

APPENDIX E

SECTION 404 (b) (1) EVALUATION

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North Padre Island Storm Damage Reduction and Environmental Restoration Project
Packery Channel, Corpus Christi, Texas

I. Project Description

a. Location

The study area for Packery Channel encompasses the area between the boundary of the Upper Laguna Madre and Corpus Christi Bay to the north and the intersection of Laguna Madre and Baffin Bay to the south. The southern limit of the study area was extended to Baffin Bay since earlier modeling results exhibited changes extending to this location, whereas modeling results toward Corpus Christi Bay showed little change (not unexpected since the shallow Laguna Madre joins the much deeper bay). Packery Channel is a potential environmental enhancement project that would provide a dredged channel across North Padre Island between the Upper Laguna Madre and the Gulf of Mexico. The existing channel is located northeast of the John F. Kennedy (JFK) Causeway, which crosses the Laguna Madre between the city of Corpus Christi and Padre Island. The existing channel is largely the result of the modern dredging of a historically shallow cut between what was the historic pass and Laguna Madre.

The total length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway is approximately 18,700 feet. The alignment is not straight but follows an existing channel from the bay, which would be extended east-southeast approximately 4,500 feet toward the Gulf.

b. General Description

The length of the proposed channel from the Gulf end of the jetties to the Gulf Intracoastal Waterway (GIWW) is approximately 18,500 feet (3.5 miles). The Packery Channel alignment follows an existing channel southeast of the GIWW for approximately 2.6 miles to a basin southeast of State Highway 361 (SH 361). From this basin the proposed new channel will extend approximately 0.9 mile toward the Gulf. Packery Channel will allow recreational and small commercial boats access between the GIWW and the Gulf. Traffic will not include large commercial ships, tows, deepwater draft barges, or any floating vessel with a draft greater than 4 feet.

According to the design engineer, URS (2002), the proposed channel opening involves dredging a new channel from the Gulf into the existing basin area (Inner Basin) located southeast of the SH 361 bridge (Reach 1). Two impermeable rock jetties will extend from the shoreline approximately 1,400 feet paralleling the channel. The Inner Basin will be widened and deepened. The existing Packery Channel west of SH 361 (Reach 2) that extends to the GIWW will also be widened and deepened.

Southeast of the SH 361 bridge in Reach 1, the channel width varies at the Inner Basin from 80 feet expanding to 650 feet at the channel bottom. From bulkhead to bulkhead including side slopes, the width is 800 feet at the widest. The proposed new channel extending from the basin toward the Gulf

will narrow to a channel bottom width of approximately 116 feet with an approximate 280-foot span (bulkhead to bulkhead including side slopes). The channel depth proposed is -12 feet mean sea level (MSL) plus 2 feet advanced maintenance and 2 feet of allowable overdepth.

Within Reach 2, the depth of the channel is proposed at a required depth of -7 feet MSL with 1 ft allowable overdepth. The channel bottom width is designed for 80 feet along Reach 2, and the side slopes may extend the width to approximately 110 feet in certain areas.

Sandy dredged material will be deposited on the beach, east of the seawall, to nourish eroding beaches and provide protection from storm events. Fine-grained dredged material will be placed in designated areas adjacent to the channel in Reach 1.

Concrete bulkheads are proposed on the north and south sides of the channel from the western end of the jetty to the SH 361 bridge (Reach 1). Behind the bulkheads fill material is required in placement areas (PA) PA 1, PA 2, and PA 3 to bring the ground elevation to grade with the top of the bulkhead. The beach nourishment area (PA 4S) will be located south of the jetties and seaward of the seawall. Another proposed beach nourishment area (PA 4N) is located on the north side of the jetties for use of sandy maintenance material, if necessary.

Approximately 753,800 cy of new work material will be dredged. An additional 56,200 cy of material must be excavated from PA 1 before dredged material can be placed in it, resulting in a total of 810,000 cy. The material will be placed at the four dredged material placement areas covering approximately 69.9 acres. Two maintenance material locations are also proposed: PA 4N and an upland confined disposal area south of the channel on City of Corpus Christi property.

PA 1 is approximately 20.2 acres in size. Placement volume for PA 1 is 128,800 cy.

Concrete bulkhead structures will be constructed on the north and western sides of PA 1 and act as retaining structures. The existing floodwall will serve as the southern retaining structure. A levee will be constructed on the eastern end.

PA 2 is an approximate 15.5-acre placement area that will contain a volume of 76,000 cy. Concrete bulkheads will be constructed as the southern retaining structure for the PA. Bulkheads will be constructed partially across the northern boundary of PA 2. An opening of approximately 575 feet along the northern bulkhead will allow for fill material in PA 2 to grade into existing ground level (secondary dunes) on the north side

The approximate 7.1-acre PA 3 will contain a volume of 60,400 cy. Concrete bulkheads are proposed along the Inner Basin and will serve as the eastern retaining structure for PA 3. The existing floodwall serves as the southern retaining structure and a levee at the SH 361 embankment provides the western containment.

New work material comprised primarily of sand will be used for beach nourishment at PA 4S to provide some protection from major storm events. An approximately 27.1-acre area for beach nourishment will be located south of the jetties. All material in Reach 1 is suitable for beach placement

due to the predominant composition of sand. Sediment from portions of Reach 2 is also appropriate for beach placement.

The project design proposes constructing two impermeable rock jetties with sidewalks at the crest of each jetty. The proposed jetties will parallel the channel onshore and offshore, starting approximately at Station 174+00. For both jetties, construction on shore extends approximately 700 feet. The north jetty extends from the shoreline outward approximately 1,430 feet, and the south jetty extends approximately 1,478 feet. The jetties will be oriented at 12 degrees north of shore-normal to provide shelter from southeasterly summer waves. Jetty elevation is proposed at 7.25 feet MSL with a jetty crest width of 16 feet. The footprint at the base of each jetty is approximately 60 feet wide. The approximate distance between the two jetty crests is 280 feet. The channel width of approximately 116 feet extends to approximately 160 feet including benches or side slopes.

The estimated annual maintenance dredging volume in Reach 1 is 54,750 cy. The majority of deposition will be transported by currents and be located toward the end of the jetties. Windblown sand deposition is also included in this annual dredge volume.

A proposed alternative for maintenance material will occur north of the jetties on the beach (PA 4N). Another maintenance material placement area (MMPA) is proposed within a City of Corpus Christi property, south of the channel. Material not appropriate for beach placement will be placed in this confined upland disposal area. This PA will encompass approximately 7.5 acres of undeveloped property and accommodate anticipated maintenance dredging of 15,000 cy of material every 5 years for the 50-year project life.

A sand bypassing system is proposed to move the sand that accumulates in the area updrift of the jetty. The average mechanical bypassing volume of sand to maintain current shoreline position is 160,000 cy/year. Sand bypassing may be conducted on a yearly or biennial schedule.

c. Authority and Purpose

The Galveston District of the U.S. Army Corps of Engineers (USACE) completed a 905(b) analysis of the potential project in 1998. This analysis was undertaken to determine whether there would be a potential Federal interest in a project for environmental restoration, flood damage reduction, navigation, and/or related purposes in the vicinity of Packery Channel. The analysis recommended that the necessary feasibility-level studies be conducted to characterize the potential benefits in more detail and to identify the most cost-effective project features to realize them.

The USACE produced a Project Study Plan (PSP) in 1999 that included the results of various studies used to screen a large array of preliminary project alternatives and to provide information to help the study sponsor assess the likelihood of project authorization for construction upon conclusion of the Feasibility Study. The analysis showed that a new water-exchange pass would ameliorate high salinity episodes in the upper Laguna Madre. However, these episodes only average about 1 year in 5; therefore, the potential environmental benefits to marine resources and area wildlife from the project would be negligible.

The USACE was subsequently directed by Congress under the Water Resource Development Act (WRDA) of 1999 (PL106-53, Sec. 556 entitled "North Padre Island Storm Damage Reduction and Environmental Restoration Project" to "carry out a project for ecosystem restoration and storm damage reduction at North Padre Island, Corpus Christi, Texas." Pursuant to this directive, the USACE prepared a "Project Report," including the "Environmental Acceptability" of the project (Environmental Acceptability Document (EAD) based on the local sponsor's plan. For the purposes of this exercise, "Environmental Acceptability" was interpreted as compliance with the National Environmental Policy Act (NEPA). The Environmental Acceptability Document was submitted for approval. Because of the magnitude, potential impacts, new compliance requirements, and the political controversy of this project, an Environmental Impact Statement (EIS) is being prepared.

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material

New work material will be dredged to open the channel. A description of the new work material can be found in the Draft EIS (DEIS), Sections 1.2 and 3.3.

(2) Quantity of Material

Table 1 provides the quantities, by reach, of the new work and maintenance material expected from the preferred alternative.

Table 1. Quantities of New Work and Maintenance Dredged Material (cy)

Reach	New Work Material	Maintenance Material (50 years)
East of SH 361 Bridge (Reach 1) *	720,000	2,737,500
West of SH 361 Bridge (Reach 2)	90,000	320,000
Sand Bypass **		8,000,000
TOTAL	810,000	11,057,500

* Includes 56,200 cy one-time excavation from PA 1.

** Estimated annual maintenance (160,000 cy).

(3) Source of Material

All dredged material will come from the excavation and subsequent maintenance of Packery Channel.

e. Description of the Proposed Discharge Sites

(1) Location

An estimated 810,000 cy of material will be dredged. The dredged material will be placed in four placement areas: PA 1 - 128,800 cy of new work material on the south side of the channel between the existing seawall and the proposed shoreline protection bulkhead (56,200 cy will be excavated from PA 1 to provide necessary volume for channel new work material); PA 2 - 76,000 cy of new work material on the north side of the channel to the north of the proposed shoreline protection bulkhead; PA 3 - 60,400 cy of new work material on the south side of the channel between the existing seawall and the proposed shoreline protection bulkhead; and PA 4S - 544,800 cy of new work material on the beach on North Padre Island. The 544,800 cy for PA 4S includes approximately 56,200 cy excavated from PA 1. A proposed maintenance location on the beach, north of the jetties, will accommodate sandy material, if necessary. A proposed maintenance material placement area (MPPA) will accommodate 15,000 cy maintenance dredging every 5 years. A sand transfer system will be utilized to move sand from the areas north and south of the jetties to designated beach areas. Amenities would include the construction of navigational aids, roadways, parking areas, walkways, and other recreational facilities.

(2) Size

The placement and maintenance areas will encompass approximately 96.3 acres:

PA 1 – 20.2 acres

PA 2 – 15.5 acres

PA 3 – 7.1 acres

PA 4S – 27 acres

PA 4N – 19 acres

MMPA – 7.5 acres

(3) Type of Site and Habitat

PA 1 – unvegetated sand (i.e., channel fill sand); primary and secondary dune complex; beach

PA 2 – primary and secondary dune complex; upland grassland; high salt marsh; tidal flats; submerged aquatic vegetation; beach; channel fill sands

PA 3 – upland grassland; high and low salt marshes; tidal flats; submerged aquatic vegetation; open water

PA 4N and PA 4S – beach sand

MMPA – disturbed/upland grassland

(4) Time and Duration of Discharge

The placement sites will be constructed during the dredging of Packery Channel. Proposed maintenance dredging is every 5 years for the reach west of SH 361 and annually east of SH 361.

f. Description of Placement Method

Hydraulic cutterhead dredges are proposed for the entire channel excavation. Mechanical excavation, using standard earthmoving equipment will be used to manage material in the appropriate placement area.

II. Factual Determinations

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope

An upland confined placement area for maintenance material will be constructed adjacent to the channel upon an approximate 7.5-acre tract of land and a dike elevation of approximately 20 feet above the existing ground elevation. PA 1 would have a levee on east end, bulkhead on north side, and existing floodway on the south side so the sand would be allowed to mound to a proper elevation. PAs 2 and 3 would have a retaining dike with a top elevation of approximately 2 feet higher than the top elevation of the bulkhead cap. The dike should have a crown width of approximately 5 feet and side slopes of 3 horizontal to 1 vertical.

The recommended design template for the beach placement is an approximate 220-foot-wide berm extending seaward from the seawall. The top elevation of the berm is 3 feet MLLW, which is approximately 2 feet above existing beach elevation. From the seaward edge of the berm, the fill will extend seaward with a slope of approximately 50 horizontal to 1 vertical and terminate at the third offshore bar. In addition, it may be necessary to construct a small temporary retaining dike along the seaward edge of the project area to contain the discharge as it is placed on the beach.

Sediment Type

The new work material will mostly be sandy (93% overall, 68% in Reach 2). Results for new work material sediment analysis and grain-size distribution are presented in Table 3.2-2 of the DEIS.

Dredged/Fill Material Movement

Concrete and sheetpile bulkheads, berms, and dikes will be constructed to protect dredged/fill material from movement in the channel, and to provide additional protection during storm events. Drainage channels will take the supernatant from the dredged material in PAs 1 and 2 to the Gulf, and PA 3 will drain to the Inner Basin, while leaving the mostly sandy dredged material in the PAs.

(4) Physical Effects on Benthos

Nonmotile organisms occurring in the sediment in the dredged areas will be placed in PAs and will be buried. Placement of material in the proposed beach placement site would bury those benthic organisms incapable of escaping or burrowing up through the dredged material. Burial of organisms will occur during initial construction placement, but since the material is similar to bay bottom, and what presently exists on site, recolonization should be rapid.

(5) Other Effects

None known.

(6) Actions Taken to Minimize Impacts

Use of suitable material for beach nourishment will provide benefit to counter the erosional trend. During sand placement, small retaining dikes may be constructed along the landward side and seaward side to contain material. These retaining dikes will advance along the beach as necessary during the fill placement. In addition, sand fencing to prevent potential erosion will be used in appropriate locations.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water

One of the most dramatic changes that would be caused by the proposed project, would be the change in the water exchange patterns in the Upper Laguna Madre, via the new opening to the Gulf. However, dredging and placement operations are expected to have only minimal short-term impacts on water quality in the area. Impacts to water quality, primarily salinity, are discussed more fully in the DEIS Section 4.2.

(a) Salinity

The proposed project results in more exchange with the Gulf of Mexico and a change in salinity of a few ppt in the vicinity of the inlet, and much smaller changes well into the Laguna Madre. (DEIS Section 4.2.2)

(b) Water Chemistry

The majority of the new work material is sandy, to which contaminants generally do not adhere. Aside from a temporary increase in local suspended solids, no negative impacts are expected (DEIS Section 4.2.3).

(c) Clarity

There will be some temporary increase in local turbidity during dredging and placement operations. Water clarity is expected to return to normal background levels shortly after operations are completed. The finer material from both construction and maintenance would be placed in upland sites, reducing the potential impacts from turbidity.

(d) Color

Water immediately surrounding the construction and maintenance dredging will become discolored temporarily due to disturbance of the sediment.

(e) Odor

The new work material is not expected to be anoxic, so there should be no odors associated with dredging or placement. There may be a short period when foul odors are emitted by the dredged material contained in the PAs.

(f) Taste

No detectable impacts in the marine environment.

(g) Dissolved Gas Levels

No dissolved gas levels except, perhaps, minor amounts of hydrogen sulfide are expected.

(h) Nutrients

Nutrient levels may be temporarily elevated near the PAs as sediments release their organic compounds.

(i) Eutrophication

Nutrients are not expected to reach levels high enough for periods long enough to lead to eutrophication of the surrounding waters.

(j) Others as Appropriate

None known.

(2) Current Patterns and Circulation

Model results show a decrease in tidal range at the vicinity of Packery Channel, with a maximum decrease of 0.09 foot. The PAs are not expected to adversely affect currents or circulation patterns (DEIS Section 4.2.1).

(a) Current Patterns and Flow

Minor impacts are expected due to the opening of the inlet. The PAs are not expected to adversely affect currents or flow conditions.

(b) Velocity

Minor impacts are expected. An increase in flow velocity is expected, though calculations by URS/Dames & Moore (2002) do not indicate adverse side slope erosion.

(c) Stratification

No impacts are expected.

(d) Hydrologic Regime

Minor impacts are expected.

(3) Normal Water Level Fluctuations

The water level in the Packery Channel area will be subject to a more direct influence of the Gulf tide when the inlet is open, as a result, small effects are expected (DEIS Section 4.2.1).

(4) Salinity Gradients

There will be minor effects; i.e., a change in salinity up to a few ppt under certain conditions (DEIS Section 4.2.2).

(5) Actions That Will Be Taken to Minimize Impacts

No actions required.

c. Suspended Particulate/Turbidity Determination

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site

An increase in suspended particulates and turbidity levels is expected during dredging and placement operations. These are temporary and localized events.

(2) Effects on Chemical and Physical Properties of the Water Column

(a) Light Penetration

Turbidity levels will be temporarily increased during dredging and placement operations.

(b) Dissolved Oxygen

No adverse impacts to dissolved oxygen are expected.

(c) Toxic metals and organics

No adverse impacts are expected (DEIS Section 3.3.1).

(d) Pathogens

None expected.

(e) Aesthetics

The PAs have been designed to minimize impacts and adverse aesthetic qualities. The project will design potential SAV habitat, which may be ultimately beneficial to recreational fishermen by providing aquatic habitat. Beach nourishment is proposed to alleviate the eroding shoreline and also provide some protection from storm events.

(f) Others as Appropriate

None known.

(3) Effects on Biota

Dredging of the channel and Inner Basin as well as the emplacement of jetties will impact approximately 2.9 acres of submerged aquatic vegetation, 3.7 acres of high salt marsh, 0.1 acres of tidal flats, 12.1 acres of channel fill sands, 0.1 acre of upland grassland, 1.6 acres of primary and secondary dunes, and 6.1 acres of beach. The placement of dredged material on PAs 1 through 4 and the MMPA will impact 2.3 acres of submerged aquatic vegetation, 7.2 acres of high salt marsh, 0.2 acre of low salt marsh, 1.4 acres of tidal flats, 4 acres of channel fill sands, 9.8 acres of upland grasslands, 22.1 acres of primary and secondary dunes, and 49.1 acres of beach. Forty-six of the acres placed on the beach would be a positive impact (i.e., Beneficial Use).

The placement of dredged material on approximately 46 acres south and north of the proposed Gulf jetties will be for the purpose of beach nourishment. Sandy maintenance material will be placed on either the north or south side of the jetties. The design of the channel from the Inner Basin to the Gulf includes approximately 5.4 acres of broad shallow (< -2 feet MLT) shelves between the natural sides of the channel and bulkheads (northern and southern sides). These areas may be suitable for natural SAV recruitment, assuming that conditions caused by tidal currents and vessel wakes are not too high energy or turbid. An additional 15.6 acres of created SAV beds will be proposed to the FWS as a 3:1 mitigation ratio for SAV replacement. Estuarine organisms depend on seagrass at sometime in their life cycle for protection, food, and as a nursery site. No other impacts are expected on photosynthesis, or suspension/filter feeders, except for temporary impacts from placement operations, which will increase the local turbidity levels.

Proposed secondary development for public/park facilities would impact an additional 0.3 acre of tidal flats, 3.4 acres of dunes, and 3.7 acres of beach.

(4) Actions Taken to Minimize Impacts

During sand placement on the beach, small retaining dikes along the landward and seaward sides may be used to contain material. Also, best management practices (BMPs), such as sand fences, may be installed to offset potential erosion. During placement of dredged material, particularly fine-grained material, it may be necessary to increase the ponding in the area to allow the fines to settle. This would be accomplished by adjusting the number of boards in the weir structure. The discharge effluent from these placement areas will be controlled to achieve acceptable levels of total suspended solids (daily samples taken when effluent is most turbid). PAs 2 and 3 will predominantly consist of sand

material. Due to the small size of PA 3, alternating discharge of material between PAs 2 and 3 to allow for settling of solids may be necessary.

d. Contaminant Determinations

No increase in contaminant levels is expected during construction and placement operations. The potential for contaminants has been evaluated through chemical analyses, and grain-size analyses. Sandy material will be used beneficially on the beach, and silty material will go into confined upland PAs.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton

Construction and placement operations are expected to have only minor temporary, local impacts on plankton due to increased turbidity levels.

(2) Effects on Benthos

Project dredging and placement operations will potentially bury 46 acres of benthos in PA 4. However, except for those lost during construction dredging, there will be recovery. Benthic organisms can migrate upward through placed material, if it is not too thick and, except for those areas such as part of PAs 1–3 that become uplands, recolonization will occur.

(3) Effects on Nekton

Opening the channel will provide additional water column for use by nekton. Turbidities associated with dredging operations may affect some aquatic organisms locally near the active dredges and outflow weirs, however, no significant impact on nekton populations is anticipated from the construction/maintenance dredging and placement operations. The proposed new channel area represents a small increase in habitat for those nekton species common in deeper offshore waters, which periodically invade the bay through the deep channel corridor (Breuer, 1962). Creating a new channel would also result in a small increased feeding and nursery area for demersal fish (Breuer, 1972) (DEIS Section 4.5.1). Changes in salinity would have beneficial but insignificant impacts on fisheries in the Laguna Madre.

(4) Effects on Aquatic Food Web

There will be minor temporary impacts to the food web from the turbidity associated with construction and maintenance dredging.

(5) Effects on Special Aquatic Sites

There are no coral reefs or riffle and pool complexes in the project area. Approximately 1.5 acres of tidal flats will be impacted in addition to 5.2 acres of submerged aquatic vegetation and 11.1 acres of high and low salt marsh (only 0.2 acre is low salt marsh). Potential secondary development impacts by proposed recreational development may negatively affect another 0.3 acre of tidal flats.

(6) Threatened and Endangered Species

There are no Federally-listed threatened or endangered aquatic species occurring in the project area. However, critical habitat for the piping plover will be affected by channel and jetty construction (6.2 acres) and beach nourishment, a temporary impact (24.6 acres).

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination

Testing has demonstrated that adequate mixing exists to dilute the concentrations of effluents from the UCPAs.

(2) Determination of Compliance With Applicable Water Quality Standards

Sediment analyses of new work material have been performed and testing of elutriates prepared with maintenance material has not demonstrated any violation of applicable water quality standards. The State of Texas has granted a water quality certification for previous maintenance dredging of Packery Channel, indicating that water quality standards are being met.

(3) Potential Effects on Human Use Characteristics

(a) Municipal and Private Water Supply

The proposed project will not impact any municipal or private water supplies.

(b) Recreational and Commercial Fisheries

Recreational and commercial fishing in the Laguna Madre may also be enhanced as a result of the minor salinity changes that are expected (DEIS Section 4.5.1.1). Recreational opportunities will increase with the construction of the channel extension.

(c) Water Related Recreation

The project will allow easier access to the Gulf for local fishermen. Passes and jetties, e.g., those at Port Mansfield, are normally heavily fished. Any improvement to fisheries from the expected minor salinity changes would benefit local recreational fishermen. An increase in boat traffic, however, may be a detriment to fishermen currently using the existing channel. Amenities should provide more parking for patrons interested in using the beach, and beach nourishment will provide a beach south of the channel for use by local residents and visitors to the area. The beach front will be cut by the channel limiting the ability of persons to use that portion of the beach; however, access to both sides of the channel will be provided.

(d) Aesthetics

The project is designed to minimize any adverse impacts to the environment and aesthetic qualities in the area.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The Mollie Beattie Habitat Community (MBHC), a State-Federal cooperative preserve on State-owned land, is located in the immediate area of the proposed project, north of the existing Packery Channel and west of SH 361. MBHC covers approximately 1,000 acres of high and low salt marshes, seagrass beds, coastal prairies, and tidal flats which serve as valuable habitat for a variety of shorebirds (including the threatened piping plover (*Charadrius melodius*)), wadingbirds, and other species.

Potential direct impacts of the proposed project to the MBHC are associated with dredging along Reach 2 and include increased turbidity in adjacent waters and noise from equipment and humans disturbing local wildlife. These negative impacts are considered temporary and would not result in significant long-term implications. Maintenance dredging along this reach will occur approximately once every 5 years; thus, exposure to the dredging activities will be limited.

Secondary impacts associated with the project may include an increase of public use at the MBHC, resulting in an increase in vehicle traffic, including watercraft and automobiles; and a potential increase in shoreline erosion associated with boat wakes and/or hydrologic changes due to the opening of the channel to the Gulf of Mexico.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

The project is expected to result in net benefits to the human environment without adding to negative cumulative impacts in the aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary effects on the aquatic ecosystem should occur as a result of the recommended project.

**FINDINGS OF COMPLIANCE WITH
SECTION 404(b)(1) GUIDELINES
FOR
THE NORTH PADRE ISLAND STORM DAMAGE REDUCTION
AND ENVIRONMENTAL RESTORATION PROJECT
NUECES COUNTY, TEXAS**

1. No significant adaptations of the Guidelines were made relative to the evaluation for this project.
2. The recommended plan is the result of evaluation of the proposed dredging and extension of Packery Channel and the No-Action alternative.
3. The recommended plan will not violate any applicable State or Federal water quality criteria or toxic effluent standards of Section 307 of the Clean Water Act.
4. The recommended plan will not adversely affect any State or Federally-listed threatened or endangered species. Critical habitat for the piping plover will be removed due to the proposed construction of the channel; however, these impacts, considered in total, are not considered to be significantly adverse to the birds or the critical habitat.
5. The recommended plan will not result in adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. There are no significant adverse impacts expected for the estuarine ecosystem diversity, productivity and stability, or recreational, aesthetic, and economic values.
6. Appropriate steps to minimize potential adverse impacts on the estuarine system include coordination with State and Federal resource agencies during final design prior to construction to incorporate all valid suggestions. Impacts to submerged aquatic vegetation and special aquatic sites affected by channel widening, deepening, and expansion will be mitigated.
7. Based on the guidelines, the preferred alternative is specified as complying with the requirements of the Section 404(b)(1) guidelines.

4 June 2002
Date

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