyster harvest is temporarily prohibited in the area due to coliform bacteria contamination. This problem results from camps on spoil islands, homeowners along Chocolate Bayou with improper waste treatment, and to some extent animal wastes from adjacent marshlands. This area is, however, still capable and does produce large quantities of oysters.

We appreciate having had the opportunity to review this draft report.

Sincerely,


JAMES U. CROSS
Executive Director

B-149

cc: Mr. John Degani



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
144 First Avenue South
St. Petersburg, Florida 33701

Date: April 5, 1972

Reply to
Attn of: FSE

Subject: Gulf Intracoastal Waterway, Brazoria County, Texas
GIWW Chocolate Bayou Channel - Maintenance Dredging

To: Regional Director
Bureau of Sport Fisheries and Wildlife
Albuquerque, New Mexico 87103

This is in reference to your letter dated March 10, 1972, regarding the Corps of Engineers' plans for maintenance dredging in the Gulf Intracoastal Waterway, Chocolate Bayou Channel, Brazoria County, Texas. We have received your draft report and agree with your recommendations.

In future maintenance dredging operations, we recommend that all additional spoil should be placed entirely on upland locations.

We appreciate the opportunity your staff has given ours to participate in formulating these recommendations.

E. J. Brakke

for Jack W. Gehringer
Regional Director



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

July 12, 1972

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel by letter dated November 1, 1971, and referenced SWGCO-M, enclosed for our review and comment a drawing depicting plans for spoil disposal in connection with maintenance dredging of the landlocked portion of Chocolate Bayou Channel in Brazoria County, Texas.

This letter is our report on the proposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received the concurrence of both of these agencies as indicated in the enclosed copies of letters from Executive Director James U. Cross, dated June 15, 1972, and Acting Regional Director E. J. Brakke, dated April 19, 1972, respectively. This report covers only the landlocked portion of Chocolate Bayou Channel. Our review and recommendations for the remainder of the Chocolate Bayou Channel have been presented in a letter report dated May 22, 1972.

Only two spoil disposal areas would be used in dredging the landlocked portion. They would lie east of the channel approximately between Corps of Engineers Stations 280+00 and 295+00, and 423+00 and 435+00. These two areas would lie on land above elevation +7 feet and would be completely leveed. The water effluent would be returned to the waterway by means of spillways, small natural streams, and man-made ditches.

The proposed plan of spoil disposal should have no appreciable effect on fish and wildlife resources of the area.

We appreciate the opportunity to comment on this maintenance dredging project.

Sincerely yours,

W. O. Nelson
Regional Director

B-151

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Rec., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSW, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT



JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

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HARRY JERSIG
SAN ANTONIO

June 15, 1972

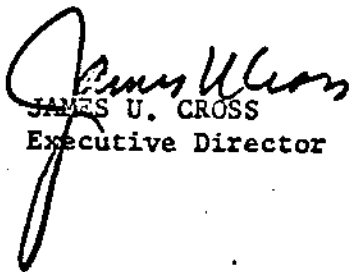
Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

We have reviewed the field draft report on Maintenance Dredging in Chocolate Bayou Channel, Brazoria County, Texas, and concur in the recommendations and provisions of the Fish and Wildlife Service report.

We appreciate having had the opportunity to review this draft report.

Sincerely,


JAMES U. CROSS
Executive Director



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
144 First Avenue South
St. Petersburg, Florida 33701

Date: April 19, 1972

Reply to
Attn of: FSE

Subject: Corps of Engineers' Proposed Plans for Spoil Disposal
in Connection with Maintenance Dredging of the Landlocked
Portion of Chocolate Bayou Channel in Brazoria County, Texas

To: Regional Director
Bureau of Sport Fisheries and Wildlife
Albuquerque, New Mexico

Reference is made to BSF&W letter dated April 4, 1972, transmitting
a copy of subject draft report, and requesting our review and comments.

We concur in your recommendations and appreciate the opportunity your
staff provided ours to participate in their formulation.

E. J. Brakke
Acting Regional Director

SWGCO-M

29 November 1972

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to our SWGCO-M letters of 2 July and 1 November 1971, and 7 April and 21 April 1972 and your final reports of 22 May and 12 July 1972 concerning recoordination pursuant to P.L. 91-190 of maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou Channel in Brazoria County, Texas. Forwarded under separate cover to your Fort Worth Office are four sets of drawings of the final plans for the disposal of dredged materials.

Recommendation No. 6 on page 6 of your report dated 22 May 1972 specifies the limits for constructing disposal areas between Stations 174+00 and 236+00. The recommended 1,000 foot distance from the center line of the channel to the backside of the areas establishes a 200 foot width for the disposal area located between Stations 174+00 and 184+00 and a 300 foot width for the disposal area located between Stations 190+00 and 200+00.

Confirming telephonic conversations with your Fort Worth personnel, your recommended 1,000 foot limit is considered too restrictive with respect to the aforementioned disposal areas. The size of the areas will be too small for constructing levees and confining materials during future maintenance dredging operations. It is proposed to comply with this recommendation when this new project is deepened and widened. However we plan to re-coordinate the disposal of dredged materials

SWGCO-M

29 November 1972

Mr. W. O. Nelson, Jr.
Regional Director

in the subject bay reach of the channel prior to the first maintenance dredging contract.

If other revisions are needed in the future to meet changing conditions, additional recoordination will be accomplished. However in order for all governmental agencies to accomplish the task required by P.L. 91-190 within the established time limits, it is recommended that any suggested revisions be held to the minimum during the next five years.

Sincerely yours,

1 Incl (quad)(fwd sep
to BSY&W in Ft.W.)

Dear Mr. Nelson:

WELDON M. GAMEL
Chief, Construction-Operations Division

Dwg File No.

IHW 315-25

(in 4 sheets)

Copy furnished: w/Incl.

Mr. John G. Degani, Bureau of Sport Fisheries and Wildlife
Bureau of Sport Fisheries and Wildlife

Fort Worth, Texas 76102

Mr. Don Moore (w/1 cy Incl)

National Marine Fisheries Service

Biological Laboratories

4700 Avenue U

Galveston, Texas 77550

bcc: Area Engr

Fort Point Area Office

ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1402 ELM STREET, THIRD FLOOR

DALLAS, TEXAS 75202

July 30, 1971

District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Reference is made to your letter of July 2, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, in Brazoria County, Texas. The drawings were also submitted to the Texas Water Quality Board and their recommendations have been incorporated with those of this office as follows:

1. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the Intracoastal Waterway.
2. The work must be performed in a manner that will reduce turbidity to the lowest practicable level.
3. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
4. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.
5. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Surveillance and Analysis Division Facility in Ada, Oklahoma.

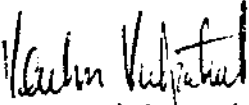
This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely,



Kenton Kirkpatrick
Acting Assistant Director
Air and Water Programs Division

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
VICE-CHAIRMAN
LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



JAMES U. CROSS
J. E. PEAVY, MD
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

July 16, 1971

RE: Application for Corps of Engineer
Permit - Maintenance Dredging
Operations, Gulf Intracoastal
Waterway, Chocolate Bayou
Brazoria County, Texas

Mr. Wallace R. Greene
Environmental Protection Agency
Acting Director, Division of
Planning & Interagency Programs
1402 Elm Street, Third Floor
Dallas, Texas 75202

Dear Mr. Greene:

This is in response to your July 7, 1971 request for certification that your proposed spoil disposal in open waters in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, in Brazoria County, Texas will not cause pollution of the waters of the State of Texas to such an extent as to cause a violation of the established Texas Water Quality Standards.

Insofar as can be accomplished in a matter of this kind, we believe it is established, subject to the qualifications and requirements following, that the activity you have proposed will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. In making this certification, we limit it to those things under the jurisdiction of this agency according to the various statutes which this agency administers. Disturbances of bay bottoms on state-owned lands require the approval of the Texas Parks and Wildlife Department who would also rule with regard to possible interference with shellfishing from other than a water quality standpoint. Our review of this matter has been almost exclusively a review

Mr. Wallace R. Greene

Page 2

July 16, 1971

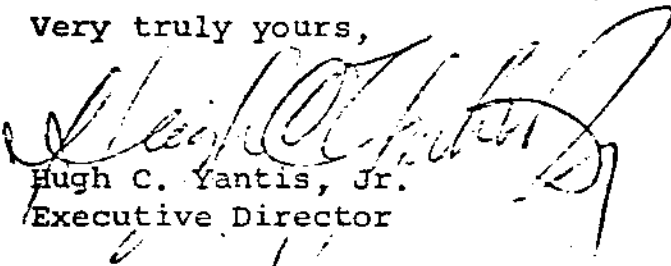
of the information you have furnished. It has not been feasible to make a detailed study including inspections and evaluations in the field, but we have to the extent possible with available staff obtained the views of those within the agency who might have pertinent information.

The following requirements are a part of the certification granted by this letter:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline or other fuels or materials capable of causing pollution arising from your operations is prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

We appreciate your cooperation in this matter and if we can be of additional assistance, please let us know.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

ccs: TWQB District 7
Corps of Engineers
Texas Parks and Wildlife Department

ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1600 PATTERSON, SUITE 1100

DALLAS, TEXAS 75201

January 12, 1972

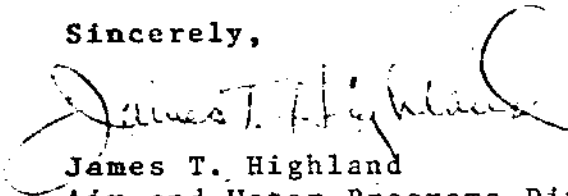
District Engineer
U. S. Army Engineer District
Galveston
Attn: Mr. Weldon M. Gamel
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Your proposal for maintenance dredging of the landlocked portion of Chocolate Bayou in Brazoria County, Texas, as presented in information forwarded with your letter of November 1, 1971, has been reviewed by this office and the Texas Water Quality Board. It is the opinion of each of our offices that the spoil disposal procedures proposed will prevent more than negligible temporary degradation of existing water quality in the work area and that no violation of established water quality standards will result.

We appreciate your cooperation in coordinating this work with us and with interested fish and wildlife agencies.

Sincerely,


James T. Highland
Air and Water Programs Division

29 November 1972

Mr. Arthur W. Busch
 Regional Administrator, Region VI
 Environmental Protection Agency
 Federal Activities Coordination
 1600 Patterson, Suite 1100
 Dallas, Texas 75201

Dear Mr. Busch:

Reference is made to our letter SWGCCO-M dated 2 July 1971 and your interim reply of 30 July 1971 concerning recoordination pursuant to P.L. 91-190 of maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, in Brazoria County. Reference is also made to our supplemental letter of 1 November 1971, and your reply thereto dated 12 January 1972. Pursuant to the request in your letter of 30 July 1971, water and sediment samples were taken and the test results were furnished in our letter of 23 May 1972.

Forwarded under separate cover are three sets of drawings of the final plans for the disposal of dredged materials as reordinated with governmental fish and wildlife agencies.

Copies of the Bureau of Sport Fisheries and Wildlife reports dated 22 May and 12 July 1972, which conform with the approved plans, are inclosed for your information. We plan to periodically re-coordinate our maintenance dredging operations; however in order to accomplish the task required by P.L. 91-190 within established time limits, it is requested that suggested revisions be kept to a minimum during the next five years.

Your continued cooperation will be appreciated.

Sincerely yours,

- 2 Incls
 1. BSP&W reports
 2. Dwg File No. (fwd sep)
 IHW 315-25
 (in 4 sheets)(trip)

WELDON M. GAMEL
 Chief, Construction - Operations Division

Copy furnished: w/o Incl
 Regional Director
 Bureau of Sport Fisheries
 and Wildlife
 P. O. Box 1306
 Albuquerque, New Mexico 87103

B-162

bcc: Area Engr
 Fort Point Area Office



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

December 20, 1972

Colonel Nolan C. Rhodes
District Engineer
Galveston District
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel Rhodes:

We have reviewed the final plans for the disposal of dredged materials from maintenance dredging operations in the Gulf Intracoastal Waterway, Chocolate Bayou, Brazoria County, Texas.

This office concurs with the final plans.

Your cooperation and assistance in the water pollution control program is greatly appreciated.

Sincerely yours,

James T. Highland
for Charles H. Hembree
Chief
Federal Assistance Branch

12 May 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, San Bernard River, in Brazoria County, Texas.

A copy of our current contract technical provisions covering control measures for environmental protection is and will be furnished along with each drawing.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 1 June 1971. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

2 Incis

1. Dwg. File No.

DW 1150-790

(in 3 sheets)

2. Tech. Provisions

Copies furnished:

Bur. Sport Fisheries & Wildlife

River Basin Studies

7A25G 819 Taylor Street

Ft. Worth, Texas 76102 (w/incls in trip)

Dr. Albert K. Sparks, Lab. Dir.,

Nat'l. Marine Fisheries Svc

Biological Laboratories

4700 Avenue U

Galveston, Texas 77550

(w/incls)

E. D. McGENEE

Acting Chief

Construction-Operations Division

B-164

SWCCO-M

12 May 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1512 Commerce Street (Seventh Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, San Bernard River, in Brazoria County, Texas.

A copy of our current contract technical provisions covering control measures for environmental protection is furnished along with each drawing.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 1 June 1971. This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

- 2 Incls (in trip)
1. Dwg. File No.
 IWW 1150-790
 (in 3 sheets)
2. Technical Provisions

E. D. McGEHEE
Acting Chief
Construction-Operations Division



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

RB

June 1, 1973

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter dated November 16, 1971, referenced SWGCO-M, enclosed for our review and comments drawings showing the proposed plan for spoil disposal during maintenance dredging of the Gulf Intracoastal Waterway, San Bernard River. The channel is entirely in Brazoria County, Texas.

We have reviewed the plan for spoil disposal as shown on drawings, sheets 1-3, Corps of Engineers File No. IWW 1150-790, dated April 1971. This letter is our report on the plan, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received concurrence from these agencies as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison, dated April 26, 1973, and Regional Director Jack W. Gehringer, dated April 30, 1973, respectively.

The San Bernard River rises as the boundary between Colorado and Austin Counties and flows southeasterly for 105 miles across the Gulf Coast Prairie. It empties directly into the Gulf of Mexico just east of the Cedar Lakes estuary. The principal tributaries of the river are East, Middle, and West Bernard Creeks. The Gulf Intracoastal Waterway crosses the river a mile above the mouth.

The San Bernard River drains most of the Brazos-Colorado Coastal Basin. This area is subject to heavy rainstorms, sometimes associated with tropical hurricanes. The river overflows its banks several times a year and causes considerable agricultural damage.

The river has been deepened to 9 feet and widened to 100 feet from the Gulf Intracoastal Waterway at Station 0+00 up the river for 26 miles to Station 1370+20. A sharp bend in the river at Station 135+00 has been rectified.

B-166

Spoil from the channel between Stations 0+00 and 1370+20 is to be placed adjacent to the river on 12 disposal areas used in previous dredging operations. These disposal areas are delineated on the drawings and are identified with numbers. All are on the east bank of the river except Area No. 6 which lies on the west bank. Area No. 6 is the only leveed area. Many of the other disposal areas are confined by roads and private lands adjacent to the project.

The San Bernard National Wildlife Refuge lies above Cedar Lakes near the west bank of the river. No spoil will be deposited on refuge lands.

The San Bernard River is tidal for 40 miles. Other tidal waters in the project area are Red Fish Bayou and Pelican Lake which empty into the river just upstream from the Gulf Intracoastal Waterway. The quality of these waters is generally good. They provide habitat for many species of fishes and crustaceans including redfish, gafftopsail, catfish, spotted seatrout, sheepshead, flounder, croaker, menhaden, mullet, brown shrimp, white shrimp, and blue crab. Marine sport and commercial fishing of importance occurs in the San Bernard River.

Brackish marshes border the lower reach of the river. Bottomland hardwoods border the river upstream of the marshes. The clay and loam soil of the river bottomlands is intermixed with alluvial sands deposited at flood stages. This area is timbered with ash, hackberry, pecan, and cottonwood. Woodlands along the river give way to the native tall grasses, improved pastures, and cultivated crops of the coastal prairie.

White-tailed deer, squirrels, mourning doves, cottontail and swamp rabbits, raccoons, opossums, bobwhites, bobcats, armadillos, skunks, and coyotes are found along the river. Landowner restrictions and the high cost of hunting fees and leases limit hunting in the area.

The river and its associated marshes provide habitat for limited numbers of beaver, otter, and mink, but these animals are not populous enough to support trapping.

The most important wildlife in the project area is waterfowl. Mallard, pintail, baldpate, lesser scaup, teals, and canvasback, are the principal wintering species. Mottled ducks nest in the tall grass near tributary streams. A variety of shore and wading birds is found on the coastal marshes along the lower reach of the river.

The plan for spoil disposal has been evaluated using nautical charts of the area and using our own field information and information obtained from biologists of the Texas Parks and Wildlife Department and the National Marine Fisheries Service.

The quality of estuarine water in the river and its tributaries would temporarily decrease with dredging. Disturbance of the bottom and runoff of waste water from the disposal areas would increase turbidity and prevent light penetration. Fish food production would decrease. Benthic communities on the channel bottom would be removed with the spoil. The value of the estuarine habitat for fishes and crustaceans would be reduced. Over a period of time following the completion of dredging operations, formerly occurring plant and animal communities would become reestablished in estuarine areas not permanently destroyed.

Many spoil disposal sites are located in wooded areas. Grasses, understory vegetation, and small trees would be covered with spoil. These areas would lose their value to wildlife until vegetation can be reestablished.

Disposal sites near the Gulf Intracoastal Waterway would cover coastal marshes. Spoil would run off of these spoil areas into adjacent marshes and into Pelican Lake and Red Fish Bayou. Estuarine habitat would be covered. Water exchange between the river and its tributaries could be restricted.

Most of the permanent damage to marsh and estuarine waters could be prevented by leveeing existing coastal disposal sites or by using alternate disposal sites. The following recommendations, particularly Nos. 1, 2, and 3, are directed toward that objective.

It is recommended that:

1. The spoil areas east of the channel between Stations 7+00 and 45+00 no longer be used. Instead, spoil should be placed on the GIWW spoil area west of the channel between Stations 0+00 and 35+00.
2. The spoil areas between Stations 45+00 and 105+00 be leveed to prevent spoil from spilling into Pelican Lake. The levee should begin at the proximal point of discharge at Station 45+00 and extend in a northerly direction for 800 feet. The levee should then turn westerly and parallel the

channel to Station 60+00, swing away from the river until the levee is 1,000 feet from the channel, and continue westerly at this distance to Station 105+00.

3. Spoil disposal operations be inspected frequently to prevent accidental spillage of dredged material outside of leveed spoil areas.
4. Prior to issuance of contracts for maintenance dredging in the project area, the Corps of Engineers notify the Regional Director, Bureau of Sport Fisheries and Wildlife, Post Office Box 1306, Albuquerque, New Mexico 87103, and the Regional Director of Coastal Fisheries, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the proposed work to permit a review of the dredging program.

Should it become necessary to change the location or size of any disposal area, other than changes required to comply with the recommendations of this report, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on your proposed plan for spoil disposal is appreciated.

Sincerely yours,



Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Water Res. Div., NMFS, Galveston, Tex.
- (2) Regional Director, BOR, South Central Reg., Albuquerque, N. Mex.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSW, Div. of River Basin Studies, Fort Worth, Tex.

TEXAS
PARKS AND WILDLIFE DEPARTMENT



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AUSTIN, TEXAS 78701

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TEMPLE

JOE K. FULTON
LUBBOCK

April 26, 1973

Mr. William M. White
Acting Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

Reference is made to your March 23 Review Draft Report concerning the Corps of Engineers' plan for spoil disposal during maintenance dredging of the light-draft channel in the San Bernard River, Texas.

The report, as written, presents an accurate assessment of the project's probable effects on fish and wildlife resources of the impact area. We concur with your recommendations without additional comment.

We appreciate having had the opportunity of coordinating with your agency in this matter of mutual concern.

Sincerely yours,

A large, stylized handwritten signature in cursive script, appearing to read "Clayton T. Garrison".

CLAYTON T. GARRISON
Executive Director

CTG:BM:wj



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
144 First Avenue South
St. Petersburg, Florida 33701

April 30, 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to Mr. William M. White's letter dated March 23, 1973, transmitting a copy of your draft report on the Corps of Engineers' plan for spoil disposal during maintenance dredging of the light-draft channel in the San Bernard River, Texas.

We have reviewed this report and concur with your presentation of the findings and recommendations. The opportunity to assist you in the preparation of this report is appreciated.

Sincerely yours,

A handwritten signature in cursive script that reads "Jack W. Gehringer".

Jack W. Gehringer
Regional Director

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Date: June 9, 1971

Your Ref: SWDCO-M

Reply to
Attn of: Federal Activities Coordination Branch

Subject: Maintenance Dredging Operations in the Gulf Intracoastal Waterway

To: District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Reference is made to your letter of May 12, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, San Bernard River, in Brazoria County, Texas. The drawings were also submitted to The Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

- a. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.
- b. The dredging operations should be performed in a manner that will reduce turbidity to the lowest practicable level.
- c. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- d. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.
- e. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

A handwritten signature in cursive script that reads "Charles H. Hembree".

CHARLES H. HEMBREE
Acting Director, Division of
Planning & Interagency Programs

B-173

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
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LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



JAMES U. CROSS
J. E. PEAVY MD
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST
AUSTIN, TEXAS 78701

475-2651

May 19, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal Plan
for Gulf Intracoastal Waterway
Maintenance (San Bernard River)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Attn: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your May 13, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, San Bernard River, in Brazoria County, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

B-174

Mr. Richard A. Vanderhoof, Regional Director

Page 2

May 19, 1971

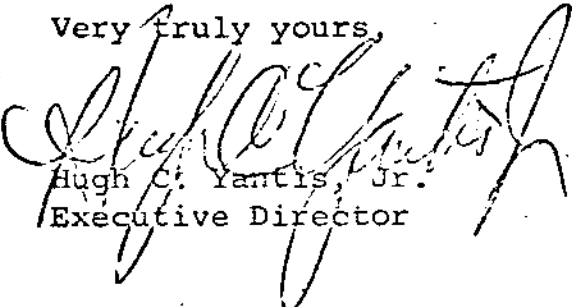
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

1. The work must be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
3. The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
4. Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,


Hugh C. Yantis, Jr.
Executive Director

ccs: Corps of Engineers, Galveston District
Texas Parks and Wildlife Department
WQB District 7

25 May 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Colorado River Channel, in Matagorda County, Texas.

These spoil areas are located on land and are provided by local interests. Upland spoil areas are subject to change as the local sponsor acquires new areas and disposes of old ones. However, spoil will be confined on land within leveed spoil areas owned by local entities or individuals, except between stations 510+00 and 545+00, spoil will be allowed to flow into the cut-off channel of the Colorado River.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 21 June 1971. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

- 2 Incls
1. Dwg. File No.
 IV# 1150-738 (in 7 sheets)
2. Tech. Provisions

WELDON H. GAMEL
Chief, Construction-Operations Division

Copies furnished:
Bur. of Sport Fisheries & Wildlife
River Basin Studies
7A25G 819 Taylor Street
Ft. Worth, Tx 76102 (w/incls in trip)

B-176

Dr. Albert K. Sparks, Laboratory Director
National Marine Fisheries Service
Biological Laboratories
4700 Avenue U, Galveston, Tx 77550 (w/incls)

SWCCO-M

25 May 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1512 Commerce Street (Seventh Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Colorado River Channel, in Matagorda County, Texas.

These spoil areas are located on land and are provided by local interests. Upland spoil areas are subject to change as the local sponsor acquires new areas and disposes of old ones. However, spoil will be confined on land within leveed spoil areas owned by local entities or individuals, except between stations 510+00 and 545+00, spoil will be allowed to flow into the cut-off channel of the Colorado river.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.


It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 21 June 1971. This plan is being re-coordinated with fish and wildlife agencies.

Sincerely yours,

- 2 Incls (in trip)
- 1. Dwg. File No.
IWW 1150-788
(in 7 sheets)
- 2. Technical Provisions

WELDON M. GAMEL
Chief, Construction-Operations Division

B-177



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

RB

February 7, 1974

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter dated May 25, 1971, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal during maintenance dredging of the Colorado River Channel in Matagorda County, Texas, and requested our comments on the proposal.

This letter, which constitutes our report on the proposal, was prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The report was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received the concurrence of both of these agencies as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison dated March 2, 1973, and former Regional Director Jack W. Gehringer dated February 21, 1973, respectively.

The Colorado River Channel is a 9-foot-deep by 100-foot-wide channel that originates at approximately Corps of Engineers Station 454+600 of the Gulf Intracoastal Waterway and follows the natural channel of the Colorado River, except between Stations 507+00 and 540+00, upstream to a turning basin at about mile 15.5. Between Stations 507+00 and 540+00, the channel alignment was rectified to bypass a sharp bend of the river.

Nine spoil areas, all lying on land, are proposed for disposal of spoil dredged from the Colorado River Channel. These areas, designated by Corps of Engineers station numbers, are listed in Table 1.

Table 1. Designation and Location of Spoil Areas

Spoil Area Number	West Side of Channel	East Side of Channel
1	150+00 to 290+00	
2		295+00 to 352+00
3	387+00 to 411+50	
4		430+00 to 496+00
5		497+50 to 545+00
6	570+00 to 745+25	
7		755+00 to 780+00
8	780+00 to 821+30	
9		833+00 to 848+70

Spoil areas Nos. 2, 3, and 8, are completely leveed, and spoil area No. 6 is leveed between Stations 702+00 and 745+25. Also, area No. 7 is leveed on its ends and on the backside. Area No. 9 would be completely leveed with the new work while the remaining spoil areas, Nos. 1, 4, and 5, would not be leveed.

The Colorado River is tidal for about 20 to 25 miles upstream from its mouth. This section of the river, which includes the project channel, is a river estuary in that the river empties directly into the Gulf of Mexico rather than into an estuarine bay. As is characteristic of river estuaries, the Colorado River is subject to fluctuating salinity levels depending upon the flows of the river. As a result, the project area provides habitat at various times for both estuarine organisms and freshwater organisms. During periods of normal or low flows the project area provides feeding and nursery habitat for several estuarine species of fish and crustaceans including spotted seatrout, flounder, red drum, black drum, Atlantic croaker, menhaden, sheepshead, mullet, white shrimp, brown shrimp, and blue crab. During periods of above normal flows freshwater fish such as channel catfish, yellow catfish, blue catfish, carp, gar, buffalofish, sunfish, crappie, and largemouth bass occupy the project area.

The Colorado River Channel is bordered on both sides by a floodplain. That portion of the floodplain adjacent to the river is vegetated with hardwood forest intermixed with some rangeland. The forest consists mainly of ash, hackberry, pecan, and cottonwood, with some elm, willow, sycamore, and oaks. Understory vegetation is primarily smilax, greenbriars, hawthorns, wax myrtle,

and French mulberry. The rangeland areas are vegetated by several species of perennial weeds and grasses.

The floodplain of the Colorado River provides valuable wildlife habitat primarily for upland-game animals. Gray squirrels and fox squirrels are present in moderate numbers in the timbered areas. The population density is estimated to be about one squirrel to 2 acres. Mourning doves and bobwhites also occur in moderate numbers. White-tailed deer are present in low to moderate numbers. Portions of the floodplain are seasonally flooded and, when flooded during the fall and winter months, provide feeding and resting habitat for wintering waterfowl. The principal species of waterfowl in the area are the pintail, mallard, green-winged teal, blue-winged teal, canvasback, redhead, Canada goose, and snow goose.

The proposed plan of dredging and spoiling would destroy or damage valuable fish and wildlife habitat. The non-leveed spoil areas are excessively large and cover valuable wildlife habitat. Spoil placement on these areas would destroy existing vegetation rendering these areas virtually useless as wildlife habitat. Also, a lack of retention levees would allow spoil to flow unobstructedly beyond the designated spoil areas and cover additional valuable habitat. Several years would be required for processes of natural succession to restore the areas to predisturbance conditions; furthermore, subsequent spoiling from maintenance dredging would prohibit any significant restoration.

The dredging of the channel would temporarily increase turbidity, would displace benthic organisms, and leave a relatively sterile bottom. The removal of the benthic community and associated detritus within the channel would lower the fertility of the aquatic habitat. Processes of natural succession would require a considerable time to restore this area. Between Stations 507+00 and 540+00 spoil would be allowed to flow into the bypassed bendway of the Colorado River and eventually fill this valuable habitat.

The proposed plan of spoil disposal would result in significant and unnecessary damages of fish and wildlife resources. To reduce the damages to these resources, certain changes should be made in the proposed plan.

It is recommended that:

1. Spoil areas Nos. 1 and 4 be leveed on their ends and on the backsides no more than 1,000 feet from the channel centerline and all spoil be retained within these levees.

2. No spoil be placed on spoil area No. 5 between Stations 504+00 and 515+00 and between Stations 534+00 and 545+00.
3. Spoil area No. 5 be leveed on its ends and on the backside no more than 1,000 feet from the channel centerline between Stations 515+00 and 534+00 and all spoil be retained within these levees.
4. Spoil area No. 6 be leveed on its ends and the backside no more than 1,000 feet from the channel centerline between Stations 570+00 and 702+00, and all spoil placed on area No. 6 be retained within these levees and the existing levees.
5. Leveed spoil areas be inspected frequently to prevent accidental spillage of dredged materials outside of the areas.
6. Prior to the issuance of contracts for maintenance dredging of the Colorado River Channel, the Corps of Engineers notify the Coastal Fishery Supervisor, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571 and the Bureau of Sport Fisheries and Wildlife, Post Office Box 1306, Albuquerque, New Mexico 87103, of the proposed work to permit review of the dredging program.

Should it become necessary to change the location or size of any disposal area, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the proposed plan of spoil disposal is appreciated.

Sincerely yours,



Regional Director

Enclosures 2

Copies (10)

B-181

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Water Res. Div., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Recr., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSW, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT



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CLAYTON T. GARRISON
EXECUTIVE DIRECTOR
JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

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TEMPLE

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LUBBOCK

March 2, 1973

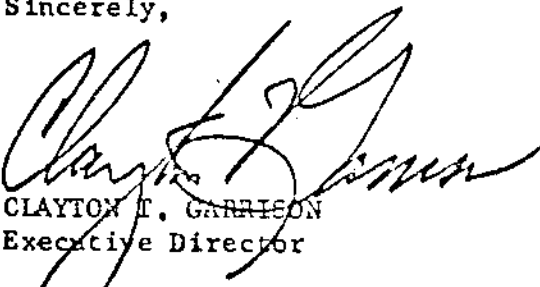
Mr. Wm. M. White
Acting Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

Reference is made to your agency's draft report concerning spoil disposal in connection with maintenance dredging of the Colorado River Channel in Matagorda County, Texas. Our field staff has reviewed this draft report and their comments have been coordinated with the Austin office staff. They find, in general, that the report is an accurate assessment of ecological implications which would be associated with this project. We do concur with this draft report in its entirety.

We appreciate having had the opportunity of coordinating with you in regard to this matter of mutual concern.

Sincerely,


CLAYTON T. GARRISON
Executive Director
CTG:RM:wj



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
144 First Avenue South
St. Petersburg, Florida 33701

February 21, 1973

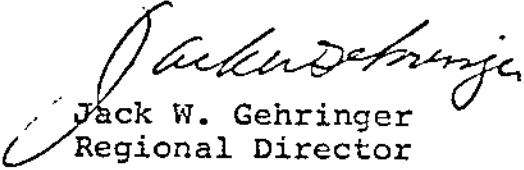
Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

Reference is made to Mr. William M. White's letter dated January 23, 1973, transmitting a copy of your draft report on the Corps of Engineers' plans for spoil disposal in connection with maintenance dredging of the Colorado River Channel, Matagorda County, Texas, and requesting our review and comments.

We have reviewed this report and suggest that the phrase "no more than" be inserted after "backside(s)" in recommendation Nos. 1, 3, and 4. We concur with the remainder of the report, as written.

Sincerely yours,


Jack W. Gehringer
Regional Director



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

RB

May 15, 1974

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

This letter is a supplement to the Bureau of Sport Fisheries and Wildlife report of February 7, 1974, concerning the Corps of Engineers plans for spoil disposal in connection with maintenance dredging of the Colorado River Channel in Matagorda County, Texas. This report has been prepared under authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The views and conclusions expressed herein have been coordinated with the Texas Parks and Wildlife Department and the National Marine Fisheries Service. Both agencies have expressed their concurrence in this report as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison dated April 23, 1974, and Regional Director William H. Stevenson dated May 7, 1974, respectively.

The Corps of Engineers has informed us that the plans upon which our report of February 7, 1974, was based contained an error. The error concerned the extent of existing levees around spoil area No. 6 which lies on land between Corps of Engineers Stations 570+00 and 745+25.

Spoil area No. 6 was originally described as being leveed only between Stations 702+00 and 745+25. In Recommendation No. 4 of our report of February 7, 1974, we recommended that spoil area No. 6 be leveed on its ends and on the backside no more than 1,000 feet from the channel centerline. We now have been informed that spoil area No. 6 was completely leveed about two years ago. The existing back levee varies in distance from the channel centerline from 1,400 to 1,900 feet.

We have consulted with the Texas Parks and Wildlife Department concerning the magnitude of habitat loss which would occur in the area between the 1,000-foot-from-channel-centerline back-levee

alignment recommended in our February 7, 1974, report, and the existing 1,400- to 1,900-foot alignment of the back levee which is now in place. It appears that this extension of the spoil area would have no significant biological impact. The area involved has been affected by previous spoiling and has thereby lost its original productivity.

In view of the above, we are rescinding Recommendation No. 4 of our report of February 7, 1974.

Sincerely yours,



Regional Director

Enclosures 2

Copies (10)

Distribution

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Water Res. Div., NMFS, Galveston, Tex.
- (2) Regional Administrator, EPA, Reg. VI, Dallas, Tex.
- (1) Regional Director, Bur. of Outdoor Recr., Albuquerque, N. Mex.
- (1) Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSWF, Div. of River Basin Studies, Fort Worth, Tex.

DEPARTMENT OF THE ARMY
FIRM AND WILDLIFE DIVISION
BUREAU OF SPORT FISHERIES
& WILDLIFE
1405 ROSS AVENUE, NEW ALBUQUERQUE, N.M.

SWCCO-M

8 May 1974

February 7, 1974

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries
& Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson: Copies of the Bureau's letter
dated February 7, 1974, on SWCCO-M

Reference is made to Mr. William H. White's letter dated 8 April 1974
with inclosed draft of a report and your letter dated 7 February 1974
with inclosed report concerning the disposal plans for maintenance
dredging of the Colorado River Channel in Matagorda County, Texas.

We can comply with most of your recommendations with the exception of
those for Disposal Areas 1, 4 and 5 because of the following:

Area Nos. 1 and 4 - The 1,000 foot distance specified from the
centerline of the Colorado River Channel to locate the back limits for
a new levee in these areas is considered too restrictive for these areas.
The 1,000 feet should be from the high bank of the channel rather than
centerline.

Regional Director

Area No. 5 - Your recommendation to delete two portions of Area
No. 5, each 1,100 linear feet in length, makes the two remaining areas
between Stations 497+50 to 504+00 and Stations 515+00 to 534+00 too
restrictive for effective disposal operations. The back limits need to
be not less than 1,500 feet from the channel centerline in lieu of the
1,000 foot recommendation.

The next time these areas are used, the landowner will be contacted for
permission to construct back levees as you have recommended.

Sincerely yours,

MARTIN W. TEAGUE
LIEUTENANT COLONEL, CE
DEPUTY DISTRICT ENGINEER

Copy furnished:
Mr. John G. Degani
Bureau of Sport Fisheries
& Wildlife
Fort Worth, Texas 76102

B-187

Return to: O&M Branch

Mail

)
ENVIRONMENTAL PROTECTION AGENCY
REGION VI
Division of Air and Water Programs
1402 Elm Street, Third Floor
Dallas, Texas 75202

July 23, 1971

District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Reference is made to your letter of May 25, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway Colorado River Channel in Matagorda County, Texas. The drawings were also submitted to the Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

1. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.
2. The work must be done with the minimum production of turbidity in the waters where the work is taking place.
3. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters to adjacent waters.
4. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.
5. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Surveillance and Analysis Division Facility in Ada, Oklahoma.

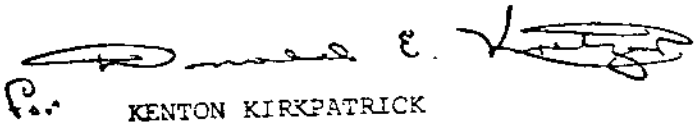
This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely,



P.s. KENTON KIRKPATRICK
Acting Assistant Director
Division of Air and Water Programs

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
VICE-CHAIRMAN
LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



JAMES U. CROSS
J. E. PEAVY, MD
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

July 8, 1971

RE: Corps of Engineers, Galveston District
Spoil Disposal Plan for Gulf Intracoastal
Waterway Maintenance (Colorado River
Channel)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your May 28, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Colorado River Channel, in Matagorda County, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

Richard A. Vanderhoof

2

July 8, 1971

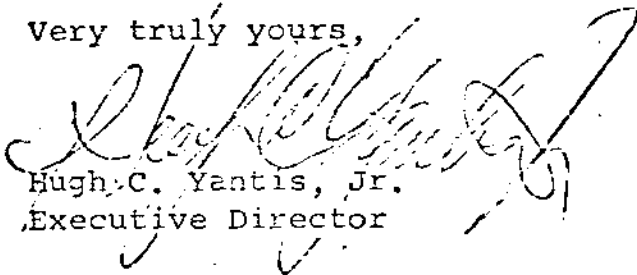
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

cc: TWQB District 8
Corps of Engineers, Galveston District
Texas Parks and Wildlife Department

SWCCO-M

30 April 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Palacios in Matagorda County, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 24 May 1971. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dwg., File No.
IHW 1150-737 (in
4 sheets)

WELDON M. CANEL
Chief, Construction-Operations Division

Copies furnished:
Bureau of Sport Fisheries & Wildlife
River Basin Studies
Fort Worth, Texas 76102
w/incl in trip.

Dr. Albert K. Sparks
Laboratory Director
Nat'l. Marine Fisheries Svc
Galveston, Texas 77550
w/incl.

B-192

EWCCO-M

30 April 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Palacios, in Matagorda County, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 24 May 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupes)
Dwg. File No.
EW 1150-787
(in 4 sheets)

WILSON M. GAMBL
Chief, Construction-Operations Division



UNITED STATES
 DEPARTMENT OF THE INTERIOR
 FISH AND WILDLIFE SERVICE
 BUREAU OF SPORT FISHERIES AND WILDLIFE
 POST OFFICE BOX 1306
 ALBUQUERQUE, NEW MEXICO 87103
 July 11, 1972

District Engineer
 Corps of Engineers, U. S. Army
 Post Office Box 1229
 Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel, by letter of April 30, 1971, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway, Channel to Palacios in Matagorda and Tres Palacios Bays, Texas, and requested our views on the proposal.

This letter is our report on the plans for spoil disposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared in cooperation with the Texas Parks and Wildlife Department and the National Marine Fisheries Service. It has received concurrence from these agencies as indicated in the enclosed copies of letters from Executive Director James U. Cross, and Acting Regional Director Harold B. Allen, dated June 20, 1972, and April 25, 1972, respectively.

We have reviewed the proposed plan of spoil disposal on the entire reach of the Channel to Palacios, from its intersection with the Gulf Intracoastal Waterway at about Corps of Engineers Station 591+00 to the city basin at Station 0+65, a distance of about 16 miles, as charted on four sheets of map No. IWW 1150-787, dated April 1971.

The proposed spoil areas would be on the west side of the channel in bay water and on land west of the municipal basin and north of the city basin. There would be 17 spoil areas in open water varying in length from 500 to 7,000 feet. Openings between the spoil banks would range from 1,300 to 2,000 feet in width. Spoil would be placed a minimum of 900 feet from the edge of the waterway. Beyond this point the spoil would be permitted to spill promiscuously.

The project is located in an area of high-quality habitat used by fishes and crustaceans as feeding, breeding, and nursery grounds. A live oyster reef lies across Tres Palacios Bay in the general

vicinity of Stations 135+00 and 176+00. The important species of fishes and crustaceans using the area include red drum, black drum, spotted seatrout, sand seatrout, Atlantic croaker, southern flounder, striped mullet, menhaden, gafftopsail catfish, spot, sheepshead, blue crab, brown shrimp, and white shrimp.

The area also contains habitat of importance to waterfowl, shorebirds, and wading birds. Most of the waterfowl use is by migrants during the winter. Principal species of waterfowl include the pintail, mallard, mottled duck, redhead, canvasback, lesser scaup, American widgeon, blue-winged teal, green-winged teal, shoveler, and American coot. The principal shorebirds and wading birds are ibises, egrets, herons, gulls, terns, pelicans, roseate spoonbills, rails, sandpipers, and plovers. The roseate spoonbill and the reddish egret are listed as peripheral species in the Bureau of Sport Fisheries and Wildlife Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States."

The existing channel to Palacios is a shallow-draft channel of 12-foot depth. Much of this channel traverses bay water 10 feet or greater in depth. Spoil from previous dredging has not as yet accumulated to the extent of causing circulation problems in Tres Palacios and Matagorda Bays. Neither has placement of spoil in these areas hindered boat or fish movement.

Because damage to the environment has been minimal and existing spoil accumulations are small, it would be appropriate at this time to redesign the pattern of spoiling to eliminate excessive length in spoil areas and to provide for openings of at least 2,000 feet between points of spoiling. Additional openings should be provided between the shoreline and Station 60+00 and between Stations 140+00 and 170+00 to prevent spillage of materials onto the live oyster reef in the latter location. Most of the planned openings would have to be relocated also because of changes in spacing and the greater width involved.

Table I delineates open water locations for spoil disposal as described in the project plan and as modified for fish and wildlife. Openings between the spoil areas are delineated also to facilitate comparison.

Table 1. Spoil Disposal Areas Located in Open Water as Designated in the Project Plan and as Modified for Fish and Wildlife (Spoil area limits are identified by Corps of Engineers' Station Numbers)

Spoil Areas with Project Plan		Spoil Areas with Modified Plan	
Spoil Areas	Openings	Spoil Areas	Openings
40+00 to 88+00		60+00 to 88+00	Shoreline to 60+00
98+00 to 166+00	88+00 to 98+00	108+00 to 140+00	88+00 to 108+00
176+00 to 210+00	166+00 to 176+00	170+00 to 210+00	140+00 to 170+00
220+00 to 225+00	210+00 to 220+00	230+00 to 280+00	210+00 to 230+00
235+00 to 245+00	225+00 to 235+00	300+00 to 325+00	280+00 to 300+00
255+00 to 325+00	245+00 to 255+00	345+00 to 375+00	325+00 to 345+00
341+00 to 371+00	325+00 to 341+00	395+00 to 425+00	375+00 to 395+00
387+00 to 417+00	371+00 to 387+00	445+00 to 475+00	425+00 to 445+00
433+00 to 463+00	417+00 to 433+00	500+00 to 540+00	475+00 to 500+00
479+00 to 509+00	463+00 to 479+00	560+00 to 600+00	540+00 to 560+00
525+00 to 555+00	509+00 to 525+00	620+00 to 660+00	600+00 to 620+00
571+00 to 601+00	555+00 to 571+00	695+00 to 725+00	660+00 to 695+00
617+00 to 647+00	601+00 to 617+00	750+00 to 780+00	725+00 to 750+00
660+00 to 696+00	647+00 to 660+00	805+00 to 835+00	780+00 to 805+00
716+00 to 746+00	696+00 to 716+00		
761+00 to 791+00	746+00 to 761+00		
806+00 to 836+00	791+00 to 806+00		

Presently the easterly limit of the points of spoil discharge is 900 feet from the near bottom edge of the channel. There is no limit as to placement at the backside of the spoil areas. To prevent uncontrolled placement of spoil in the backside areas, the maximum distance of the points of discharge should be no more than 1,500 feet from the near bottom edge of the channel.

Prior to the issuance of contracts for maintenance dredging in the Channel to Palacios, the Corps of Engineers should notify the Regional Director, Texas Parks and Wildlife Department, La Porte, Texas, of the proposed work to permit review of the dredging operations.

It is recommended that:

1. Openings be provided and no spoil be discharged between the shoreline and Station 60+00, and between Stations 88+00 and 108+00, 140+00 and 170+00, 210+00 and 230+00, 280+00 and 300+00, 325+00 and 345+00, 375+00 and 395+00, 425+00 and 445+00, 475+00 and 500+00, 540+00 and 560+00, 600+00 and 620+00, 660+00 and 695+00, 725+00 and 750+00, and 780+00 and 805+00.
2. The backside limit to the discharge of spoil be no more than 1,500 feet from the near bottom edge of the channel.
3. Prior to issuance of contracts for dredging, the Corps of Engineers notify the Regional Director, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571, of the proposed work to permit review of the dredging program.

Should it be necessary to further change the location or size of any disposal area or openings between designated spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the proposed plan for disposal of spoil from maintenance dredging of the Gulf Intracoastal Waterway, Channel to Palacios is appreciated.

Sincerely yours,


Acting Regional Director

Enclosure

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Rec., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (1) Field Representative, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSWF, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT



JAMES U. CROSS
EXECUTIVE DIRECTOR
JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

COMMISSIONERS

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CHAIRMAN WELLS

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HARRY JENSIG
SAN ANTONIO

COMMISSIONERS

PEARCE JOHNSON
AUSTIN

BOB BRUNSON
TEMPLE

JOE K. FULTON
LUBBOCK

June 20, 1972

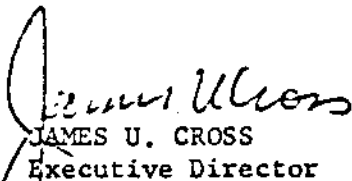
Mr. William M. White
Acting Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

We have examined and concur with the review draft report concerning the Corps of Engineers plans for spoil disposal in connection with maintenance dredging in the Gulf Intracoastal Waterway, Channel to Palacios in Matagorda and Tres Palacios Bays, Texas, and find it to be well presented.

We appreciate having had the opportunity to review this draft report.

Sincerely,


JAMES U. CROSS
Executive Director

cc: Mr. John Degani



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
144 First Avenue South
St. Petersburg, Florida 33701

Date: April 25, 1972

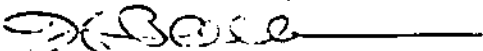
Reply to
Attn of: FSE

Subject: Corps of Engineers' Proposed Plans for Spoil Disposal in Connection
with Dredging Operations in the Gulf Intracoastal Waterway, Channel
to Palacios in Matagorda and Tres Palacios

To: Regional Director
Bureau of Sport Fisheries and Wildlife
Albuquerque, New Mexico

Reference is made to BSF&W letter dated March 30, 1972, transmitting
a copy of subject draft report, and requesting our review and comments.

We concur in your recommendations and appreciate the opportunity your
staff provided ours to participate in their formulation.


Harold B. Allen
Acting Regional Director

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Date: June 9, 1971

Your Ref: SWGCO-M

Reply to
Attn of: Federal Activities Coordination Branch

Subject: Maintenance Dredging Operations in the Gulf Intracoastal Waterway

To: District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Reference is made to your letter of April 30, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Palacios, in Matagorda County, Texas. The drawings were also submitted to The Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

a. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.

b. The dredging operations should be performed in a manner that will reduce turbidity to the lowest practicable level.

c. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.

d. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.

e. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.



CHARLES H. HEMBREE

Acting Director, Division of
Planning & Interagency Programs

GORDON FULCHER
CHAIRMAN
JERRY L. BROWNLEE
VICE-CHAIRMAN
LESTER CLARK
HARRY P. BURLEIGH

TEXAS WATER QUALITY BOARD



JAMES U. CROSS
J. E. PEAVY, MD
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

May 19, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal
Plan for Gulf Intracoastal
Waterway Maintenance
(Channel to Palacios)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Attn: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your May 4, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway ~~between the Channel and~~ Palacios in Matagorda County, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

Mr. Richard A. Vanderhoof, Regional Director

Page 2

May 19, 1971

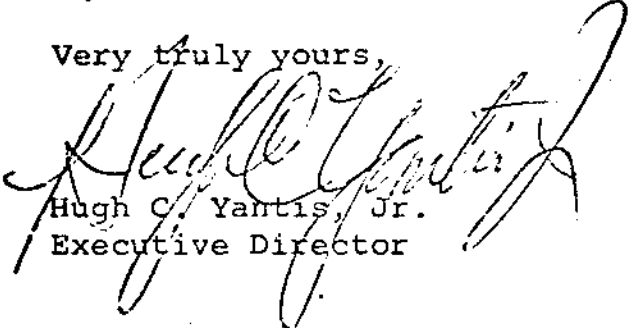
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

1. The work must be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
3. The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
4. Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,


Hugh C. Yantis, Jr.
Executive Director

ccs: Corps of Engineers, Galveston District
Texas Parks and Wildlife Department
WQB District 8

SWGCO-M

26 May 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Victoria, in Calhoun and Victoria Counties, Texas.

The spoil areas that are located on land are provided by local interests. Upland spoil areas are subject to change as the local sponsor acquires new areas and disposes of old ones. However, spoil will be confined on land within leveed spoil areas owned by local entities or individuals, approximately between station 750+00 and 1625+00.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 21 June 1971. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

- 2 Incls
1. Dwg. File No.
 IW 1150-739 (in 11 sheets)
2. Tech. Provisions

WELDON M. CAMEL
Chief, Construction-Operations Division

Copies furnished:
Bur. of Sport Fisheries & Wildlife
River Basin Studies
7A25G 819 Taylor Street
Ft. Worth, Tx 76102 (w/incls in trip)

Dr. Albert K. Sparks, Laboratory Director
National Marine Fisheries Service
Biological Laboratories
4700 Avenue U
Galveston, Tx 77550 (w/incls)

B-205

SWGCO-M

26 May 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1512 Commerce Street (Seventh Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Victoria, in Calhoun and Victoria Counties, Texas.

The spoil areas that are located on land are provided by local interests. Upland spoil areas are subject to change as the local sponsor acquires new areas and disposes of old ones. However, spoil will be confined on land within leveed spoil areas owned by local entities or individuals, approximately between station 750+00 and 1895+00.

The current contract technical provisions covering control measures for environmental protection are furnished with the drawing.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 21 June 1971. This plan is being re-coordinated with fish and wildlife agencies.

Sincerely yours,

- 2 Incls (in trip)
- 1. Dwg. File No.
IWW 1150-789
(in 11 sheets)
- 2. Technical Provisions

WELDON M. GAMBL
Chief, Construction-Operations Division



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

RB

May 8, 1974

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel's letter of May 26, 1971, referenced SWGCO-M, enclosed drawings depicting plans for spoil disposal in connection with maintenance dredging operations of the Gulf Intracoastal Waterway, Channel to Victoria in Calhoun and Victoria Counties, Texas, and requested our comments on the proposal.

This is our report on the proposal, prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service. The report has received concurrence from both of these agencies as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison, dated April 29, 1974, and Acting Regional Director Evert J. Brakke, dated July 12, 1973, respectively.

The Channel to Victoria is a 9-foot by 100-foot channel originating in San Antonio Bay at approximately Corps of Engineers Station 729+400 of the Gulf Intracoastal Waterway. From here the channel extends northwesterly about 35 miles to a turning basin about seven miles south of Victoria, Texas. Included in the proposed plan is maintenance dredging of the Channel to Seadrift, a 9-foot by 100-foot tributary channel that originates at about mile 6.5 of the Channel to Victoria and extends northeastward about two miles to a turning basin near Seadrift, Texas.

We have reviewed the proposed plan of spoil disposal for maintenance dredging of the Channel to Victoria as charted on eleven sheets of map No. IWW 1150-789, dated May 1971.

The location of proposed spoil areas as defined by Corps of Engineers Station numbers is given in Table 1. All spoil areas between the Gulf Intracoastal Waterway and about Station 771+75 would be

located in water, and spoil placed on these areas would be permitted to spill promiscuously beyond discharge points. Between Stations 771+75 and 1895+30, spoil would be placed on land within leveed areas.

Table 1. Location of Spoil Areas Proposed for Use During Maintenance Dredging of the Channel to Victoria and the Channel to Seadrift

Spoil Area No.	Location	Spoil Area No.	Location
<u>Channel to Victoria</u>			
1.	9+00 to 40+00 R	16.	905+25 to 922+50 L
2.	30+00 to 50+00 L	17.	951+00 to 987+25 L
3.	70+00 to 176+00 L	18.	1010+00 to 1028+75 L
4.	193+25 to 215+00 R	19.	1042+50 to 1080+00 L
5.	235+00 to 247+00 R	20.	1082+00 to 1535+00 L
6.	252+00 to 268+00 L	21.	1538+85 to 1710+00 L
7.	273+00 to 292+00 R	22.	1731+35 to 1895+30 L
8.	297+00 to 317+00 L		
9.	322+00 (Channel to Victoria) to 30+00 (Channel to Seadrift) <u>1/R</u>	<u>Channel to Seadrift</u>	
10.	339+00 to 360+00 L	23.	60+00 to 78+00 R
11.	377+00 (Channel to Victoria) to 50+00 (Channel to Seadrift) <u>1/ R</u>		
12.	382+00 to 397+00 L		
13.	402+00 to 420+00 R		
14.	432+00 to 818+30 L		
15.	826+65 to 875+75 L		

1/ Common to both Channel to Victoria and Channel to Seadrift.
 R - Location on right ascending side of channel.
 L - Location on left ascending side of channel.

From its origin to about Station 771+75, the Channel to Victoria and its tributary Channel to Seadrift, lie within or adjacent to estuarine habitat. This reach of the Channel to Victoria lies along the eastern side of San Antonio Bay, Guadalupe Bay, and Mission Lake. The Channel to Seadrift also is located in eastern San Antonio Bay. Above Station 771+75 the Channel to Victoria crosses an area of low-lying uplands intermixed with some small

bayous and potholes, skirts the eastern and northern edge of Green Lake, and then parallels the Guadalupe River about 0.5 to 1 mile to the east.

The bay areas adjacent to the channels are shallow (less than four feet deep) and provide productive estuarine habitat. These shallow areas serve as feeding, nursery, or breeding habitat for several species of fishes and crustaceans including red drum, black drum, sand seatrout, spotted seatrout, southern flounder, Atlantic croaker, sheepshead, striped mullet, spot, pinfish, anchovy, bay menhaden, ling, and gafftopsail catfish.

The shallow bays within the project area are basically of two types - areas vegetated with submerged vegetation, primarily widgeongrass and shoalgrass, and nonvegetated areas.

Vegetated areas are not widespread in the project area. Distribution is restricted either by excessive turbidity or by unfavorable substrata. However, there are two areas within the project area of influence where important beds of submerged aquatics occur. One area lies in the shallows adjacent to the shoreline between Swan Point and spoil area No. 4. The other area lies in the shallows adjacent to the shoreline between the city of Seadrift and spoil area No. 13. These vegetated sites are major nursery areas, particularly for juvenile fishes and crabs. Also, the adults of several species of fishes, valued by sport and commercial fishermen, concentrate their feeding activities in these vegetated areas.

The shallow nonvegetated areas also are valuable feeding and nursery habitat, particularly upper San Antonio Bay, Guadalupe Bay, and Mission Lake. These areas are strongly influenced by the flows of the Guadalupe River which branches about 1.5 miles from Guadalupe Bay to form two distributaries known as the North Guadalupe River and the South Guadalupe River which in turn empty into northern Guadalupe Bay. The aforementioned bay areas are characterized by low salinities and muddy, detritus-rich bottoms. Consequently, they are valuable nursery habitat for several species of fishes, brown shrimp, and white shrimp. Upper San Antonio Bay, Guadalupe Bay, and Mission Lake comprise about one-half of the shallow bay nursery area regularly used by brown shrimp and white shrimp in the San Antonio Bay estuarine system.

Several oyster reefs lie within the project area. The largest reef, Mosquito Point Reef, is located west of the Channel to Victoria approximately between Stations 150+00 and 200+00. The

reef begins about 2,400 feet from the channel centerline and extends more or less perpendicular to the channel. Other small reefs are scattered west of the Channel to Victoria between Stations 290+00 and 350+00. These reefs are major contributors to the San Antonio Bay oyster harvest which, between 1960 and 1969, averaged nearly 270,000 pounds of shucked meat annually.

Wildlife habitat within the project area comprises the bays and associated marshes and the upland areas. Wintering waterfowl, shorebirds, and wading birds, are among the most abundant wildlife within the project area. These birds are concentrated in the estuarine areas where the shallow bays and marshes provide feeding, resting, and, for some species, nesting habitat.

Wintering waterfowl are particularly abundant within Guadalupe Bay, Mission Lake, and the surrounding marshes. Waterfowl also concentrate in the shallow vegetated areas of the bay, as the submerged vegetation is a major food source. The waterfowl carrying capacity of San Antonio Bay is closely related to the quantity of submerged vegetation. The principal species of waterfowl within the project area are the pintail, green-winged teal, blue-winged teal, baldpate, redhead, lesser scaup, canvasback, and snow, blue, and Canada goose.

The principal species of shorebirds and wading birds within the area are the common egret, cattle egret, snowy egret, great blue heron, Louisiana heron, roseate spoonbill, reddish egret, and white pelican. There is a large rookery on Kenyon Island (located between the North Guadalupe River and the South Guadalupe River) and a smaller rookery on a small island in Mission Lake.

The marshes adjoining Mission Lake support a population of American alligators.

The upland portions of the project area provide habitat for several other forms of wildlife. These include the white-tailed deer, fox squirrel, coyote, raccoon, opossum, gray fox, bobwhite quail, mourning dove, and several species of hawks, owls, and songbirds.

Three species of wildlife within the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 114, dated March 1973, "Threatened Wildlife of the United States." The American alligator is listed as an endangered species, and the reddish egret and roseate spoonbill are listed as peripheral species.

Fish and wildlife resources would be detrimentally affected by the spoil disposal operations. Spoiling would be most detrimental in

the estuarine segment of the project area where spoil would be placed directly into the bays or placed over the crest of emergent spoil banks and allowed to spill into the bays. Spoiling above Station 771+75, i.e., in the upland sector of the project area, would have less effect on fish and wildlife resources as spoil would be contained within leveed areas.

The proposed spoiling within the estuarine segment of the project area would damage fish and wildlife habitat through the physical displacement and partial filling of productive shallow bay areas. The physical displacement would result in the replacement of productive estuarine habitat with low value terrestrial habitat. Partial filling would cover natural bay bottoms with relatively sterile spoil and thus lower the productivity of these areas. The proposed spoiling also could damage oyster reefs by covering portions of reefs with a layer of sediments.

Spoil deposition in bay waters also would alter established circulation patterns which would in turn affect salinity gradients, nutrient distribution, the movement of aquatic organisms, and sedimentation rates. Such alterations of the estuarine ecosystem are not as pronounced as the displacement or partial filling of bay waters, but their effects could be equally as damaging to estuarine productivity.

To limit damages, the size of several spoil areas and extent of spoil flow should be controlled by constructing toe levees to retain the spoil. In other areas, the magnitude of damages would warrant the elimination of portions of some spoil areas.

The proposed spoiling within spoil area No. 4 would result in excessive damages to the estuary. Previous spoil deposition in this area has eliminated beds of submerged vegetation, filled areas of the bay, and altered natural water circulation patterns that flow southerly along the shoreline. The proposed spoiling would increase these adverse conditions. More of the valuable submerged vegetation would be destroyed, more of the bay would be filled, and circulation would be further altered.

To provide some limit to the aforementioned damages, no spoil should be placed in or allowed to enter the bay from spoil area No. 4. Instead, the emergent portion of spoil area No. 4, lying approximately between Stations 193+25 and 210+00, should be leveed and the spoil should be contained within the leveed area.

At spoil area No. 13, spoil would be placed over the crest of and lateral to an emergent spoil island lying between Station 410+00 and 420+00. The island lies within 600 feet of the mainland, and the proposed spoil deposition eventually would fill a shallow bay area between the mainland and the island. Natural currents flowing southeasterly along the shore of the mainland would be disrupted by the gradual filling of the bay and the eventual creation of a peninsula. The proposed spoiling also would destroy submerged vegetation and create an environment unsuitable for the reestablishment of this vegetation.

Within spoil area No. 13, spoil should be placed in such a manner that the aforementioned damages are avoided. Levees should be constructed using material from the emergent spoil island lying between Stations 410+00 and 420+00 so as to contain the spoil between points 625 feet and 1,125 feet laterally from the centerline of the channel with a southerly limit at Station 402+00 and a northerly limit at Station 420+00.

Spoiling between Stations 630+00 and 700+00 also poses serious threats to the estuarine ecology. Within this part of spoil area No. 14 spoil would be placed over the crest of an existing spoil bank and allowed to flow into a reach of Guadalupe Bay that is very narrow (ranging in width from about 1,500 feet to 2,500 feet) and very shallow (less than 2 feet deep). As Guadalupe Bay is a major feeding and nursery area for fish and crustaceans and as it is an important wintering area for waterfowl, spoiling in this section of the bay would destroy or degrade valuable habitat. The extent of damage would be aggravated by the shallow depths of the bay.

Damages associated with spoiling between 630+00 and 700+00 would not be restricted to the valuable habitat in the immediate area. This narrow section of Guadalupe Bay is the only direct connection between Mission Lake and the remainder of the San Antonio Bay estuarine system. Repeated spoiling between Stations 620+00 and 700+00 would significantly reduce circulation and eventually isolate Mission Lake which comprises about 1,800 acres of valuable estuarine habitat. A reduction in circulation would degrade the estuarine environment of Mission Lake while the eventual isolation of this lake would convert productive estuarine habitat into a freshwater lake of much lower value.

Circulation patterns induced by the flow of the Guadalupe River also would be altered. The mouth of the North Guadalupe River,

centered approximately opposite Station 686+00, and the mouth of the South Guadalupe River, centered approximately opposite Station 640+00, are the primary sources of nutrients and freshwater entering the San Antonio Bay estuary. The changes in circulation patterns that would result from continued spoiling in the narrow, shallow section of the estuary would result in significant changes which could seriously disrupt the equilibrium of the entire San Antonio Bay ecosystem.

In view of the damages which would occur, no spoil should be placed within the bay or allowed to enter the bay between Stations 630+00 and 700+00.

The proposed spoiling within spoil area No. 23 would physically displace or partially fill shallow bay areas. Furthermore, a public boat channel existing near the southern edge of the proposed spoil area could become filled. This boat channel extends from the vicinity of Swan Point to the confluence of the Channel to Victoria with the Channel to Seadrift and was constructed by the Texas Parks and Wildlife Department primarily for fisherman access.

To prevent damages to the shallow estuarine habitat and a highly-used public facility, an emergent spoil island lying within spoil area No. 23 should be leveed and the spoil contained within the leveed area.

Because of the value of fish and wildlife resources within the project area and the need to reduce the impact of the project on these resources, the following modifications in project plans are recommended:

1. When spoil areas Nos. 1, 2, and 3, become continuous and emergent at 1.5 feet above the mean low tideline at a distance of not more than 1,000 feet from the channel centerline, toe levees be constructed and subsequently refurbished on the ends and on the backsides at a distance of not more than 1,000 feet from the channel centerline.
2. No spoil be placed in or allowed to enter the bay from spoil area No. 4; instead, the emergent portion of spoil area No. 4 lying approximately between Stations 193+25 and 210+00 be leveed and the spoil contained within the leveed area.

3. When spoil areas Nos. 5, 6, 7, 8, 9, 10, 11, and 12, become continuous and emergent at 1.5 feet above the mean low tideline at a distance of not more than 1,350 feet from the channel centerline, toe levees be constructed and subsequently refurbished on the ends and on the backsides at a distance of not more than 1,350 feet from the channel centerline.
4. Within spoil area No. 13, levees be constructed using material from the emergent spoil island lying between Stations 410+00 and 420+00 so as to contain the spoil between points 625 feet and 1,125 feet laterally from the channel centerline with a southerly limit at Station 402+00 and a northerly limit at Station 420+00.
5. No spoil be placed within or allowed to enter the bay from that portion of spoil area No. 14 lying between Stations 630+00 and 700+00.
6. When the remaining portions of spoil area No. 14 lying between Stations 432+00 and 630+00 and 700+00 and 771+75 become continuous and emergent at 1.5 feet above the mean low tideline at a distance of not more than 750 feet from the channel centerline, toe levees be constructed and subsequently refurbished on the ends and on the backsides at a distance of not more than 750 feet from the channel centerline.
7. Until toe levees are constructed in the spoil areas mentioned in recommendations Nos. 1, 3, and 6, the points of discharge be relocated frequently to permit the uniform buildup of spoil equidistant from the channel centerline.
8. Within spoil area No. 23, an emergent spoil island be leveed and the spoil contained within the leveed area.
9. Prior to the issuance of contracts for maintenance dredging of the project channels, the Corps of Engineers notify the Regional Director of Coastal Fisheries, Texas Parks and Wildlife Department, 105 San Jacinto Street, La Porte, Texas 77571; the Field Supervisor, Bureau of Sport Fisheries and Wildlife, Room 327, U. S. Custom House, Galveston, Texas 77550; and the Area Supervisor, Water Resources Division, National Marine Fisheries Service, 4700 Avenue U, Fort Crockett, Galveston, Texas 77550, of the proposed work to permit review of the dredging program.

Should it become necessary to change the location or size of any disposal area, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the proposed plan of spoil disposal is appreciated.

Sincerely yours,



Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Water Res. Div., NMFS; Galveston, Tex.
- (2) Regional Administrator, EPA, Reg. VI, Dallas, Tex.
- (1) Regional Director, Bureau of Outdoor Recr., Albuquerque, N. Mex.
- (1) Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSWF, Div. of River Basin Studies, Fort Worth, Tex.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

144 First Avenue South
St. Petersburg, Florida 33701

July 12, 1973

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries & Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

By letter of June 4, 1973, Mr. William M. White requested our review of and comment on your draft report concerning the Corps of Engineers plans for spoil disposal in connection with maintenance dredging of the Gulf Intra-coastal Waterway, Channel to Victoria, Texas.

We have reviewed the draft report and concur in the findings and recommendations. Our review was limited to those parts relating to marine fisheries, including habitat.

The opportunity provided by your staff to participate in the preparation of this report is appreciated.

Sincerely yours,

Evert J. Brakke
Acting Regional Director

TEXAS
PARKS AND WILDLIFE DEPARTMENT

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AUSTIN, TEXAS 78701

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Beaumont

LOUIS H. STUMBERG
San Antonio

April 29, 1974

Mr. William White
Acting Regional Director
Bureau of Sport Fisheries & Wildlife
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Mr. White:

This letter is in response to a telephone call by Mr. John Degani concerning the Bureau of Sport Fisheries and Wildlife report dated June 4, 1973 on the maintenance dredging of the Gulf Intracoastal Waterway, Channel to Victoria, Texas. Mr. Degani indicated he was unable to find the comments by this Department on that report. This is to indicate our concurrence with the subject report.

We regret the oversight in not submitting comments and appreciate the opportunity to coordinate with you on this project.

Sincerely,

A handwritten signature in cursive script, appearing to read "Clayton T. Garrison".

CLAYTON T. GARRISON
Executive Director

CTG, WJS:ac

cc: Mr. John Degani

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF WATER PROGRAMS
Division of Planning & Interagency Programs
1402 Elm Street, Third Floor
Dallas, Texas 75202

July 7, 1971

Your Ref: SWGCC-M

District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Reference is made to your letter of May 26, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Victoria, in Calhoun and Victoria Counties, Texas. The drawings were also submitted to the Texas Water Quality Board and their recommendations have been incorporated with those of this office as follows:

1. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.
2. The work should be performed in a manner that will reduce turbidity to the lowest practicable level.
3. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters to adjacent waters.
4. The discharge of oil, gasoline, or other fuels capable of causing water pollution arising from these operations must be prohibited.
5. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

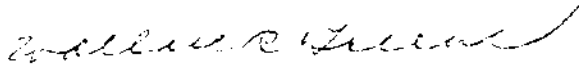
This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.

Sincerely,



WALLACE R. GREENE
Acting Director, Division of
Planning & Interagency Programs

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LESTER CLARK
HARRY F. BURBESON

TEXAS WATER QUALITY BOARD



JAMES L. CROSS
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BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST. 475-2651
AUSTIN, TEXAS 78701

June 14, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal Plan -
For Gulf Intracoastal Waterway
Maintenance (Channel to Victoria)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your May 27, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Victoria, in Calhoun and Victoria Counties, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

B-220

Mr. Richard A. Vanderhoof

Page 2

June 14, 1971

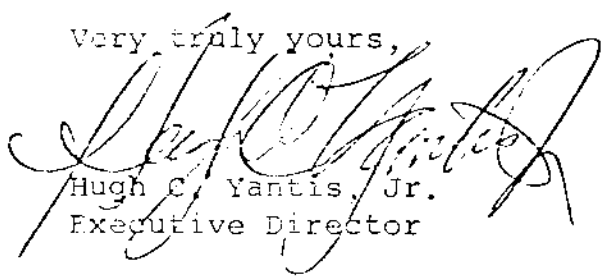
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place.
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

ccs: TWQB District 8
Corps of Engineers, Galveston District
Texas Parks and Wildlife Department

16 May 1975

Mr. William C. Brownlee
Program Leader, Nongame
Texas Parks and Wildlife Department
1702 Airline
Victoria, Texas 77901

Dear Mr. Brownlee:

Reference is made to your recent telephonic conversation with Mr. David Templet regarding protection of a southern bald eagle nest during maintenance dredging of the Channel to Victoria. The verbal agreement to prohibit dredging activities within one-half mile either side of the eagle nest located near the channel during the months of October through March is acceptable. Inclosed are two partial sets of disposal plans (File No. 1WW1150-789, Sheets 7 and 8 of 11) for the Channel to Victoria. Please designate the location of the nest on one set of plans and return it with your confirmation of the recommendations. The remaining set of plans is for your files.

If you have any questions, you may contact Mr. George Roehen, telephone 713 763-1211, Ext 315, at your convenience.

Sincerely yours,

2 Incl
As stated

E. D. McGEHEE
Chief, Construction-
Operations Division

TEXAS
FISH AND WILDLIFE DEPARTMENT



REINHOLD HENSON
Chairman - Austin
JOE R. FULTON
Vice-Chairman - Lubbock
JACK E. STONE
Wata

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Braunton

LOUIS H. STUMBERG
San Antonio

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

May 29, 1975

Mr. E. D. McGehee
Chief, Construction - Operations Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Dear Mr. McGehee:

Enclosed is the map showing the location of the southern bald eagle nest situated near the channel to Victoria. I have also included the location of an alternate nest which may be used by the birds.

The recommendation to prohibit maintenance dredging within one half mile either side of the primary nest site during the months of October through March should keep nest disturbance to a minimum.

I wish to thank you and the Corps of Engineers for your cooperation in protecting this nest site.

If I can be of any further service, please call on me.

Sincerely,

William C. Brownlee
Program Leader, Nongame

WCB:ed

cc: P. B. Uzzell

SWCCO-M

15 April 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1305
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with dredging operations in the Gulf Intracoastal Waterway, Channel to Port Mansfield, in Willacy County, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 15 May 1971. This plan is also being coordinated with the Environmental Protection Agency, Dallas, Texas, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dwg. File No.
IW 1175-174 a
(in 1 sheet)

WELDON M. GAHEL
Chief, Construction-Operations Division

Copies furnished:
Bureau of Sport Fisheries
and Wildlife
River Basin Studies
7A250 819 Taylor Street
Fort Worth, Texas (w/incl in trip)

Mr. S. Hoogland
Nat'l. Marine Fisheries Svc
Biological Laboratories
4700 Avenue U
Galveston, Texas (w/incl)

B-224

SWGCO-M

15 April 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Port Mansfield, in Willacy County, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 15 May 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupe)
Dwg. File No.
IW 1175-176
(in 1 sheet)

WELDON M. GAMBL
Chief, Construction-Operations Division



UNITED STATES
 DEPARTMENT OF THE INTERIOR
 FISH AND WILDLIFE SERVICE
 BUREAU OF SPORT FISHERIES AND WILDLIFE
 POST OFFICE BOX 1306
 ALBUQUERQUE, NEW MEXICO 87103

March 13, 1972

District Engineer
 Corps of Engineers, U. S. Army
 P. O. Box 1229
 Galveston, Texas 77550

Dear Sir:

Mr. Weldon M. Gamel's letter of April 15, 1971, referenced SWGCO-M, enclosed a map depicting the plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Port Mansfield in Willacy County, Texas, and requested our views on the proposal.

This letter is our report on the proposal and is prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.). It was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service. It has received the concurrence of the Texas Parks and Wildlife Department as indicated in the attached copy of the letter from Mr. James U. Cross, Executive Director, dated September 20, 1971. A letter of comments from the National Marine Fisheries Service, dated March 6, 1972, and signed by Harold B. Allen, Acting Regional Director, also is attached.

We have reviewed the proposed plan of spoil disposal for the reach of the Gulf Intracoastal Waterway, Channel to Port Mansfield as charted on 1 sheet of map No. IWW 1175-174, dated April 1971.

The Channel is a shallow-draft channel from the Gulf of Mexico to Port Mansfield. It is about 9.6 miles long and lies in the lower Laguna Madre.

The designated spoil areas are on both sides of the channel. They would lie on the north side of the channel from deep water in the Gulf of Mexico to Corps of Engineers Station -3+200, from -3+000 to -1+650, from Station 0+850 on Padre Island to about Station 12+400

in the Laguna Madre, and from Station 39+050 to the intersection of the channel with the mainstem of the Gulf Intracoastal Waterway. They would lie on the south side of the channel between Stations 12+400 and 34+000 and on the shoreline and mainland of El Sauz Island.

The designated spoil areas on Padre Island and on the shoreline and mainland of El Sauz Island would be partially leveed, primarily to prevent spoil from entering the channel. Otherwise, the spoil material would spill promiscuously beyond the points of discharge into water and onto land.

Important fish and wildlife habitat occurs in the project area, which for the most part has shallow waters. Dense growths of submerged vegetation are found throughout most of these shallow water areas.

The submerged vegetation provides high quality habitat used by many species of fishes and crustaceans for feeding, breeding, and nursery. Important species of fishes and crustaceans include Atlantic croaker, black drum, red drum, flounder, striped mullet, pompano, sea catfish, spotted seatrout, sheepshead, blue crab, and shrimp. Sport fishing and commercial fishing are important to the local economy. Both receive heavy use.

Wildlife habitat in the project area consists of spoil banks, bay waters, tidal flats, and land on Padre Island and on El Sauz Island. The islands and spoil banks have populations of coyotes, rabbits, mourning doves, bobwhites, waterfowl, wading birds, and shorebirds. The tidal flats and bay waters support populations of waterfowl, wading birds, and shorebirds. The shallow vegetated bay areas and tidal flats are used by waterfowl for feeding while the deeper portion of the bay is used for resting.

Important species of waterfowl in the area include Canada goose, snow goose, gadwall, American widgeon, pintail, masked duck, green-winged teal, blue-winged teal, mottled duck, redhead, canvasback, lesser scaup, bufflehead, ruddy duck, and coot.

The principal hunting in the area is for waterfowl. Hunting is moderate to heavy in the vicinity of Port Mansfield.

Many other birds use the project area for nesting, feeding, and resting. Among these are pelicans, cormorants, gulls, terns,

herons, egrets, ibises, roseate spoonbills, mergansers, grebes, common snipes, plovers, sandpipers, avocets, curlews, black-necked stilts, and peregrine falcons.

Several species of birds in the project area are listed in the Bureau of Sport Fisheries and Wildlife Resource Publication No. 34, "Rare and Endangered Fish and Wildlife of the United States." The brown pelican and the peregrine falcon are listed as endangered species, while the masked duck, wood ibis, reddish egret, and roseate spoonbill are listed as peripheral species.

The lower portion of the Padre Island National Seashore lies adjacent to the project area.

Of primary concern in the maintenance dredging of the Channel to Port Mansfield is the placement of spoil, particularly in bay waters. Placement of spoil in bay waters would displace fish and wildlife habitat. It may reduce or alter water circulation patterns. It may result in temporary turbidity.

To prevent destruction and deterioration of fish and wildlife habitat and reduction of water circulation, extreme care should be taken in the placement of spoil.

Between Stations 12+400 and 34+000 there would be a reach better than 4 miles in length without a planned opening to permit water circulation, migration of fishes and crustaceans, and passage of small boat traffic. A 2,000-foot opening centered at Station 24+000 would provide these measures.

Between Stations 34+000 and 39+050 extreme care should be taken to prevent any spillage of spoil into this reach.

Spoil material placed in bay waters between Stations 12+400 and 34+000 should be placed slightly over the crest. The points of discharge should be relocated frequently to permit the buildup of the spoil material equally distant from the channel. When any part of the spoil bank becomes emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel, toe levees should be constructed and refurbished prior to each maintenance dredging operation on the ends and backsides of the spoil areas.

Spoil materials placed on Padre Island and on El Sauz Island should be retained by toe levees which should be subsequently refurbished prior to each dredging operation.

Prior to the issuance of contracts for maintenance dredging, the Corps of Engineers should notify the following persons of the time schedule for the proposed work: Regional Director, Texas Parks and Wildlife Department, Rockport, Texas; and Superintendent, Padre Island National Seashore, Corpus Christi, Texas.

It is recommended that:

1. A 2,000-foot opening centered at Station 24+000 be provided in the proposed spoil bank south of the waterway and between Corps of Engineers Stations 12+400 and 34+000.
2. No spoil material be permitted to spill into bay water between Corps of Engineers Stations 34+000 and 39+050.
3. When spoil areas become emergent at 1.5 feet above mean low tide at a distance of 1,500 feet from the centerline of the channel between Corps of Engineers Stations 12+400 and 23+000, and Stations 25+000 and 34+000, toe levees be constructed and subsequently refurbished prior to each maintenance dredging operation on the ends and backsides.
4. Toe levees be constructed and subsequently refurbished prior to each maintenance dredging on Padre Island and on El Sauz Island to prevent spoil from spilling into bay water.
5. Prior to issuance of maintenance dredging contracts, the Corps of Engineers inform the following persons of the time schedule: Regional Director, Texas Parks and Wildlife Department, P. O. Box 1117, Rockport, Texas 78382; and Superintendent, Padre Island National Seashore, P. O. Box 8560, Corpus Christi, Texas 78412.

Should it be necessary to change the location or size of any disposal area or openings between designated spoil areas, the revised plan should be submitted sufficiently in advance to permit coordination and subsequent agreement prior to contracting for maintenance dredging of the area.

The opportunity to comment on the Corps of Engineers proposed plan to dispose silt from maintenance dredging of the Channel to Port Mansfield is appreciated.

Sincerely yours,

William M. White

Acting Regional Director

Enclosures 2

Copies (10)

Distribution:

- (5) Executive Director, Texas Parks and Wild. Dept., Austin, Tex.
- (2) Regional Director, Nat'l Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Laboratory Director, Biol. Lab., NMFS, Galveston, Tex.
- (2) Regional Director, Bureau of Outdoor Rec., Denver, Colo.
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Tex.
- (2) Regional Director, Nat'l Park Service, Santa Fe, N. Mex.
- (2) Superintendent, Padre Island Nat'l Seashore, Corpus Christi, Tex.
- (1) Field Representative, USDI, SW Reg., Albuquerque, N. Mex.
- (2) Field Supervisor, BSFV, Div. of River Basin Studies, Fort Worth, Tex.

PARKS AND WILDLIFE DEPARTMENT

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JAMES U. CROSS
EXECUTIVE DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

September 20, 1971

Mr. W. O. Nelson, Jr.
Regional Director
Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Nelson:

This is in reference to your letter dated August 27, 1971 and the review draft of your report regarding the Corps of Engineers plan for spoil disposal, Gulf Intracoastal Waterway, Channel to Port Mansfield.

We have reviewed the draft report and concur with it as presented, except for paragraph 3, on page 5, and Recommendation No. 1 on page 6.

In telephone conversations with Mr. Sidney Wilkerson of your Fort Worth Office, we were informed that the two exceptions mentioned above would be revised to read as follows:

Paragraph 3, page 5 (to be replaced with the two following paragraphs):

Between Stations 12+400 and 34+000, there would be a reach better than 4 miles in length without a planned opening to permit water circulation, migration of fishes and crustaceans and trespass of small boat traffic. A 2,000-foot opening centered at Station 24+000 would provide these measures.

Mr. W. O. Nelson, Jr.
Page 2


Between Stations 34+000 and 39+050 extreme care should be taken to prevent any spillage of spoil into this reach.

Recommendation No. 1 on page 6 to be revised to read:

1. A 2,000-foot opening centered at Station 24+000 be provided in the proposed spoil bank south of the waterway and between Stations 12+400 and 34+000.

With the described changes, we give the report full concurrence.

Sincerely,


JAMES U. CROSS
Executive Director



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office, Region 2
Federal Building
144 First Avenue South
St. Petersburg, Florida 33701

March 6, 1972

Regional Director
Department of the Interior
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

In answer to your letter dated February 10, 1972, our comments on your draft report on the Corps of Engineers' plan for spoil disposal, Gulf Intracoastal Waterway, Channel to Port Mansfield, Texas, are as follows:

Paragraph 3 on page 5 should be replaced with the following two paragraphs:

Between station 12+400 and 34+000, there would be a reach better than 4 miles in length without a planned opening to permit water circulation and migration of fishes and crustaceans. A 2,000-foot opening centered at station 24+000 would provide these measures.

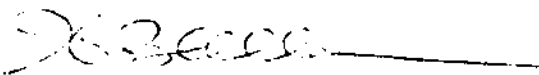
Between stations 34+000 and 39+350, extreme care should be taken to prevent any spillage of spoil into this reach.

On page 6, recommendation No. 1 should be replaced with the following:

A 2,000-foot opening centered at station 24+000 should be provided in the proposed spoil bank south of the waterway and between stations 12+400 and 34+000.

We concur with the rest of the report as written.

Sincerely yours,


Harold B. Allen
Acting Regional Director

B-233

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Date: June 9, 1971

Your Ref: SWGCO-M

Reply to

Attn of: Federal Activities Coordination Branch

Subject: Maintenance Dredging Operations in the Gulf Intracoastal Waterway

To: District Engineer

Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Reference is made to your letter of April 15, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Port Mansfield, in Willacy County, Texas. The drawings were also submitted to The Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

- a. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.
- b. The dredging operations should be performed in a manner that will reduce turbidity to the lowest practicable level.
- c. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.
- d. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.
- e. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

2

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.



CHARLES H. HEMBREE
Acting Director, Division of
Planning & Interagency Programs

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BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST 475-2651
AUSTIN, TEXAS 78701

May 19, 1971

RE: Corps of Engineers, Galveston District - Spoil Disposal Plan for Gulf Intracoastal Waterway Maintenance (Channel to Port Mansfield)

Mr. Richard A. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Attn: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your April 16, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between the Channel and Port Mansfield in Willacy County, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff, obtained the views of those within the agency who might have pertinent information.

Mr. Richard A. Vanderhoof, Regional Director

Page 2

May 19, 1971

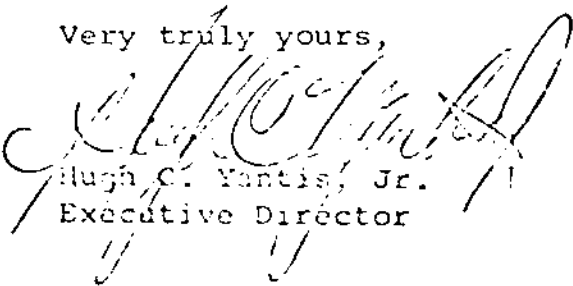
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

1. The work must be done with the minimum production of turbidity in the waters where the work is taking place.
2. Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
3. The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
4. Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

ccs: Corps of Engineers, Galveston District
Texas Parks and Wildlife Department
WQB District 11

SWCCO-M

26 April 1971

Regional Director
Bureau of Sport Fisheries and Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

Pursuant to Public Law 91-190, inclosed for recoordination is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Harlingen, in Willacy and Cameron Counties, Texas.

It is requested that your review and coordination with Texas Parks and Wildlife Department be expedited and that approval and/or comments be furnished not later than 15 May 1971. This plan is also being coordinated with the Environmental Protection Agency, which will obtain the views of the Texas Water Quality Board.

Sincerely yours,

1 Incl
Dug. File No.
IHW 1175-172
(in 10 sheets)

WELDON M. GAMEL
Chief, Construction-Operations Division

Copies furnished:
Bureau of Sport Fisheries and
Wildlife
River Basin Studies
7A25G 819 Taylor Street
Fort Worth, Texas 76102
(w/incls in trip)

Mr. B. Hoogland
Nat'l. Marine Fisheries Svc
Biological Laboratories
4700 Avenue U
Galveston, Texas 77550
(w/incl)

B-238

SWGCO-M

26 April 1971

Regional Director
Environmental Protection Agency
Federal Activities Coordination
1402 Elm Street (Third Floor)
Dallas, Texas 75202

Dear Sir:

Pursuant to Public Law 91-190, inclosed for your review and comments is a drawing showing our plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Harlingen, in Willacy and Cameron Counties, Texas.

It is requested that this plan be coordinated with the Texas Water Quality Board and that approval and/or comments be furnished not later than 15 May 1971.

This plan is being re-coordinated with Fish and Wildlife Agencies.

Sincerely yours,

1 Incl (in dupe)
Dwg. File No.
IWW 1175-172
(in 10 sheets)

WELDON M. GAMEL
Chief, Construction-Operations Division

ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY OFFICE, REGION VI
1402 Elm Street, Third Floor
Dallas, Texas 75202

Date: June 9, 1971

Your Ref: SWGCO-M

Reply to
Attn of: Federal Activities Coordination Branch

Subject: Maintenance Dredging Operations in the Gulf Intracoastal Waterway

To: District Engineer
Attention: Chief, Construction-Operations Division
U. S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Reference is made to your letter of April 26, 1971, forwarding drawings of your plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway, Channel to Harlingen, in Willacy and Cameron Counties, Texas. The drawings were also submitted to The Texas Water Quality Board, and their recommendations have been incorporated with those of this office as follows:

a. The project should be coordinated with the U. S. Fish and Wildlife Service and Texas Parks and Wildlife Department, since it involves the disturbance of the bottom of the bays in the State of Texas.

b. The dredging operations should be performed in a manner that will reduce turbidity to the lowest practicable level.

c. Spoil must be placed and contained in the approved spoil areas in such a manner as to minimize the runoff of spoil or highly turbid waters into adjacent waters.

d. The discharge of oil, gasoline, or other fuels capable of causing water pollution must be prohibited.

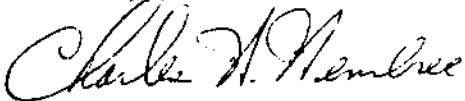
e. Sanitary wastes must be retained for adequate onshore treatment conforming to Federal and State requirements.

Wherever it appears that the bottom might be polluted, we recommend that representative samples be obtained for analyses of the material. Please advise this office, if this condition exists, so that we can make arrangements for the laboratory analyses at our Robert S. Kerr Research Center in Ada, Oklahoma.

This review has been made almost exclusively on the information furnished on the drawings. It has not been feasible to make a detailed field investigation and evaluation.

It is our understanding that a public hearing has not been held on this project, and the views of the public are not known by this office. Please advise if your Agency has made an environmental impact statement or assessment on this project.

Your cooperation and assistance in the water quality improvement and pollution control in your maintenance dredging operations are very much appreciated.



CHARLES H. HEMBREE
Acting Director, Division of
Planning & Interagency Programs

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AM
L. BROVNLIE
E-CHAIRMAN
ER CLARK
Y F. BURLEIGH

TEXAS WATER QUALITY BOARD



JAMES U. CROSS
J. E. PEAVY, MD
BYRON TUNNELL
HUGH C. YANTIS, JR.
EXECUTIVE DIRECTOR

1108 LAVACA ST 475-2651
AUSTIN, TEXAS 78701

May 20, 1971

RE: Corps of Engineers, Galveston
District - Spoil Disposal Plan
For Gulf Intracoastal Waterway
Maintenance (Channel to Harlingen)

Mr. Richard M. Vanderhoof, Regional Director
Environmental Protection Agency
Water Quality Office, Region VI
1402 Elm Street, 3rd Floor
Dallas, Texas 75202

ATTN: Mr. Jerry T. Thornhill, Chief
Federal Activities Branch

Dear Mr. Vanderhoof:

This is in response to your April 28, 1971 request for a review of the Corps of Engineers Plan for spoil disposal in connection with maintenance dredging operations in the Gulf Intracoastal Waterway between the Channel and Harlingen in Willacy and Cameron Counties, Texas. You also requested our comments concerning the water pollution control needs or water quality considerations of the spoil disposal plan.

Insofar as can be established in a matter of this kind, we believe it is established, subject to the qualifications following, that the activity you have described will not cause a violation of the established Texas Water Quality Standards. This agency has not held a public hearing on this matter and the views of the public are not known. Our review of this matter has been almost exclusively a review of the information you have furnished. It has not been feasible to make a detailed study, including inspections and evaluations in the field, but it has, to the extent possible with available staff,

Mr. Richard A. Vanderhoof

Page 2

May 20, 1971

obtained the views of those within the agency who might have pertinent information.

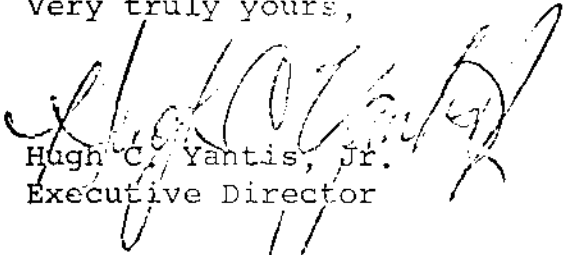
It is suggested that you contact the Texas Parks and Wildlife Department regarding disturbance of the bottom of the bays in the State of Texas who has a vital interest in this field.

In the course of the maintenance dredging operations themselves, we recommend that strict attention be given to the following items:

- 1) The work must be done with the minimum production of turbidity in the waters where the work is taking place."
- 2) Spoil must be placed and contained in approved spoil areas in such a manner as to minimize the runoff of spoil of highly turbid waters into adjacent waters.
- 3) The discharge of oil, gasoline or other fuels capable of causing pollution arising from these operations must be prohibited.
- 4) Sanitary waste must be retained for disposal onshore in some legal manner.

Thank you for the opportunity to review the plans for this work and if we can be of additional assistance, please contact us.

Very truly yours,



Hugh C. Yantis, Jr.
Executive Director

ccs: TWQB District 11
Corps of Engineers, Galveston District
Texas Parks and Wildlife Department

RB



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1206
ALBUQUENQUE, NEW MEXICO 87103

June 2, 1975

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

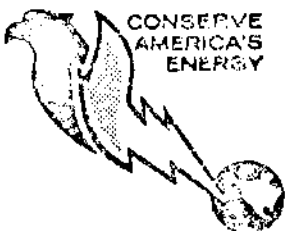
Dear Sir:

Mr. Weldon M. Gamel, by letter dated April 26, 1971, referenced SWGCC-M, enclosed for our review and comments drawings showing the proposed plan for disposal of spoil material from maintenance dredging of the Channel to Harlingen, a shallow-draft tributary of the Gulf Intracoastal Waterway, in Willacy and Cameron Counties, Texas. By letter dated January 7, 1975, Mr. E. D. McGehee submitted revised disposal plans which proposed a backside levee to enclose Spoil Area No. 1.

We have reviewed the plan for the disposal of dredged material as depicted on 10 sheets, Corps of Engineers File No. IWW-1175-172 dated April 1971. This letter, comprising our comments on the proposed plan, has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The report was prepared with the assistance of the Texas Parks and Wildlife Department and the National Marine Fisheries Service and has received the concurrence of these agencies as indicated in the enclosed copies of letters from Executive Director Clayton T. Garrison, dated April 18, 1975, and Regional Director William H. Stevenson, dated May 13, 1975, respectively.

The Service previously provided comments to you by letter dated January 29, 1975, regarding your revised plans for Spoil Area No. 1.

The Gulf Intracoastal Waterway in South Texas generally follows the mainland shore of the Laguna Madre. The Channel to Harlingen leaves the Waterway at Intracoastal Waterway Station 130+928 and proceeds inland in a westward direction as a land cut called the Arroyo Colorado Cutoff. The channel joins the Arroyo Colorado approximately 7.5 miles inland and continues westward in the river for an additional 18 miles, terminating in a 400-foot-wide turning basin at



B-244

Save Energy and You Serve America!

Port Harlingen. Project channel dimensions are a depth of 12 feet and a bottom width of 125 feet. Several sharp bends in the river have been bypassed by land cuts to shorten the channel length. This rectification has created oxbow lakes in the cutoff channel segments.

The Channel to Harlingen is identified on the drawings with a single series of Corps of Engineers Station Numbers, beginning with Station 0+000 at the Gulf Intracoastal Waterway and ending with Station 136+950 at the head of the turning basin. River rectification occurs between Stations 52+600 and 53+600, 66+100 and 67+400, 67+400 and 70+200, and 126+500 and 130+000.

Dredged materials are to be deposited near the channel in twenty-three disposal sites used in previous dredging operations. One of these is an unconfined open-water site bayward of the Gulf Intracoastal Waterway between Waterway Stations 126+200 and 130+900. The remaining sites parallel the channel over its course to Harlingen as indicated in Table 1. All but the first five are completely enclosed by levees. Levee completion for Area No. 1 is planned during the next maintenance operation.

Table 1. Location of Spoil Disposal Sites
for the Channel to Harlingen

No.	Station Limits	Relation to Channel	Location Existing Levees
1.	1+560 to 9+000	North	Front and East Side
2.	9+200 to 16+730	North	Part of front
3.	17+412 to 23+055	North	None
4.	19+500 to 26+000	South	None
5.	25+330 to 38+075	North	None
6.	39+670 to 52+500	North	Ring leveed
7.	53+640 to 64+300	North	Ring leveed
8.	67+740 to 69+700	South	Ring leveed
9.	74+800 to 77+470	North	Ring leveed
10.	77+860 to 83+000	North	Ring leveed
11.	86+660 to 90+485	North	Ring leveed
12.	91+635 to 97+113	North	Ring leveed
13.	97+800 to 99+000	South	Ring leveed
14.	102+180 to 104+460	North	Ring leveed
15.	107+450 to 110+100	North	Ring leveed
16.	111+680 to 113+120	North	Ring leveed
17.	113+320 to 115+375	North	Ring leveed
18.	115+910 to 118+330	North	Ring leveed
19.	126+060 to 129+760	North	Ring leveed
20.	127+070 to 129+600	South	Ring leveed
21.	130+500 to 132+850	North	Ring leveed
22.	132+250 to 136+265	South	Ring leveed

The Channel to Harlingen extends across the gently rolling coastal plain of the Rio Grande Delta and provides much of the drainage of the Arroyo Colorado. Land elevations within the delta are low, gradually falling in a northeast direction toward the Laguna Madre. Deltaic soils are level, high in fertility, and readily cultivated where natural or artificial drainage is available. As a result, most natural brushy vegetation and woodlands of the delta have been cleared for the cultivation of cotton, grain sorghum, vegetables, citrus trees, improved pasture grasses, and ornamental shrubs and trees.

The Channel to Harlingen provides one of the few brackish-water tributaries of the lower Laguna Madre. Tidal influences on the channel vary widely with the amount of fresh water flowing to the bay. During major floods, the channel may be entirely fresh. Virtually all other estuarine habitat in the project area is found on the Laguna Atascosa National Wildlife Refuge which borders the Laguna Madre both north and south of the Arroyo-Colorado Cutoff. Several large tidal flats, separated from each other by low brushy ridges, flank the channel in the refuge area. These flats periodically provide estuarine habitat when flooded by high wind-blown tides. One tidal flat on the south side of the channel contains the lower Cayo Atascosa. The Cayo Atascosa once flowed north through the entire length of the refuge, but has since been compartmentized by dikes to impound the freshwater Laguna Atascosa and Laguna Del Cayo (Lakes). Only the lower 2.5 miles of the Cayo Atascosa are now open to the channel.

The channel and associated estuarine habitat are attractive to estuarine-dependent fauna except when high freshwater flows carry poor quality water to the Gulf. During these periods the channel carries heavy loads of pesticide-laden return flows, sewage effluents, treated and untreated cannery and food processing wastes, and many other pollutants from upstream sources. Sport fishing for spotted seatrout, red drum, black drum, and flounder is popular along the south bank of the channel at Arroyo City. Two recreational areas have been created on the south bank of the channel within the refuge. Flooded tidal flats and the lower Cayo Atascosa are particularly valuable as a nursery habitat for juvenile menhaden, red drum, brown and white shrimps, and blue crab. The shallow relatively secluded waters in these areas provide shelter and an abundant supply of food.

Past spoil disposal in Spoil Areas Nos. 1, 2, and 3 has created an almost continuous ridge along the north bank of the Arroyo-Colorado Cutoff. Siltation on the tidal flats in this vicinity, mainly from Spoil Area No. 1, has covered benthic communities, contributed to turbidity problems, and depleted nursery habitat. The enclosing of Spoil Area No. 1 with a backside levee

and spilling the return water into the channel as now planned will prevent further siltation of these flats.

Unconfined open water spoiling is proposed along the lower reach of the Arroyo-Colorado Cutoff. The material would be placed on the bay side of the Gulf Intracoastal Waterway between waterway Stations 126+200 and 130+900. It can be expected that this material will be highly contaminated by pollutants such as pesticides, sewage effluents, and industrial wastes from upstream sources which have settled in the channel since it was last maintained. The Environmental Protection Agency should be consulted to determine what environmental control measures may be necessary to prevent dispersal of silt and pollutants in the bay.

The open water disposal area between water Stations 126+200 and 130+900 also is designated for use during maintenance dredging of the Gulf Intracoastal Waterway from Port Isabel to Mud Flats, Texas. Our report of July 13, 1971, on that segment of the waterway, contains additional discussion and recommendations which apply to this disposal area.

Prior to issuance of contracts for maintenance dredging, the Corps of Engineers should notify the following persons of the time schedule of the proposed work to allow final coordination of any needed changes in disposal operations, dredging times, or other details: Regional Marine Fishery Biologist, Texas Parks and Wildlife Department, Rockport, Texas; Area Supervisor, Environmental Assessment Division, National Marine Fisheries Service, Galveston, Texas; Refuge Manager, Laguna Atascosa National Wildlife Refuge, San Benito, Texas; and Field Supervisor, Division of River Basin Studies, U. S. Fish and Wildlife Service, Corpus Christi, Texas.

It is recommended that:

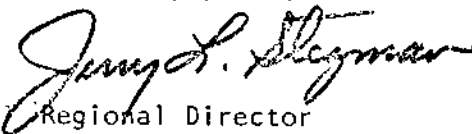
1. The Environmental Protection Agency be consulted to determine control measures necessary to minimize silt dispersal and prevent the dissemination of pollutants into the bay.
2. The Fish and Wildlife Service report of July 13, 1971, regarding maintenance dredging operations in the Gulf Intracoastal Waterway, Port Isabel to Mud Flats, Texas, be referred to for recommendations applicable to the disposal area between waterway Stations 126+200 and 130+900.
3. Prior to issuance of contracts for maintenance dredging the Corps of Engineers notify the following of the time

schedule for the proposed work and give them an opportunity to comment on the plan at that time:

- a. Regional Marine Fishery Biologist, Texas Parks and Wildlife Department, Rockport, Texas 78382.
- b. Area Supervisor, Environmental Assessment Division, National Marine Fisheries Service, Galveston, Texas 77550.
- c. Refuge Manager, Laguna Atascosa National Wildlife Refuge, U. S. Fish and Wildlife Service, San Benito, Texas 78586.
- d. Field Supervisor, Division of River Basin Studies, U. S. Fish and Wildlife Service, 4455 Padre Island Drive, Corpus Christi, Texas 78411.

The opportunity to provide comments on your spoil disposal plans for maintenance of the Channel to Harlingen is appreciated.

Sincerely yours,


Regional Director

Enclosures

Copies (10)

Distribution:

- (10) Executive Director, Texas Parks and Wildlife Dept., Austin, Texas
- (2) Regional Director, Nat'l. Mar. Fish. Serv., St. Petersburg, Fla.
- (2) Area Supervisor, Env. Assmt. Div., NMFS, Galveston, Texas
- (2) Regional Administrator, EPA - Reg. VI, Dallas, Texas
- (1) Regional Director, Bureau of Outdoor Recr., Albuquerque, N.M.
- (1) Special Asst. to the Secretary, USDI, SW Reg., Albuquerque, N.M.
- (1) SW Reg. Representative, Nat'l. Audubon Soc., Austin, Texas
- (2) Field Supervisor, FWS, Div. of River Basin Studies, Fort Worth, Tex.
- (1) University of Texas at San Antonio Library, San Antonio, Texas

APPENDIX C
Archeological Resources



Texas Historical Commission
Box 12276, Capitol Station
Austin, Texas 78711
Truett Latimer
Executive Director

March 18, 1974

Mr. D.T. Graham
Chief, Engineering Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

RE: E.I.S. Concerning Maintenance Dredging: GIWN From The Sabine-
Neches Waterway at Port Arthur to Port Isabel, Texas.

Dear Mr. Graham:

In response to your request concerning the above-referenced project area, we have examined our files and discussed this matter with Mr. Carl Clausen, Marine Archeologist and offer the following comments:

1. Where maintenance dredging will not exceed the measurements of the original channel, no measures, other than assuring minimal siltation of known submerged cultural resources, are necessary.
2. Where the channel will be enlarged or deepened as part of a maintenance operation, underwater magnetometer surveys may be necessary in areas thought to have a high density of resources.
3. Existing spoil areas should be used for depositing material resulting from the dredging operation. When new areas are earmarked for spoiling, magnetometer surveys of these areas may be indicated.

Thank you for the opportunity to comment on this matter. If we may be of further assistance, please advise.

Sincerely,

Truett Latimer,
Executive Director

By

A handwritten signature in black ink, appearing to read "Alton K. Briggs".

Alton K. Briggs
Archeologist

AKB:pc

18 February 1975

Mr. John F. Turney
Superintendent
Padre Island National Seashore
10235 South Padre Island Drive
Corpus Christi, Texas 78418

Dear Mr. Turney:

On 10 February 1975, Major Howell discussed with you the possibility of using the dredged materials we were planning to excavate by pipeline dredge from the Tributary Channel to Fort Mansfield to refurbish and restore the beach north of the north jetty. The purpose of this letter is to confirm this discussion and request your comments.

We normally maintain the entrance channel and jetty channel by hopper dredge and deposit the material in an open Gulf disposal area. The channels are presently shoaled to such an extent we can not use a hopper dredge, but must use a pipeline dredge. The material to be excavated will consist primarily of a sandy material. About 300,000 cubic yards of this material will be removed under the proposed contract.

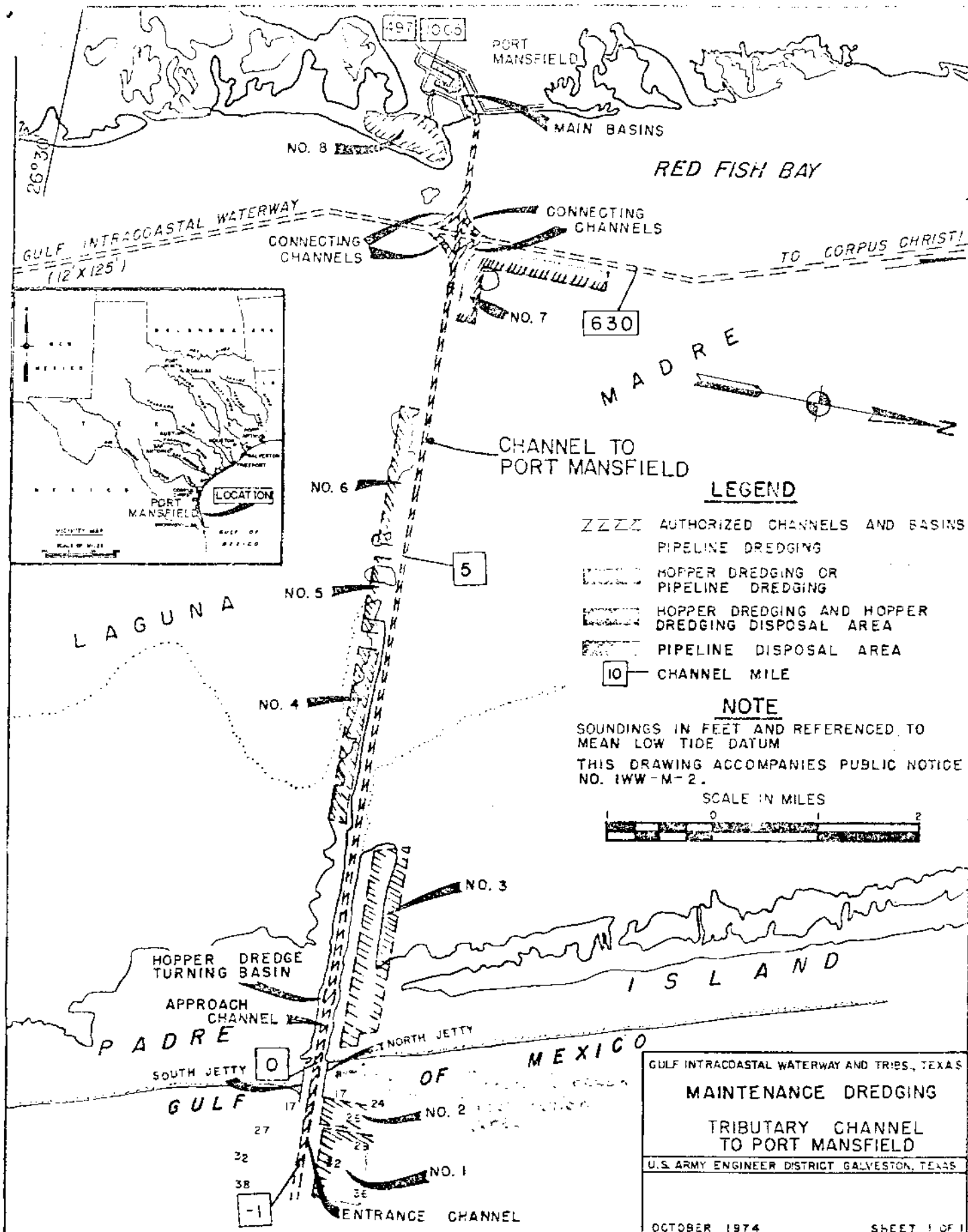
We are aware of the extensive erosion that has taken place along the beach just north of the north jetty and propose to use the dredged material to refurbish and restore this beach area. This will be somewhat experimental and we hope the experience gained will give us insight for future projects of this nature. The approximate location of the proposed area to be used is depicted on the attached drawing.

We would appreciate your comments on this proposal. We are anticipating doing the dredging in May or June 1975. Should you have any questions concerning the proposed dredging, call Mr. George Rothen, 713 763-1211, extension 315.

Sincerely yours,

1 Incl
As stated

E. D. McGEHEE
Chief, Construction-
Operations Division



GULF INTRACOASTAL WATERWAY AND TRIBUT., TEXAS
MAINTENANCE DREDGING
 TRIBUTARY CHANNEL
 TO PORT MANSFIELD
 U.S. ARMY ENGINEER DISTRICT GALVESTON, TEXAS
 OCTOBER 1974 SHEET 1 OF 1

26 February 1975

Mr. Truett Latimer
Executive Director
Texas Historical Commission
Box 12276, Capitol Station
Austin, Texas 78711

Dear Mr. Latimer:

On 10 February 1975 Major Milton Howell talked with Mr. Alton K. Briggs about our proposal to restore portions of the beach north of the north jetty of the Tributary Channel to Port Mansfield.

We normally maintain the entrance channel and jetty channel by hopper dredge and deposit the material in an open Gulf disposal area. The channels are presently shoaled to such an extent we cannot use a hopper dredge, but must use a pipeline dredge. The material to be excavated will consist primarily of a sandy material. About 300,000 cubic yards of this material will be removed under the proposed contract.

We are aware of the extensive erosion that has taken place along the beach just north of the north jetty and propose to use the dredged material to restore this beach area. This will be somewhat experimental and we hope the experience gained will give us insight for future projects of this nature. The approximate location of the proposed area to be used is depicted on the attached drawing.

We have discussed this proposal with Mr. John Turney, Superintendent of the Padre Island National Seashore, and he has indicated full support of the restoration of the beach.

As a result of the 10 February 1975 discussion, Mr. Briggs sent us a copy of a map showing the area to be restored is located on the border of the Mansfield Cut Underwater Archaeological District. In accordance with Section 106 of the National Historic Preservation Act, we request an on-site inspection to discuss the proposed beach restoration with the Council.

SWGD-M
Mr. Truett Letimer

26 February 1975

Since we plan to advertise the project in March 1975, award the contract in April 1975, and start work in May 1975, we would appreciate an on-site meeting at your earliest convenience. Should you have any questions concerning the proposed dredging or in coordinating a meeting date, please call either Mr. George Eochen or Major Milton Howell, 713 763-1211, extension 315 or 316.

Sincerely yours,

1 Incl
As stated

E. D. McGEREE
Chief, Construction-
Operations Division



Texas Historical Commission
Box 12276, Capitol Station
Austin, Texas 78711
Truett Latimer
Executive Director

March 20, 1975

Mr. E.D. McGehee
Department of the Army
Galveston District
Corps of Engineers
P.O. Box 1229
Galveston, Texas 77550

Re: Maintenance Dredging: Tributary Channel to Port Mansfield

Dear Mr. McGehee:

On February 11, 1975, staff members of the Texas Historical Commission and the Texas Antiquities Committee participated in an on-site inspection of the Tributary Channel to Port Mansfield. After a thorough discussion of the proposed undertaking using maps and charts, the area of our concern, the Mansfield Cut Underwater Archeological District, and the North Jetty area was examined by sea, land and air. In our opinion, this dredging and beach nourishment will not have an adverse effect upon any National Register properties. Short-term deposition of sediments may temporarily effect the site.

Our inspection of the site and magnetometric data which has been gathered by the Texas Antiquities Committee within the past year indicate that the existing facility is creating adverse effects on the site. What is thought to be one of three 1554 shipwrecks was effected when the tributary channel to Port Mansfield project was implemented many years ago. Approximately one third of the shipwreck was destroyed and scattered by construction of the pass and the North Jetty. Wave action, somewhat altered by the North Jetty construction, and the channel appears to be displacing materials from the shipwreck. When considering the effect on the site and the belief that these are the earliest shipwrecks whose locations are confirmed in the United States, we feel that the only manner in which the significance of the shipwreck can be preserved is by recovery. As portions of the wreck lie in Federally controlled waters and is being effected by an existing Federal project, is this recovery a Federal responsibility?

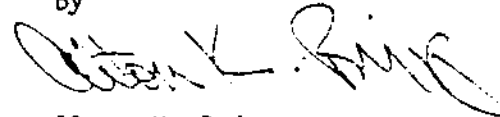
To reiterate, we do not feel that the scheduled dredging of the channel and beach nourishment will have an adverse effect on the site; however, we do believe the existing project is having an adverse effect on the site by altering the natural course of wave action and currents. Thank you for the opportunity to participate in this on-site consultation in our joint effort to provide the future with a past.

Sincerely,

Truett Latimer
State Historic Preservation Officer

AKB:pc
cc: John Turney
Mike Bureman
Ronald Ice

C-6

By

Alton K. Briggs
Archeologist

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

Colonel Don S. McCoy
District Engineer
Corps of Engineers, Galveston District
Department of the Army
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

On April 3, 1975 the Advisory Council received Corps of Engineers' adequately documented determination that the proposed use of dredged materials for restoration of a portion of the beach at Padre Island, Texas, would have no adverse effect on the Mansfield Cut Underwater Archeological District, Port Mansfield vicinity, a property included in the National Register of Historic Places. The Council staff has reviewed Corps determination of no adverse effect and notes no objection to the determination.

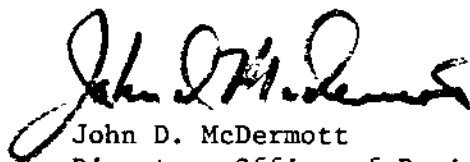
In accordance with Section 800.4(d) of the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800) Corps may proceed with the undertaking.

However, the Council notes from the State Historic Preservation Officer's comments on the proposed undertaking that the existing port and related facilities, previously constructed by the Corps in this area, are causing a change in the natural wave action and currents, resulting in adverse effects on the archeological district. On the basis of this information the Council requests that the Corps investigate this matter to determine what actions are necessary to correct any existing adverse conditions.

The Council requests that Corps report the results of its investigation to the Council at the earliest opportunity. If you have further questions or require assistance regarding this matter, please contact Michael H. Bureman of the Council staff at (303) 234-4946.

The Council appreciates Corps' cooperation in this matter.

Sincerely yours,



John D. McDermott
Director, Office of Review
and Compliance



United States Department of the Interior

NATIONAL PARK SERVICE
Padre Island National Seashore
10235 South Padre Island Drive
Corpus Christi, Texas 78418

IN REPLY REFER TO:

L3023

March 12, 1975

Mr. E. D. McGehee
Department of the Army
Galveston District
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

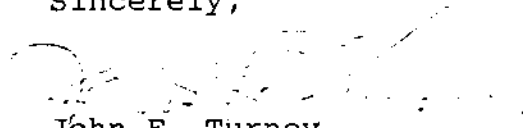
Dear Mr. McGehee:

I am in agreement with the proposal to refurbish and restore the beach north of the jetties at the Port Mansfield Channel using the dredge materials and a pipeline dredge. Therefore, I concur in the operation.

Archeologists from our Southwest Regional Office of the National Park Service, Santa Fe, New Mexico, participated in the on-site inspection on March 11, 1975. This inspection covered the beach and the offshore water by Corps of Engineers' boat and by air.

The opinion of the archeologists is that the beach nourishment project will have no adverse effect upon archeological resources and any effect will be temporary.

Sincerely,


John F. Turney
Superintendent

cc:
Southwest Regional Office, Santa Fe
Mr. Alton Briggs, Texas State Historical Committee
Mr. Louis Wall, Advisory Council on Historic Preservation

APPENDIX D

Technical Information on
Resuspension of Pollutants

APPENDIX D

TECHNICAL INFORMATION ON RESUSPENSION OF POLLUTANTS

The following is a direct quotation from Alabama Marine Resources Bulletin Number 9, Publication of the Alabama Marine Resources Laboratory April 1973, entitled "Environmental Effects of Hydraulic Dredging in Estuaries," by Edwin B. May.

"Since materials in mud are exposed to the water during overboard disposal of dredge spoil, the complex physical and chemical interrelationship between mud and water is essentially what determines the degree that dredging affects water quality. Although bacteria are important in biological exchanges between mud and water (Hayes and Phillips, 1958; Burchard, 1971) it is apparently not of immediate importance to the situation of dredging. Much work remains in determining the chemical mechanisms which regulate the exchange of these components between mud and water and their influence on aquatic biota. Little is known of the physicochemical forms of these elements, their relative stabilities or their rates of interconversion and exchange in water and sediment (Wolfe and Rice, 1972). However, their properties and behavior are adequately known to explain with some degree of certainty the lack of wholesale release into the water during dredging.

Many of the most important reactions between mud and water components are oxidation-reduction (redox) reactions and sorption-desorption ionic processes (Nelson, 1962; Lee, 1970). A typical vertical profile of a shallow estuary shows a column of oxygenated water over a thin zone of oxidized brownish to olive grey sediment and an underlying black or medium grey layer of reduced mud. Many metals having several valence states and phosphorus compounds are more soluble in their reduced form and generally precipitate when oxidized. Because the sediment surface is normally oxidized, it acts as

a barrier to the more soluble reduced chemicals in the deeper muds (Windom, 1972). Metals may occur in the mud as metallic sulfides many of which are highly insoluble (Lee, 1970). These mechanisms apply to most metals and other mud components but there are exceptions when some forms of certain metals such as mercury are more soluble in an oxidized state than when reduced (Hem, 1970; Yeaple et al., 1972; D'Itri, 1972). However, dissolved mercury is commonly removed from water through adsorption of suspended organic and inorganic particulate matter which precipitates (Fleischer, 1970; D'Itri, 1972).

When the oxidized surface of the sediment is disturbed by dredging and the reduced muds are resuspended in the water, a theoretical possibility exists that large amounts of some of the chemicals in the mud could become dissolved into the water. Several investigators have partially explained why this does not occur. There is a large concentration of reduced iron in the sediments (Windom, 1972). Iron comprises about 5 percent of the sediments in Mobile Bay (unpublished, Gulf South Research Institute) which is similar to other bays (Biggs, 1967). When it is dredged and placed into suspension it is immediately oxidized forming iron hydroxide. The iron hydroxide then has the capability of scavenging other metals out of solution and precipitating them with the iron. In addition, some of the other metals may precipitate as hydroxides (Nilsson, 1971). This process is aided by the organic matter and the high concentration of clays in dredge effluent which are capable of adsorbing large amounts of metals (Lee, 1970). In addition, it is possible that the solubility rates of many metallic forms are too slow to allow release under the observed conditions of rapid settlement in dredge effluents.

Sediment acts as an effective buffer on phosphorus and the concentration in water remains fairly constant (Pomeroy, Smith and Grant, 1965). The reversible exchange system involves an ion-exchange process in which clay, iron and other metals are directly involved

(Jitts, 1959). In the presence of oxygen, phosphorus in the water may combine with iron to form ferric iron-phosphate or more probably is sorbed on some complex or hydrous oxide of ferric iron (Lee, 1970) which are insoluble and precipitate. The chemical mechanisms of nitrogen exchange are different than phosphorus but are largely dominated by the redox system (Keeney, 1972). Nitrogen release by sediments is favored by oxidizing conditions but the release is slight and is apparently not rapid. Nitrate is different in that it shows essentially no sorption tendencies on clay minerals (Lee, 1970) but clays readily sorb organic nitrogenous compounds (Keeney, 1972).

The extent to which spoil disposal would be expected to alter dissolved concentrations of these materials is largely dependent on how it affects the conditions which regulate these exchange processes. The mechanisms are influenced by pH, the presence or absence of hydrogen sulfide and dissolved oxygen, and the composition and concentration of suspended sediments. Little change in pH and no hydrogen sulfide was detected around dredges during this study. The release of large quantities of reduced sediments into the water by dredges creates a rapid oxygen demand which reduces dissolved oxygen to some degree. However, the solids settle so rapidly that the area of low oxygen is mostly confined to the areas of extremely high suspended solid concentrations in the mud flow. Oxygen levels that may have been low enough to influence the release of chemicals into the water were not found in the water around the dredge discharges studied. Unless the oxygen concentration is very near zero the redox potential remains oxidative and is little affected (Mortimer, 1971; Keeney, 1972). Reducing conditions were not found in the water around dredges operating in Mobile Bay. In oxygenated water, as long as pH and Eh (redox potential) are not greatly changed, no large-scale release of nutrients or trace elements would be expected to occur (Mortimer, 1971) especially in the presence of high mud concentrations.

Thus, the lack of total oxygen depletion, rapid settlement of solids and the formation of highly concentrated density layers strongly influence the distribution and fate of the mud components. The high clay concentrations in the discharge and flocculation cause components of the mud to remain associated with the suspended solids and to settle rapidly into the mud flow. They are trapped there because of the large adsorption capacity of the sediments and the oxygenated condition of the overlying water.

It was found in this study that the concentration of most materials in the sediment has little relationship to the effect dredges have on water quality. This has been observed in other areas also (Windom, 1972) and it is apparently valid for undisturbed sediments as well (Lee, 1970). This may not be true where the sediments are very heavily polluted but in a typical estuary no simple relationship has been observed. This is a very important point since it has been assumed by the Environmental Protection Agency that the quality of sediment determines the effects that dredge effluents have on water quality. Further attempts to regulate dredging activities based on sediment criteria alone would be a mistake. Until all of the many interrelated factors which determine how dredge effluents may or may not affect water quality are better understood, arbitrary standards should not be established. Future research should be directed at a more complete knowledge of sediment-water chemistry and at determining the actual effect on water quality when dredging sediments of various grades."

APPENDIX E
MISCELLANEOUS CORRESPONDENCE
AND NEWS RELEASE



001 1075

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1600 PATTERSON
DALLAS, TEXAS 75201

CERTIFIED MAIL - RETURN RECEIPT REQUESTED (762639)

Colonel Don S. McCoy
District Engineer
Galveston District
U. S. Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel McCoy:

We appreciated the opportunity to meet with members of your staff on October 3, 1975, to further clarify our previous recommendations on your dredged material disposal plans for Federal Navigation projects. In accordance with our discussions, I offer the following modifications and suggest they be incorporated into your dredging plans:

- a. Matagorda Ship Channel, Texas, Public Notice No. GUAD-M-1. Recommendation No. 3 of our letter dated January 9, 1975, should be modified to read as follows:

3. Openings shall be maintained between spoil disposal areas 16, 17, 18, and 19 at sufficient depths to allow maximum circulation between Cox Bay and Lavaca Bay.

Additionally, since the final Environmental Impact Statement was filed with CEQ on August 4, 1975, our recommendations on this project are for long term approval unless there is an appreciable change in your disposal plans.

- b. GIWW - Relocation in Corpus Christi Bay, Public Notice No. IWW-NW-1. Recommendation No. 2 of our letter on this project should be modified to read as follows:
 2. Openings between dredged material disposal areas shall be maintained at sufficient depths to allow maximum possible flow between dredged material disposal mounds.
- c. GIWW-High Island to Galveston Bay, Public Notice No. IWW-M-8. Recommendation No. 4 of our letter dated March 26, 1975, should be modified to read 2,300 feet instead of the 1,350 feet restriction.

2.

- d. GIWW-Tributary Channel to Port Mansfield, Public Notice No. IWW-M-2.
Recommendation No. 2 of our letter dated February 4, 1975, should be modified to read as follows:
 - 2. Openings between spoil disposal areas shall be maintained to allow maximum circulation between the spoil disposal areas.
- e. GIWW-Port Isabel to Mud Flats, Public Notice No. IWW-M-4.
GIWW-Corpus Christi Bay to Mud Flats, Public Notice No. IWW-M-9.
Recommendation No. 1 of our letters dated March 20, 1975, and February 27, 1975, should be deleted.
- f. Houston Ship Channel, Public Notice No. HSC-M-1.
GIWW-Tributary Channel to Harlingen via Arroyo Colorado, Public Notice No. IWW-M-5.
Recommendation No. 3 of our letter dated January 13, 1975, and April 17, 1975, should be deleted.
- g. GIWW-Galveston Bay to Matagorda Bay, Public Notice No. IWW-M-3.
GIWW-Port Arthur Canal to High Island, Public Notice No. IWW-M-12.
Please delete recommendation No. 4 and recommendation No. 2, of our letters dated March 24, 1975, and June 11, 1975, respectively.

Thank you for the opportunity to meet and discuss these matters and for the excellent cooperation displayed by your staff during on-site inspections of these disposal areas.

Sincerely yours,


for John C. White
Regional Administrator

U. S. ARMY ENGINEER DISTRICT GALVESTON
CORPS OF ENGINEERS



JUNE 16, 1775

NEWS RELEASE
PUBLIC AFFAIRS OFFICE
110-A Essayons Building
400 Barracuda Avenue
Galveston, Texas 77550
Ph: 713/763-1211, Ext: 305



HURRICANE-FLOOD PROTECTION



NAVIGATION



FLOOD CONTROL



BASIN PLANNING



THE ENVIRONMENT



RECREATION

Engineers Complete Environmental

92/November 5, 1974

Statement on Texas Section of GIWW

GALVESTON, Texas -- A draft environmental statement on maintenance dredging of the Texas Section of the Gulf Intracoastal Waterway and its tributary channels has been completed by the Corps of Engineers in Galveston.

Colonel Don S. McCoy, District Engineer, said the two-volume statement describes maintenance required for the GIWW which follows the coastline and extends from the Sabine-Neches Waterway near the Louisiana border to Port Isabel near the Mexican border.

The Gulf Intracoastal Waterway and tributary channels total about 560 miles in length. Tributary channels include Offatts Bayou Channel, Chocolate Bayou Channel, the San Bernard River Channel, Colorado River Channel, channels to Palacios, Victoria, Seadrift, Rockport, Aransas Pass, Port Mansfield, Harlingen, and the Port Isabel Side Channel and Small Boat Harbor.

Dredging of the channels is accomplished by hydraulic pipeline dredge with exception of the Port Mansfield Entrance Channel which is normally maintained by hopper dredge.

The statement points out that periodic maintenance dredging of these channels is required to keep them open to commercial and recreational navigation. Nearly all disposal areas have been used previously for disposal of materials.

Maintenance dredging will remove or disturb some bottom dwelling organisms, cover vegetation and result in temporary increases in turbidity, the statement said. Productive marsh habitat will be converted to high ground habitat in some disposal areas.

However, the statement said, continued maintenance will preserve environmental benefits such as improved water circulation and disposal islands that resulted from channel construction.

Other benefits include continued access to back bays for recreational craft, bird nesting areas on disposal islands, and reduction in fish kills caused by previous high salinity in some areas. Maintenance is described as essential to the existing economy and will contribute to continued economic growth of the Texas Gulf Coast.

The environmental statement will be reviewed by Federal, State and local agencies, private citizens, conservation and environmental groups and others as required by the National Environmental Policy Act of 1969.

3-3-3-3-3

Single copies of the statement may be obtained by writing to the Environmental Resources Branch, U. S. Army Engineer District, Galveston, P. O. Box 1229, Galveston, Texas 77550.

--30--

Distr: 1-5, 7, 8, 12, 13