

# Appendix 1

Final Environmental Assessment Folly Beach, South Carolina  
Shore Protection Project, April 1991

APPENDIX 4  
ENVIRONMENTAL ASSESSMENT  
404 (b) EVALUATION  
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FOLLY BEACH, SOUTH CAROLINA  
SHORE PROTECTION PROJECT  
GENERAL DESIGN MEMORANDUM

## ENVIRONMENTAL ASSESSMENT

### Shoreline Protection Folly Beach, South Carolina

1. Introduction. This environmental assessment addresses an extension and modifications to the authorized shoreline protection project at Folly Beach, S.C. A final Environmental Impact Statement for Beach Erosion Control and Hurricane Protection for Folly Beach, S.C. was filed with CEQ on July 11, 1980, coordinated with other agencies, and circulated for public review and comment. The 1980 authorized Folly Beach protection plan recommended nourishment of 16,860 feet of beach with five year periodic renourishments. A 25 foot wide berm would be constructed four feet NGVD and fronted by a beach with a face slope of 30' horizontal to 1' vertical. Near shore sand borrow sites were located adjacent to the lighthouse and bird key inlets. The 1991 Folly Beach General Design Memorandum provides for extending the Folly Beach shoreline protection project approximately 3,000 feet north and 8,000 feet south. This environmental assessment addresses in detail the extended portions of the project, modifications to the proposed beach profile along the entire reach of the project, relocation of the borrow sites and addresses the impact of new environmental laws and regulations on the entire project since filing of the Environmental Impact Statement in 1980.

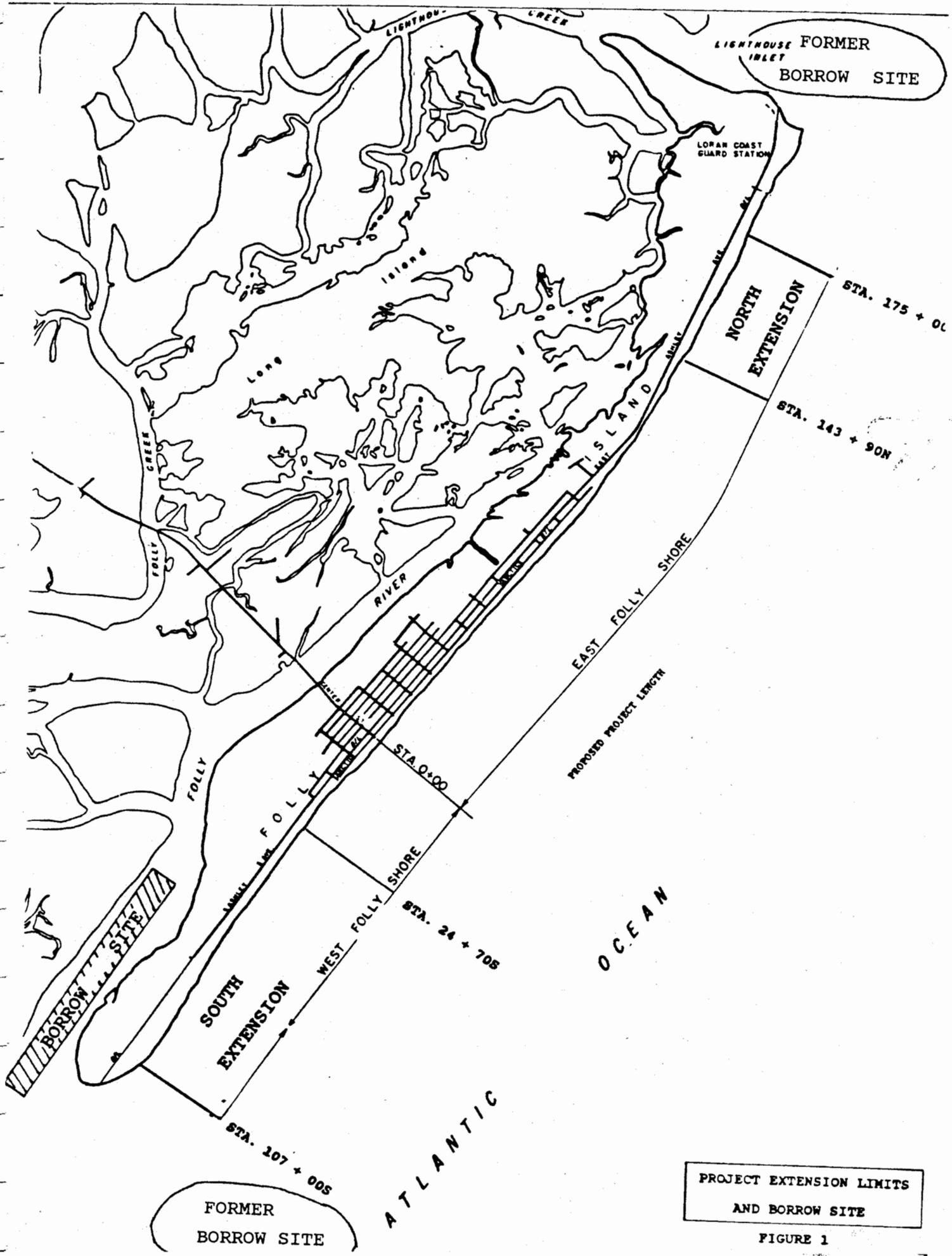
Supplemental information concerning the environmental impacts of Shoreline Protection on Folly Beach may be found in:

a. Folly Beach, South Carolina, Special PED Report to Reevaluate Federal Justification for Storm Damage Reduction; U.S. Army Corps of Engineers, Charleston District, South Carolina, August 1988.

b. Final Detailed Project Report, Charleston Harbor, Folly Beach, South Carolina; U.S. Army Corps of Engineers, Charleston District, South Carolina, August 1987.

## 2. Project Description.

a. Location. Folly Beach is located on Folly Island about six miles South of the Charleston Harbor Entrance (Figure 1). The island is six miles long, one-half mile wide, and is oriented northeast to southwest. The Town of Folly Beach lies in the middle of the island between the former U.S. Coast Guard Loran Station to the northeast and the Charleston County Park to the southwest. South Carolina Route 171 crosses the marsh between James Island and Folly Island and provides the only highway access to Folly Beach.



PROJECT EXTENSION LIMITS  
AND BORROW SITE

FIGURE 1

b. Proposed Action. The modified plan of improvement provides for extending the shoreline protection northeastward from Station 143+90N to Station 175+00N and southwestward from Station 24+70S to Station 107+00S (Figure 1). Total project length would be 28,200 feet or 5.34 linear miles of shoreline. A berm will be constructed with a top width of 15 feet and an elevation of 9.0 feet NGVD. The project extends from just below the former U.S. Coast Guard base (station 175+00 north), and includes the Charleston County Park on the west end of Folly Island (station 107+00 south). 2.5 million cubic yards of beach quality material will be placed during the initial effort. This material will be placed seaward of existing revetments.

Periodic nourishment will require 1.7 million cubic yards of material every eight years with one periodic nourishment effort occurring at the last 10 year interval. This last periodic nourishment will require 2.1 million cubic yards of material. Actual quantities of periodic nourishment will be based on a monitoring plan which will be implemented immediately upon completion of initial construction.

The Corps of Engineers', Coastal Engineering Research Center determined that the nine groins immediately north of the Holiday Inn (meeting a 90 percent impermeability criteria) would substantially reduce the quantity of sand required for shoreline protection. As a part of the recommended plan these nine groins will be rehabilitated to meet this criteria. The groin design is explained in detail in the Engineering Design and Cost Estimates appendix of the General Design Memorandum.

Adequate quantities of sandy borrow material exist in the borrow site located in lower Folly River which is designated for the total project length. Core borings of the insitu material within the borrow area characterize the material as a fine sand classification under the Unified Soils Classification system. Grain size for the sand samples varied from 0.10 millimeters (3.39 phi) to 0.28 millimeters (1.85 phi) with a composite mean grain size of 0.15 millimeters (2.75 phi). The initial 1980 approved near shore borrow sites (located adjacent to Stono Inlet and Lighthouse Inlet) were eliminated based on environmental concerns and the potential diversion of sand from Bird Key and Kiawah Island.

Construction would be by means of a pipeline dredge. The pipeline would run adjacent to and parallel with revetments on the beach. Navigation on Folly River would be minimally affected by the presence of the dredge. Sand would be pumped along the 28,200 linear feet reach of the project. Sand would be discharged as a slurry to a design elevation of +9.0 feet NGVD. Temporary training dikes of sand would be used to contain the discharge and control the fill placement. Fill sections

will be graded by landbase equipment. Scraps and any hardpan that may develop during or after project completion will be graded and raked as necessary in coordination with recommendations and requirements from regulatory agencies. All work will be performed between October 15 and May 15 to minimize impacts to sea turtles, fish, shellfish and infauna. It is anticipated construction will take 5 to 6 months including mobilization.

2) Topography and Soils. Folly Beach lies on the lower coastal plain which was once a submerged portion of the continental shelf. The island is fronted by gently sloping beaches on the seaward side and backed by productive salt marshes. Elevations of the developed section of the island range from 5 to 14 feet NGVD. Soils are white, medium-to fine-grained siliceous sands with some sea shells and shell fragments. The soils have alkaline tendencies and low fertility due to excessive nutrient leaching.

4) Surface Waters - The principal surface waters in the planning area are the Folly River and Stono River and the Atlantic Ocean. The Folly and Stono Rivers are classified by the State of South Carolina as SA or waters suitable for shellfishing for market purposes and other uses requiring waters of lesser quality.

5) Biotic Communities - A detailed description of the individual biotic communities and fish and wildlife resources is found in the final EIS.

6) Other Environmental Factors:

7) Endangered Species - Comprehensive coverage of Endangered Species which may occur in the Folly Beach Project area was discussed in the 1980 EIS. However, following is the most current list of endangered or threatened species which may be present in the Folly Beach area:

West Indian manatee (Trichechus manatus) - E  
Bald eagle (Haliaeetus leucocephalus) - E  
Bachman's warbler (Vermivora bachmanii) - E  
Wood stork (Mycteria americana) - E  
Red-cockaded woodpecker (Picoides borealis) - E  
Arctic peregrine falcon (Falco peregrinus tundrius) - T  
Piping plover (Charadrius melodus) - T  
Kemp's ridley sea turtle (Lepidochelys kempii) - E  
Loggerhead sea turtle (Caretta caretta) - T  
Shortnose sturgeon (Acipenser brevirostrum) - E  
Canby's dropwort (Oxypolis canbyi) - E  
Pondberry (Lindera melissifolia) - E

Seven species are currently listed which are under status review.

- American swallow-tailed kite (Elanoides forficatus forficatus) - SR
- Bachman's sparrow (Aimophila aestivalis) - SR
- Flatwoods salamander (Ambystoma cingulatum) - SR
- Incised groovebur (Agrimonia incisa) - SR
- Sea-beach pigweed (Amaranthus pumilus) - SR
- Cypress knee sedge (Carex decomposita) - SR
- Chaff-seed (Schwalbea americana) - SR

Recent coordination with the U.S. Fish and Wildlife Service (USFWS) and S.C. Wildlife and Marine Resources Department (SCWMRD) has shown that the loggerhead sea turtle nests on Folly Beach adjacent the project zone on the north and south ends of the island where high tide beach exists.

- 4) Cultural Resources - A review of the National Historical Register indicates no known historical or archeological sites are located within the proposed project zone. The nearest identified site adjacent to the project is a civil war encampment located at the northeast end of Folly Island within the former Coast Guard compound. The Folly Beach project will have no impact on the site.
- 9) Coastal Barrier Resources System (CBRS) - The lower reach of Folly River lies within the Bird Key Complex, M07, of the CBRS. Approximately 30% of the designated borrow site falls within the Bird Key Complex. Formal consultation with the USFWS (October 1, 1990) has determined that the proposed project is consistent with purposes of the CBRA. However, the USFWS stipulated that the Corps 1) implement a monitoring plan to assess the integrity of Bird Key; 2) make a concerted effort to perform beach nourishment outside turtle nesting season; and 3) maintain coordination with the Service and SCWMRD throughout the life of the project.
- 10) Other Environmental Factors - There are no wildlife preserves, important agricultural lands, wild and scenic rivers, natural landmarks, recognized scenic areas, or any other environments of special interest located where they could be impacted by the proposed project.

Existing Beach Conditions - Folly Beach has and continues to experience severe erosion problems. The historic shoreline erosion rate for Folly Island was 4.2 feet per year before the construction of revetments and bulkheads. Groin fields and an array of hard shore protection devices constructed by local property owners have afforded only a limited level of protection of shoreline recession. The mean tidal range is 5.3 feet with a significant wave height of about 4.2 feet. Hardened shoreline

protection coupled with continued erosion have almost eliminated a high tide beach area over most of the island except the extreme north and south ends of the beach.

12 Need for Proposed Actions - The recommended project provides for beach restoration and periodic nourishment of 28,200 feet of beach at Folly Island. The beach fill section would provide an average usable width above mean high water of 90 feet, which would provide shore protection as well as wildlife and recreational usage. Advance nourishment would provide an additional sacrificial usable beach approximately 110 feet wide.

13 Alternative Analysis - The Final Detailed Project Report, Charleston Harbor, Folly Beach, S.C., 1987, evaluated a total of 6 nonstructural and 6 structural alternatives and the no action alternative. The extension of the beach nourishment lengths was addressed in the initial alternative analysis.

14 Environmental Consequences - Mitigative Measures

The proposed project will immediately benefit the environment by providing shore line protection benefits and land loss prevention. A beach will be maintained which will provide a diverse habitat for wildlife and benthic populations, enhance aesthetic beauty and add to recreational enjoyment.

Temporary degradation of water quality will occur at both the dredging and the nourishment sites due to the re-suspension of silty material. A temporary reduction of benthic populations in the borrow and beach fill areas will likely occur as well as a corresponding decline in photosynthesis.

During dredging and filling operations, motile members of the invertebrate and fish communities can be expected to avoid the area. Re-colonization of disturbed areas of benthic organisms can be expected to occur once dredging and beach nourishment operations are completed.

Even though sea turtle nesting habitat does not currently exist in the proposed nourishment project zone, turtle nesting activity could be expected to occur after the beach has been nourished. The proposed project will provide more than five miles of beach habitat suitable for turtle nesting. All construction activities will be restricted during the active turtle nesting season.

15 Alternatives To Proposed Action.

Alternatives to the proposed project were identified and discussed in detail in the FEIS and Final Detailed Project Report, Folly Beach, August 1987.

Conclusion /

The proposed action has been thoroughly assessed and coordinated and will not significantly affect the environment, therefore, the Corps of Engineers issues a Finding of No Significant Impact (FONSI).

404(b) EVALUATION FOR THE SHORELINE PROTECTION  
OF FOLLY BEACH, SOUTH CAROLINA

1. Project Description.

a. Description of the proposed discharge of dredged or fill materials.

(1) General: This 404(b) Evaluation addresses an extension and modifications to the authorized shoreline protection project at Folly Beach, South Carolina. A final Environmental Impact Statement (including a 404(b) evaluation) for Beach Erosion Control and Hurricane Protection for Folly Beach, South Carolina was filed with CEQ on July 11, 1980, coordinated with other agencies and circulated for public review and comment.

(2) General characteristics of material: Clean sand from nearby shoals.

(3) Quantity of material proposed for discharge: Initial beach nourishment operations would require 2.5 million cubic yards. Renourishment would require replacement of 1.7 million cubic yards of fill at 8-year intervals.

(4) Source of material: Sandy shoals in the lower Folly River (see Figure 1).

b. Description of the proposed disposal site for dredged or fill materials.

(1) Location: The ocean shoreline along Folly Island, South Carolina. Total project length would be 28,200 feet or 5.34 miles extending from Station 107+00 South to Station 175+00 North.

(2) Type of disposal site: Undiked nourishment area on the above-mentioned beach. This is not a "disposal" site in the usual sense because the primary purpose is to build up an eroding beach, rather than to dispose of unwanted material.

(3) Method of discharge: Hydraulic pipeline.

(4) When will disposal occur: Scheduling will occur after project authorization.

(5) Projected life of disposal site: Not applicable.  
(See b(2) above).

(6) Bathymetry: Not applicable.

2. Physical Effects (40 CFR 230.4-1(a)).

a. Potential destruction of wetlands - effects on 40 CFR 230.4-1 (a)(1)(i-vi): The intertidal nourishment area would not be considered wetlands under the definition given in 33 CFR 323.2. The area could possibly be considered "wetlands" as defined in Executive Order 11990. In any case, the nourishment area cannot be considered "highly productive" or said to "perform important functions" as described in 40 CFR 230.4-1(a)(1).

- (1) Food chain production: Not significant.
- (2) General habitat: Not significant.
- (3) Nesting, spawning, rearing and resting sites for aquatic or land species: Not significant for the area affected.
- (4) Those set aside for aquatic environment study or sanctuaries or refuges: Not applicable.
- (5) Natural drainage characteristics: Not significant.
- (6) Sedimentation patterns: Not significant.
- (7) Salinity distribution: Not significant.
- (8) Flushing characteristics: Not significant.
- (9) Current patterns: Not significant, except that existing currents and waves erode the beach severely.
- (10) Wave action, erosion or storm damage protection: Highly eroded beach would be restored. Renourishment would be required at 8-year intervals to maintain the beach as erosion continues.
- (11) Storage areas for storm and flood waters: Not applicable.
- (12) Prime natural recharge areas: Not applicable.

b. Impact on water column (40 CFR 230.4-1(a)(2)). Because of the nature of the nourishment area, the clean nature of the material to be dredged and its large particle size, impacts on the water column are not significant.

- (1) Reduction in light transmission: Temporary, not significant.
- (2) Aesthetic values: Temporary, not significant.
- (3) Direct destructive effects on nektonic and planktonic populations: Temporary, not significant.

c. Covering of benthic communities (40 CFR 230.4-1(a)(3)).  
(1) Actual covering of benthic communities: The beach benthic community consists of many individuals of relatively few species. Many inhabitants are relatively immobile and would experience suffocation and mortality from beach fill. Initial losses could be large, but recovery would be rapid due to recruitment from adjacent areas. Long term effects would be minor.  
(2) Changes in community structure or function: Not significant (see c(1) above).

d. Other effects (40 CFR 230.4-1(a)).

(1) Changes in bottom geometry and substrate composition: Not significant, except for improvement to existing beach.  
(2) Water circulation: Not significant.  
(3) Salinity gradients: Not significant.  
(4) Exchange of constituents between sediments and overlying water with alterations of biological communities: Not significant.

3. Chemical-Biological Interactive Effects (40 CFR 230.4-1(b)).

a. Does the material meet the exclusion criteria? Yes. The material is predominantly sand and shell with particle sizes larger than silt. The material would be dredged only from sandy shoals in the lower Folly River and would be compatible with native beach sand upon which it would be deposited as nourishment. Both exclusions (b)(1)(i) and (b)(1)(ii) are met.

b. Water column effects of chemical constituents (40 CFR 230.4-1(b)(2)): Not applicable.

c. Effects of chemical constituents on benthos (40 CFR 230.4-1(b)(3)): Not applicable.

4. Description of Site Comparison (40 CFR 230.4-1(c)).

a. Total sediment analysis (40 CFR 230.4-1(c)(1)): Not required (see 3.a above).

b. Biological community structure analysis (40 CFR 230.4-1(c)(2)) Not required (see 3.a above).

5. Review Applicable Water Quality Standards.

a. Compare constituent concentrations: Not applicable (see 3.a).

b. Consider mixing zone: Not applicable.

c. Based on a and b above will disposal operation be in conformance with applicable standards? Yes.

6. Selection of Disposal Sites (40 CFR 230.5) for Dredged or Fill Material.

a. Need for the proposed activity: The beach has experienced severe shoreline erosion resulting in significant loss of recreational beach and threat of loss to oceanfront property.

b. Alternatives considered: All nonstructural plans considered were either inadequate or inappropriate for meeting project objectives, or had already been implemented. Of all structural plans considered, the only alternatives which sufficiently addressed the planning objectives were beach development and beach plus dune development. The selected plan is the smallest of 9 such beach or beach and dune plans considered. Hence, its requirements for borrow material and beach fill are the lowest capable of meeting the project objectives. Borrow sites would be in areas least subject to environmental degradation and the material is clean and compatible with native beach sand.

c. Objectives to be considered in discharge determination (40 CFR 230.5(a)):

(1) Impacts on chemical, physical, and biological integrity of aquatic ecosystem (40 CFR 230.5(a)(1)): Not significant.

(2) Impact on food chain: Not significant.

(3) Impact on diversity of plant and animal species: Not significant.

(4) Impact on movement into and out of feeding, spawning, breeding and nursery areas: Not significant.

(5) Impact on wetland areas having significant functions of water quality maintenance: Not applicable or not significant.

(6) Impact on areas that serve to retain natural high waters or flood waters: Not applicable.

(7) Methods to minimize turbidity: The borrow area of clean, large particles would be utilized to minimize turbidity.

(8) Methods to minimize degradation of aesthetic, recreational and economic values: The project has as its primary purposes shoreline protection and the improvement of recreational and economic features. Aesthetic enhancement would also result from project construction.

(9) Threatened and endangered species: None adversely affected. Although loggerhead sea turtle nesting habitat does not currently exist in the proposed nourishment project zone, turtle nesting activity could be expected to occur after the beach has been nourished. The proposed project will provide more than five miles of beach habitat suitable for turtle nesting. In order to avoid potential conflicts with turtle nesting, all work will be performed between October 15 and May 15 to minimize impacts to sea turtles, fish, shellfish and infauna.

(10) Investigate other measures that void degradation of aesthetic, recreational, and economic values of navigable waters: Not applicable (see 6.b and 6.c(8)).

d. Impacts on water uses as proposed disposal site (40 CFR 230.5(b)(1-10)):

(1) Municipal water supply intakes: Not applicable.  
(2) Shellfish: Not significant.  
(3) Fisheries: Not significant.  
(4) Wildlife: Not significant.  
(5) Recreation activities: Recreational activities would be greatly improved.

(6) Threatened and endangered species: None adversely affected (see 6.c(9)).

(7) Benthic life: Not significant (see 2.c(1)).

(8) Wetlands: Not applicable/not significant.

(9) Submersed vegetation: Not applicable.

(10) Size of disposal site: This project plan was chosen over others that would require more material placed over a larger area.

(11) Coastal Zone Management programs (40 CFR 230.3(e)): The proposed action is consistent with the South Carolina CZM program.

e. Considerations to minimize harmful effects (40 CFR 230.5(c)(1-7)):

(1) Water quality criteria: No legally applicable criteria would be exceeded.

(2) Investigate alternatives to open water disposal: Not applicable.

(3) Investigate physical characteristics of alternative disposal sites: Not applicable.

(4) Ocean dumping: Not applicable.

(5) Where possible, investigate covering contaminated dredged material with cleaner material: Not applicable. Material is clean.

(6) Investigate methods to minimize effect of runoff from confined areas on the aquatic environment: Not applicable.

(7) Coordinate potential monitoring activities at disposal site with EPA: Not applicable. No monitoring would be required as material is clean sand and biotic impacts would be minor.

7. Statement as to contamination of fill material if from a land source (40 CFR 230.5d): Not applicable.

8. Determine mixing zone: Not applicable.

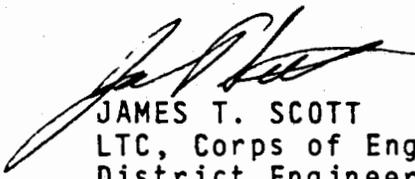
9. Conclusions and determinations:

a. Feasible alternatives to the proposed discharge have been considered and none that are practicable will have less adverse impact on the aquatic and semi-aquatic ecosystem.

b. There are no unacceptable environmental impacts on the aquatic and semi-aquatic ecosystem as a result of the discharge.

c. The discharge of the dredged (or fill) material will be accomplished under conditions which will minimize, to the extent practicable, adverse environmental effects on the aquatic and semi-aquatic ecosystem.

10. Findings: Based on the above evaluation and determinations, the proposed discharge site for the Folly Beach Project has been specified through the application of the Section 404(b) Guidelines.

  
JAMES T. SCOTT  
LTC, Corps of Engineers  
District Engineer

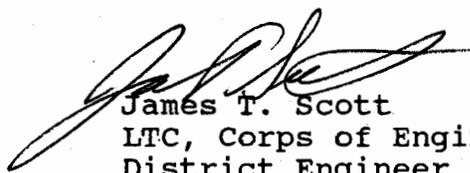
FINDING OF NO SIGNIFICANT IMPACT  
SHORELINE PROTECTION EXTENSION  
FOLLY BEACH, SOUTH CAROLINA

The proposed Folly Beach shoreline protection extension project has been thoroughly assessed and coordinated with local, state and federal agencies. Based upon the attached environmental assessment, 404(B) evaluation, and environmental coordination, I conclude that the environmental effects of the proposed shoreline protection extension and periodic nourishment are not significant, and that the preparation of an Environmental Impact Statement is not warranted. Specific factors considered in making the determination include the following:

- An EIS was prepared and filed with CEQ in 1980 for the base nourishment project at Folly Beach. This NEPA document discusses the need, alternatives, and selected plan in detail.
- Water quality impacts would be temporary and not significant.
- Cultural resources would not be affected.
- No endangered species would be adversely affected. Conversely, over five miles of loggerhead sea turtle habitat would be created and maintained.
- Construction and renourishment activities would not significantly affect fish and wildlife.
- No significant land use changes would occur.

APR 25 1991

          
Date

  
James T. Scott  
LTC, Corps of Engineers  
District Engineer