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FINAL

ENVIRONMENTAL ASSESSMENT

BEACH EROSION CONTROL PROJECT

VENICE BEACH, SARASOTA COUNTY, FLORIDA

JUNE 1992

FINDING OF NO SIGNIFICANT IMPACT

BEACH EROSION CONTROL PROJECT

VENICE BEACH, SARASOTA COUNTY, FLORIDA

I have reviewed the attached Final Environmental Assessment that has been prepared for the Beach Erosion Control Project - Venice Beach, Sarasota County, Florida. The potentially significant resources affected by the proposed project include: endangered sea turtles, shoreline wildlife species, marine species, cultural resources, water quality, air quality, noise levels, aesthetic resources, recreation, and the quality of the human environment.

Environmental commitments, as described in section 9.00 of the attached FEA, have been made to avoid potentially significant impacts. I have considered the available information in the assessment and it is my determination that the impacts resulting from the proposed project will not have a significant effect on the physical, biological, cultural, socioeconomic environment, or the quality of the human environment, and that the preparation of an Environmental Impact Statement is not required.

4 June 92
DATE

Terrence C. Salt
Colonel, U.S. Army
District Engineer

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Final
Environmental Assessment
Beach Erosion Control Study
Sarasota County, Florida

1.00 SUMMARY. This Final Environmental Assessment (FEA) has been prepared to document project modifications that have been incorporated into the Venice Beach erosion control project, Sarasota County, Florida since last described in the Final Environmental Impact Statement (FEIS) dated April 1985. Information contained in the FEIS is incorporated by reference into this FEA, and therefore only the proposed design modifications and proposed mitigation for anticipated impacts from these changes are discussed in this document. Modifications include: (1) reduction in the length of beach to be nourished, (2) selection of new borrow sites, and (3) the use of a hopper type dredge in the place of hydraulic dredging in the borrow sites. Mitigation for anticipated impacts will consist of the construction of 1.0 acre of artificial reefs. A list of environmental commitments for the project is contained in section 9 of this document.

2.00 INTRODUCTION. This Environmental Assessment has been prepared to comply with the National Environmental Policy Act (NEPA) and to document project modifications since the completion of the Final Environmental Impact Statement dated April 1985. Modifications include: (1) reduction in the length of beach to be nourished, (2) selection of new borrow sites, and (3) the use of a hopper type dredge in the place of hydraulic dredging in the borrow sites.

3.00 PROJECT LOCATION. The project is located on the west coast of Florida near the middle of the peninsula and about 55 miles south-southeast of Tampa. The project is situated on Manasota Key, a barrier island separated from the mainland by tidal inlets (Figure 1), and includes three borrow sites located offshore of Manasota Key and Siesta Key (Figure 2).

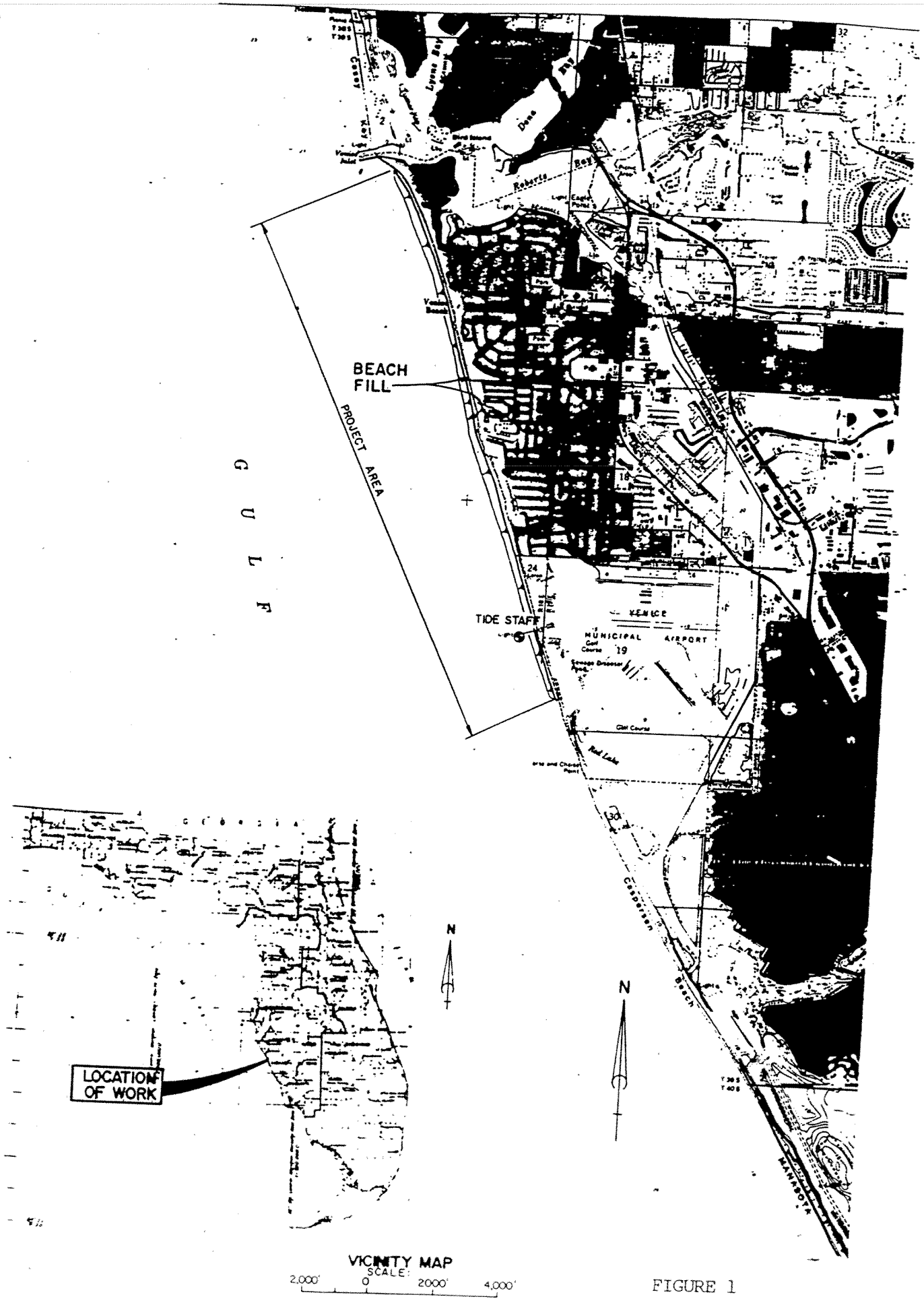

BEACH FILL
PROJECT AREA
G U L F
TIDE STAFF
VENICE MUNICIPAL AIRPORT
LOCATION OF WORK
N
N
VICINITY MAP
SCALE:
2,000' 0 2000' 4,000'

FIGURE 1

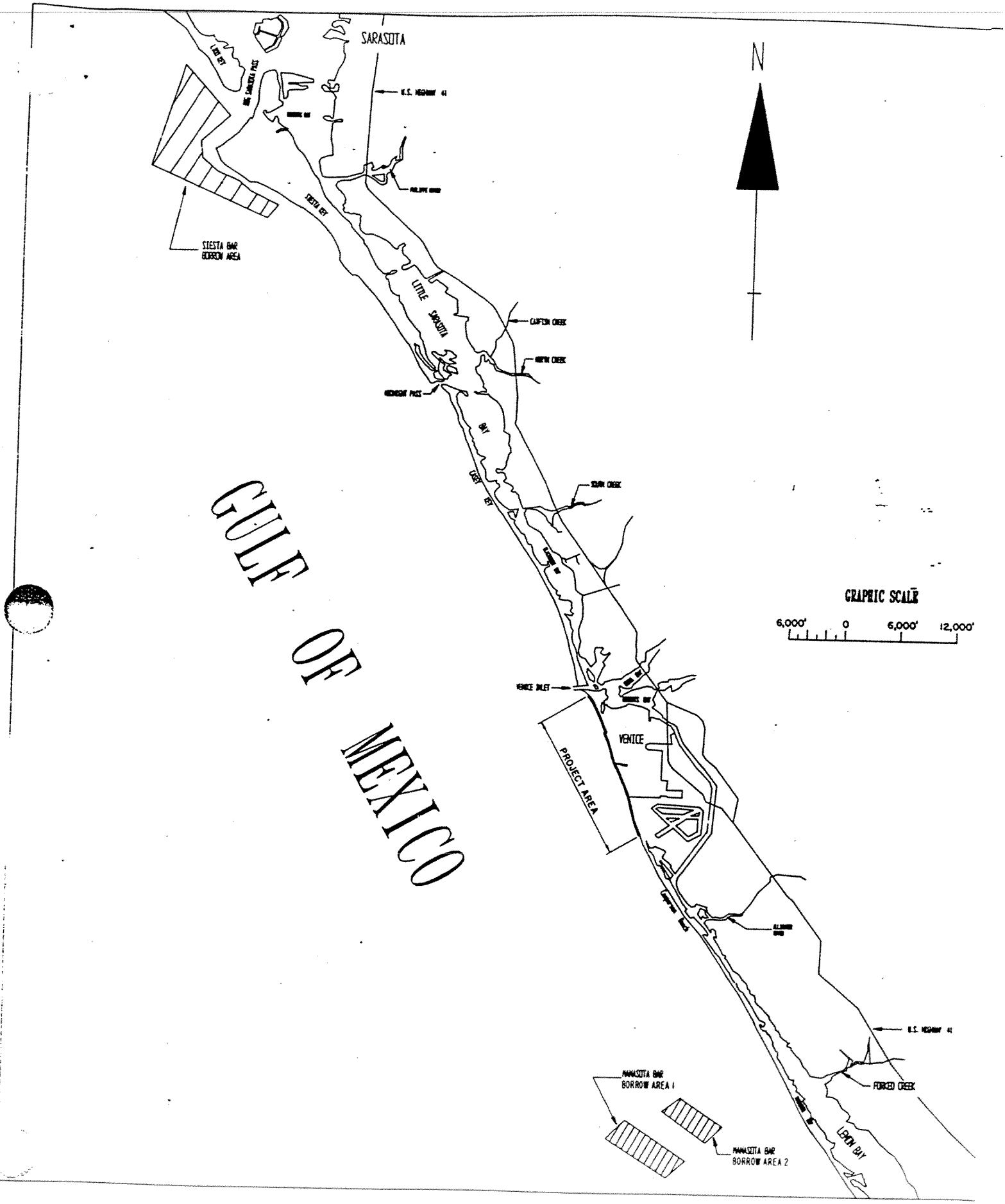

SARASOTA
N
SIESTA BAR
BORROW AREA
LITTLE
SARASOTA
BAY
GULF
OF
MEXICO
GRAPHIC SCALE
6,000'
0
6,000'
12,000'
VENICE
PROJECT AREA
MANASOTA BAR
BORROW AREA 1
MANASOTA BAR
BORROW AREA 2
FORKED CREEK
LEMON BAY

FIGURE 2

4.00 NEED FOR THE PROPOSED ACTION. The Gulf of Mexico shoreline of Sarasota County is being eroded by waves, currents, and seasonal storms. The shoreline is receding at a rapid rate in some areas and the beach profile is being lowered in a similar fashion. The receding shoreline will eventually undermine some manmade shorefront structures if erosion control is not begun. The erosion has exposed some seawalls and revetments to direct attack. The lower beach profile reduces the resistance to storm floods and causes a reduction of the wave energy absorption property of the beaches. Gulf storms cause abrupt changes in the erosion rates along these shorelines. The combination of receding shoreline and lowered beach profile is detrimental to the area's economy. Loss of aesthetically appealing and recreationally suitable beach areas to erosion reduces the area's appeal to tourists. The lower beach profile subjects the developed areas to the increased danger of storm flooding and subsequent commercial, public, and private property problems.

5.00 PROPOSED ACTION. The proposed U.S. Army Corps of Engineers project at Sarasota County, Florida consists of the following:

5.01 (1) The recommended plan provides for restoration of a protective beach along 3.2 miles of shoreline. The north limit of initial restoration is about 850 feet south of the south jetty at Venice Inlet (Caseys Pass). The south limit is at DNR survey monument R-133 which is immediately south of the Venice sewage treatment plant. A total of 2.05 million cubic yards of sand would be placed during the initial construction. This material consists of fill placed behind the Erosion Control Line, design beach section fill, advance nourishment fill, and fill for sorting losses (overfill). The authorized project berm elevation is 9.0 feet mean sea level. The authorized project berm width is for a 50 foot wide berm measured seaward of the Erosion Control Line (ECL) extending south from the Venice Inlet a distance of about 12,850 feet, tapering to 20 feet in width, from the ECL, and maintaining that width for an additional 4,000 feet.

5.02 (2) Borrow Sources. The borrow areas for the initial and periodic future renourishments are shown on figure 2. A hopper type dredge is currently being proposed for use in excavation of the required borrow materials.

5.03 The primary borrow area consists of two shoals located between 1.21 to 3.14 miles offshore of Manasota Key and about 9.8 miles south of Venice Inlet. The seaward shoal is about 7,200 feet long and 2,600 feet wide. Similarly, the landward shoal is of dimensions of 4,900 feet by 2,400 feet. The mean grain size is 0.37 millimeters and 0.23 millimeters, respectively. The visual estimate of shell content ranged from 11 to 17 percent. Shell content was found to be 25 percent by weight. The two

shoal areas could provide an estimated 1.1 million cubic yards of sand.

5.04 The secondary site is identified as the Siesta Key site but is actually the ebb shoal of Big Sarasota Pass. The borrow area is horseshoe shaped conforming to the shoal. The landward boundary of this site was held to a minimum of 1,500 feet from shore to avoid any impacts to the shoreline following excavation of material. The mean grain size is 0.31 millimeter and the visual estimate of shell content ranged from 2 to 70%, with and average of 23 percent. The actual shell content by weight was found to be 26 percent. It is estimated that approximately 10.1 million cubic yards of sand lie within this area.

6.00 ALTERNATIVES TO THE PROPOSED PLAN. Twenty-four alternatives were initially developed for consideration. Of the original 11 nonstructural, 12 structural, and the No Action alternative; 1 nonstructural alternative, 4 structural alternatives, and the No Action alternative were retained for detailed study. The No Action alternative was used for comparison, as the base line condition, with the other alternatives. For a detailed description of all the alternatives refer to the Final Environmental Impact Statement (July 1984).

7.00 AFFECTED ENVIRONMENT.

7.01 General Environmental Setting. Manasota Key is located on the middle gulf coast of Florida, approximately 55 miles south of Tampa. Manasota Key is typical of the low and narrow barrier islands located on the Gulf Coast of Florida. The Key is about 16 miles long, it is 100 feet to 1½ miles wide, and it has elevations generally below 10 feet above mean low water. The northerly three-fourths of the island is in Sarasota County and the rest is in Charlotte County. Its beach is narrow and steep with ongoing shorefront development south of the city of Venice. Four bridges and one causeway provide access to the mainland. Approximately 70 percent of its 1,800 acres is developed. Numerous areas along the shore are primarily developed for residential, resort, and tourist accommodation purposes. Development includes shops, motels, hotels, apartments, and other service establishments catering, either directly or indirectly to tourists visiting the area. The western shoreline is being eroded at the rate of 3.4 cubic yards per foot per year. Sparse growths of salt grass, sand spur, and sea oats occur among the beach bluffs and dunes.

7.02 Biological Resources. The project is in an area of overlap between subtropical marine species and temperate marine species. Many of the sessile tropical species are at the northern limit of their range and are under some natural stress during the winter months because of lowered temperatures and the increased turbidities brought on by storms. Many motile forms, such as fish, migrate in and out of the area with the seasons. During warmer summer months, tropical species predominate, while during the cooler winter months, temperate species are relatively more abundant.

The offshore area is predominately a sand or sand/shell bottom characterized by scattered limestone aggregate outcrops or hardgrounds. To determine the extent of hardgrounds within the study area a side scan sonar survey was performed. The survey covered the area between the north and south study limits out to a distance of about 1200 feet from shore and the two borrow sites with a 1000 foot buffer around the sites. In addition to the side scan survey, aerial photographs were used to identify rock outcrops close to shore that may not have been detected by the side scan. One hardground area of approximately 1.3 acres was found between DNR monuments R-124 and R-125 within the beach fill area. A second area of approximately 0.4 acres was located 750 feet west of DNR monument R-120. This area was identified by USFWS as the most productive reef that would be impacted by the beach fill. Four small areas were identified, these areas are comprised of scattered rock 0.5 acres, boulders 0.03 acres, a man-made groin 0.03 acres, and a derelict groin 0.03 acres.

Because of the frequent scouring and pounding that occurs during storms and rough seas, shallow water rock outcrops located close to shore do not usually support a large diversity of plant and animal life. Surface vegetation is usually sparse and limited to small varieties of green, brown, and red algae. Some small whelks and snails, starfish, sea anemone, and urchins also inhabit this benthic community, with a variety of crabs, shrimp and other small invertebrates. When the waters are calm enough, small bait fish often congregate around these rocky areas, in turn attracting larger shallow water fishes such as flounder, redfish, seatrout, snook and tarpon. Although these shallow water hardgrounds are usually not of high quality, they do serve as important fish concentration areas for both commercial and sport fishermen and sport divers. In the study area, the close proximity of rock outcrops to the shoreline increases its value to divers and snorklers because of easy access.

Hardground and/or reef communities located farther offshore in water deeper than 10 feet are more protected from the pounding and scouring effects of wave action. For this reason, growth is more luxuriant, with large specimens of red and green algae, sea fans and large soft and hard corals, along with a greater diversity of invertebrates. Usually, reefs in this area will

have greater relief than those located in shallower water. The greater relief and organism diversity attract a variety of larger fish species that utilize the reef as a permanent residence. Grouper, snapper, grunt, porgy and angelfish are usually abundant around most reefs in this area. These reefs also seem to attract greater numbers of baitfish, and therefore attract a wider variety of, as well as greater numbers of the larger pelagic predator species. Generally, the reefs located farther offshore are considered to have more natural resource value than those areas located in shallow water closer to shore.

The Manasota Key area supports both commercial and recreational fisheries. Fish of commercial significance include striped mullet (Mugil cephalus), spotted seatrout (Cynoscion nebulosus), pompano (Trachinotus carolinus), grouper (Mycteroperca sp. and Epinephelus sp.), and red snapper (Lutjanus campechanus). Important commercial shellfish include pink shrimp (Penaeus duorarum), blue crab (Callinectes sapidus), and stone crab (Menippe mercenaria). Sportfish commonly fished for in the area include tarpon (Megalops atlanticus), snook (Centropomus undecimalis), sheepshead (Archosargus probatocephalus), spotted seatrout, mangrove snapper (Lutjanus griseus), and red drum (Sciaenops ocellatus).

7.03 Threatened or Endangered Species. The U.S. Fish and Wildlife Service (USFWS) by letter dated July 29, 1991 identified the West Indian Manatee (Trichechus manatus, E), Bald Eagle (Haliaeetus leucocephalus, E), Wood Stork (Mycteria americana, E) and Loggerhead Sea Turtle (Caretta caretta, T) as species which are likely to occur along the beach replenishment area of the project. The National Marine Fisheries Service (NMFS) by letter dated August 5, 1991 identified the Finback Whale (Balaenoptera physalus, E), Humpback Whale (Megaptera novaeangliae, E), Right Whale (Eubaleana glacialis, E), Sei Whale (Balaenoptera borealis, E), Sperm Whale (Physeter catodon, E), Green Sea Turtle (Chelonia mydas, T), Hawksbill Sea Turtle (Eretmochelys imbricata, E), Kemp's Ridley Sea Turtle (Lepidochelys kempi, E), Leatherback Sea Turtle (Dermochelys coriacea, E) and Loggerhead Sea Turtle (Caretta caretta, T) as species which are likely to occur within the proposed borrow sites for the project.

7.04 Cultural, Historical, and Archeological Resources. An archival and literature review, including a review of the current National Register of Historic Places listing and consultation with the Florida State Historic Preservation Officer (SHPO), was conducted to determine if significant cultural resources are present in the project area. Magnetometer surveys of the proposed borrow areas were also completed.

Five known terrestrial archeological sites are located in the vicinity of this beach renourishment project. Placement of dredged material on the beach will not affect these sites or any

other unknown archeological resources. Reference letter from the SHPO dated May 24, 1990. A magnetometer survey was completed for the three proposed off-shore borrow areas: two located in the vicinity of Manasota Key and one in the vicinity of Sarasota Point at Siesta Key. Four anomalies were identified by the magnetometer survey, all of which are located in the Siesta Key borrow area. Three of the anomalies have been determined to be potentially significant cultural resources which may represent sites eligible for listing on the National Register of Historic Places. Avoidance of impacts and coordination with the SHPO are discussed in paragraph 8.04.

7.05 Water Quality. The waters in the study area are used for swimming, fishing, boating, and other recreational uses; therefore, the standard quality of Gulf of Mexico waters is affected by those activities. The State of Florida lists the area's waters as being Class III quality (suitable for recreation and the propagation of fish and wildlife). No other water use classification is known to be within the study area.

7.06 Hazardous and Toxic Wastes. The nature of the work involved with the renourishment of beaches is such that contamination by hazardous and toxic wastes is very unlikely. The areas under study are high energy littoral zones and the materials used for nourishment are composed of particles with large grain sizes that do not normally have contaminants adsorbing to them. No contamination due to hazardous and toxic waste spills is known to be in the study area.

7.07 Aesthetic Resources. Consideration of aesthetic resources within the project study area is required by the National Environmental Policy Act of 1969 (NEPA) PL 91-190, as amended. Aesthetic resources are defined as "those natural and cultural features of the environment that elicit a pleasurable response" in the observer, most notably from the predominant visual sense. Consequently, :aesthetic resources are (commonly referred to as) visual resources, ...features which can potentially be seen.

The existing beach has narrowed considerably from the jetties to just south of the water treatment plant. The beach is developed commercially for the greater length of the project area. Most of the beachfront is shadowed by hotels and condominiums, however some of the project beachfront is single family homes. Few small sand dunes with native vegetation can be found along the Sarasota County white sandy beach.

7.08 Coastal Barrier Resources. Manasota Key is a coastal barrier island, however the proposed project area (Venice Beach) is not part of the Coastal Barrier Resources System.

7.09 Noise. Ambient noise levels in the project area are low to moderate. The major noise producing sources are the breaking surf, adjacent residential areas, and aircraft activities to and from the local airport. These sources are expected to continue at their present noise levels.

7.10 Air Quality. Air quality along coastal Manasota Key is good due to the presence of either on or off shore breezes. The Florida Department of Environmental Regulation, Air Quality Division has classified Sarasota County as an attainment area.

7.11 Recreation. Consideration of Federal development of project-related recreational resources is contained in Section 4 of the 1944 Flood Control Act as amended by Sections 4, 209, and 207 of the Flood Control Acts of 1946, 1954, and 1962 respectively. Basic legislation is further affected by the Land and Water Conservation Fund Act (Public Law 88-578), the Federal Water Project Recreation Act (Public Law 89-72), and the Water Resources Development Act of 1986 (Public Law 99-662). The Corp's objective in terms of recreational development is to "fully consider the recreation potential that may be applied at Corps Civil Works Projects" (ER 1165-2-400).

The public access and use of the Sarasota County Beach project area has been observed to have a high use rate. Passive and active use of the public beach provides recreation resources for a varied cross section of Sarasota County public.

8.00 ENVIRONMENTAL EFFECTS.

8.01 General Environmental Setting. The effect of this proposal on the coastal zone would be to enhance the zone's appearance and suitability for beach type recreation and to restore some of the beach zone's ability to provide protection against storms and flooding.

8.02 Biological Resources. Dredging will result in the loss of benthic organisms in the borrow site. These communities will reestablish quickly after completion of the project. Disposal of sand on the beach will have only temporary impact on marine and shorelife in the immediate vicinity of construction. Nearshore free-swimming organisms can avoid the area for that period of time and will be able to move back into the project area after construction. Some littoral and sublittoral invertebrates in the reaches receiving fill may be buried and lost, but many organisms inhabiting the high energy surfzone are well suited for burrowing and will burrow up through the fill material and survive. Turbidity levels along the disposal site will temporarily increase, but will return to normal after beach equilibrium is achieved. Because the project area is in a high wave energy zone, naturally occurring turbidity levels along the surfzone are

high. Organisms inhabiting this zone will be impacted by run-off from the disposal area but are adapted for survival in such conditions; thus, impacts will be minor. Any losses due to the project would be replaced within a short time (Marsh, et al. 1980). Commercial and recreational fisheries at or near the dredging and disposal sites should not experience any substantive adverse effects.

Approximately 1.9 acres of the hardground area located offshore of the project beach will be covered by sand. The largest productive hardground area, located west of DNR monument R-120, is far enough offshore that it will not be directly impacted by the placement of sand on the beach or stabilization of the beach by wave action. Hardgrounds not directly impacted (ie. covered by sand) but close to shore may be susceptible, to some degree, to negative impact from sedimentation and turbidity due to the beach disposal. These hardground communities are dominated by sponges and soft corals, with a very small percentage of hard coral coverage. As a group, the hard corals are most sensitive to potential impacts. Soft corals, sponges, and other sessile organisms are more tolerant of increased turbidity and sedimentation (Pullen and Naqvi, 1983), and no significant short or long-term effects on these organisms are expected. Without implementation of proper controls mechanical damage could result from anchors dragging across hardground or discharge pipes being laid along the bottom. Measures will be taken to avoid adverse impacts to hardground communities during dredging and beach disposal operations. These measures include predredging surveys to locate and mark hardground areas. Pipelines will be placed only in approved areas away from hardgrounds and anchoring will be permitted in sandy areas only. Specific requirements to protect hardground communities from damage will be included in the dredging contract.

Once the entire 3.2 miles of beach has been nourished, it is estimated that a total of 1.9 acres of hardgrounds will have been covered by sand. The loss of these hardgrounds will be mitigated by constructing similar artificial reefs as near as possible to the affected areas.

8.03 <u>Threatened or Endangered Species.</u> On August 7, 1991 the Corps submitted a Biological Assessment (BA) to the NMFS pursuant to Section 7 of the Endangered Species Act that the proposed project would not adversely affect any species under their purview. On September 25, 1991 NMFS concurred with our determination of no affect to any species under their purview. In their response NMFS included the following measures to further reduce the likelihood of adverse affects by hopper dredging:

1. Inform dredge personnel of the potential presence of sea turtles in the project area, the turtles' endangered status, the need for precautionary measures, and the Endangered Species Act prohibition on taking sea turtles.

2. Require dredge personnel and COE dredge inspectors to monitor the dredging area and spoil for the presence of sea turtles.

3. Inform the NMFS immediately should the take of a sea turtle occur.

On August 7, 1991 the Corps submitted a BA to the USFWS pursuant to Section 7 of the Endangered Species Act that the proposed project may affect nesting sea turtles under their purview but would not adversely affect the West Indian Manatee. On October 30, 1991 USFWS concurred with our determination. In their response USFWS included the following reasonable and prudent measures to minimize taking:

1. During periods of nesting activity, relocation of nests will be required.

2. Nourished beaches will be tilled if compaction or escarpments occur.

Terms and Conditions

Section 9 of the Endangered Species Act prohibits the taking of listed species without a special exemption. In order to be exempt from the prohibitions of Section 9 of the Act, the following terms and conditions, which implement the reasonable and prudent measures described above, must be complied with.

1. Nest survey and relocation activities must begin 65 days prior to nourishment activities as follows:

For Venice Beach, nest surveys and relocation do not have to begin earlier than May 1 or continue after September 15.

2. Nest surveys and relocation will be conducted by personnel with prior experience and training in nest survey and relocation procedures, and with a valid Florida Department of Natural Resources permit. This is essential to reduce the number of undetected nests.

3. Nests shall be relocated between sunrise and 10 a.m. each day and the relocation will be to a nearby self release beach hatchery in a secure setting where artificial lighting will not conflict with hatchling orientation.

4. Nourished beaches will be plowed to a depth of at least 36 inches immediately following completion of beach nourishment if sand compaction measures greater than 500 cone penetrometer index units (cpu). Sand compaction measurements will be taken in February for at least two consecutive years, and tilling will be repeated if compaction exceeds 500 cpu.

5. Escarpments in excess of 18 inches extending more than 100 feet in length and exceeding 500 cpu will be mechanically leveled to the natural beach contour prior to May 1. If leveling is needed, nest relocation procedures will be followed as stated in #1-3. If escarpments in excess of these criteria reform in the two subsequent nesting seasons, they will be leveled to the natural beach contour as described above.

6. A report describing the action taken to implement the terms and conditions will be submitted to this office within 60 days of completion of the proposed work for each year when activity has occurred. This report will include dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, description and location of hatcheries, nest survey and relocation results and hatching success of nests.

7. The contractor will notify the Service office issuing this biological opinion 30 days prior to commencing the project.

The following Conservation Recommendations are provided to further reduce the potential for adverse impact to nesting sea turtles.

1. Beach renourishment be planned for and conducted outside the period May 1 - September 15 whenever possible.

2. When the dredge is located off the nesting beach, nighttime lighting should be minimized by eliminating lights, screening, or shielding lights when possible. Low pressure sodium lights (shielded) are recommended for those lights which cannot be eliminated.

3. Sea oats or other appropriate dune vegetation should be planted on nourished beaches to enhance dune restoration. The Florida Department of Natural Resources, Division of Beaches and Shores, can provide technical assistance in the design and implementation.

In the event a turtle nest is dug up by beach construction activities, the following procedure should be followed:

1. Immediately notify the Florida Department of Natural Resources permitted individual responsible for nest relocation on the project for removal of the nest to the beach hatchery. Before eggs are relocated, the top of each egg will be marked with a nontoxic felt tipped pen and individually and gently placed on 2-3 inches of moist sand in a rigid walled container, being careful not to change the axis of the eggs. Eggs will be covered with a fine nylon mesh and then 2-3 inches of moist sand, shaded from the sun, and immediately transported to the artificial nest chamber, while ensuring that the orientation of each egg remains as in the natural nest.

8.04 Cultural, Historical, and Archeological Resources. As stated in paragraph 7.04 above, five known terrestrial archeological sites are located in the vicinity of this beach renourishment project. It has been determined that placement of dredged material on the beach will not affect these archeological sites. (Reference letter from the State Historic Preservation Officer (SHPO) dated May 24, 1990.) A magnetometer survey was completed for the three proposed borrow areas: two located in the vicinity of Manasota Key and one in the vicinity of Sarasota Point at Siesta Key. No magnetic anomalies were identified in the Manasota Borrow areas. Three of the four magnetic anomalies which were identified in the Siesta Key borrow area have been determined to be potentially significant and may represent sites eligible for listing on the National Register of Historic Places. To avoid impact on these resources, buffer zones with a 200 foot radius will be established around each anomaly. The SHPO concurred with this determination in a January 15, 1991 letter. This coordination was conducted in compliance with the National Historic Preservation Act of 1966, as amended (PL 89-655) and the Archeological and Historic Preservation Act, as amended (PL 93-291); and Executive Order 11593.

8.05 Water Quality. The beach restoration and periodic nourishment plan as proposed would cause temporary increases in turbidity at the dredging and discharge sites. A lower dissolved oxygen condition might be caused by the turbidity; these conditions would cause short term impacts. However, due to the turbulence at the discharge site this item would be negligible. These temporary conditions would not significantly affect the area's water quality; should turbidity exceed State water quality standards as determined by monitoring the contractor would be required to cease work until conditions returned to normal.

8.06 Hazardous and Toxic Wastes. The probability of contamination by hazardous and toxic wastes is judged to be negligible. The borrow site is sufficiently removed from shipping lanes and in high energy areas with littoral drift. Studies have shown that contaminants usually do not adsorb to particles with grain sizes suitable for beach restoration. Additionally magnetic anomalies likely to be a source of HTW contamination have been avoided in the borrow area. The beach renourishment site is also an unlikely source of HTW contamination. There is no recent history of oil spills or other contamination at the beach site.

8.07 Aesthetic Resources. The plan to renourish the Sarasota County Beach from the Venice inlet jetties to Caspersen Beach will improve the aesthetics of the beach as long as similar sand is used. The sand berm will provide the county with an aesthetically pleasing beach.

8.08 Coastal Barrier Resources. There are no designated coastal barrier resources in the present project area that would be affected by this project.

8.09 Noise. Construction equipment, i.e. booster pumps if needed, will be properly maintained in order to minimize effects of noise. Since the increases to the current level of noise as a result of this project will be localized and minor, there will only be a temporary reduction in aesthetics and no expectation of adverse effects to the environment as a result of construction related noise.

8.10 Air Quality. The short term impact of emissions by the dredge or other construction equipment associated with the beach replenishment will not significantly impact air quality. Sarasota County is an attainment area and the Department of Environmental Regulation does not regulate mobile emission sources in attainment areas. No permits are required for this project.

8.11 Recreation. While the Sarasota County Public Beach is being renourished, public access will be restricted for safety considerations. With the beach renourishment project completed, the Sarasota County public will have a wider beach for improved recreation activities.

9.00 ENVIRONMENTAL COMMITMENTS.

The Corps and contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments into the project contract specifications:

(1) To avoid impact to cultural resources, buffer zones with a 200 foot radius will be established around each anomaly.

(2) Inform dredge personnel of the potential presence of sea turtles in the project area, the turtles' endangered status, the need for precautionary measures, and the Endangered Species Act prohibition on taking sea turtles.

(3) Require dredge personnel and COE dredge inspectors to monitor the dredging area and spoil for the presence of sea turtles.

(4) Inform the NMFS immediately should the take of a sea turtle occur.

(5) Precautions will be taken during construction activities to insure the safety of the manatee. To insure the contractor and his personnel are aware of the potential presence of the manatee in the project area, their endangered status, and the need for precautionary measures, the contract specifications will include the standard protection clauses concerning manatees. The contractor will instruct all personnel associated with the construction of the project about the presence of manatees in the area and the need to avoid collisions with manatees. All vessels associated with the project shall operate at 'no wake' speeds at all times while in shallow waters, or channels, where the draft of the boat provides less than three feet clearance of the bottom. Boats used to transport personnel shall be shallow draft vessels, preferably of the light-displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any work boat shall follow routes of deep water to the extent possible. Shore crews or personnel assigned to the disposal site for the workshift shall use upland road access if available. All personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act. The contractor shall be held responsible for any manatee harmed, harassed, or killed as a result of the construction of the project. If a manatee is sighted within 100 yards of the dredging area, appropriate safeguards will be taken, including suspension of dredging, if necessary, to avoid injury to manatees.

(6) Sea turtle nest survey and relocation activities must begin 65 days prior to nourishment activities as follows:

For Venice Beach, nest surveys and relocation do not have to begin earlier than May 1 or continue after September 15.

(7) Sea turtle nest surveys and relocation will be conducted by personnel with prior experience and training in nest survey and relocation procedures, and with a valid Florida

Department of Natural Resources permit.

(8) Sea turtle nests shall be relocated between sunrise and 10 a.m. each day and the relocation will be to a nearby self release beach hatchery in a secure setting where artificial lighting will not conflict with hatchling orientation.

(9) Nourished beaches will be plowed to a depth of at least 36 inches immediately following completion of beach nourishment if sand compaction measures greater than 500 cone penetrometer index units (cpu). Sand compaction measurements will be taken in February for at least two consecutive years, and tilling will be repeated if compaction exceeds 500 cpu.

(10) Escarpments in excess of 18 inches extending more than 100 feet in length and exceeding 500 cpu will be mechanically leveled to the natural beach contour prior to May 1. If leveling is needed, nest relocation procedures will be followed as stated in #1-3. If escarpments in excess of these criteria reform in the two subsequent nesting seasons, they will be leveled to the natural beach contour as described above.

(11) A report describing the action taken to implement the terms and conditions will be submitted to the USFWS, Vero Beach field office within 60 days of completion of the proposed work for each year when activity has occurred. This report will include dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, description and location of hatcheries, nest survey and relocation results and hatching success of nests.

(12) The contractor will notify the Chief, Environmental Resources Branch who will notify the USFWS, Vero Beach field office 30 days prior to commencing the project.

(13) When the dredge is located off the nesting beach, nighttime lighting should be minimized by eliminating lights, screening, or shielding lights when possible. Low pressure sodium lights (shielded) are recommended for those lights which cannot be eliminated.

(14) In the event a turtle nest is dug up by beach construction activities, the following procedure should be followed:

1. Immediately notify the Florida Department of Natural Resources permitted individual responsible for nest relocation on the project for removal of the nest to the beach hatchery. Before eggs are relocated, the top of each egg will be marked with a nontoxic felt tipped pen and individually and gently placed on 2-3 inches of moist sand in a rigid walled container, being careful not to change the

axis of the eggs. Eggs will be covered with a fine nylon mesh and then 2-3 inches of moist sand, shaded from the sun, and immediately transported to the artificial nest chamber, while ensuring that the orientation of each egg remains as in the natural nest.

(15) One acre of artificial reef will be constructed in conjunction with construction of the beach fill.

(16) A total of 1.0 acre (ground surface) of artificial reef will be constructed utilizing the criteria in the USFWS Coordination Act report.

(17) Contractor will monitor turbidity at both the dredging and discharge sites. Should the monitoring reveal turbidity levels above State standards work will be suspended until turbidity levels return to within State standards.

(18) Measures will be taken to avoid adverse impacts to hardground communities during dredging and beach disposal operations. These measures include predredging surveys to locate and mark hardground areas. Pipelines will be placed only in approved areas away from hardgrounds and anchoring will be permitted in sandy areas only.

10.00 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS.

10.01 National Environmental Policy Act of 1969, as amended. Environmental information on the project has been compiled and the Final Environmental Assessment, dated January 1992, has been prepared and was circulated prior to finalization in accordance with the National Environmental Policy Act.

10.02 Endangered Species Act of 1973, as amended. A list of endangered, threatened, proposed, or candidate species was received from the U.S. Fish and Wildlife Service dated July 29, 1991 and from the National Marine Fisheries Service dated August 5, 1991. Consultation was initiated with NMFS on August 7, 1991 and completed on September 25, 1991. Consultation was initiated with USFWS on August 7, 1991 and completed on October 30, 1991. This project was fully coordinated under the Endangered Species Act; therefore, this project is in full compliance with the Act.

10.03 Fish and Wildlife Coordination Act of 1958, as amended. In response to the requirements of this Act, the district has and will continue to maintain continuous coordination with the USFWS during all stages of the planning and construction process. On October 30, 1991 the USFWS submitted a draft Fish and Wildlife Coordination Act Report, which is included in this report as attachment C, with the following recommendations:

1. To prevent damage to the productive reef located at DNR monument R-120 the width of the beach fill should be reduced by 100 feet for a length of 900 feet along the shoreline beginning 450 feet north of the monument and ending 450 feet south of the monument.

2. The large boulders that make up the groin south of Venice Beach, as well as the derelict groin in this same vicinity, should be taken offshore and used to create an artificial reef.

3. Under current conditions, approximately 2.3 acres of hardbottom will be buried. We recommend that at least one acre of artificial reef is deployed prior to project construction. This will provide an alternative refuge for fish displaced by the project.

4. Assuming that the artificial structure will have approximately the same surface area per acre above the scour zone as the six hardbottom areas, we recommend a mitigation ratio of no less than 1 to 1. Since we believe the reef offshore DNR monument R-120 is irreplaceable, this 0.4 acre area cannot be mitigated. The remaining hardbottom area occupies an area of 1.9 acres which requires the construction of 1.9 acres of artificial reef.

5. The artificial reef structure selected for mitigation should be designed to provide habitat for species which are of interest to local scuba divers and snorkelers. It should be constructed of natural material (i.e. limestone). Design features should include: a) extensive unshaded horizontal surface area; b) openings near the bottom for stone crabs; c) interstitial spaces approximately 10 cubic feet; d) large overhanging ledges; e) numerous projections, crevices and holes.

6. Based on existing reef acreage, we recommend that the designed reef consist of 16 modules, either of limestone boulders or the limestone embedded concrete modules, which are 50 ft. wide by 100 ft. long by at least 5 ft. high.

7. Monitoring and annual reporting to the U.S. Army Corps of Engineers and resource agencies on the effectiveness of the mitigation should be incorporated as a project feature. Monitoring should include quantitative measurement of the macroepibenthos per square meter by wet weight of organisms which have colonized artificial substrate. Comparisons should be made between total biomass, macroepifloral biomass and macroepifaunal biomass at the designed reef and at nearby natural reefs. Fin fish communities at both reef types should be censured and compared in number, species and biomass (estimated). Fish communities should also be

compared at both reef types using similarity indexing. Sampling should take place once in each season for three years or until it is clear that community structure has stabilized.

8. The Fish and Wildlife Service should be funded by the U.S. Army Corps of Engineers to participate in the monitoring of the designed reefs. This will promote a better understanding of design effects on reef communities and facilitate the development of an increasingly effective artificial reef strategy and better informed decision making for future Civil Works projects.

9. The reef mitigation plan described above should be included as a Federal project feature subject to cost sharing (i.e. 75% Federal, 25% local) to defray the project sponsor's cost of mitigation in accordance with current Corps policy as established by the principles and guidelines.

The following is the Corps response to the USFWS recommendations:

Recommendation #1 - The design fill contained within the General Design Memorandum consisted of a berm width of 203 feet referenced to DNR monument R-120 or a width of 50 feet seaward of the established Erosion Control Line (ECL). This berm width will provide the maximum net benefits associated with storm damage protection for structures within the City of Venice. The berm height was +9.6 feet mean low water (MLW) with a slope of 1 foot vertical and 20 feet horizontal to MLW and 1 foot vertical/30 feet horizontal from MLW to the existing bottom. This fill section formed the basis for quantity and cost estimates used within the GDM. This section is not necessarily the anticipated equilibrium profile for the fill material but rather serves as a recommended plan from the National Economic Development Plan analysis contained in the feasibility report.

The recommended construction berm width is 255 feet referenced to DNR monument R-120. The berm height would be +9.6 feet mean low water (MLW) and the slope 1 foot vertical to 15 feet horizontal. Utilizing a beach profile survey dated February/March 1990, the construction fill section would intercept the existing bottom approximately 610 feet seaward of the monument.

Assuming that the maximum beach fill profile adjustment would occur during major storm events, a computer simulation of shoreline response was conducted for storm frequencies of 1 through 50 years. Birkemeier and Sargent (1985) developed a computer program, DUNE, to develop the relationship between shoreline recession and storm surge. The DUNE program attempts

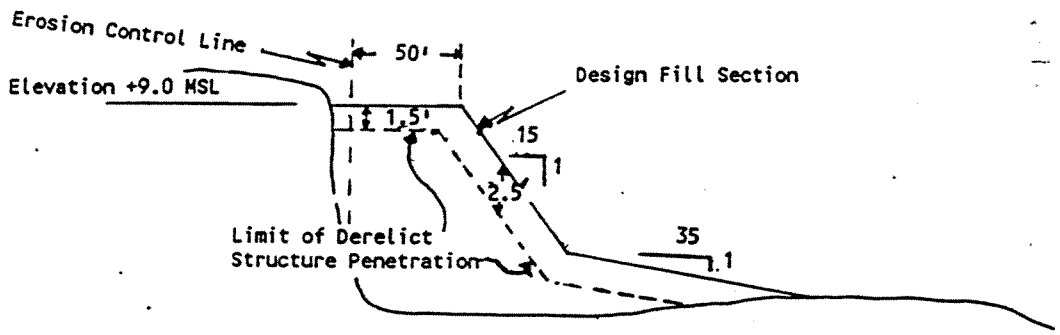
to conserve the volume of material within the littoral environment by redistributing material eroded above mean sea level to a profile which includes accumulation below mean sea level. Input to the computer program consists of a pre-storm beach profile, storm surge level, deep water significant wave height, mean sediment grain size, and water temperature. The primary output is a post-storm beach profile. Using the input data of construction berm slope and the smallest median sediment size for fill (.23 mm), post-storm profiles intercepted the existing surveyed bottom at a maximum distance of 657 feet seaward from the monument. The following table presents the results of the simulation modeling.

Storm Frequency (Years)	Post-Storm Berm Width (Feet)	Seaward Limit of Post-Storm Profile (Feet)
1	255	616
2	255	617
5	245	656
10	227	657
20	195	622
30	177	623
50	(Storm Surge Level Above Fill Elevation)	

The above simulation indicates that the equilibrium post-storm profile would not encroach upon the concerned hard bottom. It should also be noted that this is the worst case storm condition scenario and that during periods of average wave energy and water levels, the equilibrium profile may be shoreward of that presented.

The Jacksonville District therefore does not concur in the recommendation to reduce the berm width within the immediate area of the referenced hard bottom community.

Recommendation #2 - The removal of the large boulders and derelict groin and subsequent relocation offshore as artificial reef would be cost prohibitive due to the shallow depths of the surrounding water that would prevent derrick barge access. There are also safety considerations concerning work in the surf zone. In addition it would be very difficult to write a performance specification to accomplish this work unless each boulder was surveyed as to size and location. It would be much more cost effective to provide a known quantity of limestone and rubble as artificial reef material. We will include in the contract plans and specifications the requirement for the contractor to remove all obstructions that penetrate the beach fill template as shown below. In the case of rubble that exceeds the +7.5 foot MSL elevation of the template this material will be removed and placed adjacent to the existing rubble. This will be accomplished due to safety concerns for the public use of the project and as required by the State DNR.



Recommendation #3 - The Corps concurs that one acre of artificial reef will be constructed in conjunction with construction of the beach fill.

Recommendation #4 - The Corps does not concur with this recommendation because the areas impacted are of relatively low relief (1-3 feet) which are frequently and severely scoured by wave action and longshore currents. This condition limits the hardbottoms' ability to support algal and sessile invertebrate cover. Based on recommendations contained in the USFWS May 2, 1990 letter for the Manatee County shore protection project, the Corps will construct artificial reefs totaling 1.0 acre of surface area with 5 feet of vertical relief for the Sarasota County shore protection project. It is our opinion that half an

acre of artificial reef which extends 5 feet above the bottom in a lower wave energy zone, i.e., deeper water, would provide a more stabile habitat to support algal and sessile invertebrates, and a greater diversity of fish species will adequately compensate for the loss of each acre of low relief hardbottom such as that described in the CAR.

Recommendation #5 - The Corps concurs with the artificial reef design features.

Recommendation #6 - The Corps does not concur with the number (16) of artificial reef modules needed to mitigate project impacts. Based on the response to recommendation #4 the Corps will construct eight (8) artificial reef modules with the dimensions as stated in this recommendation. Project cost factors, as specified in National Economic Development guidelines, require that the reef be constructed as inexpensively as possible as long as project goals are met. It is expected that concrete rubble would serve as acceptable reef habitat.

Recommendation #7 - The Corps concurs with the need to assess the effectiveness of the mitigation project. The Corps will commit to a visual inspection annually until it is evident that the artificial reef structures have met their intended goal of providing hardbottom habitat. A report will be prepared following the inspection and a copy furnished to the USFWS.

Quantitative and comparison analyses between the artificial reefs and nearby natural reefs are not warranted for this type of mitigation i.e. replacement of hardbottom. The successful colonization of artificial structures is well documented therefore, the Corps does not concur with the need for additional studies of this type.

Recommendation #8 - The Corps will conduct a visual inspection annually until it is evident that the artificial reef structures have met their intended goal; therefore, funding for the USFWS to participate in a monitoring program will not be needed. However the Corps will notify the USFWS prior to the inspections so they may participate if they wish.

Recommendation #9 - The Corps has determined that mitigation for project impacts is required. Therefore, the cost of mitigation becomes part of the cost of the project and shared as described in the GDM.

10.04 <u>National Historic Preservation Act of 1966, as amended.</u> The cultural resources study, documentation and coordination, has been conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA). Additionally, the assessments and final determinations are in compliance with the Archeological and Historic Preservation Act, which amends the Reservoir Salvage

Act of 1960 and Executive Order 11593, Protection and Enhancement of the Cultural Environment. U.S. Army Corps of Engineers regulations ER 1130-2-438 are applicable, in addition to 36 CFR 800.

10.05 Clean Water Act of 1972, as amended. The study is in partial compliance. Full compliance will be achieved with issuance of a Section 401 permit from the State. A Section 404(b) Evaluation is included in this report as attachment A.

10.06 Clean Air Act of 1972, as amended. Coordination on August 20, 1991 with the Department of Environmental Regulation, Air Quality Division determined the proposed project is in partial compliance with the Clean Air Act. No permits will be required for this project. Full compliance has been achieved with receipt of comments on the draft EA from the U.S. Environmental Protection Agency.

10.07 Coastal Zone Management Act of 1972, as amended. The study is in partial compliance at this time. Full compliance will be achieved with receipt of comments from the State Clearinghouse. A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Attachment B.

10.08 Farmland Protection Policy Act of 1981. No prime or unique farmland will be impacted by implementation of this project. This act is not applicable.

10.09 Wild and Scenic River Act of 1968, as amended. No designated Wild and Scenic river reaches will be affected by project related activities. This act is not applicable.

10.10 Marine Mammal Protection Act of 1972, As Amended. Incorporation of the safe guards used to protect threatened or endangered species during dredging and disposal operations will also protect any marine mammals in the area, therefore, this project is in compliance with the Act.

10.11 Estuary Protection Act of 1968. No designated estuary will be affected by project activities. This act is not applicable.

10.12 Federal Water Project Recreation Act, As Amended. The principles of the Federal Water Project Recreation Act, (Public Law 89-72) as amended, have been fulfilled by complying with the recreation cost sharing criteria as outlined in Section 2 (a), paragraph (2). Another area of compliance includes the public beach access requirement on which the renourishment project hinges (Section 1, (b)).

10.13 Resource Conservation and Recovery Act of 1976, Public Law 94-580; 7 U.S.C. 100, et seq. This law has been determined to be not applicable as there are no items regulated under this act either being disposed of or affected by this project.

10.14 Toxic Substances Control Act of 1976, Public Law 94-469; U.S.C 2601, et seq. This law has been determined to be not applicable as there are no items regulated under this act either being disposed of or affected by this project.

10.15 E.O. 11990, Protection of Wetlands. No wetlands will be affected by project activities. This project is in compliance with the goals of this Executive Order.

10.16 E.O. 11988, Floodplain Management. No activities associated with this project will take place within a floodplain, therefore this project is in compliance with the goals of this Executive Order.

11.00 COORDINATION. This project has been coordinated with the Following agencies: U.S. Fish and Wildlife Service, National Marine Fisheries Service, Florida State Historic Preservation Officer (SHPO), Florida Department of Environmental Regulation Air Quality and Water Management Divisions, and Sarasota County. This document was circulated for public review prior to its preparation as a Final Environmental Assessment.

12.00 PUBLIC INVOLVEMENT. Scoping was initiated by letter dated May 21, 1991 to potentially interested parties. This FEA was circulated for a thirty (30) day public review. Comments were incorporated into the Final EA as Appendix D.

13.00 LIST OF PREPARERS. This FEA was prepared by:
William Porter, Biologist and main writer, USACE
Janice E. Adams, Archeologist, USACE
Paul C. Stevenson, Landscape Architect, USACE
James McAdams, Environmental Engineer, USACE

This FEA was reviewed by:
Elmar Kurzbach, Chief, Environmental Studies Section, USACE
Hanley Smith, Chief, Environmental Resources Branch, USACE

14.00 REFERENCES.

Beach Erosion Control Study For Sarasota County, Florida with Environmental Impact Statement, July 1984, Department of the Army, Jacksonville District, U.S. Army Corps of Engineers, Jacksonville, Florida.

Marsh, G.A., et al. 1980. "Evaluation of Benthic Communities Adjacent to a Restored Beach, Hallandale (Broward County), Florida," Vol. II, Ecological Evaluation of a Beach Nourishment Project at Hallandale (Broward County), Florida, MR 80-1(II), U.S. Army Corps of Engineers, Coastal Engineering Research Center.

Pullen, E.J., and S.M. Naqvi. 1983. "Biological Impacts on Beach Replenishment and Borrowing." Shore and Beach, April 1983.

15.00 MAPS, FIGURES, and TABLES.

Figure 1 - Location Map of Project Area

Figure 2 - Location Map of Borrow Area

16.00 ATTACHMENTS.

1. Attachment A - Section 404(b) Evaluation
2. Attachment B - Florida Coastal Zone Management Program Federal Consistency Evaluation
3. Attachment C - Fish and Wildlife Coordination Act Report with Biological Opinion
4. Attachment D - Comments and Responses

ATTACHMENT A

SECTION 404(b) EVALUATION

SHORE PROTECTION AND EROSION CONTROL PROJECT
VENICE BEACH, SARASOTA COUNTY, FLORIDA

1. Project Description

a. Location. The project is located on the west coast of Florida near the middle of the peninsula and about 55 miles south-southeast of Tampa. The project is situated on Manasota Key a barrier island separated from the mainland by tidal inlets and includes two borrow sites located offshore of Manasota Key and Siesta Key.

b. General Description. The proposed work consists of dredging shoal material from the borrow sites and disposing that material on or along Venice Beach.

c. Authority and Purpose. This study was authorized by the following resolutions: Committee on Public Works of the U.S. Senate on 21 August 1964 and the Committee on Public Works of the House of Representatives on 3 September 1964, in accordance with Section 110 of the River and Harbor Act of 1962. The resolution resolved the Secretary of the Army be requested to direct the Chief of Engineers to make a survey of the shores of Sarasota County, Florida, and such adjacent shores as may be necessary in the interest of beach erosion control, hurricane protection, and related purposes. Authority, policy and guidelines forming the basis for the recommendations contained in the report are established by the 1974 Water Resources Act, the National Environmental Policy Act of 1969, and the laws governing Federal beach erosion control studies and projects.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The fill material is predominately fine quartz sand with varying amounts of whole and broken shell. The mean grain size is 0.31mm and the average silt content is 6 percent.

(2) Quantity of Material. During the first beach disposal operation approximately 2,050,000 cubic yards of material will be dredged and disposed. On the average approximately 527,500 cubic yards of material will be dredged and disposed during subsequent maintenance dredging operations approximately every ten years.

(3) Source of Material. The primary borrow area consists of two shoals located between 1.21 to 3.14 miles offshore of Manasota Key and about 9.8 miles south of Venice Inlet. The seaward shoal is about 7,200 feet long and 2,600 feet wide. Similarly, the landward shoal is of dimensions of 4,900 feet by 2,400 feet. The secondary site is identified as the Siesta Key site

but is actually the ebb shoal of Big Sarasota Pass. The borrow area is horseshoe shaped conforming to the shoal. The landward boundary of this site was held to a minimum of 1,500 feet from shore to avoid any impacts to the shoreline following excavation of material.

e. Description of the proposed Discharge Site.

(1) Location. The recommended plan provides for restoration of a protective beach along 3.2 miles of shoreline. The north limit of initial restoration is about 850 feet south of the south jetty at Venice Inlet (Caseys Pass). The south limit is at DNR survey monument R-133 which is immediately south of the Venice sewage treatment plant.

(2) Size. Approximately 120 acres will be filled along the beach.

(3) Type of Site. The project site is a sand beach.

(4) Type of Habitat. The habitat consists of a carbonate and quartz sand beach.

(5) Timing and Duration of Discharge. Dredging and disposal is expected to begin approximately 1 March 1992. Once dredging begins, construction will take approximately ten months to complete.

f. Description of Disposal Method. Disposal will be by discharge from a pipe attached to a hopper dredge, or hopper barge.

2. Factual Determination

a. Physical Substrate Determination.

(1) Substrate Elevation and Slope. Top elevation of the construction beach fill will be 9.6 feet MLW. The slope will be 1 on 15 from the berm to where it intersects with the existing bottom. The equilibrium profile for the beach fill will vary along the project beach depending on wave/current distribution of the fill material. Generally, the equilibrium berm width will be less than the constructed width with a flatter slope from the berm to the existing bottom.

(2) Sediment Type. The sediment is predominantly fine quartz sand (mean grain size = 0.31mm), with varying amounts of shell. The average silt content is 6 percent.

(3) Dredge/Fill Material Movement. The fill material will be subject to erosion by waves with the net movement of fill material to the south.

(4) Physical Effects on Benthos. Some benthic organisms will be buried by the fill. Most organisms in this high wave energy ecosystem are adapted for existence in an area with considerable substrate movement, thus most will be able to burrow up through the fill material. Recolonization will occur within a year. Benthic organisms associated with nearshore hardground

areas that will be covered by fill will be lost.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water. The placement of fill on the beach will increase turbidity in the nearshore area. Because the immediate nearshore area is a high wave energy system and subject to naturally occurring elevated turbidity, increases due to the project will not be significant. Fill placement will have no long-term or significant impacts, if any, on salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, nutrients or eutrophication.

(2) Current Patterns and Circulation. Currents in the project area are both tidal and longshore. Net movement of water due to the longshore current is from the north to the south. Placement of the fill on the beach will have no effect on the currents.

(3) Normal Water Level Fluctuations and Salinity Gradients. Tides in the project area are a mixture of semi-diurnal and diurnal types. During part of each month two high and two low tides occur each day, and during the balance of the month only one high and one low tide occur each day. The diurnal tidal range along Manasota Key is 2.1 feet. The mean tide level is 1.3 feet, referenced to mean low water (MLW). Salinity is that of ocean water. Fill placement will not affect normal tide fluctuations or salinity.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There will a temporary increase in turbidity levels in the project area during discharge. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity will not be exceeded.

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

(a) Light Penetration. Light penetration will decrease during discharge in the immediate area where sand is being deposited on the beach. This effect will be temporary and will have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered significantly by this project due to high energy wave action and associated adequate reaeration rates.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens will be released by the project.

(d) Aesthetics. Aesthetic quality will be reduced during that period when work is occurring. There will be long-term increase in aesthetic quality of the beach once the work is completed.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. Primary productivity is not a recognized, significant phenomenon in the surf zone, where a temporarily increased level of suspended particulates will occur. There will be no effect on the nearshore productivity as a result of the proposed beach disposal.

(b) Suspension/Filter Feeders. There will be no long-term adverse impact to suspension/filter feeders.

(c) Sight Feeders. There will be no long-term adverse impact to sight feeders.

d. Contaminant Determinations. Deposited fill material will not introduce, relocate, or increase contaminants.

e. Aquatic Ecosystem and Organism Determinations. The fill material that will be placed on the beach will consist of quartz and calcareous sand that is similar enough to the existing substrate so that no impacts are expected.

(1) Endangered and Threatened Species. There will be no impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Sea turtle nesting may occur in the project area during the time dredging and beach disposal takes place. If construction takes place during the nesting season a nest relocation program will be implemented. All sea turtle nests discovered within the beach disposal area will be removed and relocated to a nearby self-release beach hatchery. All relocation and incubation efforts will conform to the guidelines in the "Manual of Sea Turtle Research and Conservation Techniques", Second Edition, 1983, prepared for the Western Atlantic Sea Turtle Symposium and distributed by the Florida Department of Natural Resources.

(2) Hardbottom Habitat. Hardbottom habitat does exist offshore of Manasota Key. Most of these areas are far enough offshore that they will not be affected as a result of depositing sand on the beach. Some hardgrounds do exist within and just outside the surfzone along the beach and will be covered by sand.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. The fill material will not cause unacceptable changes in the mixing zone specified in the Water Quality Certification in relation to: depth, current velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents.

(2) Determination of Compliance with Applicable Water Quality Standards. Because of the inert nature of the fill material state water quality standards will not be violated.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Recreational and commercial fisheries will not be impacted by the disposal of dredged material on the beach.

(c) Water Related Recreation. Water related recreation will be preserved and enhanced by the nourishment of the beach.

(d) Aesthetics. The stabilization of an eroding beach will improve aesthetics.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The Venice Beach, Manasota Key project is not located within the Florida Coastal Barrier Resources System. The disposal of dredged material on the beach will improve recreational opportunities on Manasota Key.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of the placement of fill at the project site. Subsequent renourishment will occur approximately every ten years. The impact of disposing material on the beach during these dredging cycles will be minor.

3. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

c. The discharge of fill materials will not cause or contribute to, after consideration of disposal site dilution and dispersion, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The disposal of dredged material on the beach will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant

adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.

ATTACHMENT B

FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES
VENICE BEACH, SARASOTA COUNTY, FLORIDA
SHORE PROTECTION AND EROSION CONTROL STUDY

1. Chapter 161, Beach and Shore Preservation.

The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed work plans and information will be submitted to the state for a permit in compliance with this chapter.

2. Chapters 186 and 187, State and Regional Planning.

These chapters establish the State Comprehensive Plan which sets goals that articulate a strategic vision of the State's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been coordinated with the state and no adverse comments were received.

3. Chapter 252, Disaster Preparation, Response and Mitigation.

This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed beach disposal will help protect the beach from erosion and reduce damage resulting from storms. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands.

This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed beach nourishment would create increased recreational

beach and turtle nesting habitat. There would be a 1.9 acre adverse impact on the nearshore low (1-3 feet) relief hardbottom rock outcrops adjacent to the beach. However, this loss will be compensated for by constructing 1.0 acres of 5-6 foot vertical relief artificial reefs. No seagrass beds will be affected. The proposal would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition.

This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership, this chapter would not apply.

6. Chapter 258, State Parks and Aquatic Preserves.

This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: Beach disposal would have a positive impact on the recreation of the area and therefore, would be consistent with this chapter. The project would not adversely impact aquatic preserves near the project area.

7. Chapter 267, Historic Preservation.

This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Four historically significant sites are located near the beach disposal area. The SHPO has indicated that the proposed beach disposal will not adversely affect any significant cultural resources. Therefore, the project will be consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism.

This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed beach disposal would provide more space for recreational beach and the protection of recreational facilities along the beach. This would be compatible with tourism for this area and therefore, would be consistent with the goals of this chapter.

9. Chapters 334 and 339, Public Transportation.

This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project.

10. Chapter 370, Saltwater Living Resources.

This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fisherman and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed beach disposal will cover approximately 1.9 acres of nearshore rock outcrops that have been uncovered by the erosion. There will be an adverse impact to this resource and the aquatic habitat that it provides. To mitigate this impact, 1.0 acres of artificial reefs similar to the outcrops covered will be constructed to replace the habitat lost. The beach disposal itself will create a larger more suitable area for turtle nesting along this segment of beach. Based on the overall impacts of the project, the project appears to be consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources.

This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The proposed beach disposal has been coordinated with the US Fish and Wildlife Service and The National Marine Fisheries Service for compliance with Section 7 of the Endangered Species Act. Four species of turtles listed by the USFWS as endangered could potentially use this segment of beach for nesting. However, the proposed beach disposal will increase the amount of habitat available for nesting. The impacts to nesting will be minimized to the extent possible by the implementation of a nest relocation program, if construction occurs during the nesting season. The restored beach will be tilled if sand compaction, after construction, is greater than 500 cone penetrometer units. The construction of artificial reefs will mitigate the impacts associated with the covering of nearshore rock. Therefore, the project would comply with the goals of this chapter.

12. Chapter 373, Water Resources.

This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control.

This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: This project does not involve the transportation or discharging of pollutants.

14. Chapter 377, Oil and Gas Exploration and Production.

This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore does not apply.

15. Chapter 380, Environmental Land and Water Management.

This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development.

Response: Beach disposal for erosion control along Venice Beach does not appear to have any regional impact on resources in the area. Therefore, the project would be consistent with the goals of this chapter.

16. Chapter 388, Arthropod Control.

This chapter provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project would not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control.

This chapter authorizes the regulation of pollution of the air and waters of the state by the DER.

Response: An application for Water Quality Certification has been submitted to DER for the beach nourishment scheduled for FY-1992. Water Quality Certification will be obtained for subsequent dredging and beach disposal operations. An environmental assessment of project impacts has also been prepared and will be reviewed by the appropriate resource agencies including DER, Therefore, the project is complying with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation.

This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to project on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands and therefore, this chapter does not apply.

ATTACHMENT C

U.S. FISH AND WILDLIFE SERVICE

COORDINATION ACT REPORT

WITH

BIOLOGICAL OPINION

SARASOTA COUNTY SHORELINE PROTECTION PROJECT
SARASOTA COUNTY, FLORIDA

DRAFT
FISH AND WILDLIFE COORDINATION ACT REPORT

Submitted to:
Department of the Army
Jacksonville District
Corps of Engineers
Jacksonville, Florida

U.S. Fish and Wildlife Service
Fish and Wildlife Enhancement
Vero Beach, Florida

October 1991

United States Department of the Interior
FISH AND WILDLIFE SERVICE
P.O. BOX 2676
VERO BEACH, FLORIDA 32961-2676

October 30, 1991

Colonel Terrence C. Salt
District Engineer
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Attn: Planning Division

Dear Colonel Salt:

In accordance with the Fiscal Year 1991 Transfer Fund Agreement between The U.S. Fish and Wildlife Service (Service) and the Jacksonville District Corps of Engineers (Corps), this represents the Draft Fish and Wildlife Coordination Act Report on the Sarasota County Shoreline Protection Project, Sarasota County, Florida. The Corps has requested an evaluation of the environmental effects of nourishing 3.2 miles of beaches along the coastline of the City of Venice with material dredged from two borrow areas located offshore. This information is needed to enable the Corps to reformulate and evaluate the authorized project to assure that it conforms to current environmental needs and criteria.

In accordance with the Fish and Wildlife Coordination Act(48 Stat. 401, as amended; 16 U.S.C., 661 et seq.) the draft report is being coordinated with the National Marine Fisheries Service and the Florida Game and Fresh Water Fish Commission, and will be considered final when concurred with by those agencies and will represent the views of the Department of the Interior.

Sincerely yours,

David L. Ferrell
Field Supervisor

cc:
NMFS, Panama City, FL
FG&FWFC, Vero Beach, FL

Sarasota County Shoreline Protection Project
Sarasota County

Draft
Fish and Wildlife
Coordination Act Report

Submitted to Jacksonville District
U.S. Army Corps of Engineers
Jacksonville, Florida

Prepared by: Bruce Birnhak, Project Biologist
Approved by: David L. Ferrell, Field Supervisor

Vero Beach, Florida, Field Office
U.S. Fish and Wildlife Service
Vero Beach, Florida

October 1991

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EXECUTIVE SUMMARY

The Corps of Engineers (Corps) has requested a Fish and Wildlife Coordination Act Report from the U.S. Fish and Wildlife Service (Service) regarding the environmental impacts of a proposed beach nourishment project at Sarasota County, Florida. Sand fill for the project would be obtained from the ebb tide shoal at Big Sarasota Pass and offshore of Manasota Key. The fill is of high quality and no rock outcrops were reported in the borrow area. Biological surveys of the area by the Service and the sponsor's contractors have shown that there are hardbottom areas immediately offshore of the beaches proposed for renourishment. Service SCUBA investigations indicate that there are currently approximately 2.4 acres of hardbottom within the project area. Our observations also show that these hardbottom areas currently provide habitat for a diverse community of fishes and invertebrates. One particular area of hardbottom is a productive 0.4 acre reef that the Service recommends be avoided and conserved.

The Service also recommends other hardbottom impacts be avoided if possible; however, based on a mitigation ratio of 1 to 1, 1.9 acres of artificial reef would adequately mitigate for 1.9 acres of hardbottom. Due to moderate energy and scouring, few large sponges or gorgonians, which take many years to grow, are able to become established in the nearshore environment. Some of the epibenthos, therefore, may be replaceable if an artificial structure of equal surface area and of similar substrate were to be placed outside the project area. The biological rationale supporting this mitigation recommendation is provided in the report.

The Service also recommends, as part of the mitigation plan, that a minimum of 0.5 acres of designed reef be deployed before sandpumping begins to provide alternative habitat for fish displaced by the project.

I. INTRODUCTION

Nourishment of the 3.2 miles of shoreline in the vicinity of the City of Venice in Sarasota County, Florida, was authorized by the Water Resource Development Act of 1986 (Public Law 99-662). The General Design Memorandum (GDM) for beach erosion control projects within Sarasota County was published in January, 1991.

II. PROJECT DESCRIPTION

The presently considered project calls for the construction of a protective beach along the 3.2 mile reach of shore from DNR monument number R-116 to DNR monument R-133. A total of 2.05 million cubic yards of sand would be placed during the initial construction. The authorized project berm elevation is 9.0 feet mean sea level. After construction, the equilibrium toe of fill would extend approximately 800 ft. offshore of the DNR survey monuments. The primary borrow area consists of two shoals located between 1.21 to 3.14 miles offshore of Manasota Key and about 9.8 miles south of Venice Inlet. Silt content of the sand at the shoal is reported to be 7 percent. The secondary borrow site is the ebb shoal of Big Sarasota Pass, the silt content at this site is 4 percent.

III. DESCRIPTION OF STUDY AREA

Sarasota County is situated on the Gulf of Mexico in southern Florida. The coastal City of Venice is located in the central part of the county. The project site is located on the beaches of the City of Venice, south of Venice Inlet (Fig. 1). Photographs of the existing beaches are attached in appendix A.

IV. FISH AND WILDLIFE RESOURCES

Fish and wildlife habitats in the project area which could be affected by this beach erosion control project include the intertidal beach zone, borrow area, nearshore reefs and hardbottom and the supralittoral beach which serves as nesting habitat for the threatened loggerhead sea turtle.

A. Community Descriptions

Intertidal Beach Zone. The beaches of Sarasota County are typical of other west-southern Florida beaches which are subject to the force of Gulf of Mexico waves. These beaches usually have low species diversity, but populations of individual species are often very large. Species such as coquina clams, ghost crabs, annelid worms, mole crabs and sand drum are highly specialized to survive in this moderately high energy environment.

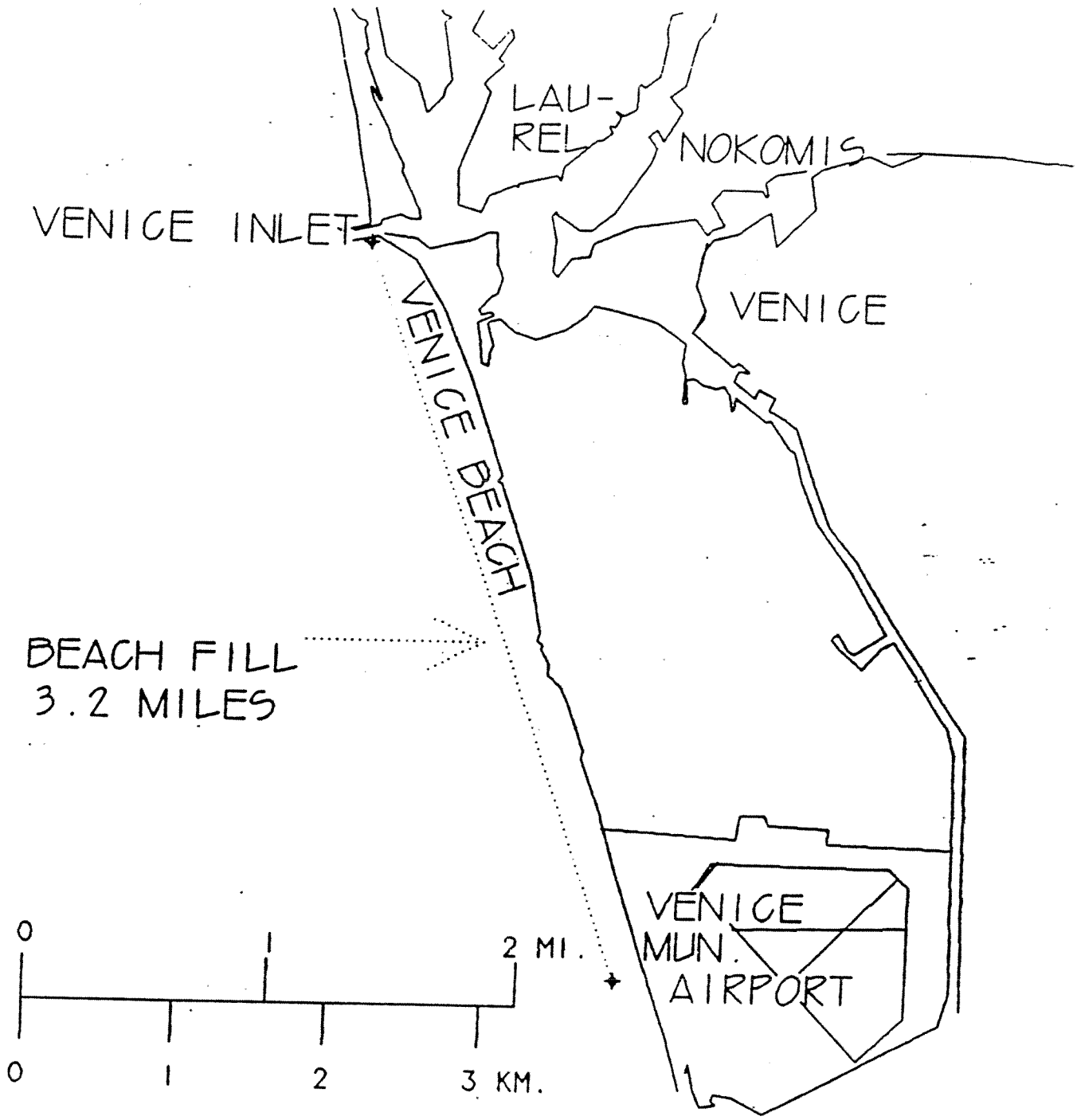

FIGURE 1. PROJECT VICINITY AND LIMITS

Borrow Area. Numerous species of macro-invertebrates inhabit the proposed borrow area. These include, hydrozoan, bivalves, gastropods, annelids, crustaceans, sea cucumbers, brittlestars, etc. These will be unavoidably lost during dredging. However, this habitat is not unique and the area will likely recover within one year (Courtenay, et. al. 1974). Motile fauna expected to inhabit this area would include penaeid shrimp, callenectid crabs, flounder and sole. These species should easily avoid the dredge and no adverse effects to them are anticipated, provided displacement habitat is available.

Nearshore Reefs and man-made and natural hardbottom. Rocky reefs occur adjacent to and seaward of the project area. These features were mapped by Coastal Planning & Engineering, Inc. a consultant firm hired by the local sponsor. These rock outcrops provide habitat for a wide variety of fishes and invertebrates. In addition to the natural reefs, a man-made groin and a derelict groin are also providing productive fishery habitat. Three other hardbottom areas are found in proximity to the beach.

B. Taxa and Important Species

Epibiota

The most abundant and evident producers on the Venice reefs are the algae. The exposed rock provides stable substrate for these organisms which, through photosynthesis, produce basic organic material on which much of the reef's food web is based. Carbon fixed far offsite is also concentrated on the reefs. Attached filter feeding organisms contribute to this organic base by trapping nutrient rich phytoplankton as it is swept past the reef by wave and wind generated currents. Sessile cnidaria such as anemones and stinging hydroids capture zooplankton and other larger organisms which drift to them.

Fishes and Motile Invertebrates

In addition to the algal food which grows on the reefs, fish and motile invertebrates are attracted to the basic structure of the reef. The numerous crevices, holes, and undercut ledges provide refuge from larger predatory fish. These reefs also provide a barrier to currents and substrate for attachment of demersile adhesive eggs.

Sea Turtles

The loggerhead turtle (Caretta caretta) nests primarily on beaches from North Carolina to Florida. Approximately ninety percent of loggerhead nesting within the U.S. occurs in Florida (Murphy and Hopkins, 1984). The highest density nesting beaches in Florida occur from Canaveral National Seashore, Volusia County, south to John U. Lloyd State Recreation Area in Broward county (Conley and Hoffman, 1986). Nesting densities vary from less than one nest per km on the average for some beaches in the northeast, southeast, and panhandle of Florida to over 600 nests per km on some stretches of beach in south Brevard County (Ehrhart and Witherington, 1986). The most recent estimate for

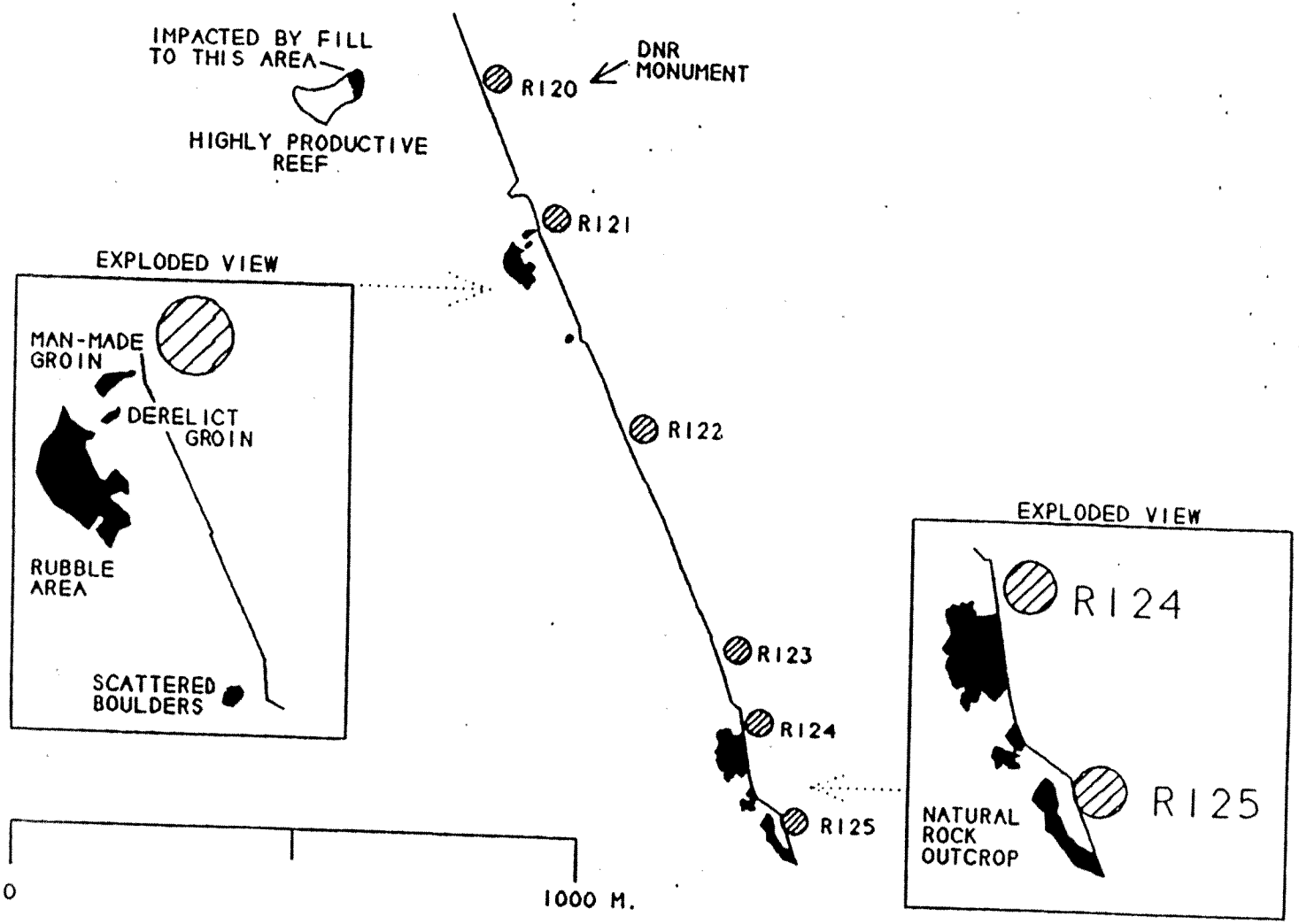

FIGURE 2. AREAS OF HARDBOTTOM

total annual nesting effort in the southeastern U.S. is 58,000 nests based on aerial surveys conducted in 1983 (Murphy and Hopkins, 1984). The U.S. loggerhead nesting population, one of the two most significant nesting populations in the world, may represent up to 30 percent of the worldwide loggerhead nesting population (Ross, 1982). This is in contrast to other sea turtle species where nesting occurs largely outside the U.S. The loggerhead nesting season is from May 1- September 15, with most nesting occurring in June and July.

V. FISH AND WILDLIFE SERVICE UNDERWATER OBSERVATIONS

Methods

On September 17, 1991, Fish and Wildlife Service biologists inspected hardbottom locations nearshore areas in the project area. The most productive reef that would be impacted by the beach fill is located approximately 750 feet west of DNR monument R-120. Underwater photographs of the reef (Appendix 2) were taken, and the variety of fish species recorded.

The sponsor of the project, the City of Venice hired the aforementioned consultant firm, Coastal Planning & Engineering,Inc. to obtain benthic information. Reefs offshore were located by side-scan sonar while inshore hardbottom areas were located on aerial photographs. Relying on the consultants information that no hardbottom communities occurred at the proposed location of the borrow areas, we concentrated on locating natural and man-made hardbottom in the area proposed to be filled by beach nourishment. Our survey revealed that in addition to the previously productive reef, a rock groin, a derelict groin, a scattered rock site, and a natural rock outcrop that originated on the land and ran west into the Gulf occurred within the project area.

The man-made groin occurs immediately south of Venice public beach is composed of large boulders and is .03 acres in area. This site is found near DNR monument R-121. A .03 acre derelict groin composed of large boulders also occurs near monument R-121. A .5 acre scattered rock area is also found near monument R-121. A .03 acre area of boulders occurs near DNR monument R-122. A natural rock outcrop encompassing an area of 1.3 acres is found between monuments R-124 and R-125 (See Figure 2).

Results

The most productive hardbottom community was found associated with the reef located west of DNR monument R-120. A list of the fishes observed at this reef is found on Table 1.

The next most important hardbottom area is the natural rock outcrop between R-124 and R-125. This area has 3-feet high relief and supports diverse fishery resources.

VI. DISCUSSION AND IMPACTS

Beach zone. Since sandy beaches are populated by small, short-lived organisms with great reproductive potential, in most instances these communities recover quickly from environmental disturbances. The impacts of this beach erosion project on the beach zone fauna will depend primarily on the quality of the nourishment material. Since the sand proposed to be used for this project is of similar composition to the natural beach, recovery of the beach fauna should occur in a few months or less.

Nearshore Reef Zone and hardbottom areas. We estimate that approximately 2.3 acres of nearshore reef and hardbottom areas will be buried by beach fill if this project is implemented as proposed. A portion of the most productive reef will be covered by beach fill. This is the reef located offshore DNR monument R-120. According to Corps GDM, the cross-section shows that the equilibrium toe of fill will extend offshore 820 feet at DNR monument R-120 which will cover .4 acres of reef. Because of the productivity of this reef, the Service considers this reef irreplaceable.
In addition to the value of the reef to the productivity of the ecosystem, is the recreational value the reef provides. Beach access to the reef is afforded by Venice City Beach which allows SCUBA divers easy access to the reef. Consequently, the reef is heavily used.

VII. BIOLOGICAL OPINION - LOGGERHEAD SEA TURTLE

The loggerhead is the only species of marine turtle that nests on the projects beaches. These beaches are considered as low density nesting beaches. The Florida Department of Natural Resources report that 72 nests were constructed in 1989 on these beaches while in 1990 71 nests were counted. In a letter dated August 7, 1991, the Corps stated that the project may affect the nesting Loggerhead sea turtle. We concur with that determination.

If a nest relocation program is implemented, some nests will likely remain undetected and subsequently be buried by nourishment material or crushed by heavy equipment. In spite of the best intentions or efforts by persons relocating nests; wind, rain and tides can quickly obscure tracks and prevent workers from finding nests. If not properly conducted, relocation of nests to hatcheries can result in reduced hatching rate. In summary, although relocation of nests during beach nourishment is preferable to allowing destruction of the nests, the avoidance of adverse impacts is not absolute.

The Reasonable and Prudent Measures and the Terms and Conditions provided below with the Incidental Take statement, will reduce the degree of adverse impacts on sea

turtles. In view of this, it is the Service's Biological Opinion that the project as proposed is not likely to jeopardize the continued existence of listed sea turtles.

Incidental Take

Section 9 of the Endangered Species Act prohibits the taking of listed species without a special exemption. Taking is defined to mean harass, harm, pursue, hunt, shoot, wound. kill, trap, capture or collect, or attempt to engage in any such conduct. Taking can only be authorized through special provisions.

Section 7(b)(4) of the Act requires that when a proposed agency action is found to be consistent with Section 7(a)(2) of the Act and the proposed action is likely to result in the take of some individuals of the listed species incidental to the action, the Service will issue a statement that specifies the impact (amount or extent) of such incidental taking. It also states that reasonable and prudent measures, coupled with terms and conditions to implement these measures, be provided to minimize such impacts. The Service must also specify procedures to be used to handle or dispose of any individual specimens taken. Reasonable and prudent measures are requirements of the action agency.

We have reviewed the biological information and other information relevant to this action, and based on our review, incidental take is authorized for all nests missed by a nest relocation program within the project boundary. This is inclusive of the direct impacts of nest burial and crushing and the indirect impacts of aberrant nests and broken eggs which may result from sand compaction in nesting seasons subsequent to nourishment activities.

Reasonable and Prudent Measures

The Service considers the following reasonable and prudent measures necessary and appropriate to minimize the take:

1. During periods of nesting activity, relocation of nests will be required.

2. Nourished beaches will be tilled if compaction or escarpments occur.

Terms and Conditions

Section 9 of the Endangered Species Act prohibits the taking of listed species without a special exemption. In order to be exempt from the prohibitions of Section 9 of the Act, the following terms and conditions, which implement the reasonable and prudent measures described above, must be complied with.

1. Nest survey and relocation activities must begin 65 days prior to nourishment activities as follows:

   For Venice Beach, nest surveys and relocation do not have to begin earlier than May 1 or continue after September 15.

2. Nest surveys and relocations will be conducted by personnel with prior experience and training in nest survey and relocation procedures, and with a valid Florida Department of Natural Resources permit. This is essential to reduce the number of undetected nests.

3. Nests shall be relocated between sunrise and 10 a.m. each day and the relocation will be to a nearby self-release beach hatchery in a secure setting where artificial lighting will not conflict with hatchling orientation.

4. Nourished beaches will be plowed to a depth of at least 36 inches immediately following completion of beach nourishment if sand compaction measures greater than 500 cone pentrometer index units (cpu). Sand compaction measurements will be taken in February for at least two consecutive years, and tilling will be repeated if compaction exceeds 500 cpu.

5. Escarpments in excess of 18 inches extending more than 100 feet in length and exceeding 500 cpu will be mechanically leveled to the natural beach contour prior to May 1. If leveling is needed, nest relocation procedures will be followed as stated in #1-3. If escarpments in excess of these criteria reform in the two subsequent nesting seasons, they will be leveled to the natural beach contour as described above.

6. A report describing the actions taken to implement the terms and conditions will be submitted to this office within 60 days of completion of the proposed work for each year when activity has occurred. This report will include dates of actual construction activities names and qualifications of personnel involved in nest surveys and relocation activities, description and location of hatcheries, nest survey and relocation results and hatching success of nests.

7. The contractor will notify the Service office issuing this biological opinion 30 days prior to commencing the project.

CONSERVATION RECOMMENDATIONS

The following Conservation Recommendations are provided to further reduce the potential for adverse impact to nesting sea turtles.

1. Beach renourishment be planned for and conducted outside the period May 1 - September 15 whenever possible.

2. When the dredge is located off the nesting beach, nighttime lighting should be minimized by eliminating lights, screening, or shielding lights when possible. Low pressure sodium lights (shielded) are recommended for those lights which cannot be eliminated.

3. Sea oats or other appropriate dune vegetation should be planted on nourished beaches to enhance dune restoration. The Florida Department of Natural Resources, Division of Beaches and Shores, can provide technical assistance in the design and implementation.

In the event a turtle nest is dug up by beach construction activities, the following procedure should be followed:

1. Immediately notify the Florida Department of Natural Resources permitted individual responsible for nest relocation on the project for removal of the nest to the beach hatchery. Before eggs are relocated, the top of each egg will be marked with a non-toxic felt-tipped pen and individually and gently placed on 2-3 inches of moist sand in a rigid-walled container, being careful not to change the axis of the eggs. Eggs will be covered with a fine nylon mesh and then 2-3 inches of moist sand, shaded from the sun, and immediately transported to the artificial nest chamber, while ensuring that the orientation of each egg remains as in the natural nest.

This concludes consultation under Section 7 of the Act, as amended. If there are modifications made in the project, or if additional information becomes available relating to threatened and endangered species, reinitiation of consultation may be necessary.

VIII. MITIGATION

We estimate that most of the existing 2.3 acres of the nearshore rock will be either buried or severely degraded by beach fill as a result of this project. As stated previously, we consider the reef offshore DNR monument R-120 irreplaceable and thus cannot be mitigated. The other 1.9 acres of hardbottom are not as productive and can thus be mitigated. This could be accomplished by providing new limestone substrate in the form of an artificial reef of equivalent unscoured surface area.

Too often, artificial reefs are created without a clearly defined purpose and without sufficient planning. The United States, in particular, has pursued an unsophisticated and frugal approach to artificial reef planning and construction. The use of scrap and discarded rubble, because of its low cost, is most commonly used (McGurrin, et. al.,

1989) despite its inadequacy in providing suitable habitat for targeted species. In contrast, the Japanese have invested billions of dollars in developing techniques to create new habitat and increase seafood production (Grove, et. al., 1989; Sonu et. al., 1985). These efforts have been reported by Sheehy (1983), and Brock and Norris (1989) to have resulted in much more efficient reef technology. While costs per area of reef are higher, the increase in reef fish and epibenthic organism abundance per area over traditional U.S. reef technology (Sheehy, 1983; Brock and Norris, 1989) may more than offset this cost (Sato, 1985).

To correct the deficiencies in and fragmentation of the U.S. artificial reef program, the Secretary of Commerce was directed, under the provisions of the National Fishing Enhancement Act of 1984 to develop and publish a long-term National Artificial Reef Plan to promote and facilitate responsible and effective artificial reef use based on the best scientific information available. A working plan was published by the National Marine Fisheries Service in 1985 under the authorship of Richard B. Stone. To conform to the Plan each project should have a clearly defined list of species targeted for habitat enhancement and user group intended to be benefitted.

Some fundamental features which should be incorporated into the design are: 1) extensive unshaded horizontal surface area for the attachment and growth of gorgonians and macroalgae; 2) openings near the bottom, for Stone crabs, depth of at least 2 ft. and height of no more than 1 ft.; 3) interstitial spaces of approximately 10 cubic ft.; 4) large overhanging ledges to provide shaded resting space for large fish, particularly common snook; 5) numerous projections, crevices, and holes ranging in size from one to three inches in width and up to 1 foot in length (projections) and up to one foot in depth (holes and crevices). These smaller features are intended to provide refugia for small fish and for juvenile fishes, as well as to provide additional surface area for epibiotic growth.

We have seen designs for concrete modules, similar in design to Japanese modules, which could be used for artificial reef construction. These structures incorporate many of the features mentioned above but would be built of concrete rather than limestone. A possible solution to the potential problems associated with substrate selectivity in fouling organisms, would be to embed limestone rock in the surface of the concrete. Alternatively, the Corps of Engineers, by letter dated February 27, 1990, to the City of Vero Beach, proposed as mitigation for reef loss due to the Indian River County Erosion Control project, the construction of 8 rock rubble reef structures 100 feet long by 50 feet wide by 5 feet high. If the rocks used to construct such a reef are of a variety of sizes and of sufficient diameter (2 feet minimum) to provide large interstitial spaces and if the majority of the surface area of the structure were limestone, we would consider the construction of 16 of these modules to constitute adequate habitat replacement for the losses expected to occur as a result of the Sarasota County project. These structures would cover approximately 1.9 acres of the sea floor and would be of high relief with a significant proportion of the reef surface above the scour zone similar to the existing Venice Beach reefs.

Therefore, an artificial reef created with the provision of suitable substrate as an objective would replace nearly 100% of the existing habitat values of the existing reef. It is our opinion, therefore, that if carefully planned and executed, an artificial reef of equal acreage would adequately compensate for reef losses incurred by the proposed project. We welcome the opportunity to work with Corps staff and that of Sarasota County in developing a suitable, yet economical, reef design and in monitoring the effectiveness of that design.

IX. FISH AND WILDLIFE SERVICE RECOMMENDATIONS

The Fish and Wildlife Service recommends that the following be included in the Sarasota County Beach Erosion Control General Design Memorandum:

A. Project Design

1. To prevent damage to the productive reef located at DNR monument R-120 the width of the beach fill should be reduced by 100 feet for a length of 900 feet along the shoreline beginning 450 feet north of the monument and ending 450 feet south of the monument.

B. Hardbottom Mitigation

1. The large boulders that make up the groin south of Venice Beach, as well as the derelict groin in this same vicinity, should be taken offshore and used to create an artificial reef.

2. Under current conditions, approximately 2.3 acres of hardbottom will be buried. We recommend that at least one acre of artificial reef is deployed prior to project construction. This will provide an alternative refuge for fish displaced by the project.

3. Assuming that the artificial structure will have approximately the same surface area per acre above the scour zone as the six hardbottom areas, we recommend a mitigation ratio of no less than 1 to 1. Since we believe the reef offshore DNR monument R-120 is irreplaceable, this .4 acre area cannot be mitigated. The remaining hardbottom area occupies an area of 1.9 acres which requires the construction of 1.9 acres of artificial reef.

4. The artificial reef structure selected for mitigation should be designed to provide habitat for species which are of interest to local SCUBA divers and snorkelers. It should be constructed of natural material (i.e. limestone). Design features should include: a) extensive unshaded horizontal surface area; b) openings near the bottom for stone crabs; d) interstitial spaces

approximately 10 cubic feet; e) large overhanging ledges; f) numerous projections, crevices and holes.

5. Based on existing reef acreage, we recommend that the designed reef consist of 16 modules, either of limestone boulders or the limestone embedded concrete modules, which are 50 ft. wide by 100 ft. long by at least 5 ft. high.

6. Monitoring and annual reporting to the Corps of Engineers and resource agencies on the effectiveness of the mitigation should be incorporated as a project feature. Monitoring should include quantitative measurement of the macroepibenthos per square meter by wet weight of organisms which have colonized artificial substrate. Comparisons should be made between total biomass, macroepifloral biomass and macroepifaunal biomass at the designed reef and at nearby natural reefs. Fin fish communities at both reef types should be censused and compared in number, species and biomass (estimated). Fish communities should also be compared at both reef types using similarity indexing. Sampling should take place once in each season for three years or until it is clear that community structure has stabilized.

7. The Fish and Wildlife Service should be funded by the Corps of Engineers to participate in the monitoring of the designed reefs. This will promote a better understanding of design effects on reef communities and facilitate the development of an increasingly effective artificial reef strategy and better informed decision making for future Civil Works projects.

8. The reef mitigation plan described above should be included as a Federal project feature subject to cost-sharing (i.e. 75% Federal, 25% local) to defray the project sponsor's cost of mitigation in accordance with current Corps policy as established by the principles and guidelines.

X. SUMMARY

The Corps of Engineers has requested comments from the Fish and Wildlife Service regarding a proposed beach nourishment project at Sarasota County, Florida.

The proposed project will result in the direct burial of approximately 2.3 acres of hardbottom. The Service recommends that the width of the nourishment be reduced by 100 feet to protect the productive reef that occurs offshore DNR monument R-120. Hardbottom acreage buried should be mitigated for with artificial reef habitat at an approximate ratio of 1 to 1 with a suitable reef design. Monitoring of the created reef should be conducted for three years or until reef community structure has stabilized.

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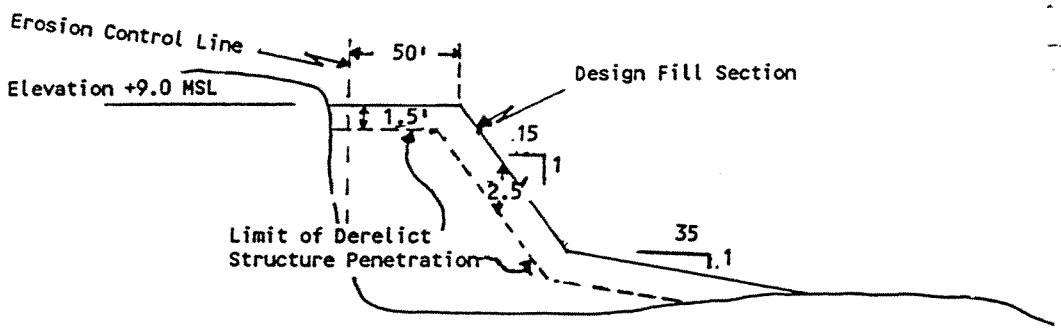
Table 1. Fish Species Observed at Reef Waterward of R-120.

Gray snapper	(Lutjanus griseus)
Spadefish	(Chaetodipterus faber)
White grunt	(Haemulon plumieri)
Spottail pinfish	(Diplodus holbrooki)
Sheepshead	(Archosargus probatocephalus)
Red grouper	(Epinephelus morio)
Spotted seatrout	(Cynoscion nebulosus)
Dusky damselfish	(Pomacentrus fuscus)
Black sea bass	(Centropristis striata)
Redfish	(Sciaenops ocellata)
Snook	(Centropomus undecimalis)
Atlantic moonfish	(Vomer sepapinnis)
Scrawled cowfish	(Acanthostracion quadricornis)
Porcupinefish	(Diodon hystrix)
Gag grouper	(Mycteroperca microlepis)
Gray triggerfish	(Balistes capriscus)

Recommendation #2 - The removal of the large boulders and derelict groin and subsequent relocation offshore as artificial reef would be cost prohibitive due to the shallow depths of the surrounding water that would prevent derrick barge access. There are also safety considerations concerning work in the surf zone. In addition it would be very difficult to write a performance specification to accomplish this work unless each boulder was surveyed as to size and location. It would be much more cost effective to provide a known quantity of limestone and rubble as artificial reef material. We will include in the contract plans and specifications the requirement for the contractor to remove all obstructions that penetrate the beach fill template as shown below. In the case of rubble that exceeds the +7.5 foot MSL elevation of the template this material will be removed and placed adjacent to the existing rubble. This will be accomplished due to safety concerns for the public use of the project and as required by the State DNR.



Recommendation #3 - The Corps concurs that one acre of artificial reef will be constructed in conjunction with construction of the beach fill.

Recommendation #4 - The Corps does not concur with this recommendation because the areas impacted are of relatively low relief (1-3 feet) which are frequently and severely scoured by wave action and longshore currents. This condition limits the hardbottoms' ability to support algal and sessile invertebrate cover. Based on recommendations contained in the USFWS May 2, 1990 letter for the Manatee County shore protection project, the Corps will construct artificial reefs totaling 1.0 acre of surface area with 5 feet of vertical relief for the Sarasota County shore protection project. It is our opinion that half an

ATTACHMENT D

COMMENTS

AND

RESPONSES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

DEC 19 1991

Colonel Terrance R. Salt
District Engineer, Jacksonville
P.O. Box 4970
Jacksonville, FL 32232

Attn: Mr. A.J. Salem, Chief
Planning Division

Subject: Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Beach Erosion Control Shoreline Protection Project at Venice Beach, Sarasota County, Florida

Dear Colonel Salt:

Pursuant to Section 309 of the Clean Air Act, EPA, Region IV has reviewed the subject document which discusses the modifications to the original project design. These changes include a reduction in the length of beach to be nourished, selection of new borrow sites, and use of a hopper type dredge in lieu of hydraulic dredging in the borrow sites. Currently the project entails pumping approximately 2 million cubic yards of fill along a 3.2 mile reach of eroding Venice shoreline. Mitigation for inundation of hardbottom habitat by this fill will be accomplished by construction of 1.9 acres of artificial reefs.

EPA remains equivocal regarding the issue of pumping sand onto an eroding shoreface. Generally, we have not actively opposed beach nourishment when it provided a disposal site for a proximate, already authorized navigation project. The key factor, however, was whether or not significant biologically sensitive resources (seagrasses, reef habitat, etc.) would be adversely affected through the use of this disposal method. In this particular case the value of the threatened structures, declining width of the recreational beach, and the perceived need to provide continued economic potential to shorefront property owners serves as the rationale for beach nourishment.

1

An unstated problem at Manasota Key is not only the shoreline erosion, but the election of home owners, businessmen, etc., in conformance with the current zoning regulations to intensify development in this attractive, but high risk area. Given the amenities associated with living on the shoreline, this may be

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understandable. Nonetheless, Corps of Engineers' publications have well documented that coastal islands are dynamic physiographic features due to marine processes.

This notwithstanding, we are sensitive to the economic and societal benefits accruing from individual beach nourishment projects. However, the local sponsors should be made aware of the possibility that ultimate economic losses could actually be greater due to intensification of land use predicated in large measure on the assumption that a beach will always be present in front of the property. These observations may not seem important to the affected homeowners given the immediate benefits of broadening the beach. However, we would be remiss not to make local interests aware of all the facts since the technical insight/understanding on the long-term effectiveness of beach nourishment has been called into doubt by some coastal geologists.

(2)

In this regard, an important point to emphasize is that "short-term" protection is all that is being offered. At the end of the project life it is conjectural whether the present erosion situation will be any different. The EA did not indicate whether the exact cause of the beach losses is known. At some point a study to determine the causal reason for this erosion should be considered in an attempt to see if a more lasting solution is available. The nonstructural alternative of building relocation was eliminated in the FEIS, but may prove to be the only "solution" to the situation.

The use of the selected borrow site should be examined in the context of its long-term effect on the sand budget of Manasota Key. The shoreline of the island is currently degrading. If the material from the various borrow sites (or a subset thereof) is moved directly onto the shoreface, how will this affect future onshore sediment movement via natural processes? We are concerned that the present instability may be exacerbated and/or maintenance frequency may have to be shortened. These possibilities should be determined now rather than after the fact. Additionally, the use of a hopper instead of hydraulic dredges lessens the precision of extraction and placement of the fill material. This adds to the potential uncertainty associated with this element of the project.

(3)

Moreover, one of the basic components of the computer model, DUNE, used to determine storm reduction benefits assumes that the amount of material eroded must equal the amount deposited. If the offshore area has been mined of material, then it would appear that the model results would be influenced. The extent of the "influence" should be determined.

(4)

The Jacksonville Storm Damage model contains a number of component elements. Assumptions used in the development of an estimate of annual storm damages consider the scenario of sea level rise. However, we were not able to determine how the potential for an increase in the present rate of sealevel rise would influence this project. If an accelerated rise does prove to be the case, the details of the impact(s) should be assessed. (5)

Benefits generated by project construction include significant annual storm damage reduction. We understand how this benefit component is generated, but have some misgivings regarding the underlying assumptions used in its justification. Namely, the value of property on an eroding shoreline is open to question. Moreover, there is the immediate implication that after each storm event property owners would refurbish their dwellings to pre-event conditions. This, in fact, is the underlying premise of the without project comparison. Rather, it seems much more likely that after a few years beach front property owners would acknowledge reality and the annual loss value would just accumulate as no repairs were accomplished. The figure would rapidly approach the total value of the beach front dwellings and then as rapidly decline after they were no longer habitable. Of course, the value of the adjoining, landward property would probably increase as it became "beach front". (6)

We would be interested to learn if there are any data which would support the premise that in the absence and/or anticipation of a federally subsidized nourishment project that homeowners will continue to sustain the losses assumed by the Corps of Engineers' models. The most interesting factor associated with this overall benefits' comparison is the fact that the costs of the nourishment project over its life span often are larger than the current value of threatened property. (7)

The use of artificial reefs as mitigation has some potential shortcomings. These artificial reefs appear to function largely as fish attractors. Their part in the overall life cycle of many species which are ostensibly receiving a "mitigation" effort remains debatable. As the matter currently stands, these devices serve to make certain fish populations more vulnerable by decreasing effort per unit of catch ratios. Some insights into the overall situation will be gained by evaluating the results of the monitoring program discussed at EA-18. Depending on the results of this investigation, another kind of mitigation may be necessary. (8)

Thank you for the opportunity to comment on this action. If we can be of further assistance in this matter, Dr. Gerald Miller (404-347-3776) will serve as initial point of contact.

Sincerely,

Heinz J. Mueller, Chief
Environmental Policy Section
Federal Activities Branch

STATE OF FLORIDA

Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

LAWTON CHILES
GOVERNOR

January 7, 1992

Mr. A. J. Salem, Chief
Planning Division
Department of the Army
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Draft Environmental Assessment - Beach Erosion Control Project - Venice Beach - Sarasota County, Florida

SAI: FL9112040730C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 83-150, the Coastal Zone Management Act Reauthorization Amendments of 1990 and the National Environmental Policy Act, has coordinated a review of the above referenced project.

Pursuant to Presidential Executive Order 12372, the project will be in accord with State plans, programs, procedures and objectives when consideration is given to and action taken on the enclosed comments and requirements of our reviewing agencies.

The Department of Environmental Regulation (DER) indicates that the Siesta Key borrow area sand will be preferable to borrow area one. The DER concurs with the United States Fish and Wildlife Service (USFWS) recommendations made in their October 30, 1991, Coordination Act Report regarding incorporation of a system of reports as a project feature to include quantitative and comparison analyses between the artificial reefs and nearby natural reefs. The DER also concurs with the USFWS regarding measures to minimize the taking of sea turtles during the construction process. The DER indicates these measures should be implemented through the seven terms and conditions outlined in the Coordination Act Report. Please refer to the enclosed DER comments.

The Department of Natural Resources (DNR) notes concerns pertaining to the assessment of hardbottom habitat loss directly affected by beach fill placement and the removal of an unknown quantity of material from the secondary borrow site. Please refer to the enclosed DNR comments.

The State of Florida has completed a review of the consistency determination for this project and, based on the information available at this time, agrees that the project, at this stage, is consistent with the Florida Coastal Management Program. However, certain issues of concern have been identified by our reviewing agencies which will require resolution in federal consistency reviews conducted at subsequent decision points. Pursuant to 15 CFR 930.34 and .37, you should prepare a consistency determination at each major decision point for the State's review. Continued State agreement will be based, in part, on adequate reconciliation of previously identified concerns.

This letter reflects your compliance with Presidential Executive Order 12372.

Sincerely,

Janice L. Alcott

Janice L. Alcott, Director
State Clearinghouse

JLA/bl

Enclosure(s)

cc: Department of Environmental Regulation
Department of Natural Resources
Department of State

Florida Department of Environmental Regulatio
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-24
Lawton Chiles, Governor
Carol M. Browner, Secre

January 6, 1992

Janice L. Alcott
Director, State Clearinghouse
Office of Planning and Budgeting
Budget Management and Planning Policy Unit
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: COE, Environmental Assessment, Beach Erosion Control at Venice Beach, Sarasota Co.
SAI: FL9112040730C

Dear Ms. Alcott:

The Department has reviewed the Environmental Assessment (EA) for the Beach Erosion Control and Shore Protection Project at Venice Beach, Sarasota County, Florida. The Department is presently reviewing the Corps of Engineer's application for Water Quality Certification. Our permitting section has made a request for additional information required in the processing of the permit.

9 The sands from borrow area one, the most near shore of the Manasota Key borrow areas, may not be suitable for beach renourishment. Grain size data and geotechnical reports submitted shows that the average grain size in area one is smaller than that of the beach. The 1990 General Design Memorandum (GDM) indicates an unstable condition with an overfill ratio greater than 10 and a renourishment factor of 2.7 for area one materials. Based on this information and the expected quality of the Siesta Key borrow area sand, it is likely that the Siesta Key borrow area will be preferable to borrow area one.

The 1:1 mitigation ratio proposal will be evaluated by the permitting section when requested information regarding side scan sonar results and biological assessments has been received and reviewed.

10 The EA lists recommendations made by the United States Fish and Wildlife Service (USFWS) in their October 30, 1991, Coordination Act Report. In that report the recommendation (#7) was made that a system of "monitoring and annual reporting to the Corps of Engineers and resource agencies on the effectiveness of the mitigation (artificial reefs) should be incorporated as a project feature." We concur with the USFWS that reports should include quantitative and comparison analyses between the artificial reefs and nearby natural reefs.

11

Additionally, the USFWS presented reasonable and prudent measures to minimize the taking of sea turtles during the construction process. These measures should be implemented through the 7 terms and conditions outlined in the Coordination Act Report. Conservation recommendations, particularly the scheduling constraints, should be followed. All these measures contribute to minimizing the accidental take of sea turtles.

The Department's permitting review will serve as the state's federal consistency review for purposes of compliance with the Coastal Zone Management Act. Any questions regarding permit status should be addressed to Marlene Stern at 904/488-0130 while any questions regarding this letter may be addressed to me at the same number.

Sincerely,

for Stephen S. Brooker
Environmental Specialist
Office of Intergovernmental Programs

TSB/jb

Virginia B. Wetherell
Executive Director

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Lawton Chiles
Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agricultu
Betty Castor
Commissioner of Educatio

December 20, 1991

Ms. Janice Alcott
State Clearinghouse
Office of Planning and Budget
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: Draft Environmental Assessment for Beach Erosion Control and Shore Protection Project at Venice Beach, Sarasota County

SAI: FL9112040730C

Dear Ms. Alcott:

The Department of Natural Resources has completed a review of the above referenced draft environmental assessment, and supports the project objectives for restoring the recreational and storm protection values of Venice Beach. There is much to concur with in the project assessment and design as proposed. However, several concerns with the document as presented have been identified.

The first pertains to the assessment of hardbottom habitat loss directly affected by beach fill placement. Secondly, the Department hopes to work with the Corps and local sponsor on adequate mitigation for natural resource losses. Finally, questions have been raised regarding the removal of an unknown quantity of material from the secondary borrow site. These concerns should be addressed through the federal consistency process, and state project approvals required under Chapters 161, 253 and 403 Florida Statutes.

The U.S. Fish and Wildlife Service assessment of total acreage of hardbottom habitat affected by beach fill placement, 2.3 acres, differs from the U.S. Army Corps of Engineers acreage, 1.9 acres, by .4 acre. The .4 acre area consists of a nearshore hardbottom area with high ecological and recreation values. DNR finds that the Corps has not adequately assessed the extent of hardbottom area affected by the project (see attached staff assessment). DNR recommends that the Corps reassess the project's potential degradation of the hardbottom community in question and mitigate the damage as appropriate.

The Department reserves the authority to establish the minimum acceptable mitigation requirements through State permit approvals. In general, it is accepted that artificial reef construction cannot fully compensate for natural hardbottom resource losses. Additionally, the concept of providing a refuge for organisms displaced during construction is supported. An inconsistency noted in the document is the total acreage of artificial reefs that will be constructed as mitigation.

DNR's other concern identified during the review of the draft environmental assessment is the removal of an unknown quantity of sediments from the ebb shoal of Big Sarasota Pass. It is accepted that such ebb shoals can be properly mined so as to provide high quality beach fill and protect the coastal system. The document notes that the borrow site boundary considers potential affects on the adjacent Siesta Key shoreline. However, this determination appears based on a 1985 Final Environmental Impact Statement prepared in 1985. DNR suggests that the consideration of this shoal as a borrow site may be modified pending the completion of the Big Sarasota Pass inlet management study, scheduled for 1992.

Based upon the obligation of the local sponsor to secure State approvals, and opportunities for working out project conditions, the Department supports the project described within the draft environmental assessment. We believe that once approved, the Sarasota County beach restoration project will provide significant storm protection and public recreation benefits, and give careful consideration to adverse impacts to marine resources. Thank you for your time and the opportunity to provide comments on this project.

Sincerely,

John F. Wettstein
Senior Management Analyst

enclosure

cc: A.J. Salem, USACE
Carol Browner, DER
Kirby Green, DBS
Pete Mallison, DSL

Staff Assessment (December 20, 1991)
Draft Environmental Assessment for the Beach Erosion Control and Shore Protection Project at Venice Beach, Sarasota County

Hardbottom Impact Assessment

(12) Staff finds that areas of nearshore hardbottom community not identified in the environmental assessment as directly affected by the beach restoration project, may be in fact become degraded following construction. These habitats are susceptible to direct burial as the beach fill profile adjusts to wave and storm energies. Also, communities comprised of sessile organisms are sensitive to secondary affects associated with increased turbidity and sedimentation from the long term adjustment of beach fill. They are important natural resources because of the presence of protected hard corals, high productivity and habitat values, and high recreational value.

The specific acreage in question consists of a hardbottom community located offshore of DNR range monument 120. This community, composed of macroalgaes, sponges, soft corals, hard corals and reef fishes, has been described by USFWS as "irreplaceable," due to ecological and recreational values. According to the 1991 General Design Memorandum, the estimated equilibrium toe of fill indicated that .4 acres would be covered. For evidence that .4 acres of the hardbottom community would in fact not be affected by direct burial from the new beach fill design described within the draft environmental assessment, the Corps referred to the results of a computer simulation of shoreline response known as the DUNE model.

(13) This model run showed that under certain limited littoral conditions, and assuming that the equilibrium beach profile can be characterized by a geometric planform with a seaward gravity slope, that the beach fill as designed would not cover the hardbottom area after adjusting to wave and storm surge generated energies. Staff finds that this is a misapplication of the DUNE model, which was developed to show the relationship between shoreline recession and storm surge in regards to the conservation of material within coastal dune, beach and nearshore systems. Its function as a predictive model of post-storm bottom formations is limited. While it is conceivable that the model results could occur on Venice Beach as presented, it is more likely that under a wider range of conditions than those incorporated into the DUNE model, that the equilibrium profile will differ significantly. Other variables include tidal currents, alternate wave breaking regimes, and trough and bar formation.

(14) In addition to concerns regarding the adequacy of the DUNE model in predicting the areas of nearshore hardbottom subject to direct burial, staff finds that recent experience with completed beach nourishment projects gives cause for serious concern for the

degradation of hardbottom communities located adjacent to beach fill areas. Experience with monitoring beach nourishment project impacts on hardbottom communities off Miami Beach revealed that even when water column turbidity remains within state water quality standards, benthic organisms suffered significant damage from reduction light and sedimentation. In addition, observations of water column conditions over, and siltation of hardbottom communities offshore of recent Pinellas County nourishment projects, verify the likelihood of secondary impacts to the hardbottom community located off DNR range monument 120.

Staff recommends that the Corps reassess the potential degradation of hardbottom areas associated with the Venice Beach restoration project. The Corps should address staff's comments concerning the adequacy of the DUNE model in predicting the extent of burial of nearshore areas. Observations from the monitoring of comparable nourishment projects could verify the accuracy of the Corps assessment. In addition, due to the high ecological and recreational values of the hardbottom community located off DNR range monument 120, the Corps should investigate the potential degradation of that resource due to increased sedimentation and turbidity. Results from these investigations should be incorporated into any plans for mitigation of natural resource damages from the project.

Mitigation

15

An inconsistency noted in the document is the total acreage of artificial reefs that will be constructed as mitigation. Page EA-1 references construction of 1.9 acres. Page EA-21 makes a recommendation for construction of 1.0 acres of out-of-kind mitigation at a 1:.5 mitigation ratio. As per the Board of Trustees action on the Anna Maria Island Beach Restoration, staff finds that although the artificial reefs cannot be considered as complete compensation for natural productive hardbottom losses, the 1:1 mitigation ratio may be acceptable since there is no alternative design to achieve the beach nourishment objectives, and in addition to the recreational and storm protection benefits of the project, the construction of nearshore recreational reefs can be viewed as in the public interest.

Big Sarasota Pass Ebb Shoal

16

The coastal system encompassing Big Sarasota Pass, its associated ebb shoal and adjacent sandy beaches, if viewed as moving body of sand, has produced an equilibrium depositional profile where there is an abundance of sand to accrete out from the shoal. Removal of material at the seaward end of this depositional lens could create a condition wherein portions of the shoal may be reworked by coastal forces to create a new equilibrium profile. Sand from the area not disturbed will move to the area of the borrow site. It is this movement of sand, and possible affects on the shoreline of Siesta Key that concerns staff.

A complete morphological assessment cannot be completed from the information provided in the draft environmental assessment. The general reference to the 1985 FEIS also does not offer an assessment of potential impacts. Any disturbance of the equilibrium profile of this site should be examined in total, in relation to the shoreline processes occurring within the coastal system, before any material is removed from the ebb shoal. It is recommended that the Corps consider a detailed study, such as that produced in the inlet management plan scheduled for 1992, before consideration of the secondary borrow site.

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
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December 16, 1991

Mr. A.J. Salem, Chief
Planning Division
Environmental Resources Branch
US Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Susan Hammersten
Historic Sites
Specialist
(904) 487-2333
Project File No. 913329

RE: Cultural Resource Assessment Request
US Army Corps of Engineers
Draft Environmental Impact Statement for the Beach Erosion Control Project, Venice Beach, Sarasota County, Florida

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the information in the Draft Environmental Impact Statement (DEIS) for the above referenced project.

A review of our files indicated that the borrow areas for the proposed project have been surveyed for magnetic anomalies. We note that three potentially significant anomalies were identified during the survey. The current document states that the three anomalies will be protected by 200 ft. buffer zones. It is the opinion of this office that this measure will be sufficient to protect any potentially significant historical resources in the borrow areas. Therefore, it is the opinion of this office that the proposed project will have no effect on any sites listed, or eligible for listing in the National Register of Historic Places. The project may proceed without further involvement with this agency.

SARASOTA COUNTY GOVERNMENT
SARASOTA, FLORIDA

Natural Resources Department

Board of County Commissioners
Charley Richards - District 1
David R. Mills - District 2
AnnMarie Hill - District 3
Wayne L. Derr - District 4
Robert L. Anderson - District 5
John Wesley White - County Administrator

Gary S. Comp, Director

December 23, 1991

Mr. A. J. Salem, Chief
Planning Division
Department of the Army
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

Subject: Draft Environmental Assessment for Beach Erosion Control Project at Venice Beach

We are in receipt of your notice regarding the draft environmental assessment and offer the following comments.

17 Page EA-11

A sea turtle beach hatchery should be located on Manasota Key or Casey Key. Since predation by racoons is common, relocated turtle nests should be enclosed within wire screen of a mesh size large enough to allow turtle hatchlings to pass through.

18 Page EA-12

Sand compaction measures should be made of the existing beach, and the performance criteria for sand compaction of the nourished beach should be referenced to that of the existing beach.

19 Page EA-13

No mention is made of the previously identified archeological site located within the surf zone of the nourishment area. This site has been researched and catalogued with the Florida Bureau of Historical Archives. The Final Environmental Impact Statement for the project carries reference to it.

20 Page EA-17

The draft report carries inconsistent statements regarding the area of natural reefs to be impacted by the project. Also, the size of artificial reef sites proposed to be con-

P. O. Box 8 - Sarasota, FL 34230 - Telephone (813) 378-6113 - Fax (813) 378-6067
(Location: 1301 Cattlemen Road - Second Floor)

structed as mitigation for beach fill impacts does not appear to be adequate to meet even a one-to-one replacement ratio.

21 Page EA-19

The monitoring protocol for the artificial reef sites to be established should be detailed in the report. Seasonal monitoring efforts are necessary to explain reef community development over time.

22 Page EA-21

Any restructuring of the derelict groin and limestone boulders located at the south end of the Venice municipal beach should be accomplished without any material being placed adjacent to the seaward side of the existing structure.

23 Page EA-21

The statement of concurrence with the USFWS recommendation regarding the acreage of artificial reef habitat to be constructed is in error. The Corps should increase the proposed reef acreage to 1.9 acres in order to match the USFWS recommendation for mitigation of hardbottom area to be impacted.

Thank you for the opportunity to comment.

Sincerely yours,

Steven Sauers

Steven Sauers, Manager
Coastal Zone Division

Comments were received from the U.S. Environmental Protection Agency, Florida State Clearinghouse on behalf of the Florida Department of Environmental Regulation, the Florida Department of Natural Resources and the Florida Department of State Division of Historical Resources, and Sarasota County Government Natural Resources Department. Comments are sequentially numbered on the attached correspondence, responses are as follows:

U.S. Environmental Protection Agency, letter dated December 19, 1991.

1. It should be noted that approximately 50 percent of the fill to be placed along the Venice shoreline is for mitigation of the effects caused by the channel and jetties at Venice Inlet, which is a Federal navigation project. Therefore placement of approximately 1,025,000 cubic yards initially and 265,000 cubic yards during each renourishment cycle are simply bypassing a volume which would occur naturally without a navigation project in existence.

2. This paragraph insinuates that a cheaper alternative to beach nourishment in the form of relocation of shore-front structures may be advisable. Given the current sea level rise and existing long term erosion rates, relocation of shore-front structures would allow additional beach in front of near-shore structures. However, in time, these more intensely developed areas would also be exposed to the effects of long term recession and storms and their associated damages. The value of shore-front structures within the study reach is estimated to be approximately $124 million. The total price for initial and future nourishments with inflation over a 50 year project life is about $70 million. Similarly, on an annual basis, the storm damage protection benefits are estimated to be $2.25 million with a corresponding cost of 1.77 million. The annualized value of relocating (buying) the shore-front structures (estimated value of $124 million) is about $11 million per year. Therefore, in strict economic terms, beach nourishment is the clearly preferred alternative to relocation. This is especially true when remembering that relocation of shore-front structures will only transfer the erosion problem to near-shore structures in time.

3. The borrow sites off Manasota Key are shoals located in approximately 30 to 34 feet of water about 1.21 to 3.14 miles offshore. The maximum relief of these shoals is about 8 feet. Therefore, excavation of material from these areas to a specified depth of -28 an -30 for the two areas, respectively, will only reduce them to the surrounding bottom depth elevation. The calculated depth at which little sand movement occurs from the seasonal wave climate is -18 feet. Therefore, given the depth of the surrounding water, the lowering of these shoal areas will have no effects on the long term sand budget for Manasota Key. Also, placement of material on an eroding shoreline in no way impacts the incoming wave energy which is the primary erosion force.

The placement of material on the shoreline by hopper dredge has been considered in the design volume computations. It is estimated that hydraulic losses of 30 percent will occur with the use of hopper dredge equipment. The design volume includes this 30 percent to assure that the required volume is indeed in place at the conclusion of the construction. This estimate eliminates the uncertainty associated with the use of this equipment.

4. As stated in the response to paragraph 6, the removal of a portion of the shoal above the surrounding bottom a distance of 1.21 to 3.14 miles from shore will have negligible effect on the sediment budget of the area and therefore will not have any impact on the results of the DUNE modeling performed.

5. The Storm Damage model develops benefits due to storm induced recession and associated damages with and without a project fill. The model was run under the condition of no sea level rise. If, as has been documented throughout this century, the sea level does continue to rise, long-term shoreline recession will increase and storm damages will likewise increase. Deletion of the effects of sea level rise in the computation of damages results in a conservative estimate of the benefits which would arise following project implementation.

6. Replacement of damaged coastal development could occur under the existing Federal flood insurance policy with limited cost incurred to the owner. Another item is that for multi-level structures the model only assigns the value of the bottom two floors assuming total erosion past the building and supporting piles handling the higher floors. Also, the model does not include dollar losses for contents within all structures which could account for an additional unclaimed damage prevention benefit.

7. The response provided in #2 above clearly shows that the cost of nourishment over the life of the project is significantly less than the current value of the threatened property.

8. The U.S. Fish and Wildlife Service and the State of Florida Department of Natural Resources require that we mitigate loss of hardbottom habitat with replacement of same. It is not the Corps intention to create a fishing reef but to replace existing habitat that will be lost due to the project.

Florida Department of Environmental Regulation, letter dated January 6, 1992.

9. Three borrow areas are needed because there is not enough dredgable beach quality sand in the two offshore borrow areas located near the city of Venice.

The project requires approximately 2.1 million cubic yards of sand measured in place on the beach. A contractor will typically have to excavate from a borrow area 15 to 30% more material than is measured on the beach. This means that between 2.4 and 2.7 million

cubic yards of material is needed in the borrow areas to supply the 2.1 million cubic yards of material that will be measured on the beach. In addition to the 2.4 to 2.7 million cubic yards of material required, additional materials are allowed for in the renourishment plan to account for future uncertainties so that the project can be carried to completion in the event that technical or political consideration limit dredging in any of the borrow areas.

The 2 offshore borrow areas are estimated to contain 2.1 million cubic yards of beach quality material; but, only about 50% of this material is economically dredgable. Considerations that affect this reduction in quantity include:

(1) Standard dredging equipment will be used.

(2) Standard dredging methods will be used.

(3) The beach quality material lies on an undulating layer of silty sand which is to be avoided.

(4) A buffer zone is required between the beach quality sand above and the silty sand below.

(5) Uncertainties in the subsurface information caused by the spacing between borings and the problems in establishing ground elevations in the open ocean require that we make conservative judgements in order to avoid dredging the silty sand below the beach quality materials.

(6) We can not expect to dredge thin and/or isolated patches of beach quality material.

(7) The borrow areas are located in the open Gulf. Weather and wave conditions can make it difficult for a dredge to control dredging elevations.

(8) The borrow area must be designed to account for the 7 items listed above which means that only about 50% of the material will be dredgable.

<u>Quantities to be dredged in the two borrow areas</u>.

We want as much material as we can obtain from the two offshore borrow areas because this material is coarser and therefore potentially more stable than the material from the Siesta Key Borrow Area. The contractor is required to excavate 272,000 cubic yards and 561,000 cubic yards from the two respective borrow areas. We expect that the contractor will excavate approximately 50 % of the beach quality material in the buffer zone above the silty clay. The 2 borrow areas would then provide 365,000 and 736,000 cubic yards respectively.

In summary the design requires that the Contractor excavate 833,000 cubic yards from the 2 offshore borrow areas and expects that the Contractor will actually excavate approximately 1,101,000 cubic yards of beach quality material from the 2 offshore borrow areas.

Core boring logs and laboratory data.

THE 2 OFFSHORE BORROW AREAS, Borrow Area 1 and Borrow Area 2. The core borings associated to these 2 borrow areas are:

CB-S-10*	CB-S-23*	CB-S-25*	CB-S-26A
CB-S-27A*	CB-S-28A*	CB-S-29A*	CB-S-30
CB-S-31*	CB-S-32*	CB-S-33	CB-S-34*
CB-S-35*	CB-S-36*	CB-S 37*	CB-S-38*
CB-S-39*	CB-S-40*	CB-S-41*	CB-S-42*
CB-S-43*	CB-S-44*		

* Indicates laboratory tests of materials in the respective core borings.

Siesta Key Borrow Area (Big Sarasota Pass Shoal), Borrow Area 3. The core borings related to borrow area 3 are:

CB-SK-1*	CB-SK-2*	CB-SK-3*	CB-SK-4*
CB-SK-5*	CB-SK-8	CB-SK-9	CB-SK-10*
CB-SK-12*	CB-SK-13*	CB-SK-14*	CB-SK-15*
CB-SK-16*	CB-SK-17*	CB-SK-18*	CB-SK-19
CB-SK-20*	CB-SK-21*	CB-SK-22	CB-SK-23*
CB-SK-24	CB-SK-25*		

* Indicates laboratory tests of materials in the respective core borings.

Existence of fine grain sands in the borrow areas.

One method of estimating the performance of beach materials is to use the concept of "overfill ratio" as expressed in the Corps of Engineers Shore Protection Manual. This concept compares the native beach materials with the proposed borrow materials. In the GDM, the overfill ratio exceeded 10 for one of the borrow areas; this predicts that the proposed borrow area will not be as stable on the beach as the native beach materials.

We have subsequently drilled additional core borings in Borrow Area 2. We selected core borings CB-S-25, 39, 42, and 43 as being representative of the borrow area and constructed a composite gradation curve. The resulting overfill ratio again exceeds 10.

The overfill ratio of 10 is derived by mechanically cranking the Borrow Area gradation through a largely theoretical overfill formula. We believe that a overfill ratio of 1.25 should be used for Borrow Area 3, rather than the calculated overfill ratio of 10. The 1.25 is based on the experience we have in Florida using

similar materials in beach renourishment.

Also, additional core borings have been drilled in the Siesta Key Borrow Area. These additional core borings show the borrow area contains finer sand than was indicated in the GDM. The overfill factor is greater than 10, rather than the 1.5 stated in the GDM. We still intend to use the 1.5 overfill factor stated in the GDM for our design based on our beach fill experience in Florida.

FLORIDA EXPERIENCE. The borrow area materials discussed above are principally a fine quartz sand which is typical of natural sands that form many of our Florida beaches and is typical of sands we have used to renourish beaches. These fine quartz sand beaches make excellent recreational beaches and offer good storm protection. The Jacksonville beaches, St Augustine beaches, and Daytona beaches are examples of beaches composed of similar fine quartz sand.

THEORETICAL OVERFILL CALCULATIONS. Theoretical overfill calculations are valuable in evaluating beach renourishment projects but they do have limitations that must be considered:

1. They do not predict how well a material will preform on the beach in absolute terms. Instead, they indicate how much borrow area material would need to be processed in order to create a grain size distribution identical to the natural beach.

2. They are based on the assumption that the natural beach has a normal distribution of grain sizes. This is not true on this project where the natural beach is a mixture of three unique types of materials:

   a. The majority of the natural beach is composed of a fine quartz sand similar to the borrow area materials.

   b. A second fraction of the natural beach is composed of a dense gravely phosphatic sand.

   c. The third fraction of the natural beach is composed of shell, gravel sized to sand sized.

Together these three material fractions form a very complex beach material that exhibits a bimodal distribution of fine sand, coarse shell and gravel. As stated in TM-60, the adjusted SPM method is known to be unreliable when materials have a bimodal gradation.

3. They are based on the assumption that the native beach is stable. The native beach is not stable; nor, will the borrow area material be stable. The GDM provides for advanced nourishment and periodic renourishment to

account for the instability.

4. They are based on the assumption that there is a borrow area available that is similar in composition to the natural beach. The composition of this natural beach is unique and it would be virtually impossible to find a similar borrow area material. We are using the best material that is available for this project.

5. They are based on the assumption that the composition of the natural beach reflects the wave environment of the beach. West coast Florida beaches have a relatively low wave energy environment in which the fine quartz sand from Borrow Area 2 and the Siesta Key Borrow Area will behave well. The gravelly shell and the dense phosphatic material in the native beach sand are principally a result of biogenic formation and the exposures of natural outcrops of older geologic formations rather than sorting created by a higher energy wave environment.

Initially there will be shoreline recession after the borrow area materials are placed, as with all beach fills, because there will be an adjustment to the beach slope to reflect the grain size of the borrow area materials. After the beach slope stabilizes the beach erosion will decrease to an acceptable level.

10. The Corps concurs with the need to assess the effectiveness of the mitigation project. The Corps will commit to a visual inspection annually until it is evident that the artificial reef structures have met their intended goal of providing hardbottom habitat. A report will be prepared following the inspection and a copy furnished to the USFWS.

Quantitative and comparison analyses between the artificial reefs and nearby natural reefs are not warranted for this type of mitigation i.e. replacement of hardbottom. The successful colonization of artificial structures is well documented therefore, the Corps does not concur with the need for additional studies of this type.

11. The Corps will implement the reasonable and prudent measures of both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to minimize the taking of sea turtles during the dredging and beach filling operations.

Florida Department of Natural Resources, letter dated December 20, 1991.

12. The total acreage of impacts was calculated (1.9 acres) by combining impacts from both direct fill operations and potential impacts associated with stabilization of the beach profile by wave action. Hardgrounds not directly impacted (ie. covered by sand) but close to shore may be susceptible, to some degree, to negative impact from sedimentation and turbidity due to the beach disposal. These hardground communities are dominated by sponges and soft corals, with a very small percentage of hard coral coverage. As a group, the hard corals are most sensitive to potential impacts. Soft corals, sponges, and other sessile organisms are more tolerant of increased turbidity and sedimentation (Pullen and Naqvi, 1983), and no significant short or long-term effects on these organisms are expected.

13. The previous DUNE model run was provided to estimate the typical adjusted beach profile following storm events. Although the model does not consider long term variables such as tidal currents, alternate wave breaking regimes, and trough and bar formation, it does provide an approximation of the beach profile following the maximum sediment moving events. These variables should be compared in greater detail. For instance, tidal current velocities are minimal to currents produced during severe wave action. Also, it is doubtful that typical daily tidal currents would be responsible for significant onshore-offshore sediment movement. Alternate wave breaking regimes consisting of non-storm events are generally of low energy and are acknowledged to be primarily responsible for returning sediment back onshore from offshore bar systems. Storm waves, however, erode the shoreline transporting the sediment offshore to form the protective offshore bars. Review of profile lines within the Venice Beach area indicates that trough and bar formation generally occurs within the -8.0 to -4.0 foot mean low water region which is about 250 feet landward of the considered hard bottom area. Therefore, although the DUNE model is simplistic and cannot consider many of the above variables, it does estimate the adjusted profiles following the major sediment moving events.

The previous model run was made using a 0.20 mm mean sediment size. This is the smallest size to be placed from the three considered borrow areas. The project is to be constructed from south to north depleting the Manasota Key borrow sites first, then shifting to the Siesta Key (Sarasota Pass) site. The source of material to be used at DNR monument R-120 would come from the Siesta Key site which has a medial sediment diameter of 0.31 mm. The results of the previous DUNE run using a 0.20 mm size is a worst-case scenario. Running the DUNE model with a sediment size of 0.31 mm results in the following adjusted profiles:

Storm Frequency (Years)	Post-Storm Berm Width (Feet)		Seaward Limit of Post-Storm Profile (Feet)	
	.20mm	.31mm	.20mm	.31mm
1	255	255	616	573
2	255	255	617	576
5	245	255	656	615
10	227	253	657	615
20	195	224	622	599
30	177	209	623	609
50				

(Storm surge Level Above Fill Elevation)

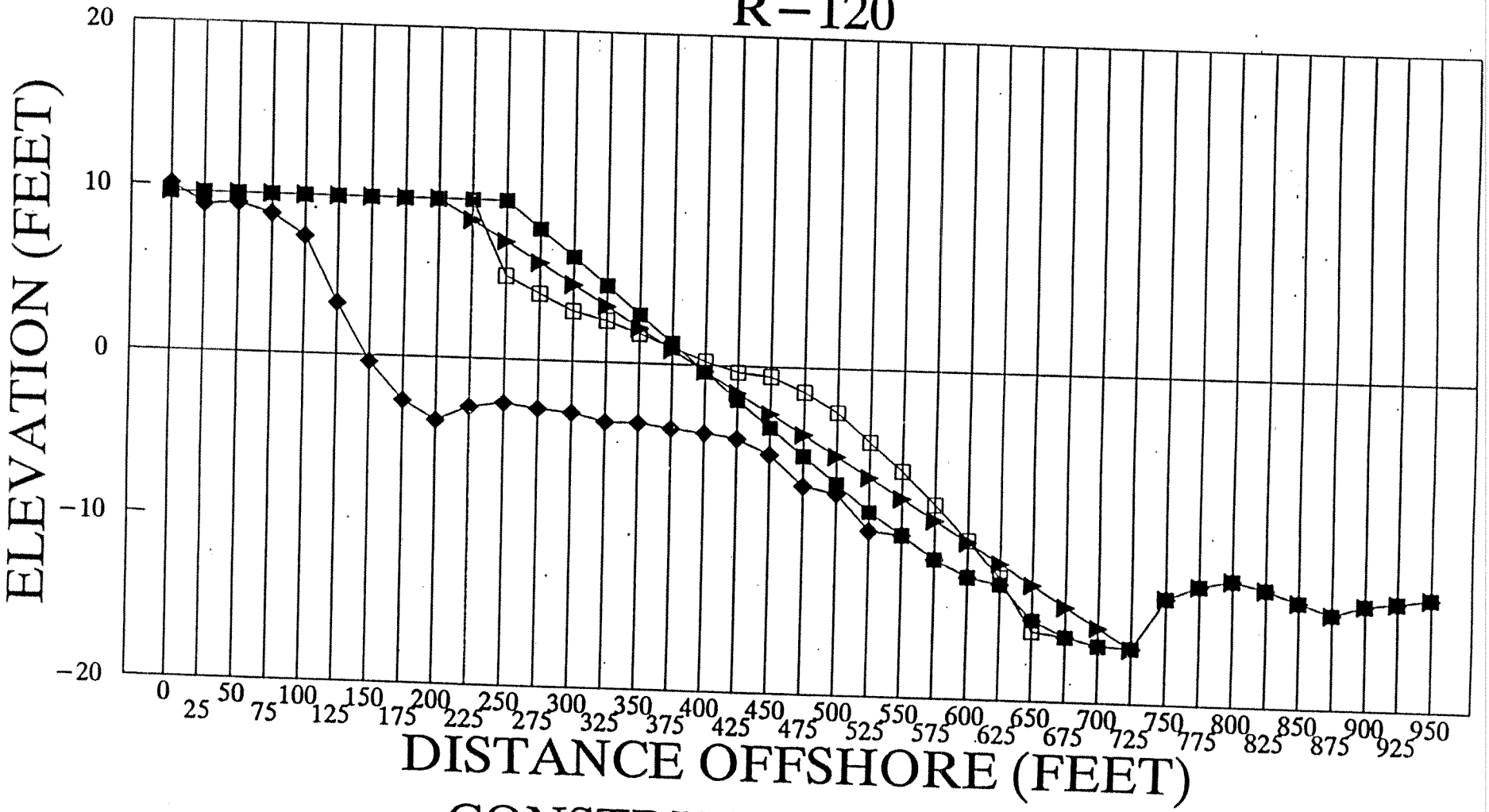
In Pinellas County, Sand Key Phase 2 (Indian Rocks Beach) is being monitored by the Department of Geology of the University of South Florida. Analysis of monitoring surveys of these projects have shown that the front slope ranged from 1 on 8 to 1 on 18. The median grain size from the Egmont Shoal at Tampa Harbor, which is the borrow area for Phase 2, is 0.20 mm. Assuming that the wave energy conditions within Pinellas County are of the same magnitude as found at Venice, using a slope of 1 on 20 for a grain size of 0.20 mm would again be a worst case scenario. The actual estimated adjusted profile would be steeper due to the sediment having a mean size of 0.31 mm.

14. The following figure presents existing, construction, and estimated adjusted fill profiles at DNR monument R-120. Adjusted fill profiles presented include the worst case DUNE model run and a 1 on 20 slope from the design berm width to existing bottom with sediment size of 0.20 mm.

The Jacksonville District maintains that the adjusted fill section at DNR monument R-120 will not encroach upon the hard bottom community of interest.

VENICE BEACH FILL

R−120



CONSTRUCT. EXISTING

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15. The inconsistency in the acreage of artificial reef that will be constructed on page EA-1 will be changed to read 1.0 acres instead of 1.9 acres.

16. The Siesta Key borrow area (Big Sarasota Pass) has been designed to provide a 1500 foot buffer between the borrow area and the shore; but, it is within the theoretical active wave zone because portions are shallower than 18 feet. We avoid dredging material from the active near shore profile because the active profile provides storm protection and we do not want to destabilize the beach by undercutting the base of the offshore profile. In practice we have established a common sense position that a 1500 foot buffer is a conservative buffer that will allow adequate storm protection and will not undercut the beach slope. We have used the 1500 foot buffer concept for years with good results.

There is approximately 15.2 (see note below) million cubic yards of sand in the Big Sarasota Pass shoal borrow area outside the 1500 foot buffer. This current beach renourishment will only use about 1.5 million cubic yards (10%) of the shoal outside the 1500 foot buffer.

We feel that the use of the 1500 foot buffer between the borrow area and the shore and the fact that we intend to only use about 10 % of the shoal outside the 1500 foot buffer, the dredging will have a minimal impact on the Big Sarasota Pass area.

Note: The entire shoal outside the 1500 foot buffer contains 15.2 million cubic yards of sand. The Contract will restrict dredging (as shown on the Contract drawings) to the southern portion of the Big Sarasota Pass shoal which contains 6.3 million cubic yards of sand to dredging grade. We estimate the project will only require 1.5 million cubic yards of the 6.3 million cubic yards present in southern portion of the borrow area. We will not use any of the 8.9 million cubic yards of sand located in the borrow area in the northern portion of the shoal. The navigation channel is the proximate boundary between the northern portion and the southern portion of the borrow area.

Sarasota County Government Natural Resources Department, letter dated December 23, 1991.

17. If needed, a sea turtle beach hatchery will be located and constructed according to the conditions specified in the State permit.

18. Sand compaction measurements will be taken according to the U.S. Fish and Wildlife Service biological opinion dated October 30, 1991 for this project which states that nourished beaches will be plowed to a depth of at least 36 inches immediately following completion of beach nourishment if sand compaction measures greater than 500 cone pentrometer index units (cpu). Sand compaction

measurements will be taken in February for at least two consecutive years, and tilling will be repeated if compaction exceeds 500 cpu.

19. As generally mentioned on page EA-13, five terrestrial archeological sites have been identified in the study area. Placement of dredged material on the beach will not adversely impact these resources. The State Historic Preservation Office agrees with this determination.

20. The Environmental Assessment consistently states that 1.9 acres of hardbottom habitat will be impacted by direct fill and subsequent stabilization of the beach profile by wave action. The Corps does not agree with a 1:1 replacement ratio. The areas impacted are of relatively low relief (1-3 feet) which are frequently and severely scoured by wave action and longshore currents. This condition limits the hardbottoms' ability to support algal and sessile invertebrate cover. Based on recommendations contained in the USFWS May 2, 1990 letter for the Manatee County shore protection project, the Corps will construct artificial reefs totaling 1.0 acre of surface area with 5 feet of vertical relief for the Sarasota County shore protection project. It is our opinion that half an acre of artificial reef which extends 5 feet above the bottom in a lower wave energy zone, i.e., deeper water, would provide a more stabile habitat to support algal and sessile invertebrates, which in turn will support a greater diversity of fish species. The replacement habitat will adequately compensate for the loss of each acre of low relief hardbottom such as that described in the CAR.

21. The Corps concurs with the need to assess the effectiveness of the mitigation project. The Corps will commit to a visual inspection annually until it is evident that the artificial reef structures have met their intended goal of providing hardbottom habitat. A report will be prepared following the inspection and a copy furnished to the USFWS.

Quantitative and comparison analyses between the artificial reefs and nearby natural reefs are not warranted for this type of mitigation i.e. replacement of hardbottom. The successful colonization of artificial structures is well documented therefore, the Corps does not concur with the need for additional studies of this type.

22. The removal of the large boulders and derelict groin and subsequent relocation offshore as artificial reef would be cost prohibitive due to the shallow depths of the surrounding water that would prevent derrick barge access. There are also safety considerations concerning work in the surf zone. In addition it would be very difficult to write a performance specification to accomplish this work unless each boulder was surveyed as to size and location. It would be much more cost effective to provide a known quantity of limestone and rubble as artificial reef material. We will include in the contract plans and specifications the requirement for the contractor to remove all obstructions that

penetrate the beach fill template as shown (See page EA-21). In the case of rubble that exceeds the +7.5 foot MSL elevation of the template this material will be removed and placed adjacent to the existing rubble. This will be accomplished due to safety concerns for the public use of the project and as required by the State DNR.

23. The Corps does not concur with the USFWS recommendation regarding the acreage of Artificial reef that needs to be constructed to mitigate project impacts. Refer to response to USFWS recommendation #4 on page EA-21 which states, "the areas impacted are of relatively low relief (1-3 feet) which are frequently and severely scoured by wave action and longshore currents. This condition limits the hardbottoms' ability to support algal and sessile invertebrate cover. Based on recommendations contained in the USFWS May 2, 1990 letter for the Manatee County shore protection project, the Corps will construct artificial reefs totaling 1.0 acre of surface area with 5 feet of vertical relief for the Sarasota County shore protection project. It is our opinion that half an acre of artificial reef which extends 5 feet above the bottom in a lower wave energy zone, i.e., deeper water, would provide a more stabile habitat to support algal and sessile invertebrates, which in turn will support a greater diversity of fish species. The replacement habitat will adequately compensate for the loss of each acre of low relief hardbottom such as that described in the CAR."

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

May 22, 1992

REPLY TO
ATTENTION OF

Programs and Project Management Division
Project Management Branch

Mr. Ong-In Shin
State of Florida
Department of Natural Resources
Bureau of Coastal Engineering and Regulation
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Dear Mr. Shin:

This is in regard to your May 14, 1992, letter concerning the Sarasota County shore protection project at the City of Venice. As you know, a meeting was held on April 30, 1992, as a result of the January 17, 1992, letter from Ms. Janice L. Alcott of the State Clearinghouse. Ms. Alcott's letter provided copies of the letters from the Department of Natural Resources (DNR) dated December 20, 1991, and the Department of Environmental Regulation (DER) dated January 6, 1992.

Ms. Alcott states in her letter that based upon information available at this time, the project at this stage is consistent with the Florida Coastal Management Program. The General Design Memorandum (GDM) was approved on April 20, 1992, subject to a Finding of No Significant Impact (FONSI) being signed. Due to the concerns raised in the state agencies' letters, it was determined that a meeting was required to answer those concerns in order to complete coordination for the consistency review and proceed with completion of a FONSI.

At the April 30, 1992, meeting with representatives of DNR, DER, the City of Venice, the city's consultant, and our office, the DNR's concerns for the impact to a localized nearshore hardground were successfully addressed in that now, adverse impacts are not anticipated to result from the project. Concerns regarding the use of the borrow area at the seaward side of the ebb tidal shoal at Big Sarasota Pass were discussed in detail. Our response to the current DNR concern about the borrow area indicated in your letter is provided in the following paragraphs.

From a geotechnical standpoint, we feel that it is inappropriate to characterize the Siesta Key/Big Sarasota Pass borrow area by the "acid leached" grain size data. The acid leached grain size does not reflect the grain size to be placed on the beach. The mean grain size of this borrow area, shown in Table 1-17 of the GDM, is 0.31 mm, as compared to the native mean grain size of 0.39 mm. This is a good match in grain sizes for a sand source. The acid leached mean grain size for Sarasota County's natural beach is 0.23 mm, the Siesta Key borrow area is 0.13 mm. In comparison with the Manatee County shore protection project, the acid leached mean grain size for the native beach is 0.17 mm and the acid leached mean grain size for borrow area is 0.12 mm. Therefore, the acid leached grain sizes for Sarasota County borrow areas are typical for the west coast of Florida.

In addition, the native beach of Venice is unusually coarse for the west coast of Florida. As stated in the GDM, "The coarser grain size is due to Venice Beach naturally containing phosphate rock fragments. The phosphate rich Bone Valley Formation is exposed at the beach and nearshore areas of Venice." The phosphate rock fragments are not acid soluble, so the acid leached native beach sand includes the coarser phosphate grains. Compare the native beach, acid leached grain size for Venice, 0.23 mm, with that of Manatee County, 0.17 mm.

The performance of the project beach is dependent upon the borrow site grain size. Obviously, if the native beach is eroding at a certain rate, beach fill of smaller grain size will erode at a greater rate. To account for these losses, overfill factors are developed in accordance with the Corps of Engineers' Shore Protection Manual (1984), the overfill factor (James, 1975), and the renourishment factor (James, 1974). For the Siesta Key borrow site, the analysis results in an overfill factor of 1.5 times to 1. This means that for a with-project beach fill section to perform at the same level as the existing beach, a volume of material 1.5 times that required to offset the ambient erosion losses will have to be placed. The analysis assures that regardless of the beach fill grain size, the performance of the project beach will be similar to the existing condition. The suitability analysis for Venice Beach is contained within the GDM on pages 1-59 through 1-62 in Table 1-17.

The above information is provided in order to complete coordination regarding the State Clearinghouse review on the project. Unless advised of a problem, our office will complete a

FONSI and continue to prepare for construction of the project at the earliest possible date.

Sincerely,

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

ADDED TO ORIGINAL → CF KIRBY GREEN

Copy Furnished:

Ms. Janice L. Alcott, Director, State Clearinghouse, Office of the Governor, The Capitol, Tallahassee, Florida 32399-0001

Mr. George N. Hunt, Venice City Manager, 401 W. Venice Avenue, Venice, Florida 34285