(3)

FINAL

ENVIRONMENTAL IMPACT STATEMENT

MURRELLS INLET

NAVIGATION PROJECT

GEORGETOWN COUNTY, SOUTH CAROLINA

"Original contains color plates: All DTIC reproductions will be in black and white"

Prepared by

U. S. ARMY ENGINEER DISTRICT, CHARLESTON, SOUTH CAROLINA

November 1976

-a-

SUMMARY

Murrells Inlet Navigation Project, Georgetown County, South Carolina

( ) Draft (X) Final Environmental Statement

Responsible Office: U. S. Army Engineer District
P. O. Box 919
Charleston, South Carolina 29402
Telephone: 803-577-4171, Ext. 229

1. Name of Action: (X) Administrative ( ) Legislative

This final environmental impact Statement presents

2. Description of Action: The recommended plan of improvement ~~consists~~ consisting of the following: dredging an entrance channel, 300 feet wide and 10 feet deep through the offshore bar, a distance of approximately 3,000 feet; dredging an inner channel, 200 feet wide and 10 feet deep for a distance of 1,850 feet then, 90 feet wide and 8 feet deep to the major berthing area at old Army crash boat dock, a distance of 13,590 feet where it would terminate in a turning basin 300 feet long and 150 feet wide; dredging a deposition basin 18 feet deep adjacent to the weir section of the north jetty; constructing a north jetty 3,455 feet long with a low weir section for sand bypassing; constructing a south jetty 3,330 feet long; constructing a fishing walkway on top of the south jetty; and constructing sand dikes on both sides of the inlet to tie the jetties to the existing dune line. Additional keywords: Army Corps of Engineers, South Carolina, END

3. a. Environmental Impacts: Short-term increase in turbidity; alteration of existing vegetation in upland disposal area; temporary frightening of birds and mammals in the area; destruction of some benthic organisms by dredge cutterhead; smothering of invertebrates under jetty stone and in beach disposal areas; possible temporary increase in local mosquito population; improvement of navigation with associated benefits to local economy, charter and commercial fishing industries, and recreational boaters; and increase in recreational opportunities as a result of the fishing walkway.

b. Adverse Environmental Effects: Temporary increase in turbidity; alteration of existing vegetation in upland disposal areas; temporary frightening of birds and mammals in the area; destruction of some benthic organisms by dredge cutterhead; smothering of invertebrates under jetty stone and in beach disposal area; possible displacement of wildlife species; and possible increase in local mosquito population.

4. Alternatives. Alternatives to the proposed action include no action; channel improvement without structural control; and modified structural controls.

5. Comments received from:

U. S. Department of Interior
U. S. Environmental Protection Agency

Comments received from (cont'd)

U. S. Department of Commerce
Forest Service, USDA
U. S. Coast Guard
Department of Health, Education, and Welfare
Soil Conservation Service, USDA
Federal Power Commission
Department of Housing and Urban Development
S. C. Department of Parks, Recreation, and Tourism
S. C. Department of Archives and History
S. C. Department of Health and Environmental Control (Bureau of Wastewater and Stream Quality Control)
S. C. Department of Health and Environmental Control (Division of Vector Control)
G. C. Merchant, Jr. (Litchfield Beaches Property Owner's Association)
Dr. and Mrs. C. R. May, III
Thomas L. Dulin, M.D.
Mrs. Josephine H. Bostick
Mrs. Samuel F. Ervin, Jr.
Lois A. and James D. McArthur
Mrs. James Judd Green
Henry B. Powell
J. H. Gasque
Mrs. J. M. Carmichael
William S. Carmichael
W. Willson Powell
Nicholas H. Beasley
P. I. Bostick, Jr.
Betty G. Carmichael
J. M. Carmichael, Jr.
Miss Willouise Carmichael
John A. Stedman
Geoffrey I. Scott
Mrs. Anne B. Powell
Frederick J. Cole
David M. Michaux
Walter I. Guy
Catherine W. Crumbley
J. L. Brown
John G. Conway
C. H. Holland
T. M. West, Sr.
L. C. McArthur, Jr.
G. E. Shopbell
Howard Walters
Mrs. Jollaine Dulin

Comments received from (cont'd)

H. B. Risher
J. Clyde Simmons
Mrs. Leroy Dulin
Mrs. W. Ellerbe Rogers
Mrs. Paul Ingle
R. W. Doepner, Jr.
John O. Gasque, Jr. and
John O. Gasque, III
Jord H. Jordan
Frank R. Thies, Jr.
E. Craig Wall, Jr.
Mrs. W. L. Kinney
B. P. McArthur
J. A. McArthur
T. J. Perritt
William H. Smith
John W. Williams
Mrs. W. Z. Betts
Mrs. D. M. Campbell
Mr. & Mrs. Warren H. Eaddy
Mrs. James D. McArthur, Jr.
James D. McArthur, Jr.
Mr. & Mrs. Kenneth C. Hanson, Sr.
Mrs. A. T. Quartz
Mrs. M. E. Teague
Mary P. McArthur
Mr. & Mrs. J. F. McBride, Jr.
Mr. & Mrs. J. F. McBride, III
Gladys M. Sachs
Rose M. Roseberry
I. N. Livingston
J. Givens Young
Jack S. Tyler
Herman W. Martin (Murrells Inlet Fishermen's and Merchants Association)
Miss Eleanor McCall
Mrs. Obbie Carter

6. Draft statement to CEQ 30 October 1975.

Final statement to CEQ _____.

Final
Environmental Statement
Murrells Inlet Navigation Project
Georgetown County, South Carolina

Table of Contents

List of Tables

List of Plates

List of Plates (cont'd)

List of Appendices

1.0. Project Description.

1.01 Project authorization. The Murrells Inlet navigation project was authorized by the Congress of the United States on 18 November 1971 under Section 201 of Public Law 298, 89th Congress (House Document 92-137, 92nd Congress, 1st Session).

1.02 Project purpose. The purpose of this project is to provide safe navigation for existing and prospective vessel traffic by establishing and maintaining a safe navigation channel from the 12-foot contour in the open ocean to the village of Murrells Inlet, and constructing a turning basin and jetties, (See Plate 1). The benefit-to-cost ratio of the proposed project is 1.4:1. A summary of project economic data is presented in Appendix A.

1.03 Description of the proposed plan of improvement.

1.03.01 General. The proposed plan (Plate 1) provides for the construction of a north jetty with a low weir section, south jetty, sand dikes, littoral drift deposition basin, entrance, inner and auxiliary channels, and recreation facilities (parking area, comfort station and fishing walkway on south jetty). The north and south jetties, sand dikes, deposition basin, and entrance channel are shown on Plate 2. Inner channel alignment is shown on Plate 3. The proposed jetty alignment is based on preliminary model testing at the U. S. Army, Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi. Further testing of this plan is presently underway and if modifications are found to be necessary, they are planned to be made in the contract plans prior to approval.

1.03.02 North jetty. The proposed jetty would be constructed entirely of quarrystone from the shoreward end of an existing dune line at elevation 9.0 feet mean low water (mlw) to the -10.0-foot mlw ocean contour as shown on Plate 2. Total length of the north jetty would be 3,455 feet. Seaward of the weir section, the jetty would consist of a head section and two trunk sections. The jetty head consists of the outer 150 feet of the jetty; this section would have two armor layers of 6-10 ton stones, a maximum crest width of 18 feet and side slopes of one vertical on two horizontal. The jetty trunk from the head to the -6 foot contour would have two armor layers of 4-7 ton stones, a maximum crest width of 15 feet and side slopes of one vertical on two horizontal. The jetty trunk from the -6.0 foot contour to the weir would have a single armor layer of 4-7 ton stones, a maximum crest width of 15 feet and side slopes of one vertical on two horizontal. The weir section would be 1,315 feet long and would allow the passage of littoral drift traveling essentially between the shoreline and the -4.0-foot ocean contour.

The weir section would have a single armor layer of 0.56 to 0.94 ton stones, a maximum crest width of 12 feet and side slopes of one vertical on two horizontal. The shoreward portion of the jetty trunk would have a single armor layer of 1-2 ton stones, a maximum crest width of 15 feet and side slopes of one vertical on two horizontal.

1.03.03 South jetty. The proposed jetty would be constructed from a new sand dike (terminating at the -2-foot contour) to the --10-foot ocean contour. The jetty would be constructed entirely of quarrystone for a distance of 3,330 feet. The top elevation of the jetty would be 9.0 feet mlw. The jetty would consist of three sections: a head section and two trunk sections. The crest widths, armor stone sizes and side slopes for these south jetty sections are the same as described for the north jetty on the ocean side of the weir.

1.03.04 Sand dikes. Sand dikes would be constructed from the shoreward ends of the stone jetties to the existing dune line at +10 feet elevation. The sand dikes would connect the jetties to the existing high land. The south dike would extend from an existing dune line to -2-foot ocean contour, a length of about 2,850 feet. The north dike would consist of strengthening (by widening) an existing sand dune for a distance of 500 feet. The dikes would have a crest width of 100 feet and side slopes of 1 vertical on 10 horizontal for north dike and 1 vertical on 25 horizontal for south dike. The dikes would be constructed of hydraulically placed, granular fill dredged from the proposed channels and deposition basin and placed by the discharge line of a dredge. Upon completion of construction, the sand dikes would be planted with sea oats, wiregrass, or other salt-tolerant plant species to aid in erosion control. Profiles and typical sections of the jetties and sand dikes are shown on Plates 4 and 5.

1.03.05 Deposition basin. Following the construction of the jetties, a deposition basin would be dredged with a pipeline dredge between the south jetty and northern limit of the entrance channel to trap littoral material moving southward over the weir section. The basin would be dredged to a depth of -18 feet and would have a capacity of 600,000 cubic yards. The side of the basin adjacent to the weir would be 1,300 feet long; the other dimensions are commensurate with the required basin capacity. The capacity of the deposition basin would be large enough to hold a three year amount of the estimated southward littoral drift of 200,000 cubic yards per year.

1.03.06 Entrance channel. The entrance channel would extend from the -10-foot ocean contour to a point within the jetties, a length of 3,000 feet. The entrance channel would be 300 feet wide and 10 feet deep. An allowable overdepth of 2 feet would be permitted to compensate for dredging inaccuracies. Initially, approximately 320,000 cubic yards of material would be removed from the entrance channel. Side slopes of 1 vertical on 4 horizontal are expected initially after the box-cut dredging of the channel. Due to the wave action in the entrance channel, the ultimate side slope would probably be 1 vertical

on 10 horizontal. The distance between the edge of the channel and the jetty toe is sufficient to allow the ultimate side slope of 1 vertical on 10 horizontal.

1.03.07 Inner channel. The inner channel (consisting of Inner Channel A and Inner Channel B) would extend from the entrance channel through Main Creek to the old Army crash boat dock, a length of 15,440 feet, where it will terminate with a turning basin 300 feet long and 150 feet wide. Inner Channel A starting at the entrance channel and extending 1,850 feet would be 200 feet wide and would have a bottom elevation of -10 feet mlw. Inner Channel B would be 13,590 feet long, 90 feet wide and would have a bottom elevation of -8 feet mlw. An allowable overdepth of 2 feet would be permitted to compensate for dredging inaccuracies. Side slopes of 1 vertical on 4 horizontal are expected after the box-cut dredging of the channel. Since there would be little or no wave action in the inner channel, it is believed that this slope would be stable and easily maintained. Approximately 200,000 cubic yards would be removed from this section during initial dredging.

1.03.08 Auxiliary channel. The auxiliary channel would extend from the entrance channel to the -10-foot contour at the mouth of Oaks Creek, a length of 670 feet. The auxiliary channel would be 200 feet wide and 10 feet deep. An allowable overdepth of 2 feet would be permitted to compensate for dredging inaccuracies. Approximately 64,000 cubic yards would be dredged initially; there would be no annual maintenance. This channel was recommended by the Waterways Experiment Station to allow better tidal flow into and out of Oaks Creek.

1.03.09 Recreation facilities. The main recreational feature in the authorized project is an 8-foot wide fishing walkway of asphaltic concrete which would be located on the crest of the south jetty. The walkway would extend from the sand dike to the jetty head, for a length of about 3,330 feet. Access to the walkway would be accomplished by the use of existing developed roads in the park which end at a parking area approximately one mile from the walkway. From the parking lot, access would be by foot traffic only along the beach in accordance with the current Master Plan for Huntington Beach State Park prepared by the South Carolina Department of Parks, Recreation, and Tourism. A parking area for 100 vehicles would be located adjacent to the existing parking area in Huntington Beach State Park. A comfort station would also be provided adjacent to the parking lot. Recreation facilities are shown on Plate 6.

1.04 Proposed dredged materials quantities and placement plan. The initial amount of material to be dredged from the various reaches is as follows:

	Cubic yards
Entrance channel	320,000
Auxiliary channel	64,000
Inner Channel A	177,000
Inner Channel B and turning basin	23,000
Deposition basin	600,000
Total dredging	1,184,000

1.04.01 Entrance channel. Initial dredging quantities for the entrance channel are estimated to be 320,000 cubic yards. This material would be used to construct the sand dikes, and one-half will be used for beach nourishment.

1.04.02 Inner channel. The initial amount of dredging required for construction of the inner channel and turning basin is estimated to be about 200,000 cubic yards. (177,000 cubic yards from Inner Channel A and 23,000 cubic yards from Inner Channel B.) Most of this material (about 194,000 cubic yards) is suitable for beach nourishment and would be pumped by pipeline dredge to nearby Garden City Beach. The remaining 6,000 cubic yards is mostly fine sand with 36 percent silt or clay and is not considered suitable for beach nourishment. This unsuitable material will be dredged from Inner Channel B and pumped by pipeline dredge to a nearby 5-acre diked upland disposal area (See Plate 1).

1.04.03 Deposition basin. The deposition basin would be located between the jetty weir and navigation channels to intercept and hold materials crossing the weir. Initial construction would require the removal of 600,000 cubic yards of sand of which approximately one-fourth would be used to construct the sand dikes and the remainder would be used for beach nourishment.

1.04.04 Auxiliary channel. Initial dredging quantities for the auxiliary channel are estimated to be 64,000 cubic yards of sand and shell. This material would be used for sand dike construction.

1.05 Diked disposal area. As discussed above, about 6,000 cubic yards of material would be placed in a 5-acre diked disposal area during initial construction and approximately 1,000 cubic yards a year for maintenance during the 50-year life of the project. This upland disposal area will be provided by Georgetown County, the project sponsor.

1.06 Operation and maintenance

1.06.01 Dredging. The most significant aspect of operation and maintenance for this project is maintenance dredging that would be accomplished about every three years. Such dredging would average about 203,000 cubic yards of material annually at a cost of about $335,000 including the cost for mobilization and demobilization. These annual quantities include sand bypassing of 200,000 cubic yards and inner channel maintenance dredging of 3,000 cubic yards. Because of the flow restriction created by the jetties, the entrance channel would have sufficient tidal currents to be self-maintained and, therefore, no maintenance dredging would be needed for that channel. Disposal material

from the inner channel would be pumped by pipeline dredge to the same general area as for the initial construction. About 2,000 cubic yards would be used for beach nourishment and 1,000 cubic yards would be pumped to the upland disposal area used for initial construction. The littoral drift that has passed over the jetty-weir and into the deposition basin will be used to stabilize the adjacent shoreline. Sand bypassing will be done by pipeline dredge with the sand being used to nourish the adjacent shoreline downdrift of the inlet in Huntington Beach State Park, or upcoast if required.

1.06.02 Jetties. Included under this project feature are the two jetties and sand dikes. No major rehabilitation of these structures should be required since toe protection will be provided for the jetties where scour is most likely to occur. As scour occurs, this apron of toe protection stone drapes the sand slope thereby holding foundation sands in place, preventing settlement of the rubble structure. It is estimated that jetty maintenance should not exceed an average of one percent of the construction cost each year.

1.06.03 Recreational facilities. Maintenance of the walkway to be constructed on the south jetty is expected to be relatively high since it has been estimated that the pavement would have to be replaced about every 25 years due to storm waves breaking on the jetty which may cause some shifting of the stones under the asphalt pavement, thereby breaking up the pavement. It was determined that maintenance of the comfort station would be less if it were located in the vicinity of an existing parking area instead of at the jetty since there would be better access for maintaining the facility and vandalism would be reduced. The South Carolina Department of Parks, Recreation, and Tourism will be responsible for maintaining all the recreational facilities including the walkway, the comfort station, and a parking area for walkway users.

1.07 Special studies. Under the aforementioned authorization, the following studies were conducted:

1.07.01 Environmental studies. Environmental studies were accomplished under a contract with the South Carolina Wildlife and Marine Resources Department. The study was designed to:

a. Provide an estimate of the biological productivity of the area with a view to preventing or minimizing any adverse project effects on biological systems.

b. Provide a basis for an assessment of changes in biological communities during and following construction of this and other similar projects.

c. Provide the basic information needed for the preparation of this environmental impact statement.

1.07.02 Model study. A physical model of Murrells Inlet and estuary was constructed at the Waterways Experiment Station (WES) in Vicksburg, Mississippi to examine the effects of currents and wave conditions on different arrangements of project appurtenances under simulated prototype conditions. WES presented seven jetty alignments for preliminary testing using surface current photographs taken every hour (prototype) for one tidal cycle. From the seven alignments presented, Charleston District selected five for preliminary testing. A brief description of these plans and the results of the preliminary testing follows:

a. Plan 1. Same as project plan presented in survey report with the following change: deposition basin is larger and a dredged channel into the basin is provided. This plan blocks flow into and out of Oaks Creek. As a result, flow into and out of Oaks Creek is very circuitous and could cause scour at the south jetty and sand dike. Surface currents are also strong toward the left side of entrance channel and could cause migration of the channel.

b. Plan 1A. This is a modification of Plan 1; a 300-foot connecting channel between Oaks Creek and the entrance channel was added to help flow into and out of Oaks Creek. Photographs show that this channel does help the Oaks Creek flow. A comparison of hour 2 for Plans 1 and 1A shows that the Oaks Creek auxiliary channel lessens the possibility of scour at the south sand dike.

c. Plan 1B. This is a modification of Plan 1A, which reduces the width of the auxiliary channel into Oaks Creek from 300 feet to 200 feet, and extends the south jetty.

d. Plan 2. This is the same as Plan 1 without the low weir section on the north jetty. Photographs show that Oaks Creek flow is still very difficult. Flow impinges on left side of channel. Velocities past end of jetties are lower at ebb with this plan than with Plan 1 which may cause a shoal. Hour 5 photograph shows eddy currents between Oaks Creek and Woodland Creek; this would indicate the start of new shoal. This is not seen on Plans 1 and 1A.

e. Plan 4. Direction of jetties with respect to the coastline is different than Plans 1, 1A and 2. The jetties in Plans 1, 1A and 2 are angled downcoast while, with this plan, the jetties appear more normal to the coastline. The north and south jetty lengths are equal in this plan. Plan 4 also provides a connecting channel to Oaks Creek. Plans 1, 1A and 2 have the north jetty longer than the south jetty. Velocities in the interior channel appeared high which could

cause some problems with small boat navigation. The interior channel could be widened from 90 to 150 feet for some distance from the inlet. This would probably lower velocities. Hour 6 photograph shows a problem with flow around the ends of the jetties; however it is less than in Plans 1, 1A and 2. This plan would probably have less problems with scour at jetty ends. The lessening of scour at the jetty ends could also be accomplished with Plans 1, 1A and 2 by lengthening the jetties.

f. Plan 6. Same as Plan 4 without the low weir section. Flow through the jetties appears to be centered more in this plan than in Plan 4. This is probably due to the absence of the low weir section.

g. Plan 7. Similar jetty alignment as Plans 1, 1A and 2 except with Plan 7 jetties are moved downcoast toward Huntington Beach. This takes better advantage of the existing channel through the inlet. North and south jetties are longer than in Plans 1, 1A and 2. Hour 9 photograph shows flows very close to the south jetty. A connection to Oaks Creek is provided without dredging a special channel. Hour 6 and 7 photographs show flows around south jetty end that could cause scour problems.

1.07.02.1 A review of the photographs by WES showed that Plans 1A and 7 appear to be the best. As discussed earlier, Plan 1A will be modified and the modified plan, designated as Plan 1B, is being tested further. Tests will consist of generating a progressive 15-day tide for eight constituents and comparison of prototype constituents at each tide station to model data; wave tests consisting of 5 and 8-second waves with wave heights of 3 and 6 feet generated from the east, southeast and south; and shoaling tests. The complete results of the model tests are not available for this report. However, Plan 1B is the selected plan pending the outcome of the detailed model testing.

1.07.02.2 Additional testing. During the period immediately following coordination of the draft EIS, model testing activities were confined to minor modification of Plan 1B to Plan 1C and evaluation of testing of Plans 7A and 7B on a comparative feature basis with Plans 1B and 1C. A discussion of additional tests which have occurred since coordination of the draft EIS follows:

a. Plan 1C. This plan was a variation of Plan 1B to provide an increased width of from 200 to 300 feet in the auxiliary channel from Oaks Creek to the entrance channel. This was done in an effort to reduce excessively high ebb velocities in the auxiliary channel during testing of Plan 1B. However, this modification produced only a slight reduction of the ebb velocities.

b. Plans 7A, 7B. Plan 7 was scheduled for testing after Plan 1C. To better evaluate the effects of velocity in the auxiliary channel, Plan 7A and Plan 7B were developed. Plan 7A was constructed with a 200-foot wide auxiliary channel having an invert elevation of -6.0 feet mlw. A 300-foot wide auxiliary channel was proposed for Plan 7B.

c. Plan 1D. As a result of testing and evaluation of Plan 1C and in recognition of the channel depth in the GDM plan, the following major revisions were made to develop Plan 1D:

(1) The jetty spacing was reduced from 900 feet to 600 feet wide to enhance the flushing action by increasing the velocity in the entrance channel.

(2) The proposed entrance channel was reduced in depth from -12 feet mlw to -10 feet mlw in order to increase the ebb velocities so that the probability of channel shoaling would be reduced.

(3) The depth of the proposed auxiliary channel leading to Oaks Creek was increased from -6 feet mlw to -10 feet mlw and the width was established at 200 feet to reduce the high velocities that could cause scouring and navigation hazards to smaller boats.

(4) The width of the initial section (Inner Channel A) of the proposed inner channel was increased from 90 to 200 feet; and, the depth was increased from -8 feet mlw to -10 feet mlw.

d. Surface current photography showed a pronounced tendency for ebb currents in this plan to migrate toward the north causing concern of a threat to the deposition basin and the north jetty.

f. Plan 1E. Plan 1E was developed in an attempt to alleviate concerns about the ebb current that arose during testing of Plan 1D. This scheme extended the north jetty 500 feet landward (parallel to the entrance channel) and moved the deposition basin access channel more seaward. Unfortunately, Plan 1E did not effectively eliminate the potential current migration problem.

g. Plan 1F. Because of undesirable results with the previous configuration, Plan 1F was developed. This scheme eliminated the 500-foot jetty extension; and, was merely the same as Plan 1D but with the areas around the deposition basin and the weir filled to -2 feet mlw. Surface current photographs showed the same pronounced tendency of current migration as did Plan 1D.

h. Plan 1G. This plan was essentially the same as Plan 1D but with a 1,300 foot deflector dike added to extend from the Garden City peninsula around the north side of the deposition basin. Its crest elevation ranged from 9.0 feet mlw starting at the dune line to 4.0 feet mlw at the outer end. Surface current photography showed that the ebb currents were effectively deflected and remained within the dredged channels. This plan is currently the adopted project plan discussed in this EIS. However, the deflector dike will not be constructed unless post-construction studies of currents indicate that the deflector dike is needed to protect the deposition basin.

2.0 Environmental Setting Without the Project.

2.01 General. Murrells Inlet is a shallow coastal inlet located about 19 miles northeast of the city of Georgetown and 13 miles southwest of the City of Myrtle Beach (Plate 1). The inlet is formed by the confluence of numerous tidal streams and is a natural opening through the barrier beach. Murrells Inlet is a comparatively small system of about 3,330 acres and is characterized by sandy ocean beaches, sand and mud flats, intertidal shellfish beds, and a large expanse of tidal marsh intersected by numerous tidal streams. The inlet channel is constantly shifting due to ocean currents and wave action, and the tidal creeks inside the inlet mouth have shoaled due to sand deposition.

2.02 History of Murrells Inlet shoaling problem. The channel leading to the migrating inlet frequently becomes obstructed by a shifting offshore bar and the inlet throat becomes obstructed by the extensive sand shoals attending migration of the inlet. This condition has created an unstable channel without adequate depths to permit unrestricted navigation through the inlet and offshore bar. Channel alignment shifts so rapidly and so often that it is difficult for the U. S. Coast Guard to maintain channel markers in proper position. During periods of low tide or high seas or swell, the bars are

extremely hazardous to navigate. To help alleviate this condition, emergency dredging under the Rivers and Harbor Act of 1945 was performed at Murrells Inlet during the periods July-August 1966; April-May 1967; July-August 1968; and April-May 1973. In May of 1973, the ocean bar was dredged to 8 feet below mean low water and the inner channel to 6 feet below mean low water with a bottom width of 100 feet in both areas. User complaints were received almost immediately after this dredging.

2.02.01 In 1974, the authorized Murrells Inlet Project was modified by P. L.93-251 to direct the Corps of Engineers to perform the emergency dredging operations needed to maintain channel depths sufficient to permit free and safe movement of vessels as an interim measure until the authorized project is constructed. Emergency dredging under this authority has been accomplished during the following periods: May-June, 1974; March-April, 1975; and in September, 1975.

2.02.02 This emergency dredging is accomplished by the only practicable equipment capable of working in such shallow inlets without damage to itself--the Corps-owned sidecaster dredge MERRITT. Moreover, such available equipment is inefficient in obtaining desirable depths, and complaints of inadequate depth are received within a week or two of its departure. Also, from an environmental standpoint, this equipment has been undesirable for dredging interior channels. In short, the emergency dredging is recognized to be an inadequate alternative to stabilizing the inlet channel by jetties.

2.03 Other Federal projects. There are no existing Federal projects in the immediate area. The nearest Federally improved harbor is Georgetown Harbor, South Carolina about 22 miles to the south by highway and Cape Fear River, North Carolina about 66 miles to the north. Little River Inlet, a Federally approved project presently in the preconstruction stage of planning, is located about 34 miles northeast of Murrells Inlet at the North Carolina-South Carolina state line. The Federally maintained Atlantic Intracoastal Waterway project is located a short distance inland from Murrells Inlet.

2.04 Regional physiography and geology. The Murrells Inlet area lies along the eastern margin of the Atlantic Coastal Plain Physiographic Province. This province is underlain by sedimentary deposits varying in geologic age from Cretaceous to Recent. These deposits are thickest near the coast and thin out toward the Fall Line in a northwesterly direction. The eastern margin of the coastal plain is characterized by its Pleistocene Age marine cut terraces. These terraces were formed during the transgression and regressin of the sea during the interglacial and glacial periods.

These terraces extend inland for about 90 miles and range in altitude from sea level to 270 feet above sea level. Seven of these terraces are generally recognized (See Plate 7). The youngest of these, the Pamlico, includes the land from the recent shoreline to an abandoned shoreline 25 feet above sea level. This terrace and recent deposits form the topography in the vicinity of Murrells Inlet. The surface deposits are sands and silts derived from erosion of older sediments.

2.04.01 Site topography. The topography in the vicinity of the inlet is characterized by the recent barrier beaches, northeast trending low islands and ridges and back beach tidal creeks. The north jetty will tie into the southern point of Garden City Beach while the south jetty will tie into the northern most point of Huntington Beach State Park. The south abutment was indicated on the Brookgreen Quadrangle of 1947 to be an island, however, the inlet which separated this abutment from the main part of Huntington Beach has since been filled. There appears to be very rapid erosion and deposition on both sides of Murrells Inlet, with much dredging and filling taking place on the northern abutment. The inlet is separated from the mainland by a wide salt marsh and tidal creek area.

2.04.02 Site geology. The Murrells Inlet area is underlain by sands of the Pamlico of the Pleistocene Epoch. These sands overlie older deposits of similar composition of possible Pliocene Age. These older sands in turn overlie a complex series of interbedded shales, limestones, and sandstones of Paleocene Age. These are believed to be the Black Mingo formation. Other Tertiary period formations which lie between the Pliocene and Paleocene have been removed by erosion. The surface sediments are of recent origin and at the inlet, are composed primarily of fine sands.

2.04.02.1 Paleontology. A shale sample collected during geological investigations contained Ostracoda, Haplacytheridea stuckeyi, Foraminifera, Robulus midwayensis, Siphogenerinoides eleganta, Guttulina problema, Nodosaria affinis, and an abundance of Globigerina sp. The presence of the fossils listed above indicates that this shale sample belongs to the Black Mingo Formation of Paleocene Age. The fine-grained matrix and abundance of Globigerina suggest offshore deposition.

2.05 Soils. The materials forming the beaches in the project area consist chiefly of silica sand, but locally, shell fragments are abundant. On most beaches a thin bed of peaty clay or sand crops out near mean sea level. This layer is commonly covered except immediately after storms and is more resistant to erosion than the beach sands. In Horry County, coquina is exposed at several places along the beach. Soils in the Murrells Inlet area belong to the Capers and Wando-coastal beach associations (Craddock and Ellerbee).

2.05.01 Capers association. Capers soils are deep, poorly drained, nearly level soils on tidal flats and are flooded almost daily

by salt-water tides. These soils have very dark grayish-brown to dark gray silt loam to clay surface layers and gray to greenish-gray silt clay loam to clay subsoils. Soils in this association contain a high percentage of organic material and are not suitable for dry land agriculture.

2.05.02 Wando-coastal beach association. This association contains deep, excessively to well-drained, gently sloping to nearly level soils which have developed in thin beds of sands. These soils occur as a broad, nearly level area between the Waccamaw River and the ocean and as sand dunes and beaches bordering the ocean. Wando soils and coastal beach make up 55 and 35 percent of this association, respectively. The remaining 10 percent is made up of Lakeland, Rutlege, and Capers soils.

2.05.02.1 Wando soils are excessively drained and occupy a long narrow strip of land paralleling the coast just behind the sand dunes along the beaches. They have dark grayish-brown fine sand surface layers and strong brown fine sand subsoils. Coastal beach consists of sands and sand dunes occupying a narrow strip of land bordering the Atlantic Ocean.

2.05.03 Murrells Inlet sediments. Sediment samples collected in Murrells Inlet were predominately sandy with varying percentages of shell except for the uppermost station which contained poorly graded silty sand. Grain size analysis data are presented in Appendix B. The chemical analysis of sediments by the U. S.Army, Corps of Engineers Division Laboratory revealed that mercury levels were high in four of the six samples collected. As shown in Table 1 values from stations MI03, MI05, MI07 and the Huntington Beach (see Plate 9) sample exceeds the limits set by the Environmental Protection Agency for the acceptability of dredged material disposal to the nations waters. The source of this mercury is unknown.

2.05.04 Littoral drift. Breaking waves create a longshore or littoral current. This current is predominately southwestward at Murrells Inlet, and is more visible in the breaker zone than in deeper water. This current or movement carries the beach sand, which is in suspension due to turbulence of the breaking waves, along the shore parallel to the beach. The sand moved in this manner is known as littoral drift. The movement of littoral drift contributes to changes in the inlet as well as the shoreline. As sand enters the inlet, spits are formed causing a contraction of the inlet throat, erosion of the opposite shore, and migration of the inlet. The predominant direction of littoral movement is southerly, therefore, most of the inlet migration has been in that direction. Average annual recession of the shoreline in the near vicinity of Murrells Inlet has been 1.3 feet or approximately 7,000 cubic yards per mile during the 94 year period 1872 to 1966. Shoreline

changes which have occurred during this period are shown in Plate 14. Based on available data, estimates of littoral drift rates for the Murrells Inlet area are as follows:

Southward moving material	186,000 cy/year
Northward moving material	54,000 cy/year
Net (southward) material	132,000 cy/year
Total littoral drift	240,000 cy/year

2.06 Hydrology

2.06.01 Ground water. There are three geologic formations in the area which serve as ground water aquifers, the Tuscaloosa, Black Creek, and Peedee (Cooke, 1936). Most of the well water along the Grand Strand comes from the Black Creek and Peedee formations.

2.06.01.1 The Black Creek formation consists chiefly of dark-gray laminated clay and sand. Water drawn from this formation is soft, highly mineralized, and contains considerable sodium bicarbonate. Many flowing wells in Georgetown and Horry Counties draw their water from this formation.

2.06.01.2 The Peedee formation consists of gray sandy marl interbedded with thin ledges of marlstone. Waters in this formation are soft and contain considerable sodium bicarbonate.

2.06.01.3 The Tuscaloosa formation contains a great deal of sand through which water can circulate freely and as a result is one of the most productive water bearing formations in the Coastal Plain of South Carolina. Water derived from the Tuscaloosa formation is soft and only moderately mineralized.

2.06.02 Surface water. The Murrells Inlet drainage system consists primarily of Oaks Creek and Main Creek, their tributary creeks and associated tidal marsh. Fresh water inflow into the system is negligible and is almost exclusively by surface runoff. Source salinities outside the inlet range from about 31.1 to 31.3°/oo. Salinity ranges in the system are from 29.9 to 31.5°/oo with values from surface to bottom not varying greater than 1°/oo. Circulation in the inlet is accomplished primarily as a result of tidal action. Waters in the inlet are generally less than 16 feet in depth and mixing processes preclude the development of a significant thermocline or halocline.

2.06.02.1 Since there is little upland discharge or freshwater inflow, currents in the inner channel are primarily generated by tides. The mean tide range at Murrells Inlet is 4.5 feet and spring tide range is 5.3 feet (the spring tide is the tide which rises highest

and falls lowest and occurs when the earth, sun, and moon are aligned). Maximum surface currents are about 2.3 feet/second and occur about one hour into the ebb tide. The maximum flood tide current as determined by the model at the Waterways Experiment Station is about 2.0 feet/second.

2.07 Water Quality. Water quality in the study area is considered to be fair to good. Recent water quality data collected and analyzed by the S. C. Marine Resources Center as part of a contract with the U. S. Army Corps of Engineers is presented in Table 2. Since there is no industrial pollution in the area, pollution problems are mainly related to bacterial contamination from improperly treated domestic wastes. This pollution problem appears to be due primarily to improper operation of septic tanks. As a result of this problem, a portion of the upper part of the estuary has been closed to shellfishing by the S. C. Department of Health and Environmental Control. As shown in Plate 8, the closed area starts at the government dock and includes all of Parsonage Creek to its junction with Allston Creek at Weston Flat.

2.08 Climatology. The climate of the area is temperate and is moderated by the nearness of the ocean and the Gulf Stream. Although summers are warm and humid, temperatures of 100° F or higher occur on the average of less than once a year. The mean annual temperature is about 63° F. The frostfree growing season averages about 230 days. The first freeze generally occurs around the first part of December and the last freeze near the end of March. Precipitation is well distributed throughout the year with an average of about 50 inches. Percentage of precipitation by seasons is as follows: 18% winter; 20% spring; 41% summer; and 21% fall. Low pressure areas moving northeast along the coast bring heavy amounts of rain but rarely snow during the winter months.

2.08.01 During the late summer or fall months, hurricanes occasionally reach the South Carolina coast. Available records indicate that from 1700 through the present, over 70 storms and/or hurricanes have struck the South Carolina coast. The highest hurricane surge tide of record at Myrtle Beach was 15.5 feet above mean sea level during hurricane Hazel in 1954. The possibility of such a storm occurring again is about one in 100. Heavy precipitation usually occurs during these storms, i.e., more than eight inches of rainfall associated with the hurricanes of September 1924 and October 1964 were recorded at the Georgetown weather station located about 22 miles southwest of the project.

2.09 Biological resources.

2.09.01 General. For the purposes of this report, biological resources will be separated into distinct assemblages of plants and animals called biotic communities. In general, biotic communities may be identified on the basis of their dominant vegetation or, in the

absence of dominant vegetation, by physiography. Twelve major biotic communities have been determined as being present within 1 or 2 miles of the project. These are:

Coastal fringe communities
- Beach
- Dune
- Maritime forest

Coastal plain communities
- Inland marshes
- Lakes and ponds
- Oak-pine forest

Estuarine communities
- Open water
- Tidal marshes
- Sand and/or mud flats
- Dredged material islands

Other communities
- Urbanized
- Agricultural lands

2.09.01.1 Each of the biotic communities described in the following sections contains a description and/or list of characteristic plants and animals. References used to compile these are as follows:

Plants - Radford et al. 1968; S. C. Wildlife and Marine Resources Department 1975; S. C. Department of Parks, Recreation, and Tourism 1974, Teal and Teal 1969.

Birds - Robins et al. 1966; Pough 1951; S. C. Department of Parks, Recreation, and Tourism 1974.

Mammals - Burt and Grossenheider 1964; Palmer 1954; S. C. Department of Parks, Recreation, and Tourism 1974.

Reptiles and amphibians - Conant 1958; Carr and Goin 1955; S. C. Department of Parks, Recreation, and Tourism 1974.

Fish - Breder 1948; Carr and Goin 1955; American Fisheries Society 1970; Cupka, 1972.

Invertebrates - Morris 1951; Gosner 1971; Miner 1950; S. C. Wildlife and Marine Resources Department 1975.

2.09.02 Coastal fringe communities.

2.09.02.1 Beach. Beach communities in the area are found along Garden City Beach northeast of the inlet and Huntington Beach to

the southwest. The beach community is comprised of a dry berm zone located beyond the high tide line, an intertidal zone that is alternately covered and exposed by tidal action, and a subtidal zone that occurs below the low tide line and extends seaward, merging with the ocean surf. Beaches, in general, are gently-sloping communities that serve as transitional areas between open water and upland terrestrial communities.

2.09.02.1.1 The beach community is a harsh environment characterized by rapid changes in most of its physical environmental parameters. This is particularly true of the upper surface layers. Vascular plants are typically absent from these communities primarily because of instability of the substrata, high salinity, and extreme fluctuation of moisture. Seaweeds, and seeds of Caribbean and European plants carried by the Gulf Stream are sometimes tossed up on the beach following the passage of storms. Sediments on the beach are stratified by wind and wave energy regimes according to particle size. Sediment composition consists of coarse to fine grained quartz sands and shells and shell fragments.

2.09.02.1.2 Macroinvertebrates are the predominant faunal organisms inhabiting the beach region and most live beneath the sand surface where salinities and temperatures are most constant. Organisms in these areas are continually subjected to strong wave and current action, the rise and fall of tides, shifting sediments, heavy predation, and wide fluctuations of temperature and salinity. Under such rigorous environmental conditions, the fauna is specialized and highly adapted for survival. A considerable portion of these organisms are filter or deposit feeders and a great diversity occurs in the intertidal zones where there is a concentration of particulate organic matter brought in by the tides or supplied by the decomposition of animals on the beach.

2.09.02.1.3 Relatively few species inhabit sandy beaches, but those present frequently occur in large numbers. Consequently, high energy beaches are far from being biological deserts, and together with the associated fauna they act as extensive food-filtering systems (Riedl and McMahan, 1974). Typical beach inhabitants are beach fleas and ghost crabs in the beach berm; Florida conquinas, mole crabs and various burrowing worms in the beach intertidal zone and blue crabs, horseshoe crabs, sand dollars and numerous clams and gastropod mollusks in the beach subtidal areas. In addition, several species of fish are commonly observed in the surf zone along the beach, many of which are of importance to the sport and commercial fisheries of the state. The Atlantic silverside, bay anchovy, Florida pompano, Gulf Kingfish, striped mullet, rough silverside, striped killifish, striped anchovy, permit, bluefish, red drum, and planehead filefish are the most common. These species are also considered to be part of the open water community discussed in Section 2.09.04.

2.09.02.1.4 The beach zone is also utilized by many species of shorebirds for nesting and feeding. Species commonly observed are the

American oystercatcher, plovers, willet, sandpipers, lesser and greater yellowlegs, gulls, and terns. Atlantic loggerhead sea turtles utilize South Carolina beaches for nesting purposes during the summer months.

2.09.02.1.5 In May, 1975, the S. C. Wildlife Marine Resources Department (SCWMRD) under a contract with the U. S. Army, Corps of Engineers, conducted studies of the macroinvertebrate communities in the project vicinity, including those in the intertidal beach zone. Samples of the intertidal macrofauna on Huntington Beach and Garden City Beach adjacent to the inlet were collected at stations located at high tide, mid-tide and low tide levels along a transect (Plate 9) on each of the two beaches. Analysis of these samples by SCWMRD showed that the existing communities are typical of those found along high energy beaches. A total of 12 species of invertebrates were found in the samples from each of the two beaches studied. The number of individuals present was moderately high, particularly on Huntington Beach. Although fewer animals were collected from Garden City Beach, no particular cause for this was evident. As shown in Table 3, the most abundant organisms collected were the haustoriid amphipods, Nerinides unidentata (a polychaete worm) and wedge shells.

2.09.02.2 Dune. Dunes are located landward and run parallel to beach communities. They are composed of drifting sand and their height and direction of movement is determined by wind direction and intensity. Few species of plants are capable of tolerating the harsh environment of the dune community. As a result, vegetative cover is usually sparse and consists predominantly of salt-tolerant perennial grasses. Typical species include Russian thistle, seabeach orach, bitter panic grass, saltmeadow cordgrass, sea oats, and broomsedges. All of these plants depend on the constant influx of nutrients because leaching in the dune community is very rapid. Likewise, all of the above species derive nutrients from particulate matter attached to the sands and precipitation. As they accumulate sand at their base, the plants increase the vertical height of the dunes and their creeping rhizome systems act as sand binders thus stablizing the dunes. Occasionally interspersed among the dune grasses are scattered individuals of sea rocket, sandspur, seaside croton, beach spurge, evening primrose, seaside elder, beach pea, and purple sandgrass.

2.09.02.2.1 The lack of vegetative cover and an insufficient food supply limits the dune community as important wildlife habitat. Ghost crabs, tiger beetles, dragonflies, song sparrows, savannah sparrows, barn swallows, six-lined racerunners, Eastern glass lizards and Eastern slender glass lizards are characteristic faunal inhabitants. Black skimmers and species of terns occasionally utilize the dune communities for nesting purposes during the spring and summer. One such species is the least tern. Nesting colonies of least terns are located in the dunes about half-way between the north access road and the inlet proper in Huntington Beach State Park and just north of the dunes on the north side of the inlet.

2.09.02.2.2 Least terns are common residents along the South Carolina coast from mid-March to late October (Sprunt and Chamberlain, 1970) and are generally found along the beach and in the ponds and streams of the salt marsh. According to Pough (1951), nesting least

terns do not require an isolated area like other terns and are frequently found on mainland beaches, land fills, and other man-made sites. He also stated that it is the least tern's tolerance of disturbance and ability to adapt to civilization which enables it to thrive in areas where island nesters such as the common tern are declining. Sprunt and Chamberlain report that sea islands, beach resorts, waterways, spoil banks, and even the mainland are colonized by least terns. They also state that "Small colonies are frequently found a few yards from heavily travelled highways." In this regard, the Corps has also observed the recent colonization of a dredged material disposal area in Charleston bordering the Ashley River and the junction of S. C. Highway 61 and U. S. Highway 17, which is a heavily travelled multi-lane thoroughfare.

2.09.02.2.3 Although some concern has been expressed over the effect of the proposed project on nesting least terns, it should be noted that it is currently not listed on the Fish and Wildlife Service's list of Endangered and Threatened Wildlife and Plants. In addition, at this writing, officials of the U. S. Department of Interior's Office of Endangered Species and International Activities have informed us that the least tern commonly found along the Atlantic coast has not been nominated for nor is it being considered for classification as an endangered species.

2.09.02.3 Maritime forest. Maritime forests occur landward of the dune community. In the project area, this community is generally confined to the Huntington Beach State Park area. Trees in the maritime forest are closely spaced and usually dominated by live oak. Many shrub species occur here as well and the undergrowth in many areas is dense and jungle-like. The maritime forest is subject to the shearing effect of wind-borne salt spray on its seaward side. This effect is particularly evident in the trees on the backside of the dunes in the state park but diminishes with increasing distance inland.

2.10.02.3.1 Trees and shrubs found in these habitats, in addition to the dominant live oaks, are red bay, red cedar, cabbage palmetto, holly, loblolly pine, yaupon, turkey oak, laurel oak, water oak, rattle vine, trumpet vine, blueberry, hercules club, and wax myrtle. Herbaceous plants include asters, dog fennel, American beautyberry, panic grass, resurrection fern, cinnamon fern, solidago, and green briar.

2.09.02.3.2 Birds are the most conspicuous faunal inhabitants of the maritime forest. This is particularly true during the spring and fall when numerous migratory species are present. Representative vertebrate species found in these communities are as follows:

Birds

Sharp-shinned hawk	Flicker
Red-shouldered hawk	White-eyed vireo
Mourning dove	Solitary Vireo
Yellow-billed cuckoo	Red-eyed vireo
Ruby-throated hummingbird	Parula warbler
Yellow-bellied sapsucker	Prairie warbler
Red-bellied woodpecker	Palm warbler

Pileated woodpecker
Downy woodpecker
Blue jay
Carolina wren
Mockingbird
Gray catbird
Brown thrasher
Robin
Hermit thrush
Ruby-crowned kinglet
Ovenbird
Yellowthroat
Baltimore oriole
Boat-tailed grackle
Cardinal
Indigo bunting
Rufus-sided towhee
White-throated sparrow
Cedar waxwing
Wood pewee

Mammals

Virginia opossum
Eastern mole
Gray squirrel
Raccoon
Cotton mouse
White-tailed deer
Marsh rabbit

Reptiles and Amphibians

Green anole
Eastern glass lizard
Southeastern five-lined skink
Eastern coachwhip
Rough green snake
Scarlet kingsnake
Southern copperhead
Scarlet snake
Yellow rat snake
Southern toad
Oak toad
Green treefrog
Squirrel treefrog

2.09.03 Coastal plain communities.

2.09.03.1 Inland marshes. Inland marshes occur in low, poorly drained areas and along the shallow margins of ponds. Standing water is present throughout the growing season and vegetational growth is dense and often dominated by emergent herbaceous grasses, rushes, and sedges. Plant species present in these marshes include:

Trees

Smooth alder
Water ash
Sweet bay
Water tupelo
Cottonwood
Black willow

Shrubs

Buttonbush
Bush huckleberry
Swamp rosemallow
American elder
American wisteria

Herbaceous plants

Carex
Marsh heather flower
Dichondra
Waterweed
Fimbristylis
Pickerelweed
Horned rush
Arrowhead
Lizard's tail
Wool-grass

Marsh pennywort	Duckweed
Juncus	Narrow-leaved cattail
Water lily	Swollen bladderwort

2.09.03.1.1 Substrates in the marshes generally consist of soft muck which is rich in partially decomposed organic matter and mixed with mineral soils. Inland marshes serve many of the same ecological functions as tidal marshes and are a source of valuable nutrients and detritus, much of which is either consumed *in situ* by small animals, or is eventually washed into deeper waters where it contributes to the food supply of larger pelagic and benthic animals. These communities are often closely associated with swamp forests, and like these forests are rich in animal life. Characteristic species include:

Birds

American bittern	Marsh hawk
Least bittern	American woodcock
Great blue heron	Common snipe
Common egret	Spotted sandpiper
Green heron	Virginia rail
Black-crowned night heron	Sora
Little blue heron	Greater yellowlegs
Glossy ibis	Lesser yellowlegs
White ibis	Solitary sandpiper
American widgeon	Long-billed marsh wren
Gadwall	Short-billed marsh wren
Green-winged teal	Boat-tailed grackle
Blue-winged teal	Red-winged blackbird
Mallard	Yellowthroat
Black duck	Sharp-tailed sparrow
Pintail	Swamp sparrow
Shoveler	Song sparrow

Reptiles and Amphibians

Eastern mud turtle	Carolina black swamp snake
Yellow-bellied turtle	Rough green snake
Spotted turtle	Eastern cottonmouth
Banded water snake	Canebrake rattlesnake
Eastern garter snake	Southern cricket frog
Eastern ribbon snake	Ornate chorus frog
Eastern kingsnake	Southern chorus frog
Red-bellied water snake	Carpenter frog
Eastern coachwhip	Southern leopard frog
Brown water snake	Bronze frog
Southern ringneck snake	Rainbow snake
Eastern mud snake	

Mammals

Marsh Rabbit	River otter
Rice rat	Raccoon
Muskrat	Mink

2.09.03.2 Lakes and ponds. These biotic communities occur a short distance from Murrells Inlet at several locations. Lakes and ponds occur in low, depressional areas where the water table reaches the surface or where the ground substrate is underlain by impermeable materials. In general, ponds are shallow enough to permit growth of rooted plants over most of their bottoms and may dry up during periods of drought whereas lakes are filled with water throughout the year and have a central deep area that is usually devoid of rooted vegetation.

2.09.03.2.1 Most of the lakes and ponds in the immediate project area are artificial and were created during the construction of residential developments. The pond in Huntington Beach State Park is fed by freshwater streams and was created when the access causeway was built across the salt marsh.

2.09.03.2.2 The vascular flora present in ponds and lakes is generally divided into three zones: Submerged, floating, and emergent. Submerged plants include bladderworts, waterweeds, water-nymph, pondweeds and egeria in fresh water to slightly brackish situations. Floating plants include white waterlily, spatterdock, water shield, duckweeds and alligatorweed. The emergent zone is dominated by rushes, sedges, and grasses previously described in the discussion on inland marshes.

2.09.03.2.3 The presence of water and abundant plant growth in many of the ponds and lakes in the area provides attractive habitat for a variety of fish, waterfowl, and other aquatic and semi-aquatic vertebrate species. Characteristics inhabitants are:

Birds

Pied-billed grebe
American widgeon
Gadwall
Green-winged teal
Blue-winged teal
Mallard
Black duck
Pintail
American coot
Shoveler
Ring-necked duck
Lesser scaup
Bufflehead
Ruddy duck
Hooded merganser
Osprey
Ring-billed gull
Belted kingfisher

Mammals

River otter
Muskrat

Reptiles and Amphibians

American alligator
Common Snapping Turtle
Eastern mud turtle
Brown water snake
Red-bellied water snake
Banded water snake
Eastern mud snake
Rainbow snake
Eastern cottonmouth
Greater Siren
Amphiuma
Southern leopard frog
Bronze frog
Bullfrog

Fish

Bowfin
Chain pickerel
Yellow Bullhead
Channel catfish
Bluegill
Starhead topminnow
Sheepshead minnow
Largemouth bass
Warmouth

2.09.03.3 Oak-pine forest. The oak-pine forest communities occupy the higher sites and are generally found a short distance inland of the inlet. Soils in these areas are excessively well drained and are subject to severe leaching. A thin layer of leaves and pine needles and cones is often intermittently present on the ground surface.

2.09.03.3.1 Live oak, water oak, and loblolly pine are the dominant tree species in these communities. The short tree or shrub region generally is a mixture of turkey oak, overcup oak, scrubby post oak, blackjack oak, and wax myrtle. Other trees present in this association are dogwood, magnolia, black willow, mockernut hickory, yellow poplar, and sweetgum. The understory includes such species as wild black cherry, sassafras, persimmon, various blueberries, laurel cherry, and herbs such as wiregrass, broomsedge, goldenrod, aster, partridge berry, Spanish moss, mistletoe, poison ivy, and catbrier.

2.09.03.3.2 Animal species found in this association include:

Birds

Cooper's hawk
Red-tailed hawk
Turkey vulture
Black vulture
Bobwhite
Mourning dove
Screech owl
Chuck-will's widow
Common flicker
Red-headed woodpecker
Eastern kingbird
Eastern phoebe
Blue jay
Common crow
Fish crow
Carolina chickadee
Brown-headed nuthatch
Mockingbird
Eastern bluebird
Loggerhead shrike
Pine warbler
Yellow-throated warbler
Summer tanager
Rufous-sided towhee

Mammals

Virginia opossum
Least shrew
Eastern Mole
Eastern cottontail
Southern flying squirrel
Raccoon
Eastern gray squirrel
Eastern fox squirrel
Gray fox
Striped skunk
White-tailed deer

Reptiles and Amphibians

Northern fence lizard
Six-lined racerunner
Southeastern five-lined skink
Southeastern crowned snake
Eastern diamondback rattlesnake
Southern toad

Eastern slender glass lizard	Oak toad
Eastern hognose snake	Pine woods treefrog
Eastern coachwhip	Barking treefrog
	Carolina gopher frog

2.09.04 Estuarine communities.

2.09.04.1 Open water. The open water community, as defined here, includes all marine and estuarine waters together with all underlying bottoms below the intertidal zone. The open water biota includes the plankton and nekton inhabiting the water column and the benthos living on or in the substrata.

2.09.04.1.1 The plankton is mainly composed of unicellular algae, larval stages of many fish and invertebrates and the adult stages of several microscopic invertebrates. Adult stage of several macroinvertebrates such as jellyfish (Chrysaora, Cyanea, Stomolophus, Rhopilema,) and comb-jellies (Mnemiopsis) which are carried by current and tides are also an important part of the plankton community.

2.09.04.1.2 Nekton. Fish are the principal nektonic species although some crustaceans such as portunid crabs, amphipods and isopods and some mollusks, such as the squid spend at least a portion of their life as nekton. A number of the fish species including many of importance to the sport and commercial fishery are considered to be estuarine dependent and utilize the coastal estuaries for at least a portion of their life cycle.

2.09.04.1.3 Benthos. The benthic environment includes a number of communities correlated largely with substratum type. Multicellular green, red, and brown algae, and unicellular algae (especially diatoms), are the primary producers within the photic zone of the benthic environment.

2.09.04.1.3.1 The benthic fauna is divided into two groups: epifauna, living on the substratum; and infauna, living within the substratum. Infaunal communities are dominated by a great diversity of burrowing and tube dwelling crustaceans (e.g. amphipods), polychaete worms, and by burrowing bivalve mollusks. Some infaunal invertebrates, especially among the crustaceans, are capable of a high degree of lateral mobility, but the majority are essentially sedentary. The infauna is, with rare exception, comprised of filter and detritus feeding invertebrates.

2.09.04.1.3.2 The epifauna contains a diversity of animal groups associated with a diverse flora. Hard substrata, such as rocks, shell and gravel surfaces, and artificial surfaces, such as pilings, wrecks, and weirs support a rich assortment of attached plants and invertebrates. Typically, these communities contain red, green, and brown algae, barnacles, attached bivalves, anemones, corals, sea fans, bryozoans, tunicates, sponges, and foraminiferans. The communities formed by these attached organisms host a number of both transient and permanent fish

species, and motile invertebrates, including gastropod mollusks, starfish, sea urchins, crabs, and shrimp. Attached epifaunal invertebrates are principally filter and detritus feeders, but some of the more motile organisms are carnivores.

2.09.04.1.3.3 The epifauna and flora of muddy and sandy bottoms tend to be much lower in diversity, and most inhabitants are microscopic. These surfaces are unsuitable for attachment by sessile invertebrates. In addition, sand bottoms such as those found in the inlet are depositional and the continual rain of sediment quickly buries attached animals. Thus, these substrata support diatoms, other unicellular algae, protistans, and attached multicellular algae. Invertebrates primarily include motile deposit feeders, such as polychaete worms, sea cucumbers, and sand dollars. Some fish and crabs also graze on the bottom. Attached organisms are restricted largely to the occasional bit of shell or small rock lying on the surface. The development of oyster reefs on muddy intertidal bottoms, for example, is dependent on the presence of bits of shell or rock for initial larval attachment.

2.09.04.1.3.4 Benthic macroinvertebrate studies. The most extensive study of the benthic macroinvertebrate communities in the project area was recently completed by the South Carolina Wildlife and Marine Resources Department under the previously discussed contract with the Corps of Engineers. Field samples for this study were collected at 18 stations within the Murrells Inlet system (Plate 9) during the period 27-29 May 1975. Sampling equipment utilized included a modified Petersen grab sampler and a modified oyster dredge. Station depths are shown in the following text table. A discussion of the findings of this study is presented in the following paragraphs.

Station	Depth (Feet)	Station	Depth (Feet)
MI01	20	MI10	10
MI02	13	MI11	13
MI03	10	MI12	10
MI04	10	MI13	13
MI05	10	MI14	10
MI06	3	MI15	10
MI07	16	MI16	10
MI08	7	MI17	10
MI09	10	MI18	10

2.09.04.1.3.4.1 Entrance channel. Sediments collected in grab samples from the entrance channel were primarily sand with a small amount of shell. As a result, most of the animals in these samples were motile and infaunal. As shown in Table 4, the fewest number of species (11) and individuals per square meter was found at the entrance of the inlet in an area which was shallow and turbulent. Species diversity (Plate 10) was highest at the most seaward station (MI01) and lowest at the entrance (MI02).

2.09.04.1.3.4.1.1 As might be expected, relatively few species were captured at these stations during the five-minute tows with the modified oyster dredge (Table 5). The sand dollar was the dominant organism captured at stations MI01 and MI02. Only one species, a bryozoan, was collected at station MI03. The brown shrimp was the only species of commercial value collected at any of the entrance channel stations although sampling at other times of the year would no doubt reveal the presence of other motile species such as the blue crab and the white shrimp.

2.09.04.1.3.4.2 Inner channel. The inner channel stations, MI04 through MI10, covered the area from just inside the inlet to the region of the fishing pier adjacent to Captain Dick's Marina at the town of Murrells Inlet. The bottom at stations MI04 and MI05 was well-scoured and the biota of these two stations was sparse. Only six species and 141 individuals (mostly haustoriid amphipods) were present in grab samples from station MI04. At station MI05, five species and 150 individuals, again mostly haustoriid amphipods, were collected. Species diversity at these two stations (Plate 10) was extremely low, with H' values of 0.53 bits/individual at station MI04 and 1.08 bits/individual at MI05. Oyster dredge samples likewise yielded few specimens at any of these stations, and none of those captured were of commercial importance.

2.09.04.1.3.4.2.1 Species diversity (Plate 10), the number of species in both dredge and grab samples (Plate 11), and biomass began to increase at station MI06, and a very "live-bottom" area was encountered at station MI07 (Tables 6,7). Although the waterdepth at this station was 16 feet, the bottom community here was the richest of any area sampled in the inlet. The high standing crop of benthic organisms at this station was mainly attributed to the amount of available shell in the area, which provided substrate for a rich epibenthic community. Sponges, bryozoans, and bivalves were dominant members of this community as indicated by dredge samples. The cross-barred venus clam at an estimated 160 individuals per square meter was the most abundant of the 46 species taken in grab samples at this station. The number of species and diversity (H') fluctuated somewhat from stations MI08 through MI10 (Plates 10,11), but both remained fairly high. Several commercially important species were found at stations MI06 through MI10, including the American oyster, the hard clam, and the stone crab. Although it is not a commercially-exploited species, the edible cross-barred venus clam appeared in large numbers at station MI09 as well as MI07. A few small rock shrimp were also collected in the dredge along this stretch of the inner channel.

2.09.04.1.3.4.3 Adjacent waterways. In addition to stations in the entrance channel and inner channel, a series of stations (MI11 through MI18) were selected in adjacent waterways within the inlet. The first of these stations (MI11) was located in an altered area near a development at the southwestern end of Garden City. The bottom type in this area was black, silty mud, and relatively few animals were present in either dredge or grab samples (Plate 11). With the exception of MI16,

the remaining stations in the adjacent waterways were all relatively "live-bottom" areas (Tables 8,9). Species of commercial significance in these samples included the American oyster, the hard clam, and the stone crab. A few specimens of the brown shrimp, and the blue crab were also present in the samples. As with several stations in the inner channel, the cross-barred venus clam was common to abundant in samples from these stations. The hard clam was particularly well-represented in collections from the Parsonage Creek area (stations M116-M118).

2.09.04.1.3.4.4 Oyster reefs. Intertidal oyster reefs within the S. C. Wildlife and Marine Resources Department's study area totaled approximately 22 acres. This included shoreline reefs along tidal creeks and isolated reefs located in shoal and flat areas. The attached map (Plate 12) shows the location and size of the intertidal oyster reefs within 0.5 miles of the centerline of the proposed channel. Subtidal (below mean low water) oyster reefs are not present to any extent in the Murrells Inlet area, and are limited to small areas immediately adjacent to intertidal reefs and in the headwaters of smaller creeks. No significant subtidal reefs were located within the study area.

2.09.04.1.4 Other animals. The open water community is also untilized by waterfowl and shorebirds particularly during the winter months. Many waterfowl are surface feeders and dabblers, and are commonly found along the shallow water zones where they feed on submerged or emergent vegetation. Other vertebrates (i.e. mammals, reptiles, and amphibians) are poorly represented in the open water community. Many of these are semi-aquatic and, thus, are temporary residents of the community. The following is a list of typical floral and faunal inhabitants, with the exception of benthic macroinvertebrates which are listed in Tables 4 through 9, of communities associated with open water habitats:

Plankton iatoms

Diatoms	Comb-jellies
Dinoflagellates	Cryptophytes
Chlorophytes	Xanthophytes
Jelly fish	Copepods
Arrow worms	

Animals with Planktonic Larval Stages

Fish	Echinoderms
Crabs	Jelly fish
Barnacles	Comb jellies
Mollusks	Copepods
Polychaete worms	

Nekton

Amphipods	Silver perch
Isopods	Star drum
Portunid crabs	Spot

Squid
Alewife
Atlantic menhaden
Gizzard shad
Bay anchovy
Mummichog
Striped killifish
Rainwater killifish
Sheepshead
Little tunny
Spadefish
Toadfish
Whiffs
Pigfish
Tonguefish
Shrimps
Atlantic croaker
Bluefish
Spotted seatrout
Weakfish
Red drum
Striped mullet
Summer flounder
Tidewater silverside
Atlantic silverside
Pinfish
Atlantic needlefish
Naked goby
Crevalle jack
Spanish mackerel
Black drum

Birds
Common loon
Brown pelican
Double-crested cormorant
Osprey
Merganser
Laughing gull
Ring-billed gull
Herring gull
Black skimmer
Royal tern
Least tern
Belted kingfisher

Mammals
Bottle-nosed dolphin

Reptiles and amphibians
Atlantic loggerhead

2.09.04.2 Tidal marsh. Murrells Inlet, as previously mentioned, is a highly saline system with limited freshwater inflow. The vegetation of the attendant wetlands reflects these hydrologic conditions and is generally dominated by emergent, narrow-leaved rushes, sedges, and grasses. The Murrells Inlet system contains approximately 1,700 acres of these tidal marshlands (Plate 13).

2.09.04.2.1 In a 1975 study, the Marine Resources Division of the South Carolina Wildlife and Marine Resources Department under contract to the U. S. Army, Corps of Engineers inventoried the marshland vegetation of the Murrells Inlet area. A discussion of the pertinent aspects of this study is presented in the following paragraphs.

2.09.04.2.2 For the purpose of this study, the tidal marshes were divided into two categories based upon elevation and vegetative composition: (1) high marsh and (2) low marsh. The low marsh is the lowest, topographically, and occurs from the mean low water

mark to approximately the mean high water level, a region which is regularly flooded by lunar tides. A monospecific association characterized by smooth cordgrass represents the low marsh vegetation. In contrast, the high marsh flora is much more diverse than that of the low marsh. A list of plant species observed during the Marine Resources Division's study is presented in Table 10.

2.09.04.2.3 As mentioned above, the Murrells Inlet system contains approximately 1,700 acres of tidal marshland. Of this amount, about 1,520 acres or 90 percent of the total is low marsh acreage dominated by a single plant species, smooth cordgrass. Where it occurs along the tidal creeks, this plant grows vigorously to its maximum height of six feet. However, when found in the high marsh, its form is typically stunted, with plant heights averaging about 0.5 to 1.0 foot.

2.09.04.2.4 High marsh covers about 170 acres or 10 percent of the tidal marshland acreage. In areas where the high marsh is fringed with low marsh, marginal bands of wiregrass and sea ox-eye are usually present. Sea oats, typically associated with sand dunes are quite common in these marshes. These areas also have a dense ground cover of dropseed, sea lavender, fimbristylis, seaside goldenrod, sedge, and cactus. Other plants commonly observed are glasswort, water-hyssop, croton, needlerush, high tide bush, and wild ryegrass.

2.09.04.2.5 In areas where the high marsh is fringed by sand and/or mud flats, marginal vegetation consists of stunted growths of glasswort, smooth cordgrass, and sea lavender. Proceeding toward the highland from these flats, the vegetative zone is characterized by sea ox-eye, spike grass, and sea lavender. Fimbristylis and high tide bush are found in this zone near the edge of the maritime forest. Needlerush is also common and occurs as either isolated clumps among the other high marsh plants or marginal bands adjacent to the upland.

2.09.04.2.6 Marsh communities have been well documented in terms of productivity, animal diversity, and importance to the marine system (and to man). The basis of the importance of these marsh communities involves the basic high productivity of the marsh itself and its function of trapping nutrients. The detritus deposited each year when the Spartina dies and decomposes provides a food base upon which the estuarine organisms thrive. The dense plant growth in the marsh provides excellent cover for many species of birds, aquatic and semi-aquatic mammals, reptiles and amphibians. Substrates in these communities are inhabited by a myriad of foraminiferans, nematodes, annelids, arthropods, and mollusks. The marsh commmunity provides a nursery ground for the principal commercial marine organisms of the state; white and brown shrimp and blue crabs. These and the young of many other sport and commercial species move in and out with the tide to feed around the stems of the marsh grass.

2.09.04.2.7 Throughout these marsh communities numerous shorebirds, waterfowl, gulls, herons, and egrets will be found. Birds such as

plovers, dowitchers and sandpipers thrive on the benthic invertebrate population around the shoreline and on open flats. In the open water bordering these communities, waterfowl will be found feeding on vegetation or small marine fishes and free swimming invertebrates. Another game bird to be found is the clapper rail, a permanent resident of these marshes. The herons and egrets feed on fish, invertebrates, reptiles, amphibians, and small mammals in the marsh. They also are found nesting and roosting during the summer months. Many gulls will be found the year around utilizing these communities for resting and scavenging. Other birds such as the red-winged blackbird, common and boat-tailed grackles, sparrows, and warblers will be found nesting and feeding on insects and grains. Birds of prey such as the osprey and marsh hawk will also be found utilizing these communities to some degree.

2.09.04.2.8 Mammals of the marshes typically include the raccoon, otter, rice rat, opossum and marsh rabbit. The raccoon and opossum are ubiquitous animals and opportunistic feeders. The otter thrives on crustaceans and fish while the rice rat and marsh rabbit are herbivores. On occasion, other mammals such as the bobcat and fox will visit these communities.

2.09.04.3 Sand and/or mud flats. Sand and/or mud flats occupy about 660 of the total 3,330 acres encompassed by the Murrells Inlet tidal system (Plate 13). In most areas they lie below the mean high water line and are alternately covered and exposed by wind-driven or lunar tides and are typically devoid of vascular plants but are frequently inhabited by numerous species of diatoms, bacteria, oysters, and infaunal invertebrates. These flats are usually fringed with stands of vigorously growing and highly productive smooth cordgrass and open water. In a few areas in the inlet, the flats are associated with the high marsh, above the mean high water mark and are subject to irregular tidal flooding. In these instances, the flats are generally fringed with stunted growths of glasswort, smooth cordgrass, and sea lavender. Proceeding toward the highland from these flats, the vegetative zone is characterized by the occurrence of sea ox-eye, spike grass, and sea lavender.

2.09.04.3.1 Tidal action provides a constant influx of particulate organic matter to these habitats creating a rich nutrient supply for filter-feeding benthic invertebrates. When the tidal flats are covered by water, these animals and nutrients constitute an important food source for a variety of fish species. When the flats are exposed, the benthic animals are fed upon by numerous wading birds and shorebirds. A representative faunal list is as follows:

Birds

Great blue heron
American egret
Snowy egret
Louisiana heron
Long-billed dowitcher
Dunlin
Semipalmated sandpiper
Herring gull

Black-crowned night heron
Yellow-crowned night heron
Glossy ibis
White ibis
American oystercatcher
Semipalmated plover
Wilson's plover
Willet
Greater yellowlegs
Ring-billed gull
Laughing gull
Least tern
Royal tern
Gull-billed tern
Short-billed dowitcher
Caspian tern
Black skimmer
Lesser yellowlegs

Reptiles and Amphibians
Carolina diamondback terrapin

Invertebrates
Atlantic jacknife clam
Purplish tagelus
Stout tagelus
Eastern oyster
Blue crab
Sunray venus
Cross-barred venus
Quahog
Lettered olive

2.09.04.4 Dredged material islands. Dredged material islands comprise about 30 acres or less than one percent of the total wetland type habitat associated with the Murrells Inlet system (Plate 13). These islands occur where dredged sediments have been discharged into shallow water zones or on marshlands. The original biotic communities that were present on these sites prior to disposal have been obliterated. Upon revegetation, these areas usually contain several biotic communities that are similar in appearance and composition to those which naturally occur in the surrounding environment. Old dredged material disposal areas in the Murrells Inlet system are sparsely vegetated with smooth cordgrass, glasswort, sea lavender, sea-blite, and sea ox-eye. Wildlife species commonly observed in these areas include black skimmers, American oystercatchers, terns, gulls, herons, egrets, several species of dickeys, raccoon, and rodents.

2.09.05 Other communities.

2.09.05.1 Urbanized. Urbanized areas in the vicinity of the project include the villages of Murrells Inlet and Garden City Beach. Live oaks and pines are the most abundant trees in the Murrells Inlet area and many varieties of domesticated plants are cultivated. Garden City Beach, on the other hand, is mainly vegetated with salt tolerant grasses and herbs.

2.09.05.1.1 The man-dominated community provides habitat to those animals that easily adapt to man's habits and habitations. The gray squirrel, flying squirrel, opossum, and many birds easily adapt to man's presence. The black rat, Norway rat and house mouse live in close association with man. Lizards and amphibians which are capable of using habitats with either natural and/or introduced vegetation are also found. Beach areas along the heavily developed Garden City Beach offer habitat for many wading birds, terns, and gulls.

2.09.05.2 Agricultural lands. In a few areas inland of the project area the natural communities have been converted to croplands and pasturelands. In creating these habitats, most of the natural vegetation has been destroyed and replaced by shrub or herbaceous growth. Fields that are left fallow after harvest provide habitat for small mammals, birds, reptiles and amphibians, and hunting grounds for birds of prey.

2.09.06 Endangered species. There are six endangered species which occur or possibly occur in the vicinity of Murrells Inlet. Endangered species are "those species in danger of extinction throughout all or a significant portion of their range." Endangered species which occur or could possibly occur in the project area are:

Reptiles and Amphibians	
American alligator	Alligator mississipiensis
Birds	
Eastern brown pelican	Pelecanus occidentalis carolinensis
Southern bald eagle	Haliaeetus l. leucocephalus
Peregrine falcon	Falco peregrinus
Kirtland's warbler	Dendroica kirtlandii
Eskimo curlew	Numenius borealis

The alligator is commonly observed in freshwater rivers and lakes and several reside in nearby Brookgreen Gardens and Huntington Beach State Park. The brown pelican is a commonly observed resident of coastal South Carolina and nests in many areas along the coast. The bald eagle is a permanent resident of the state and individuals have recently been sighted near Georgetown and on Kiawah Island. No known recent sightings have been made in the Murrells Inlet area. The peregrine falcon, Kirtland's warbler and the Eskimo curlew are transient species.

2.09.07. Sport and commercial fisheries.

2.09.07.01 Sport fisheries. Murrells Inlet harbor and adjacent inshore and offshore waters support an intense sport fishery. Principal species caught in inshore waters by surf, pier, and small boat fishermen include but are not limited to red and black drum, sheepshead, kingfish, bluefish, seatrout, spot, croaker, cobia, flounder, pompano, toadfish, black sea bass, gafftopsail catfish, sea catfish, and Spanish mackerel.

2.09.07.1.1 Although inshore fishing is good in the area, Murrells Inlet is perhaps better known for its offshore sport fishing fleet. In 1974, there were 24 charter boats and numerous private boats utilizing Murrells Inlet as a home port. Principal species fished for on these boats are king and Spanish mackerel, bluefish, dolphin, white and blue marlin, sailfish, wahoo, cobia, crevalle jack, barracuda, little tunny, amberjack, black sea bass, groupers, snapper, porgy, and triggerfish.

2.09.07.1.2 Shellfishing for oysters and shrimp is also a popular sport in the estuary. There are three public shellfish gathering areas located at (1) the northern end of the estuary; (2) in Allston Creek; and (3) on the Clam Bank Flats. As mentioned previously however, bacterial contamination has been a problem in the area and as a result, Parsonage Creek from the government dock to Allston Creek is closed to shellfishing.

2.09.07.2 Commercial fisheries. Difficulties in navigating Murrells Inlet have limited the development of commercial fishing to essentially an off-season operation of the recreational fleet. Other commercial interests have made repeated attempts to operate during recent years but have in all cases aborted their endeavors due to costly damages and delays. Unlike many ports, catches made by the fleet at Murrells Inlet are consumed for the most part in the more than 100 restaurants along the Grand Strand. As a result of this method of sales, it is extremely difficult to make an accurate determination of the total annual catch landed at Murrells Inlet. Available data on annual commercial fisheries landings are presented in Table 11. Data presented in this table were compiled from the records of licensed fish dealers by the Department of Commerce in cooperation with South Carolina Wildlife and Marine Resources Department. As shown in Table 11, the principal fish species marketed in the northern district (Georgetown, Horry, and Marion Counties) in 1974 were mullet, spot and grouper. Shrimp and oysters were the most important shellfish species landed.

2.09.07.2.1 Murrells Inlet is a significant shellfish growing area, having abundant resources of intertidal oysters and hard clams. At present, approximately 365 acres of bottoms are under lease by the State to commercial oystermen in the area.

2.10 Recreation. Murrells Inlet is part of what is known as the Grand Strand, South Carolina's most popular vacation area. The "strand", famous for its gently sloping-fine white sand beaches, is a 50-mile seashore vacationland and recreational area extending from Little River Inlet at the North Carolina-South Carolina state line to Winyah Bay near Georgetown. In addition to its famous beaches, the strand offers abundant hotel, motel, and camping facilities, 13 ocean fishing piers, numerous championship golf courses, minature golf courses, amusement parks, and two state parks, Huntington Beach State Park and Myrtle Beach State Park.

2.10.01 Recreation activities available in the Murrells Inlet area include boating, swimming, surfing, sailing, sunbathing, golfing, beachcombing, camping, and fishing. There are five marinas and numerous private docks located about the Murrells Inlet harbor. Much of the offshore charter boat fishing along the grand strand originates from the docks at Murrells Inlet. Huntington Beach State Park is located on the south side of Murrells Inlet. This park has two camping areas, picnic areas, parking lots, playgrounds, a concession stand, a trading

post, restroom facilities and a minature golf course. The park was recommended as a potential natural landmark in the Atlantic Coastal Plain Natural Region Study conducted by the Smithsonian Institute under contract to the National Park Service in 1974. However, no action has been taken on this proposal to date.

2.11 Historical and archaeological sites. The latest edition of the National Register of Historic Places (February 4, 1975) lists nine sites in Georgetown County. Three of these sites, the Georgetown County Rice Museum, Prince George Winyah Church and Cemetery, and the Georgetown Historic District are located in Georgetown. Other sites include Hopsewee (Thomas Lynch House), located 12 miles south of Georgetown on Highway 17; the Pawleys Island Historic District located southeast of the project area on Pawleys Island; the Chicora Wood Plantation located west of Murrells Inlet along the Waccamaw River flood plain; Annandale Plantation located about 14 miles south of Georgetown; the Georgetown Lighthouse located about 12 miles southeast of Georgetown on North Island; and Prince Frederick's Chapel ruins located southeast of Plantersville. Although not listed on the Natural Register, there are two properties of historical significance located near the project. These are: Brookgreen Gardens located on the west side of U. S. Highway 17 across from the entrance to Huntington Beach State Park and Atalaya, the Huntington Mansion, located inside the park.

2.12 Economic indicators.

2.12.01 General. The standard indicators and others found to be related to the Murrells Inlet area are keyed to the State of South Carolina and U. S. Department of Commerce, Bureau of Economic Analysis (BEA) Economic Area No. 30. This economic area has been delineated by the BEA and the Economic Research Service (ERS), Department of Agriculture, who have made national and area economic projections to 2020 for the Water Resources Council. The Series E projections dated April, 1974 have been adopted as the current appraisal of the long-range national trends for planning purposes. These projections are designated as "OBERS Projections". BEA Area 30 consists of nine South Carolina counties: Georgetown, Horry, Marion, Williamsburg, Dillon, Florence, Darlington, Chesterfield, and Marlboro. Projections have been made by a process of successive disaggregation of projections from the national level to the two-county level which would be most affected by a project at Murrells Inlet (Georgetown and Horry Counties).

2.12.02 Population. The 1970 population of the State of South Carolina was 2,596,000, an increase of 8.6 percent over its 1960 population and a decrease from the 10.96 percent increase registered during the 1950-1960 decade. BEA Economic Area 30 had a 1970 population of 401,600, a change of -1.5 percent from the 1960 population of 407,800. Georgetown and Horry Counties had a 1970 population of 103,500, an increase of 0.48 percent over their 1960 population of 103,000. The projected annual growth rate for this two county area is 0.8 percent through 1990; 0.4 percent from 1990 to 2000; and 0.2 percent from 2000 to 2020.

2.12.03 Income. The total personal income of residents living in the State of South Carolina amounted to $6,790 million in 1970 and averaged $2,616 per capita or 75 percent of the national average. This represents an increase of about 67 percent in real per capita income over 1960 as compared with 39 percent for the nation as a whole, 81 percent for BEA Area 30 and 76 percent for Georgetown and Horry Counties. The average per capita income in BEA Area 30 in 1970 was $2,211.

2.12.03.1 Earnings from wholesale and retail trade are closely related to disposable income and are considered to be the sum of wages and salaries, other labor income, and proprietors' incomes. In 1970, they were about 13 percent of total personal income for the United States and it is projected that they will account for about 10 percent of total personal income in 2020. In South Carolina, earnings from wholesale and retail trade amounted to about 11 percent of the state's total personal income in 1970 and have been projected to be about 9 percent of the state's total personal income in 2020. Earnings from wholesale and retail trade in Georgetown and Horry Counties amounted to about 29 percent of the total for BEA Area 30 in 1970 and have been projected to remain at this level through the year 2020.

2.12.04 Employment. The average annual employment in the state in 1972 totaled 1,131,500 with 4.3 percent of the labor force unemployed (S. C. Employment Security Commission, 1974). About 354,600 persons or 31.3 percent were employed in agriculture; 165,600 or about 14.6 percent were employed in government; 159,900 or 14.1 percent were employed in wholesale and retail trade, and the remainder were either self-employed or in contract construction, transportation, communication, utilities, finance, insurance, real estate, unpaid family workers, or domestics.

2.12.04.1 Georgetown County. The average annual employment in Georgetown County in 1972 was 12,850 persons with 6.9 percent of the labor force unemployed. Approximately 4,800 persons or 37.4 percent were employed in manufacturing; 1,550 or about 12 percent in wholesale and retail trade; 1,400 or 10.9 percent in government; 1,050 or 8.2 percent in services; and about 750 or 6 percent in agriculture.

2.12.04.2 Horry County. The average annual employment in Horry County in 1972 was 29,400 with 4.9 percent of the civilian labor force unemployed. About 5,100 persons or 17.3 percent were employed in wholesale and retail trade; 4,250 or 14.5 percent in manufacturing; 4,150 or 14.1 percent in services, 3,800 or 12.9 percent in government; and 1,850 or 6.3 percent in contract construction.

2.12.05 Recreation industry. The recreation industry is of major importance in the project area. The "Grand Strand", which includes the Murrells Inlet area, is regarded as South Carolina's most

popular vacation spot and has experienced tremendous growth over the past few years. Based on data collected by the S. C. Department of Parks, Recreation, and Tourism, the total tourist expenditures for the Strand increased from $48.5 million in 1963 to $125 million in 1969 for an average annual growth rate of about 17 percent for this six-year period. The Greater Myrtle Beach Chamber of Commerce has estimated that tourist expenditures for 1975 will be about $170 million.

2.12.05.1 Commercial recreation. As might be expected, commercial recreation has expanded rapidly during the last few years. South Carolina receipts for 1968 were about $32 million or about seven times the 1948 state receipts. National receipts, which totalled $5,980 million in 1968, increased about three and one-half times over this same period. Based on these trends and projections of other related parameters, the growth rate of commercial recreation in Georgetown and Horry County is expected to average about five percent annually until the year 2020.

2.12.05.2 Amusement and recreation services. Amusement and recreation services include services which charge fees for amusement and recreation, except motion pictures. In 1940, employment in these services was 0.38 percent of the total employment in South Carolina; in 1960, 0.44 percent; and is projected to be 0.67 percent in the year 1980. This trend of an increasing share of the total employment by amusement and recreation services is found throughout the smaller economic areas. After 1980 annual growth rates are expected to decline with all economic areas showing less than one percent growth for each 10-year period.

2.12.05.2.1 While employment growth in amusement and recreation services is expected to be minor in the years to come, the growth of earnings from these services is expected to have a brighter future. These earnings in the United States are projected at an annual growth rate of about three percent while employment for the same area was projected at less than one percent. The difference in the rates in BEA Area 030 is 2.9 percent for earnings and 0.4 percent for employment. The annual growth rate of earnings in Georgetown and Horry Counties is expected to be about three percent.

2.13 Transportation. The only land access to the project area is by way of U. S. Highway 17 which parallels the coast along the entire grand strand area. Commercial air, rail and bus service is available in nearby Georgetown and Myrtle Beach. U. S. Highways 378, 501, and 521 provide connections to west, mid-west, and southwest localities.

2.14 Future environmental setting without the project. Population centers are expected to expand to accomodate a growing population and new industries. This expansion will be achieved at the expense of undeveloped lands. Acreage currently devoted to

cropland and forestry will continue to decrease as lands of this type yield to the pressures of urban development. The population in the project area (BEA Economic Area 30) was 401,600 or about 15 percent of the 2,596,000 population of the State of South Carolina. This represents a 1.5 percent decrease in population over 1960 for the BEA Economic Area and an 8.6 percent increase for the state as compared to an increase of 13 percent for the United States as a whole. The state and area populations are both projected to increase at an average annual rate of about one percent through the year 2020. The labor force for BEA Area 30 was about 35 percent of its population in 1970, compared to 39 percent for the state. These ratios are expected to continue through 2020. The annual growth rate of personal per capita income for BEA Area 30 is expected to average 5.8 percent and will increase from the 63 percent recorded in 1970 to 77 percent of the United States average per capita income by 2020. Development in the area is expected to continue to concentrate and intensify along the Atlantic coastline in Horry and Georgetown counties with or without the project.

3.0 Relationship of the Proposed Action to Land Use Plans

The proposed project does not offer any potential for conflicting with any existing or proposed landuse plans in the Murrells Inlet area. The proposed jetty and fishing walkway in Huntington Beach State Park are compatible with the master plan for the development of the park. The project has been and will continue to be coordinated with state and local planning agencies.

4.0 The Probable Impact of the Proposed Action on the Environment

4.01 General. The proposed plan of improvement involves the construction of jetties, sand dikes, a fishing walkway and a parking lot and the dredging of entrance, auxilliary, and inner channels and a deposition basin. The project will require the removal of about 1,184,000 cubic yards of material by hydraulic pipeline dredge. Approximately 1,178,000 cubic yards of this material is sand and shell and will be used for construction of sand dikes and beach nourishment. The remaining 6,000 cubic yards is silty sand and will be disposed of in an upland disposal area. The major adverse effects of this project relate to effects on water quality and on the ecosystems in the disposal areas, channel areas, and other areas within the inlet which will be disturbed by construction activities. Beneficial effects relate to the provision of a navigation channel for the safe operation of charter, recreational, and commercial fishing boats.

4.02 Water quality. The proposed project is not expected to create any long-term or large scale adverse impacts or detrimental effects on the water quality of the Murrells Inlet system. As is characteristic of any hydraulic dredging operation, water turbidity in the vicinity of the dredge will increase as a result of the mechanical action of the dredge cutterhead. Turbidities will also

increase somewhat in the immediate vicinity of beach disposal areas. Sediment resuspended in the water will reduce light needed for marine flora and fauna and any organic sediment resuspended will result in a heavier demand for oxygen from the immediate surrounding waters and thus a decrease in available dissolved oxygen (D.O.) may occur. However, since all but a small portion (6,000 cubic yards) of the 1,184,000 cubic yards of material to be removed during construction of the Murrells Inlet project is a mixture of sand and shell with a rapid settling rate, increases in turbidities are expected to be insignificant and short-term and will not affect the long-term productivity of the Murrells Inlet system. Maintenance dredging will have similar effects but they will be of a lesser magnitude.

4.02.01 Preliminary model studies at the U. S. Army, Corps of Engineers, Waterways Experiment Station indicate that low tide levels may be up to as much as 0.5 feet lower in parts of Main Creek. This phenomenon applies to Main Creek only and water levels in other parts of the Murrells Inlet estuarine system should not be affected. This possible lowering of low tide levels in Main Creek is due to the deepening of the entrance channel in the ocean and the inner channel in Main Creek which would provide at a slightly lower elevation the same approximate channel cross section now available to drain the Murrells Inlet estuarine system. The net effect of this deepening of Main Creek is that it would be carrying approximately the same volume of water during low tide stages, but because of channel deepening, the surface elevation would be slightly lower. The total volume of water leaving Murrells Inlet on ebb tides or entering on flood tides should not be altered enough to produce any detectable change in any water quality parameter of any part of the Murrells Inlet system.

4.02.02 As discussed in Section 2.05, chemical analysis of sediment samples from the inlet indicate that levels of mercury in four of the six samples analyzed exceeded limits set by the Environmental Protection Agency for the acceptability of dredged material disposal to the nations waters. The source of the mercury is unknown since no industries utilizing or discharging mercury occur in the area. As shown in Table 1, the mercury levels were highest in beach sediments from Huntington Beach and in sandy sediments at three stations in the lower channel area. Although there is a possibility that mercury may be released into the water column during dredging, recent research by Windom (1974) indicates that this probably will not be the case. For example, Windom found that sediments with metal concentrations above preliminary EPA criteria do not produce significant metal increases in the water column when dredged. Based on this study and the fact that the highest concentrations of mercury are found in areas with the lowest concentrations of benthic invertebrates, we feel that the effects of dredging in these areas will be insignificant.

4.03 Biological resources. Of the twelve biotic communities discussed in Section 2.09, there are only four which will be affected by construction of the proposed project. These are:

(1) Open water, (2) Tidal marsh, (3) Beach, and (4) Oak-pine forest. The following is a discussion of the potential impacts of the project on these communities.

4.03.01. Open water community.

4.03.01.1 Benthic invertebrates. Out of the groups of organisms inhabitating the open water community, it is the benthic invertebrate community which will be adversely affected to the greatest degree during construction of the proposed project. As discussed in Section 1.0, dredging of project channels and deposition basin will be accomplished by hydraulic pipeline dredge. As is the case in most dredging projects of this type, some of the benthic invertebrates in the path of the dredge cutterhead will be destroyed. This gross effect has been well documented in many studies and field investigations conducted along both the Atlantic and Gulf coasts (Chesapeake Biological Laboratory, 1970; Sherk, 1971; and May, 1973) and can be expected to occur to some extent during the proposed dredging.

4.03.01.1.1 Studies conducted by the S. C. Wildlife and Marine Resources Department (discussed in Section 2.09) show that the greatest concentrations of benthic macroinvertebrates in the area of project influence occur in the portions of Inner Channel B between Stations M106 and M110 (See Plate 9). Dredging in these areas may result in the destruction of some benthic organisms, however, since only 23,000 cubic yards of material will be removed from this 13,590-foot reach, this loss is expected to be insignificant. Many impact assessments have assumed that this destruction eliminates the relatively immobile members of the benthic invertebrate community in the dredged area for an extended period of time, however, recent research indicates that this may not be a valid assumption. For example, in a 1973 study, the Skidaway Institute of Oceanography found that although the number of species and individuals per unit area were greatly reduced following dredging, several species were still present in some quantity. Recovery to levels approaching those at control stations appeared to be rapid. In conclusion they stated: "While this study suffers from lack of replication of sampling methods, it does provide an indication that the benthic community is able to quickly recover following dredging, and remains as a viable community both during and immediately after dredging operations are undertaken." As a result of the findings of the above study and other similar studies, it is expected that the disruption or destruction of benthic invertebrates will be a short-term impact since recolonization by organisms disturbed by the cutterhead and recruitment from adjacent areas will begin almost immediately after dredging is completed.

4.03.01.1.2 The suitability of newly dredged areas for recolonization will, of course, be dependent on the interaction of factors such as bottom topography, bottom substrates and habitats, water velocity and current patterns, and future sediment distribution patterns. However, since the composition of bottom sediments is not expected to change appreciably as a result of the proposed

dredging it is expected that the populations which eventually become established will be similar to those presently found in deeper channel areas.

4.03.01.1.3 Benthic invertebrate populations at the other inner channel stations (MI04 and MI05, Plate 9) were found to be low, probably due to the well scoured bottom in these areas. As a result, it is felt that the impact of dredging in these areas will be insignificant and of a short-term nature. With recruitment from adjacent areas, populations should return to predredging levels within a few months after construction is completed.

4.03.01.1.4 Most of the animals collected by SCWMRD at the entrance channel stations are adapted to a sandy substrate which is continually shifting due to natural processes. Although some of these organisms may be destroyed during the dredging of the entrance channel and deposition basin or covered by placement of jetty stone, the long-term productivity of the area should not be affected to any significant degree. Repopulation of channel areas will commence shortly after construction is completed and species composition should be similar to that which existed prior to construction. Construction of the jetties will provide a substrate for the development of epifaunal communities which are currently non-existent in the area thus increasing the areas productivity. Due to the continual movement of sand into the deposition basin after construction is completed, this area will likely provide little habitat for benthic organisms.

4.03.01.2 Oysters. Main Creek is the only tributary in which dredging will be accomplished, and as shown in Plate 12, all intertidal oyster beds in this creek occur along the edge well away from the proposed channel alignment. Dredging will not be done in such close proximity to these reefs as to result in physical damage to these communities. Although no oyster reefs will be physically damaged by the dredge, some minor silting of oyster reefs may occur as a result of the dredge cutterhead stirring up fines in the sediments. However, due to the sandy nature of a majority of the sediments, any silting is not expected to be great enough to cause oyster mortality. The project will have no affect on either the public or commercial shellfishing areas.

4.03.01.3 Fish. Available data indicate that fish populations, unlike benthic invertebrates which are relatively immobile and may undergo population reductions that may be locally severe, are less likely to be adversely affected by dredging operations. For example, Stickney (1973) in his study of the Atlantic Intracoastal Waterway in Georgia found no indication of fishes being killed during dredging operations. In some areas, dredging could be considered to be beneficial to certain species of fish, especially those which prey on the larger benthic organisms. As a dredge works its way along a channel, benthic animals which would normally be buried in the sediments are

dislodged and become susceptible to predation. This sudden availability of food quite often results in higher than normal concentrations of fishes near the dredge. A similar situation will occur in beach disposal areas. As organisms are dislodged from sandy sediments being deposited on the beach, they become subject to predation by fishes inhabiting the surf zone.

4.03.01.3.1 Although it would appear that fish are relatively unaffected by dredging, there has been some concern recently over the possible effects of increased turbidities and siltation generally associated with dredging. As a dredge moves along the channel, it invariably creates some type of turbidity plume, the size of which will vary considerably depending on the type of sediment being dredged, strength of currents and other factors. The magnitude of the impact of these suspended particles on fishes will, in most cases, be dependent on the concentration, composition, absorbed minerals or toxins and the tolerance of particular species. In general, bottom-dwelling species are the most tolerant of suspended solids, filter feeders are most sensitive and juvenile forms are more sensitive than adults. Under normal circumstances, fish can generally avoid turbid waters and have the ability to clear gill membranes of accumulated silt upon entering undisturbed water (Sherk and Cronin, 1970). However, not all species are equally susceptible to suspended solids and different suspended solids vary in their effect. As a general rule, it has been found that fish can tolerate high turbidities except when they are accompanied by low levels of dissolved oxygen, acids, alkalies, or other substances which interfere with respiration, injure gills or prevent their normal function, and they are quite capable of leaving the immediate dredging area.

4.03.01.3.2 Due to the sandy nature of the substrate in most of the areas to be dredged, turbidity plumes created by the dredge cutterhead will primarily be restricted to the immediate dredging area. Fish species which would have the highest probability of being affected are the filter feeders (primarily menhaden, herring, and shad) and juvenile forms. Estimates of the relative abundance of these species in the area at any given time varies so that it is not practical to attempt a quantitative determination of the impact on these species. In addition, some larval fishes may be destroyed as a result of the mechanical action of the dredge cutterhead. However, based on research which has been accomplished in other areas and available information on the effects of current dredging practices in the area, it is felt that any impact resulting from the proposed dredging will be of a short-term, localized nature and will not significantly affect the fish stocks in the Murrells Inlet system. Similar temporary adverse and beneficial impacts will occur during periodic maintenance dredging but will be of a lessened nature due to the lesser amounts of material involved.

4.03.01.3.3 The construction of the jetties will provide substrate for new epifaunal communities of invertebrates and provide habitat for numerous fish species. The combination of a deepened channel flanked by two jetties will concentrate fish food organisms

and thereby attract large numbers of marine sport fishes. A jetty related sport fishery will develop shortly after the project is completed and the fishing walkway on the south jetty will provide access to to this newly developed fishery. Fish species which will be available to anglers on the jetty during various times of the year are sheepshead, black drum, red drum, flounder, bluefish, seatrout, croaker, spot, and whiting.

4.03.02 Tidal marsh. Constructing the south sand dike as shown in Plate 1 may destroy a small area of tidal marsh. This tidal marsh is located in an area where existing marsh is being destroyed at a rapid rate by the large amounts of sand being deposited on it under natural conditions. As a result of this problem, it is difficult to determine the exact amount of marsh, if any, which will be affected by the proposed construction. On the plus side, the construction of the sand dike would prevent further migration of the inlet and should help alleviate the problem of shifting sands thus reducing the potential for additional marsh destruction.

4.03.03 Beach community. As discussed in Section 1.0, all but about 6,000 cubic yards of material removed during initial dredging operations will be used for beach nourishment and construction of sand dikes. Organisms inhabiting this beach fill zone will be covered as material is pumped onto the beach. When considered in terms of numbers of organisms which may be potentially destroyed, the short-term adverse impact will be significant. Because animals from high energy beaches are motile and adapted to shifting sediments, rapid recovery of the fauna on these beach areas following the deposition of dredged materials is likely. This is particularly true if the dredged material is similar to that of the original beach in grain size and other characteristics (Thompson, 1973). The long-term impact on invertebrates in the beach community is therefore expected to be insignificant.

4.03.03.1 As discussed in Section 2.09.02.2.1, a least tern nesting area is located in the dunes of Huntington Beach State Park between the north access road and the inlet proper. During construction, trucks will be driving to and from the inlet by way of the beach near this dune. However, since least terns are very tolerant of disturbance from human activity (Pough, 1951, and Sprunt and Chamberlain, 1949), it appears very likely that this colony would not be disturbed by the proposed construction or by the subsequent increase in human activity which could be attributed to project features. However, in the unlikely event that the terns find project associated human activity disturbing, there are many miles of similar dunes bordering ocean beaches plus many other areas of the type listed in Section 2.09.02.2.2 as suitable for colonization which the displaced birds could move to. Although this determination that the project should have no significant effect on terns is contrary to the unsupported statements of the USDI, it appears consonant with the works of Pough and Sprunt and Chamberlain who are recognized authorities on birds. The comments of USDI are discussed in greater detail in the responses to its letter beginning on page 47.

4.03.03.2 Although least terns will probably not be disturbed by the proposed project, other birds may avoid the area during construction because of the noise while others, especially shorebirds, will be attracted to the beach fill areas to feed on marine organisms in dredged sediments. These effects will be of a short-term nature and will end when the work is completed.

4.03.03.3 Similar temporary adverse and beneficial impacts will occur during periodic maintenance dredging but will be of a lessened nature due to the lesser amount of material involved.

4.03.04 Oak-pine forest community. A 5-acre tract of wooded upland will be provided by the local sponsor for the disposal of unsuitable materials from both initial and maintenance dredging. Prior to the use of this area, the owner will probably remove merchantable timber. In any event, dense stands of trees will be removed to permit a more even distribution of the hydraulically dredged material. To buffer the disposal area from adjoining properties, a 25-foot wide band of trees and understory vegetation will be left around the perimeter of the dike. Any trees not removed and all understory vegetation inside the diked area will be killed when their roots become covered to a sufficient depth.

4.03.04.1 Most animal life except for some small birds will be displaced during and shortly after each use of the disposal area. The 25-foot wide buffer area will provide some habitat for these displaced species. Raccoons, opossum, some small rodents, and some birds will continue to forage without interruption in the disposal area. As vegetative regrowth begins, foraging by the other species that were displaced during the preparation and clearing and subsequent use of this diked disposal area will increase. Plant and animal life inside the disposal area will fluctuate from a low during and shortly after deposition of dredged material to a high just before a dredging operation.

4.03.05 Endangered species. The endangered species frequently observed in the area, the brown pelican and American alligator, will not be adversely affected by the proposed project.

4.03.06 Mosquitoes. The use of a diked upland disposal area to avoid adverse effects on estuarine values has an adverse effect in that diking in the coastal zone creates ideal habitat for mosquitoes, particularly the salt marsh mosquito, Aedes sollicitans. Characteristics of diked disposal areas that make such areas productive of mosquitoes are the temporary ponding of water due to uneven settling of dredged material and poor drainage. The cracks that normally form during the drying of disposal areas provide very favorable oviposition sites. Natural controls such as the maintenance of stable water levels or the achievement of rapid drainage would greatly limit the production of mosquitoes in disposal areas, but neither method appears practical because of physical characteristics of the disposal areas and material to be dredged from the upper portion of the inner channel and also because of operational requirements of disposal areas. However,

the Corps of Engineers will contribute to the cost of the county comprehensive mosquito control program if it is determined that the Murrells Inlet disposal area provides a mosquito breeding site. The Federal cost will be proportionate to the contribution of the disposal area to the mosquito problem. The most commonly used insecticide is Flit M.L.O., an oil larvicide which dissipates quickly and will have no effect on aquatic life in the Murrells Inlet system. Since Flit has no residual effect, a control program utilizing oil larvicides requires frequent inspection and respraying. The use of the upland disposal area for disposal of dredged material will be infrequent, therefore the mosquito control problem is considered to be minimal.

4.04 Archaeological and historical sites. The National Register of Historic Places has been consulted and it has been determined that no existing or potential register properties will be affected by the construction of the proposed project. The project will be coordinated with the State Historic Preservation Officer and State Archaeologist to minimize potential damage to sites of historical or archaeological interest in the area.

4.05 Recreation. The effects of the proposed action on the areas recreational resources will vary from temporary minor inconveniences to visitors to Huntington Beach State Park to enhancement of the areas boating and fishing opportunities. Access for construction of the south jetty will likely be via the main entrance to the park and the existing developed roads which end at the north parking lot. Using these roads for access may cause some visitors to be inconvenienced as construction equipment and materials are moved to the construction site. In order to keep inconvenience to a minimum, every effort will be made to time these activities in such a manner that they will not interfere with the normal flow of traffic to and from the park. Since the majority of park facilities are located south of the construction area, the project will not interfere with normal uses of the park. Sightseeing activities may increase both during and after construction.

4.05.1 The jetties will provide a protected entrance to Murrells Inlet which will benefit all boaters using the inlet for passage to and from the ocean. In addition, the jetties will provide habitat for the development of a new jetty-related fishery which is currently not available in the Murrells Inlet area. The provision of a fishing walkway on the south jetty will assure that this fishery will be available to non-boaters as well as boaters. It is currently estimated that about 20,000 fishermen and 6,000 sightseers will use the fishing walkway annually.

4.06 Aesthetics. Prior to actual dredging the dikes inclosing the upland disposal area must be constructed and the area cleared of large trees. Dikes will consist of barren earth and will

contrast in an unfavorable manner with surrounding areas which are fully vegetated. This impact will be lessened considerably by the provision of a 25-foot wide buffer zone of existing trees and understory plants around the perimeter of the dike. Natural vegetative regrowth on the dikes and within the disposal area will commence soon after each dredging is completed and a relatively full vegetative cover of grasses and herbs may be achieved within a few months. The presence of the dredge boat and pipelines and other assorted construction equipment in the area will represent a temporary intrusion upon the view of boaters and from some of the dwellings along Main Creek. The physical presence of the jetties and sand dikes may be aesthetically displeasing to some individuals.

4.07 Noise and air quality. Operating dredges are generally quiet and contribute less to ambient noise levels than normal motor and speedboat traffic. Noise generated by heavy trucks moving to and from the jetty construction sites will prove to be displeasing to many individuals, especially to those residing along the access road to the north jetty. This will, however, be a temporary impact and will only occur during initial construction. Air pollution derived from the dredge and other construction equipment should be negligible during both construction and maintenance of the project.

4.08 Economic impact. The proposed project will have a favorable economic impact on the study area since it will provide direct and indirect benefits to the commercial charter boat industry, commercial fishermen, sport fishermen, recreational boaters, and marinas serving the area. Murrells Inlet, because of the shifting sands at the entrance to the inlet, is unstable. Present controlling depth of the waterway is about two to three feet above mean low water. This depth is inadequate for operation of the existing and projected fleet of commercial and recreational boats which require about -10 feet mean low water depth at the ocean entrance and in Inner Channel A and -8 feet mean low water depth in Inner Channel B for safe navigation. Construction of the proposed project will result in tangible navigation benefits of $1,902,100 per year derived from enhanced recreational boating and commercial charter boat operations, increased commercial seafood landings, reductions in vessel damage, and provision of an all-tide harbor of refuge during storms. In addition, the fishing walkway will provide an estimated annual benefit of $34,500 based on an annual visitation of 20,000 fishermen and 6,000 sightseers. Redevelopment benefits will amount to $88,000 and consist of labor income accruing to those who would be unemployed in such areas, except for the construction of the project.

4.08.01 The proposed project, by offering better access and safer conditions to all vessels, would result in some increase in business for marinas and other satellite services and businesses located in the Murrells Inlet area. The project might also stimulate the establishment of new businesses and satellite services in the area, especially in areas related to commercial charter and seafood industries.

4.09 Maintenance dredging. Maintenance dredging will be accomplished about every three years and will be required in the inner channel and deposition basin. Inner channel dredging will amount to about 9,000 cubic yards every three years with 6,000 cubic yards being used for beach nourishment and 3,000 cubic yards being pumped to the diked upland disposal area used for initial construction. Approximately 600,000 cubic yards of material will be removed from the deposition basin every three years and placed on adjacent beaches. The impacts of maintenance dredging will be similar to those of initial construction but will be of different order of magnitude.

4.10 Maintenance of existing littoral drift regimen. The construction of jetties from the shoreline to beyond the normal surf zone could interupt the long-shore (littoral drift) movement of sand, which in the vicinity of Murrells Inlet is apparently predominately southward. Such an interruption of littoral drift material could result in erosion of beaches south of the jetties since these beaches could be deprived of some of the sand presently passing across Murrells Inlet. To prevent this from occurring, provisions for bypassing sand are included in the construction and operation of the project. Project features to accomplish sand bypassing include a low weir section in the north jetty to permit the movement of sand across the jetty and a deposition basin to retain the sand which has moved across the jetty. The accumulated sand in the deposition basin would be periodically removed by hydraulic dredge and deposited on the beach south of Murrells Inlet during normal maintenance dredging operations. Concern has been expressed that the operation of the sand bypassing features might be neglected in the future because the prevention of beach erosion benefitted a relative few. Although the purpose of sand bypassing is to avoid downcoast erosion problems, once the project is constructed, the continued operation of these features would be essential to the maintenance of the navigation channel. If sand bypassing were to be neglected, the sand moving over the low weir section of the north jetty would soon fill the deposition basin and then create an obstruction in the navigation channel, therefore in order to maintain the navigation channel, it is essential that the accumulated material be periodically dredged from the basin and deposited on the downdrift beach. Because of the sand bypassing features of the project which are designed to maintain the existing littoral drift regimen at Murrells Inlet, the Murrells Inlet Project should not contribute in any way to beach erosion.

5.0 Any Probable Adverse Effects Which Cannot Be Avoided

5.01 The principal adverse effects of constructing the proposed project are related to the dredging of channels and disposal of dredged materials. The dredging will temporarily increase turbidities in the immediate vicinity of the dredge and beach disposal areas during initial construction and periodic maintenance. This increase in turbidity could cause a decrease in primary productivity due to turbid waters reducing the euphotic zone. Additionally, a possible reduction in dissolved oxygen levels in the immediate vicinity of the dredge could occur if organic sediments undergoing anaerobic decomposition are disturbed by the dredge.

5.02 In addition, some benthic organisms may be destroyed by the dredge cutterhead. Disposal of all suitable material on adjacent beaches during initial and maintenance dredging operations will smother some beach inhabitants. Some macroinvertebrates will also be covered by placement of stone during jetty construction.

5.03 Wildlife species inhabiting the upland disposal area will be displaced by clearing and deposition of dredged material. Existing vegetation in the disposal area will either be removed during initial construction or will be covered with dredged materials each time the area is used for disposal. Diking in the coastal area creates ideal habitat for salt marsh mosquitoes. Some visitors to Huntington Beach State Park may be slightly inconvenienced by construction activities.

6.0 Alternatives to the Proposed Action

6.01 **General. Several possible solutions** to the problem of providing a stablized channel of sufficient depth and width for regular use by commercial and recreational fishing vessels were considered. Experience has shown that it is not economically or physically feasible to maintain the channel by dredging alone. Therefore, it was decided that a proper solution must also include structural controls with provisions for sand bypassing. Structural controls considered include jetties, offshore breakwaters, and conventional and special facilities for sand bypassing. An optimum project was selected by maximizing benefits through comparison of cost and benefits for incremental project requirements related to variations in project depths. Five different plans were tested with physical models to determine the best location and arrangement of structural control appurtenances.

6.02 Non-structural alternatives. One plan of improvement that was considered was a program of dredging without structural controls. Emergency dredging operations at the inlet with the Corps-owned side casting dredge MERRITT proved this approach to be inefficient in obtaining desired depths. This plan was also considered more undesirable to the environmental quality of the inlet than plans with structural controls since the more frequent dredgings required would cause more disruption of benthic populations. In addition, the non-structural alternative would not provide any sheltered water for small boats navigating the entrance channel because of the absence of a jetty system. Social well-being of the local people and other users of the project would benefit less with non-structural control because an undependable entrance channel to the ocean would discourage growth of the commercial fishing and charter-boat operations, and associated businesses in the area. It was therefore concluded that some type of structural control would be required.

6.03 Structural alternatives. Structural alternatives considered included provisions for (1) intercepting, trapping and bypassing sands moving alongshore (2) sheltering using vessels from wave action, and (3) maintaining stable channel dimensions and alignments. Single jetties and double jetties with and without offshore breakwaters and-sand bypassing facilities were considered in formulating the best plan. Since each of these alternatives would accomplish the desired results with about the same environmental impacts, the selection of the best project became a matter of determining which plan maximized benefits. Either jetties or offshore breakwaters would improve economic development and social well-being in the Grand Strand area by providing adequate access to the ocean for the existing and projected fleet. The principal structural alternatives considered were therefore related to the various methods which could be utilized in intercepting and trapping littoral drift. Plans studied included (a) making the updrift jetty a complete littoral barrier causing the sand to form against it, and (b) providing a weir in the updrift jetty over which sands could flow into a deposition basin. In the first plan, sands forming the fillet against the impermeable jetty would be exposed to ocean forces and would have to be bypassed using a permanently installed hydraulic plant, a conventional hydraulic dredge requiring offshore breakwater protection, or a submarine type, jet educator system (not yet perfected). The second plan would require periodic employment of a conventional hydraulic dredge operating within the protected jetty system to remove entrapped sands from the deposition basin to downdrift beaches. The best project arrangement was found to be the construction of jetties extending from the barrier beaches on each side of a dredged inlet channel and sand-bypassing by means of an overflow weir and deposition basin.

6.04 Alternative depths. Various alternative depths for the entrance and inner channel were considered during project formulation. Entrance channel depths that were considered ranged from eight feet to 14 feet mean low water and inner channel depths were two feet less for each level of improvement. The additional two feet in the entrance channel is necessary to allow for the effects of pitch and roll in the ocean. The selection of inner channel depths was based on the loaded draft of the vessel plus an allowance of one-half foot for drag (the designed difference between the draft forward and aft when a vessel is down by the stern), one-half foot for squat (depression of water surface about the hull resulting from the bow and stern wave systems) and two-foot minimum bottom clearance. Using these criteria, boats with drafts up to 3.0 feet could safely negotiate a six-foot inner channel during all tidal stages and boats with up to 5.0 feet of draft could use the 8-foot channel which would be provided under the recommended plan of improvement.

6.04.1 The optimum navigation project was determined through maximization of benefits. Maximum benefits are achieved by incrementally adding higher levels of improvement until the incremental cost of the addition equals the incremental benefits received. Recreational boating and commercial fishing operations, which are now regulated

by the tidal cycles, would realize increasing benefits due to greater channel depths until these depths reach a level that would be adequate for the deepest draft vessels expected to use the inlet. Annual benefits from reduction of vessel maintenance also varies with channel project depth as do the jetty lengths which are based upon entrance channel length which is a function of depth. Cost and benefit analysis data for the various alternatives are presented in Table 12. As shown in this table, Plan B offers the optimum navigation facilities and therefore is the selected plan of improvement.

6.05 Alternate disposal area. The original dredged material disposal plan for the Murrells Inlet project included the use of beach for disposal of sandy materials and a 16-acre marsh area for the disposal of unsuitable materials removed from the upper portion of the inner channel. Due to the high premium now placed on marsh preservation, an alternate upland site was selected for disposal of unsuitable materials.

6.06 No action. The alternative of no action would leave the project area unchanged and would eventually result in abandonment of Murrells Inlet for all boating except small craft which could negotiate the shallow outer bar during favorable weather and tidal conditions. The recreation and navigation benefits to be derived from the proposed project would be foregone.

7.0 The Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity.

7.01 The proposed project would serve both the short-term and long-term interests of the local economy by providing immediate and continuing relief from annual boat damages and delays, allowing more efficient operation of the charter boat fleet, insuring safer navigational conditions, and enhancing the economic growth of the area by attracting additional charter and commercial fishing interests to locate in the area.

7.02 The dredging and beach disposal process is expected to produce a temporary increase in turbidities and a short-term disruption of benthic macroinvertebrate populations which are expected to recover rapidly. The construction of the jetties will result in long-term gains to the sport fishery in the inlet as fishes will be attracted to these structures to prey on food organisms concentrated by the jetties. The disposal of dredged materials on the public beach will help prevent and alleviate erosion and contribute to the maintenance and enhancement of environmental quality in the area.

8.0 Any Irreversible and Irretrievable Committments of Resources Which Would Be Involved in the Proposed Action Should It Be Implemented

8.01 The project will not cause any known significant curtailment of the diversity and range of beneficial uses of the local environment. The project would cause the loss of some fauna inhabiting the proposed channel, jetty, and deposition basin alignments and beach disposal areas. The labor, fuel, and material associated with the construction will be irreversibly and irretrievably committed.

9.0 Coordination and Comment and Response

9.01 A final EIS for this project was filed with the Council on Environmental Quality (CEQ) in 1970, the year the National Environmental Policy Act was signed. This EIS was representative of EIS's prepared during that period and consisted of a very brief presentation in general terms of the environmental impacts. No objections to this EIS were ever received and it was accepted by CEQ. However, in the intervening period, the concept of what an EIS should be has expanded considerably and the EIS filed in 1970 is no longer considered to be adequaterly responsive to CEQ's guidelines. Consequently, after the project was authorized and funds were received for pre-construction planning in FY74, the decision was made to prepare this new EIS.

9.02 A public meeting was held on 16 February 1967 to obtain the views of the public regarding the proposed navigation improvements in Murrells Inlet. About 500 persons attended, including representatives of Federal and State agencies, and local interests from nearby counties and towns. All statements emphasized the need for a safe, stable and unobstructed navigation channel through the inlet.

9.03 A second, late-stage public meeting was held on 5 March 1970 to present the District Engineer's plan for improving the navigability of Murrells Inlet before it was submitted to higher authority for review. About 230 persons attended this meeting including representatives from other agencies and local interests.

9.04 A third, post-authorization meeting was held on 29 May 1975. The purpose of this meeting was to furnish information to interested agencies and individuals as to the nature of the planned improvements and the status of the planning effort, and to solicit the views of all concerned regarding the project. The attendance at this meeting was about 90.

9.05 Throughout the study, the majority of those attending the meetings have been in favor of the proposed project. The major concern expressed relates to the possibility of increased beach erosion south of the jetties.

9.06 A draft EIS was distributed for review on 6 November 1975. All letters of comment received in response to this review are attached as Appendix C of this EIS. A circled number precedes each comment which requires a response and a corresponding number has been assigned to the appropriate response. Responses to these letters of comment are contained in the following section. Subsequent to coordination of the draft EIS, a re-evaluation of project benefits and costs revealed benefits would be maximized with a 10-foot project (10-foot entrance channel, 10-foot Inner Channel A and 8-foot Inner Channel B) instead of the previously recommended 12-foot project. Section 1.0 and other appropriate sections of this final EIS, including the responses to the letters of comment on the draft EIS reflect this change in recommended project depths.

9.06.1 Responses to Government Agencies.

U. S. Department of the Interior

1. A statement to this effect has been included in Section 2.10.01 of this final EIS.

2. Additional information on the least tern nesting area has been included in Section 2.09.02.2 of this final EIS. Also see response 4 below. Additional material has been included in Section 4.05 of this final EIS.

3. Information on flooding has been added to Section 2.08 of this final EIS.

4. Additional information has been added to this EIS which will facilitate an evaluation by reviewers of the significance of the least tern colony on Huntington Beach. In its letter of comment on the draft EIS, the USDI states that the EIS should explain the.... "critical nature of this nest site and its importance to the dwindling least tern population...." and also that...."Least tern populations have decreased drastically...due to human encroachment resulting in loss of nesting habitat." The USDI also states that...."It is probable that....construction...will eliminate the colony completely." The USDI does not present any information or cite any literature in support of these statements. The USDI comments relate to three questions which will be addressed in detail in the following paragraphs: (1) what is the relative abundance of the least tern in South Carolina; (2) what is the probable impact of the proposed work on the colony located at Huntington Beach; and, (3) what is the significance of a possible disruption of the least tern colony on Huntington Beach.

The first question relates to the relative abundance of the least tern. The Corps has searched the recent literature for references to the least tern but has not found anything to indicate that they are in a serious decline. The Corps contacted the USDI's Office of Endangered Species and International Activities and was informed that the variety of least tern found in South Carolina was not on the Fish and Wildlife Service's List of Endangered and Threatened Wildlife and Plants. The Corps was also informed that this tern was neither being considered for inclusion on the list nor had it been nominated for consideration. The Corps believes that the dearth of literature on the least tern and the failure of the USDI to even consider classifying it as a threatened species indicate that the USDI may have overstated the scarcity of least terns in their letter of comment on the draft EIS.

The second question relates to the probable impact of the proposed project on the colony located at Huntington Beach. According to Pough, an internationally known ornighologist, and Sprunt and Chamberlain, writers of the definitive work on the birds of South Carolina, the least tern will colonize a variety of habitats and is very tolerant of human activity. Sprunt and Chamberlain state that "Small colonies are frequently found a few yards from heavily travelled highways." Pough attributes its ability to thrive in regions where island-nesters are declining to its tolerance of disturbance and ability to adapt to civilization. The Corps, therefore, believes that the increased human activity anticipated to result from the project would probably not disturb the tern colony, and that the USDI comments to the contrary are invalid.

The third question relates to the significance of the possible disruption of the tern colony. Although material has been added to this EIS which indicates that the tern colony will not be disrupted, the possibility of disruption, nevertheless, does exist. Sprunt and Chamberlain report that the least tern colonizes a wide variety of

habitats in South Carolina. (See Section 2.09.02.2.2). Counter-posed to this report is the statement of USDI that "Once disturbed these colonial nesters do not necessarily find alternative sites providing adequate ecological requirements; this is why populations have decreased in recent years." The Corps believes it only logical to conclude that a bird which colonizes such a variety of habitats would have no difficulty in finding another nesting site if needed. Stated differently, there are probably a great abundance of sites having "adequate ecological requirements" for the least tern. The Corps, therefore, believes that the concern of USDI on this point is unwarranted.

5. See revised Section 2.11.

6. As discussed in Section 3.0 the proposed facilities are in concert with the recommended plan of development for Huntington Beach State Park. Also see letter of comment on the draft EIS from S. C. Department of Parks, Recreation, and Tourism. Every effort will be made to time beach nourishment so as to reduce possible disturbance to nesting wildlife such as terns or sea turtles.

7. Model studies conducted at the Waterways Experiment Station indicate that provision of an auxilliary channel connecting Oaks Creek to the entrance channel will insure that tidal flow and mixing will not be reduced. Ongoing model studies will determine the exact dimensions of this channel. The model studies also show that tidal fluctuations in Oaks Creek will be comparable to presently existing natural conditions after the project is completed.

8. The subject section of the draft EIS discussed the fact that the jetty system may be aesthetically displeasing to some individuals. Due to its location at the extreme northern end of the park it does not seem that the presence of the jetty would jeopardize designation of the park as a natural landmark any more so than do the existing park facilities. This conclusion is reinforced by the fact that the S. C. Department of Parks, Recreation, and Tourism, in their letter of comment on the draft EIS, stated: "Our Department is in favor of and fully endorses the proposed jetty project to provide safe passage for boats to and from the ocean and to further stabilize the location of Murrells Inlet".

9. The alternative of stabilizing the inlet two miles north of the existing inlet was not discussed in detail in the EIS because it is not a feasible alternative. Historical records show that the inlet has remained in the same approximate location for the past 100 years. Even with strong hurricane surges, there has been no indication that Garden City Beach would be breached in the area discussed in this comment. Although the ecological impacts might be lessened by this alternative, USDI has apparently overlooked the fact that an inlet at the northern location would have great social and economic impacts which would more than outweigh the slight lessening of environmental and ecological impacts. The area two miles north of the inlet is heavily

developed and construction of an inlet at this location would necessitate the construction, at considerable cost, of a high level bridge over the inlet in addition to relocation of numerous private residences.

10. Construction methods have not been finalized as yet and therefore cannot be discussed in the final EIS. However, every effort will be made to assure that park visitors are not inconvenienced to a significant degree and to keep impacts on the park to a minimum.

U. S. Environmental Protection Agency

Once the project is completed, all maintenance dredging will be accomplished with a hydraulic pipeline dredge.

U. S. Department of Commerce

1. The project will not affect any tidal benchmarks in the area.

2. The majority of the eggs and larvae moving into the estuary are carried by tidal currents. Since the proposed project will not significantly change the volume of water moving into the inlet from the ocean it is unlikely that the movement of these organisms would be restricted by the presence of the jetties.

Forest Service, USDA

Every effort will be made to place merchantable timber in commerce.

U. S. Coast Guard

No response required.

Department of Health, Education, and Welfare

No response required.

Soil Conservation Service, USDA

No response required.

Federal Power Commission

No response required.

Department of Housing and Urban Development

No response required.

S. C. Wildlife and Marine Resources Department

1. Although construction schedules have not been finalized as yet, every effort will be made to schedule construction during periods of lowest biological activity.

2. Concur. This information has been included in the subject section of the EIS.

3. We agree but this is stated in the subject paragraph.

4. The suggested additions and corrections have been made in this final EIS.

5. The nomination of these species for inclusion in the list of native threatened species is noted. Every effort will be made to keep the impact on these species to a minimum.

S. C. Department of Parks, Recreation, and Tourism

No response required.

S. C. Department of Archives and History

The information provided has been included in Section 2.11 in this final EIS.

S. C. Department of Health and Environmental Control (Bureau of Wastewater and Stream Quality Control)

1. The sand-bypassing capabilities designed into this project will provide a means by which southerly moving littoral drift intercepted by the deposition basin can be returned to the system south of the jetties, or north if needed. Since the project will not permanently remove sand from the system we do not feel the costs involved in building a moveable bed model to model littoral drift would be justified. It should be noted that the project will be closely monitored after completion and modifications can be made if a need develops.

2. The schedule for beach nourishment operations has not been finalized as yet; however, the suggestion offered in this comment will be taken into consideration when schedules are developed.

3. See revision to Section 4.02.01. Since the only expected change in hydrologic conditions is as described in this section, there is no reason to expect any detectable changes in any of the specific factors cited in this comment. Model studies are continuing and will be described in a detailed report to be prepared by the Waterways Experiment Station upon completion of their study.

4. Although this is a possibility, it would not create any new impacts. As discussed in the EIS, Parsonage Creek is closed to shellfishing because of bacterial contamination due to improper operation of septic tanks and not as a result of boat traffic.

5. Since the project should not affect mercury levels, it is not considered necessary to determine their source.

6. The Waterways Experiment Station of the Corps of Engineers is currently conducting research on this method of dewatering. At this writing, results are not available; however, if the DHEC wishes to suggest possible species which might be used for this purpose, consideration will be given to such plantings.

7. As discussed in the draft EIS, biological studies were conducted during 1975 by the S. C. Wildlife and Marine Resources Department. It is envisioned that a followup study will be made after construction is completed.

S. C. Department of Health and Environmental Control (Division of Vector Control)

Section 4.03.06 of the EIS has been revised to show the assumption by the Charleston District of a proportionate cost of mosquito control on disposal areas when such areas are included in a county comprehensive mosquito control program.

9.06.2 Responses to Citizens and Citizen Groups

G. C. Merchant, Jr. (Litchfield Beaches Property Owner's Association)

1. Current erosion problems are discussed in Section 2.05.04 of the draft EIS. The purpose of the sand-bypassing facility is to assure that littoral drift will be kept in the system. Therefore, we do not expect that beaches north and south of the inlet would be adversely affected by the project. See Section 4.10 of this EIS.

2. The model studies involve a wave generator which produces waves from all relevant directions. In addition, refraction diagrams are computer-plotted, for waves of various heights, periods, and directions, as these are influenced by the offshore hydrography in the vicinity of the inlet. As stated in the EIS, the jetties would reduce the hazards of operating small boats.

3. The referenced sediments come from littoral drift. See Section 2.05.04 of the draft EIS.

4. The provision of sand bypassing will prevent any project-caused beach erosion. See Section 4.10 in this EIS.

5. As discussed in Section 1.06.01 and Section 4.08, maintenance dredging, including removal of sand from the deposition basin to be used for beach nourishment, is an integral part of the project and will be accomplished about every three years or as needed.

6. A review of the record of the Public Hearing indicates that only two people expressed concern over the erosional impact south of the project. As discussed in response 1 to this letter and in Section 4.10, the purpose of the deposition basin is to provide a means by which littoral drift can be kept in the system.

7. It is stated that the draft Impact Statement is biased in favor of commercial boat operators of Murrells Inlet, and neglects the effects on other interests. It is true that the impact statement addresses itself to a definite proposal for jetties at Murrells Inlet, and these jetties serve mainly the needs of party and charter boat operators. But the impact statement, as well as the project studies on which it is based, give due consideration to all economic and environmental effects. The project proposal includes measures to obviate any shoreline erosion that might affect those north and south of the jetties. The generally southward moving littoral sands will pass over a jetty weir into a deposition basin. A pipeline dredge can operate in this area because of the sheltering jetties, and will pump the accumulated sand, at convenient intervals to the beaches north or south of the jetties, as indicated by frequent surveys, so as to make good any sand deficits that might otherwise cause beach erosion.

8. The Murrells Inlet Project cannot logically be compared to jetty projects along the Pacific coast of California.

Dr. and Mrs. C. R. May, III

1. A similar comment is discussed in responses 1 and 7 to letter from G. C. Merchant. Data generated during model studies, show that the smaller creeks and sloughs inland of the proposed inner channel will be little affected by the proposed project.

2. A review of the shoreline changes (see plate 14) around the inlet shows that they are typical of an inlet under the influence of a predominantly southward volume of sand moving in the littoral zone; that is, the generally southward growth of the northern lip of the inlet, accompanied by a somewhat seaward displacement so as to produce a slight overhang of the north lip, and a general recession of the shoreline on the less distinctly formed south lip.

As discussed in Section 2.05.04 of the final EIS, the shoreline on either side of the inlet has undergone considerable fluctuation - generally recession - within the last 100 or so years and is not a recent phenomenon associated with emergency dredging which began in 1966.

Thomas L. Dulin, MD

1. The recommended project is congressionally authorized and was developed in response to numerous requests from area residents. As discussed in Section 4.0 of the EIS, the impacts of the proposed project on the area's marine life will be of a temporary, localized nature and will not affect the area's long-term productivity. Consequently, the quality of fishing, shrimping, crabbing, and clamming should not be noticeably reduced as a result of the proposed project.

2. As discussed in Section 2.02, negotiating the inlet is extremely hazardous at times for both commercial and recreational boat traffic. Construction of the jetties, the major cost item, would help stabilize the inlet thereby providing a safe navigation channel to all boaters utilizing the inlet, not just the large fishing boats.

Mrs. Josephine H. Bostick

The Murrells Inlet area is already "commercialized" to a certain extent and present trends indicate that it will continue to be that way with or without the project. As stated in Section 4.0 of the EIS, most project impacts will be temporary and will not affect the areas marshlands or long-term productivity.

Mrs. Samuel F. Ervin, Jr.

1. The proposed plan is compatible with the master plan for Huntington Beach State Park developed by the S. C. Department of Parks, Recreation, and Tourism. Additional information on least terns has been included in Section 2.09 of this final EIS. Also see response 4 to letter of comment from the U. S. Department of Interior.

2. See revised Table 12 and Appendix A of this final EIS. Most boaters using Murrells Inlet would derive some benefits from the jetty system, not just commercial fishermen as alluded to in this comment. The party and charter boat fishermen would, of course, obtain the greatest benefit due to the greater size of their boats.

Lois A. and James D. McArthur

1. The EIS acknowledges the fact that the area is important to the recreating public.

2. Hazards to small boat navigation inside the inlet will not change appreciably with construction of the project. Problems related to damage from boat wakes should be reported to the appropriate state or local officials, since they do not come under the jurisdiction of the Corps of Engineers.

3. As shown in Table 12 of the draft EIS, commercial fishery benefits are only a small part of the total benefits to be realized as a result of this project. Our projections indicate that as many as three commercial shrimp trawlers will locate in the inlet if a safe navigation channel is provided.

4. The majority of vessels currently using the inlet draw up to 5 feet. An 8-foot inner channel will safely accommodate vessels with drafts up to 5.0 feet during all tidal stages. See revised Section 6.04 for discussion of alternate depths considered.

5. As discussed in Section 4.0 of the EIS, the impacts of the proposed project on the inlet's marine life will be of a temporary, localized nature and will not effect the area's long-term productivity. Consequently, the quality of fishing, shrimping, crabbing, and clamming should not be significantly reduced as a result of the project. Since the impacts of the recommended plan of development are not considered significant, the adoption of Plan A (6-foot inner channel) would not result in a significant benefit to the area's marine life.

6. A similar comment is discussed in response to the letters of comment at the end of this section which request adoption of Plan A.

Mrs. James Judd Green

1. A similar comment is discussed in response 5 to letter from Lois A. and James D. McArthur.

2. The Notice of Public Meeting was sent to both the Sun News and the Georgetown Times and all local radio and TV stations. Also see response 11 to letter of comment from Henry B. Powell.

3. The project will benefit all boaters using the inlet not just the commercial interests.

4. Pollution control is the responsibility of the State of South Carolina. The project will have little effect on existing pollution problems within the inlet. Also see letter of comment from the U. S. Environmental Protection Agency.

5. A similar comment is discussed in response to the letters of comment at the end of this section which recommend that Plan A be adopted.

Henry B. Powell

1. See revised paragraph 4.02.01. Also see letter of comment from U. S. Environmental Protection Agency.

2. The EIS does not consider the sport fishing industry to be the major drawing force of the tourist trade along the Grand Strand. However, the sport fishing industry does make a significant contribution to the economy of the Murrells Inlet area. Data gathered during our study show that many of the party and charter boats as well as numerous private craft have been damaged trying to negotiate the inlet, not just 6 or 7 boats as alleged in this comment.

3. Information presented in the subject section was based on data supplied by charter and party boat operators. In 1967, six trawlers used the inlet until they were forced to cease operations because of navigation difficulties.

4. A majority of the benefits to be derived from the project are attributable to the marinas in Murrells Inlet. The fact that the Garden City Marina will not benefit from all of the project was taken into consideration during the calculation of benefits.

5. The cost of capping the south jetty so that it may be used as a fishing pier is but a small increment of the total project cost. As stated in the EIS, the purpose of the project is to improve navigation in Murrells Inlet.

6. The project will also benefit private sport fishing and recreational boaters. There are no data which indicate that the natural quality of the inlet will be significantly affected or that there will be a noticeable decline in the abundance of fish and shellfish in the inlet as a result of project construction.

7. See revised Section 4.02.02.

8. See revised Section 4.03.06. Flit MLO is a highly refined mineral oil which leaves no residues and is non-toxic to non-target organisms. The control of mosquitoes will be the responsibility of the project sponsor, Georgetown County, however, the Corps of Engineers will contribute to the County comprehensive mosquito control program if it is determined that the Murrells Inlet disposal area provides a mosquito breeding site.

9. Our studies indicate that marina business can increase a significant amount without increasing the number of marinas. Any new docks or marinas proposed in the area would require a Corps of Engineers permit before they could be constructed.

10. Although the diversity values for stations MI 10 and MI 16 are slightly lower than those at MI 06, 07, 08, 09, 12, 13, 14, and 15 they are still indicative of a healthy environment. In addition, several commercially important species were captured at these two stations. The diversity at MI 11 is typical of what is found in dead-end canals with little circulation and bottom materials consisting of black-silty mud. Station MI 11 is in no way indicative of what conditions in the benthic environs will be like if an 8-foot channel is constructed. As discussed in Section 1 of the EIS, only 23,000 cubic yards of material will be removed from the 13,590-foot section designated as Inner Channel A on Plate 2. It is unlikely

that the limited amount of dredging required to remove this material will have much effect on the benthic invertebrate populations in this reach.

11. The current B/C ratio is 1.4 :1. See revised Table 12 and Appendix A. As stated in the draft EIS, three public meetings have been held for this project, the latest on 29 May 1975. The purpose of the first meeting was to obtain input from the public concerning the need for a navigation project at Murrells Inlet. The second meeting was a late-stage public meeting and was held to apprise interested individuals of the District Engineer's plan for improving the inlet. The purpose of the third meeting, a post-authorization meeting, was to furnish information on the nature of the planned improvements and the status of the planning effort, and to solicit the views of all concerned regarding the project.

Contrary to the assertion made in this comment, notice of each of these meetings was widely publicized as is indicated by the attendance at the 1967 meeting. The announcement for the 1975 public meeting was mailed to over 200 interested individuals, all interested state and Federal agencies, state and Federal Senators, and Representatives, eight area postmasters, area Mayors, six local area radio stations, four television stations, and nine state newspapers. The fact that even with such wide publicity only 90 individuals, most of whom were proponents of the project, attended this hearing suggests that there was very little objection to the project.

12. See revised Section 2.02.

13. The control of pollution in the inlet is a state responsibility. Also see response 5 to letter of comment from Lois A. and James D. McArthur.

J. H. Gasque

1. Previous dredging in the inlet was accomplished with a sidecaster dredge. In this type of dredging operation, dredged materials are simply picked up by a cutterhead and ejected into the water a short distance from the dredge thus creating high turbidities and possible siltation of shellfish beds. The dredging proposed for this project will be accomplished with a hydraulic pipeline dredge and dredged materials will either be pumped to nearby beaches or into an upland disposal site. Turbidities generated by this type of dredge are generally restricted to the immediate vicinity of the cutterhead and as such will have little effect on the inlets shellfish and fishery resources.

2. A similar comment is discussed in response to the letters of comment at the end of this section which recommend adoption of Plan A.

Mrs. J. M. Carmichael

1. A similar comment is discussed in response to letters of comment at the end of this section which request that Plan A be adopted.

2. A similar comment is discussed in response 5 to letters from Lois A. and James D. McArthur.

3. A similar comment is discussed in response 11 to letter from Henry B. Powell.

William S. Carmichael

1. A similar comment is discussed in response to letters of comment at the end of this section which recommend adoption of Plan A.
2. The depth being considered for the inner channel was originally 10 feet, not 12 feet as alleged in this comment. As discussed in Section 1.0 of this EIS, inner channel depth is now 10 feet in Inner Channel A and has been reduced to 8 feet in Inner Channel B (see Plates 2 and 3). Hazards to small boat navigation will not change appreciably in the inner harbor with the recommended channel. Also see response 2 to letter of comment from Lois A. and James D. McArthur.
3. See Table 12 and Appendix A for revised cost and benefit analysis. As shown in Table 12, total annual benefits for Plan B will exceed annual costs by $568,100 as compared to $275,000 for Plan A.

4. As discussed in Section 4.03.01.2 the project will have no effect on either the public or commercial shellfishing areas. Also see letter of comment from the Environmental Protection Agency.

W. Willson Powell

1. Annual maintenance costs will be about $468.000 while annual benefits will exceed $2 million. See revised Appendix A.

2. As discussed in the EIS, impacts on fish and wildlife resources will be temporary and localized and will not affect the area's long-term productivity.

3. As is shown in Appendix A, commercial interests are not the sole beneficiaries of the project.

4. See revised Section 2.02 of this final EIS.

5. The recommended project is congressionally authorized and was developed in response to the requests of area residents. As discussed in the EIS, the effects of project construction will be temporary. Small boat usage of waters inside the inlet will be little affected by the project.

6. A similar comment is discussed in response 11 to letter from Henry B. Powell.

7. A detailed discussion of all project impacts is presented in Section 4.0 of the EIS. Also see response 5 to letter of comment from Lois A. and James D. McArthur.

Nicholas H. Beasley

1. A similar comment is discussed in response 5 to letter from Lois A. and James D. McArthur. As discussed in Section 4.0 of the EIS, project impacts will be of a temporary nature.

2. A similar comment is discussed in response 11 to letter from Henry B. Powell.

P. I. Bostick, Jr.

1. Although a majority of the benefits are attributable to the charter and party boat fleet, private recreational and sport fishing boats will also benefit. The impact statement, as well as the project document, gives due consideration to all economic and environmental effects.

2. As discussed in Section 4.0 of the EIS, the impacts of the proposed project on the area's marine life will be of a temporary, localized nature and will not affect the area's long-term productivity. Consequently, the quality of fishing, shrimping, crabbing, and clamming should not be noticeably reduced as a result of the project.

Betty G. Carmichael

1. A similar comment is discussed in response 5 to letter from Lois A. and James D. McArthur. As discussed in Section 4.0 of the EIS, project impacts will be of a temporary nature and will not affect the inlet's long-term productivity.

2. A similar comment is discussed in response 2 to letter of comment from Willouise Carmichael.

3. See revised Section 4.03. Experience in other similar areas has shown that recolonization begins almost immediately after dredging is completed.

4. As stated in Section 1.04.02 of the EIS, the disposal area for unsuitable materials will be located in an upland area a short distance inland. No marsh areas will be used for the disposal of dredged materials.

5. The recommended project is congressionally authorized and was developed in response to numerous requests from area residents. As shown in Appendix A, the commercial interests are not the sole beneficiaries of the project.

6. A similar comment is discussed in response to letters of comment at the end of this section which request the adoption of Plan A.

J. M. Carmichael, Jr.

1. The well scoured bottom at stations MI 04 and MI 05 is caused by tidal currents, not maintenance dredging operations. It should also be noted that the deepest inner channel station sampled (MI 07) had the highest diversity (see Section 2.09.04.1.3.4). Sample stations referred to in this comment (MI 13, 14, and 15) had depths greater than proposed project depths.

2. A similar comment is discussed in response to letters at the end of this section which request the adoption of Plan A.

3. A majority of the benefits to be derived from the proposed project are attributable to the charter and party boat fleet operating out of the inlet, not commercial fisheries. Benefits attributable to commercial fishing were derived from landings at Murrells Inlet not the entire Grand Strand from the North Carolina line to Georgetown as inferred in this comment.

4. See revised Section 4.03.01. Sediments uncovered by dredging will be similar to those currently found in the inlet, mostly a mixture of sand and shell.

5. The local sponsor is Georgetown County. The project would benefit all those who use the inlet for passage to and from the ocean.

6. A similar comment is discussed in response 5 to letter from Lois A. and James D. McArthur.

Miss Willouise Carmichael

1. A similar comment is discussed in response 5 to letter from Lois A. and James D. McArthur.

2. The proposed project should have little effect on this problem. However, since all boat operators are legally responsible for any damage caused by their wakes, problems of this nature should be reported to the appropriate state or local authorities. They do not come under the purview of the Corps of Engineers.

3. A similar comment is discussed in response 11 to letter from Henry B. Powell.

4. A similar comment is discussed in response 1 to letter from J. H. Gasque.

5. As shown in Plate 1 and discussed in Section 1.04.02 of the draft EIS, the disposal area for this project will be located in uplands a short distance inland, not in marsh.

6. The impacts of the proposed dredging are discussed in Section 4.0 of the EIS. Environmental conditions which will exist in the channel after construction is completed will in no way be comparable to existing conditions in the dead-end finger canals at Garden City Beach which receive little tidal flushing. Also see response 5 to letter of comment from Lois A. and James D. McArthur and response 10 to letter of comment from Henry B. Powell. Maintenance dredging requirements are discussed in Section 1.06 of the EIS. As discussed in this section of the EIS, very little dredging will be required to maintain the inner channel and it will be accomplished at about 3-year intervals.

7. A similar comment is discussed in response 1 to letter from Thomas L. Dulin, M.D.

John A. Stedman

1. We acknowledge the fact that the recommended plan will create some opportunity for expansion of the commercial and recreational fleet; however, we have seen no evidence to indicate that the project will result in further destruction of the areas valuable marshlands. Also see response 9 to letter from Henry B. Powell and response 5 to letter from Lois A. and James D. McArthur.

2. A similar comment is discussed in response to letters at the end of this section which request the adoption of Plan A.

Geoffrey I. Scott

1. The effect of the jetties on wave refraction was not evaluated in the model, but it is believed to be negligible. It is generally believed that the refraction effects of jetties tends to reinforce the accumulation of sand fillets on both outer sides of the jetties. The erosion that has been noted downdrift of jetties where sand-bypassing has not been practiced, or has been inadequate in volume, is due to the interception of sand by the updrift jetty, and the fact that the littoral drift stream re-establishes its sand content just below the downdrift jetty at the expense of the adjacent beach. This effect is to be precluded at Murrells Inlet by sand-bypassing.

2. The jetties are designed to withstand storm waves and should not be significantly affected by hurricanes. Similar jetties at Charleston and Georgetown Harbors have withstood many storms without significant damage.

3. The jetty will not be in serious competition with existing fishing piers. The main reason being a kind of market separation; the users seek different kinds of fishing experience. For example, other piers along the Grand Strand have concessions which sell such items as food, beverages, bait, and tackle. None of these items will be available at the proposed walkway. In addition, the walkway will be on the south jetty, and there are no commercial piers on that side for some distance. There will be no access to the north jetty except by boat; therefore, the north jetty will not affect use of the Garden City Pier.

4. Sand will be bypassed downdrift of the jetties or updraft if needed.

5. A similar comment is discussed in response to letters requesting adoption of Plan A. Also see revised cost estimates in Table 12.

6. Although it is true that adoption of Plan A would probably limit the number of charter and party boats with drafts greater than 3.0 feet which could operate out of the inlet, the total number of boats berthed in the inlet will likely increase under either plan. Current pollution problems in the inlet are related to bacterial contamination from improperly treated domestic wastes and not waterway traffic.

7. Although construction schedules have not been established as yet, every effort will be made to schedule dredging during periods of low biological activity. As discussed in Section 4.02 of the EIS all but a small portion (6,000 cubic yards) of the 1,184,000 cubic yards of material to be dredged during construction of the project is a mixture of sand and shell with a rapid settling rate. As a result, turbidities will not become great enough to adversely affect oyster beds. Also see Section 4.03.01.2 and 4.03.01.3 of the EIS.

Mrs. Anne B. Powell

1. A similar comment is discussed in response 2 to letter from P. I. Bostick, Jr. Also see revised Section 4.02 and 4.03 of this final EIS.

2. A similar comment is discussed in response 1 to letter from John A. Stedman and response 1 to letter from P. I. Bostick, Jr. It should be remembered that the Congress of the United States, as representatives of the people, approved of and authorized the proposed project at Murrells Inlet after a thorough review of the benefits and costs outlined in the project document.

3. We see no reason to believe that use of the inlet by small craft will cease if the project is constructed, in fact, our projections of use of the inlet indicate that small boat use will increase significantly in the future.

4. A similar comment is discussed in response 11 to letter from Henry B. Powell.

5. A similar comment is discussed in response to letters at the end of this section which recommend adoption of Plan A.

6. See revised Section 2.02 concerning current maintenance operations. The Corps of Engineers is cognizant of the constantly changing nature of Murrells Inlet. A jetty system was included in the proposed project to help stabilize the inlet and provide a safe navigation channel for all boats using the inlet.

Frederick J. Cole

1. The project provides for the interception of southerly moving littoral drift material by means of a jetty weir and a deposition basin. The intercepted sand will, at convenient intervals, be bypassed to the beaches south of the jetty, or if the need develops, to the beaches north.

2. The limitations of physical models are well understood by the Corps of Engineers' Waterways Experiment Station and the use of the Murrells Inlet Model is well within these limitations.

Comment: Numerous letters (listed below) have been received from interested citizens requesting adoption of Alternate Plan A (8-foot entrance channel and 6-foot inner channel). Reasons given in support of Plan A are: it would reduce the amount of dredging required thus saving the food chain and ecology of the inlet and preserve future fishing, shrimping, clamming, and crabbing; and it would save tax dollars and still provide a usable channel for party and charter boat interests.

David M. Michaux
Walter I. Guy
Catherine W. Crumbley
J. L. Brown
John G. Conway
C. H. Holland
T. M. West, Sr.
L. C. McArthur, Jr.
G. E. Shopbell
Howard Walters
Mrs. Jollaine Dulin
H. B. Risher
J. Clyde Simmons
Mrs. Leroy Dulin
Mrs. W. Ellerbe Rogers
Mrs. Paul Ingle
R. W. Doepner, Jr.
John O. Gasque, Jr. and
John O. Gasque, III
Jord H. Jordan
Frank R. Thies, Jr.
E. Craig Wall, Jr.
Mrs. W. L. Kinney
B. P. McArthur
J. A. McArthur
T. J. Perritt
William H. Smith
John W. Williams
Mrs. W. Z. Betts
Mrs. D. M. Campbell
Mr. & Mrs. Warren H. Eaddy
Mrs. James D. McArthur, Jr.
James D. McArthur, Jr.
Mr. & Mrs. Kenneth C. Hanson, Sr.
Mrs. A. T. Quartz
Mrs. M. E. Teague
Mary P. McArthur
Mr. & Mrs. J. F. McBride, Jr.
Mr. & Mrs. J. F. McBride, III
Gladys M. Sachs
Rose M. Roseberry

Response: As discussed in Section 6.0 of the EIS, several possible solutions to the problem of providing a stabilized channel of sufficent depth and width for regular safe use by commercial party and charter boats and private recreational and fishing boats were considered during project formulation. Table 12 presents a breakdown of the costs and benefits associated with the four most feasible alternatives. Each of these plans included an entrance channel 300 feet wide and an inner channel with considered depths of six. eight, ten and twelve feet.

Based on the criteria utilized for selecting inner channel depths (see revised Section 6.02 of this final EIS), implementation of Plan A (6-foot inner channel) would mean that boats with drafts in excess of 3.0 feet would not be able to safely negotiate the inner channel during all tidal stages. All of the party boats and several charter boats currently operating out of Murrells Inlet have drafts in excess of 3.0 feet. We also know of at least seven party and charter boats with drafts of 4.0 to 5.0 feet which were forced to cease operation in Murrells Inlet because of navigation problems. In addition, there are several large private boats with drafts greater than 3.0 feet which are berthed inside the inlet.

As can be seen in Table 12, there is little difference in the annual costs of the various plans with a majority of the costs being allocated to jetty construction. Jetty lengths vary only slightly between the four plans. Annual maintenance dredging also does not vary significantly between the four plans since about 95 percent of the dredging is for sand-bypassing which does not change with the plans.

Annual benefits, however, vary considerably with the different plans of improvement. This is primarily due to the fact that about 90 percent of the total navigation benefits are attributable to party, charter, and commercial fishing vessels. About 10 percent of the benefits accruing to the project are to the recreational fleet of smaller boats.

It was determined through maximization of the above benefits that the plan with described in Section 1 and shown on Plates 2 and 3 provides the optimum navigation facility. The Murrells Inlet Project was authorized by Congress and as presently proposed will safely accommodate vessels with drafts of up to five feet. A majority of the vessels currently operating out of the inlet have drafts of up to 5 feet.

With reference to concerns over the projects effect on the area's fish and wildlife resources, the reviewers are apparently unaware of the project modifications and biological studies which have been made in an effort to reduce the adverse effects on these resources. For example, it was concern for these resources which prompted us to require that the disposal area for silty materials, initially located in productive marshlands, be moved to an upland site some distance inland thus

eliminating the possibility of the project adversely affecting marshlands. The use of a hydraulic pipeline dredge for all dredging instead of the currently used sidecaster dredge will reduce the high turbidities and siltation and smothering of bottom-dwelling animals which has been experienced during previous maintenance dredging operations.

With reference to concerns about the destruction of the food chain in Murrells Inlet, we contracted with the South Carolina Wildlife and Marine Resources Department to make a study of the area's biological resources so that potential project impacts could be more accurately assessed. As discussed in Section 4.0 of the draft EIS, the findings of this study indicate that the impacts of the proposed project on marine life in the inlet will be of a temporary, localized nature and will not affect the area's long-term productivity.

Consequently, the quality of fishing, shrimping, crabbing, and clamming should not be significantly reduced as a result of the project. Since the impacts of the recommended plan of development are not considered significant, the adoption of Plan A (6-foot inner channel) would not result in a significant benefit to the area's marine life.

The following individuals wrote letters in support of the project that do not require a specific response.

I. N. Livingston
J. Givens Young
Jack S. Tyler
Herman W. Martin (Murrells Inlet Fishermen's & Merchants Asso.)

The following individuals objected to the project but did not offer any comments requiring detailed response.

Miss Eleanor McCall
Mrs. Obbie Carter

LIST OF REFERENCES

1. American Fisheries Society. 1970. A list of common and scientific names of fishes from the United States and Canada, third edition. Spec. Pub. No. 6. Washington, D. C. 150 pp.

2. Boesch, D. F., 1972. Species diversity of marine macrobenthos in the Virginia area. Chesapeake Sci. 13:206-211.

3. Boesch, D. F. 1974. Diversity, stability and response to human disturbance in estuarine ecosystems. Proc. First Int. Cong. Zool., The Hague. 109-114.

4. Boyd, M. B., R. T. Saucier, J. W. Keeley, R. L. Montogomery, R. D. Brown, D. B. Mathis, and C. J. Guice. 1972. Disposal of dredge spoil. U. S. Army Engineer Waterways Experiment Station Tech. Rept. H-72-8. Nat. Tech. Inform. Serv., Springfield, Va. 134pp.

5. Breder, Charles M., Jr. 1948. Field book of marine fishes of the Atlantic coast. G. P. Putnam's Sons, New York. 332pp.

6. Burt, W. H., and R. P. Grossenheider. 1964. A field guide to the mammals. Houghton-Mifflin Co., Boston, Mass. 284pp.

7. Carr, A., and C. J. Goin. 1955. Guide to the reptiles, amphibians, and freshwater fishes of Florida. Univ. of Florida Press, Gainesville. 341 pp.

8. Chesapeake Biological Laboratory. 1970. Gross physical and biological effects of overboard spoil disposal in upper Chesapeake Bay. Final Report to the U. S. Bureau of Sport Fisheries and Wildlife (Contract 14-16-005-2096). Reference No. 70-3. Subsections included in this comprehensive report in order of presentation were as follows:
   Cronin L. E. Summary, conclusions, and recommendations. 15pp.
   Biggs, R. B. Geology and Hydrology. Project A. Reference NO. 69-23. 36 pp.
   Flemer, D. A. Phytoplankton. Project B. Ref. No. 69-15. 15 pp.
   Pfitzenmeyer, H. T. Benthos. Project C. Ref. No. 69-130. 30 pp.
   Goodwyn, F., Jr. Zooplankton, Project D. Ref. No. 69-128. 9 pp.

9. Cooke, C. Wythe, 1936. Geology of the coastal plain of South Carolina. U. S. Geological Survey, Bulletin Number 867.

10. Conant, R. 1958. A field guide to reptiles and amphibians. Houghton Mifflin Co., Boston, Mass. 366 pp.

11. Copeland, B. J., 1970. Estuarine classification and responses to disturbances. Trans. Amer. Fish. Soc. 99:826-835.

12. Craddock, G. R. and Ellerbe, C. M. General soil maps of South Carolina Counties. Soil association descriptions.

13. Cupka, David M., 1972. A survey of the ichthyofauna of the surf zone in South Carolina. S. C. Wildlife and Marine Resources Department. Technical Report No. 4.

14. Engineer Agency for Resources Inventories. 1973. U. S. Army Corps of Engineers environmental reconnaissance of the state of South Carolina. Washington, D.C. 51pp.

15. Gilmore, G., and L. Trent, 1974. Abundance of benthic macroinvertebrates in natural and altered estuarine areas. NOAA Tech. Rep. NMFS SSRF-677. 13 p.

16. Gosner, Kenneth L. 1971. Guide to identification of marine and estuarine invertebrates. Wiley-Interscience, a division of John Wiley and Sons, Inc., New York. 693 pp.

17. May, Edwin B. 1973. Environmental effects of hydraulic dredging in estuaries. Alabama Marine Resources Bulletin No. 9. 85 pp.

18. Miner, R. W. 1950. Field book of seashore life. G. P. Putnam's Sons, New York. 888 pp.

19. Morris, Percy M. 1951. A field guide to the shells of the Atlantic and Gulf coasts. Houghton Mifflin Co., Boston, Mass. 236 pp.

20. Palmer, Ralph S. 1954. The mammal guide. Doubleday and Company, Inc., Garden City, New York. 384 pp.

21. Pough, Richard H. 1951. Audubon water bird guide. Doubleday and Company, Inc., Garden City, New York. 352 pp.

22. Radford, A. E., H. E. Ahles, and C. R. Bell. 1968. Manual of the vascular plants of the Carolinas. University of North Carolina Press, Chapel Hill. 1183 pp.

23. Reish, D. J., 1961. A study of the benthic fauna in a recently constructed boat harbor in southern California. Ecology 42:84-91.

24. Riedl, R., and E. A. McMahan, 1974. High energy beaches. Pages 180-251 in H. T. Odum, B. J. Copeland and E. A. McMahan (eds.), Coastal ecological systems of the United States. The Conservation Foundation. Washington, D. C.

25. Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

26. Sherk, J. A., Jr., and L. E. Cronin. 1970. The effects of suspended and deposited sediments on estuarine organisms. An annotated bibliography of selected references. Chesapeake Biological Laboratory, Reference No. 70-19. vi +73 pp.

27. South Carolina Department of Health and Environmental Control. 1974. Water Classification Standards System for the State of South Carolina. 11 pp.

28. South Carolina Department of Parks, Recreation, and Tourism, 1974. Master Plan for Huntington Beach State Park.

29. South Carolina Water Resources Commission. 1970. South Carolina tidelands report. 178 pp.

30. S. C. Wildlife and Marine Resources Department, 1975. Murrells Inlet environmental studies report. Prelimentary report to the U. S. Army, Corps of Engineers (Contract DACW60-75-C-0016).

31. Sprunt, Alexander, Jr. and E. Burnham Chamberlain 1970. South Carolina bird life. University of South Carolina Press, Columbia.

32. Stickney, Robert. 1973. Effect of hydraulic dredging on estuarine animals studied. World Dredging and Marine Construction. p. 34-37.

33. Stickney, Robert. 1972. Effects of intracoastal waterway dredging on ichthyofauna and benthic macroinvertebrates. The Marine Resources Center, Savannah, Ga. 57 pp.

34. Teal, J., and M. Teal. 1969. Life and death of the salt-marsh. Audubon-Ballantine, New York. 274 pp.

35. U. S. Department of Commerce, National Oceanic and Atmospheric Administration. 1974. Tide tables, high and low water predictions, 1975: east coast of North and South America. U. S. Govt. Ptg. Office, Washington, D. C. 288 pp.

36. U. S. Department of the Interior, 1975. Endangered and threatened wildlife and plants. Federal Register, Vol. 40, No. 188.

37. U. S. Department of the Interior, 1975. National Register of Historic Places. Federal Register, Vol. 40, No. 24.

38. U. S. Water Resources Council, 1974. 1972 OBERS projections-economic activity in the U. S. Volumes 1-7.

39. Windom, Herbert L., 1973. Processes responsible for water quality changes during pipeline dredging in marine environments. In: Proceedings of Fifth World Dredging Conf., Hamburg, Germany.

GLOSSARY

algae - any of a group of chiefly marine or freshwater aquatic plants with no true leaves, stems, or roots ranging in size from microscopic single-cell organisms or colonies to large macroscopic seaweeds.

Amphipoda - large order of malacostracan Crustacea; includes the sideswimmers, sand hoppers, etc.; body compressed; first thoracic segment fused with head; no true carapace; mostly scavengers; most spp. marine, burrowing or moving about on the bottom and debris.

anaerobic - refers to life or processes that occur in the absence of oxygen.

Annelida - phylum consisting of elongated, segmented worms; includes earthworms, leeches, and many kinds of marine forms.

aquifer - an underground bed or stratum of earth, gravel or porous stone that contains water.

Arthropoda - largest phylum; characterized by a segmented body, segmented appendages, chitinous exoskeleton, and an extensive hemocoel; includes crustaceans, insects, spiders and their relatives, centipedes, millipedes, etc.; in all types of habitats.

association - in an ecological sense, a subunit of community organization identified by its major organisms.

benthic region - the bottom of a body of water. This region supports the benthos, a type of life that not only lives upon, but contributes to the character of the bottom.

benthos - the plant and animal life whose habitat is the bottom of a sea, lake or river.

biota - all the species of plants and animals occurring within a certain area.

biotic - of/life.

bivalve - any member of the molluscan Class Pelecypoda. Having a shell of two parts which are joined by hinge, as in pelecypods.

bloom - to flower; of algae, to appear or occur suddenly or in large quantity or degree.

Bryozoa - ectoprocta; phylum which includes the "moss animalcules"; small tufted or branched marine and freshwater organisms a few mm. high; attached to substrates.

canopy - topmost layer of leaves, twigs, and branches of forest trees, or of other woody plants.

carnivore - a flesh eater. The highest trophic level(s) at the top of most food chains.

coliform organism - any of a number of organisms common to the intestinal tract of man and animals whose presence in waste water is an indicator of pollution and of potentially dangerous bacterial contamination.

colonize - to establish a colony in or on.

community - collectively, all of the organisms inhabiting a common environment and interacting with each other.

detritus - in the ecological sense, any fine particulate debris of organic or inorganic origin.

diatom - a unicellular form of algae with walls impregnated with silica.

dissolved oxygen - the oxygen dissolved in water or sewage. Adequately dissolved oxygen is necessary for the life of fish and other aquatic organisms and for the prevention of offensive odors. Low dissolved oxygen concentrations generally are due to discharge of excessive organic solids having high BOD, the result of inadequate waste treatment.

diurnal - activity by daylight; opposite of nocturnal. Occuring every day.

diversity - refers to the number of different kinds of species in an area.

dominant - a species or group of species which largely control the energy flow and strongly affect the environment within a community or association.

ecotone - transition or interdigitated area between two adjacent communities, as the merging zone or adjacent forest and grassland.

environment - sum of all physical, chemical, and biological factors to which an organism is subjected. One of the major habitat types, such as: marine, terrestrial, rain forest, desert, lake, etc.

epifauna - that fauna living on the surface of the bottom deposits in the sea.

erosion - the process of wearing away by the action of water, wind, or glacial ice.

estuary - area where the fresh water meets salt water. For example, bays, mouths of rivers, salt marshes and lagoons. Estuaries are delicate ecosystems; they serve as nurseries, spawing and feeding grounds for a large group of marine life and provide shelter and food for birds and wildlife.

fauna - collectively, the animal life of any particular area or of any particular past time. A list of animal species and descriptions for a particular area or time.

filter feeder - any animal that obtains its food (usually small particles) by filtering it from water; e.g. Daphnia, clams, and tunicates.

flora - the plants peculiar to a country, area, specified environment, or period.

Foraminifera - one of the orders of the Class Sarcodina; main bulk of the cell is enclosed within a simple or chambered and/or coiled shell or test composed of secreted calcium carbonate (usually), silicon dioxide, or bits of foreign material cemented together with an organic secretion.

formation - any sedimentary bed or consecutive series of beds sufficiently homogeneous or distinctive to be a unit.

fossiliferous - containing fossils.

habitat - the specific place where a particular plant or animal lives; usually used in a much more restricted sense than environment, and refers to a smaller area; e.g. spring brook, treetop, weedy pond, and sandy beach.

halocline - boundary between water layers of differing salinities.

hydroperiod - rainy season.

in situ - in place.

infauna - fauna consisting of burrowers in the bottom deposits

intertidal zone - that portion of the sea bottom between high and low tide lines; depending on tidal amplitude and slope of the bottom, the intertidal zone may be narrow or very wide.

invertebrate - collectively, all animals without a vertebral column.

Isopoda - order of malacostracan Crustacea; includes pill bugs, sow bugs, and wood lice; body depressed; first thoracic segment fused with head; abdomen short, some or all segments fused; 3100 spp.; in bottom debris of salt and fresh waters.

larva - general term for any independent, active, immature stage of an animal which is morphologically quite unlike the adult; by a complicated metamorphosis in most cases.

littoral - that shallow portion of the bottom extending from the shoreline to a depth of 200 m.; the term is also used to include both the bottom and the water above the bottom at the depths indicated.

microscopic - Indistinguishable without the use of a microscope.

Molluska - Mollusk; any member of the Phylum Mollusca; Phylum including soft-bodied animals usually partly or wholly enclosed within a calcium carbonate shell and having a muscular "foot" for locomotion.

nekton - collectively, the macroscopic animals suspended in the water of ponds, lakes, rivers, and seas; they move about independently of currents and include such forms as fishes and whales.

Nematoda - Phylum which includes all the true roundworms; body slender, cylindrical, often tapered near ends, and covered with a cuticle; 100 microns to 1 m. long; marine, freshwater, terrestrial, and parasites of plants and animals.

nursery area - an area where animals congregate for giving birth or where the early life history stages develop. e.g. estuaries for shrimp

pelagic - of or pertaining to the open waters of the sea and lakes, especially where the water is more than 20 m. deep.

photic zone - the region of aquatic enviornments in which the intensity of light is sufficient for photosynthesis.

photosynthesis - synthesis of carbohydrates from carbon dioxide and water with chlorophyll as a mediator using light as energy with oxygen as a by-product.

physiography - a description of nature or natural phenomena in general.

phytoplankton - small, mostly microscopic, plants floating in the water column.

pioneer - any early occupant of an open or disturbed area of ground.

plankton - collectively, all those organisms suspended in the water of an aquatic habitat which are not independent of currents and other water movements; most such organisms are microscopic and commonly include bacteria, algae, protozoans, rotifers, larvae, and small crustaceans.

population - a group of organisms of the same species.

producer - any organisms able to synthesize organic compounds from simple inorganic substances, e.g. green plants.

productivity - the rate at which energy is stored by anabolic processes in organisms.

Protista - acellular organisms having a nucleus, chromosomes and mitotic cell division (e.g., protozoans, most algae, slime molds and fungi).

rhizome - a thick horizontal stem partly along and partly under ground, sending out shoots above and roots below.

sedentary - sessile; permanently attached to a substrate, such as a barnacle or sponge.

sere - series of communities which follow one another in slow but definite sequence, ending in a climax typical of a particular climate and geographic area; such series may be completed in a hundred years or up to thousands of years.

sessile - attached to a substrate; not motile. Without a stalk.

substratum -the ground or any other solid object to which an animal may be attached, on which it moves about, or with which it is otherwise associated.

succession - the replacement of one community by another; the definition includes the (controversial or hypothetical) possibility of "retrograde" succession.

terrace - a raised embankment with the top leveled. A level ordinarily narrow plain usu. with steep front bordering a river, lake, or sea.

Tunicata - subphylum in the Phylum Chordata; includes the tunicates, ascidians, salps, and sea squirts; highly modified marine chordates having a more or less cylindrical or globular shape; body wall covered with a secreted cuticular tunic; sessile, free-swimming, or suspended at surface; solitary or colonial.

turbidity - condition of water resulting from suspended matter; water is turbid when its load of suspended material is conspicuous.

vascular - consisting of or containing vessels adapted for transmission or circulation of fluid.

xeric - characterized by or pertaining to conditions of scanty moisture supply.

Table 1. Chemical analyses of sediment samples from the Murrell's Inlet area.

	Huntington Beach	MI03	MI05	MI07	MI10	MI18
Volatile Solids (Max. 6.0)	2.64	2.66	2.62	2.12	2.54	1.78
T.V.S. Formula EC	1.43	1.39	1.41	1.66	1.76	1.85
Total Organic Carbon	0.04	0.03	0.03	0.13	0.17	0.20
C.O.D. (Max. 5.0)	0.12	0.07	0.09	0.35	0.45	0.54
Nitrogen, Kjeldahl (Max. 0.10)	0.0107	0.0068	0.0053	0.0246	0.0154	0.0203
Oil and Grease (Max. 0.15)	0.008	0.013	0.010	0.016	0.016	0.015
Lead (Max. 0.005)	0.0004	0.0004	0.0004	0.0007	0.0006	0.0008
Zinc (Max. 0.005)	0.0006	0.0003	0.0004	0.0006	0.0005	0.0005
Mercury (Max. 0.0001)	0.00120*	0.00045*	0.00016*	0.00020*	0.00003	< 0.00002
Total P as PO_4	0.086	0.144	0.077	0.091	0.063	0.042
Iron	0.256	0.120	0.130	0.220	0.140	0.170
Cadmium	0.00006	0.00006	0.00006	0.00006	0.00007	0.00007

* Exceeds maximum limits.

Table 2. Hydrographic data collected during benthic studies in Murrells Inlet.

	MI01	MI10	MI04	MI16
Date	27-V-75	27-V-75	29-V-75	29-V-75
Depth (m)	0.5	0.5	0.5	0.5
Temp. (C)	25.4	28.4	26.5	27.2
Salinity (°/oo)	33.1	33.6	34.0	34.0
D.O. (mg/l)	7.1	6.8	6.7	6.6
NO_3 (µg/l)	19.2	6.4	1.6	17.8
NO_2 (µg/l)	0.4	1.0	0.8	1.1
PO_4 (µg/l)	0.0	19.0	0.0	0.0
SiO_2 (µg/l)	224.8	927.3	337.2	695.5
Turbidity (FTU)	1.0	14.0	3.8	5.5
Suspended Solids (mg/l)	-	-	66.0	68.8
Settleable Solids (mg/l)	-	-	18.0	21.2
Depth (m)	6.0	3.0	3.0	3.0
Temp. (C)	24.2	28.3	26.6	27.9
Salinity (°/oo)	33.9	33.5	34.0	34.0
D.O. (mg/l)	8.1	6.8	6.7	6.3
NO_3 (µg/l)	5.2	4.1	12.0	17.5
NO_2 (µg/l)	0.4	1.1	1.0	1.4
PO_4 (µg/l)	0.0	30.5	0.0	60.0
SiO_2 (µg/l)	105.4	-	498.8	800.8
Turbidity (FTU)	3.2	16.0	5.1	13.0
Suspended Solids (mg/l)	87.6	-	-	-
Settleable Solids (mg/l)	26.0	-	-	-

Source: S. C. Wildlife and Marine Resources Department.

Table 3. Species of macroinvertebrates collected on Huntington Beach and Garden City Beach and their estimated densities in numbers per m^2. Estimates are based on two $0.10m^2$ samples at each of three stations, one at high tide, one at mid-tide and one at low tide.

Huntington Beach

Species	High Tide	Mid-Tide	Low Tide
Neohaustorius schmitzi	2000	205	220
Parahaustorius longimerus	770	1150	65
Donax variabilis	325	80	90
Mysidacea			175
Nerinides unidentata	5		45
Chiridotea sp.	10		
Nephtys sp.			5
Syllis sp.			5
Caprella equilibra		5	
Caprella sp.		5	
Lepidopa websteri		5	
Pinnixa cristata			5

Garden City Beach

Nerinides unidentata		65	1280
Donax variablilis		60	5
Caprella sp.	5		30
Gammarus sp.			30
Neohaustorius schmitzi		25	
Parahaustorius longimerus		5	5
Bugula neritina			5
Eteone heteropoda			5
Mitrella launata			5
Mysidacea			5
Amphiporeia virginiana		5	
Pagurus brevidactylus			5

Source: S. C. Wildlife and Marine Resources Department.

Table 4. Species of macroinvertebrates collected in the Entrance Channel, and their estimated densities in numbers m^{-2}. Estimates are based on two $0.13m^2$ Petersen Grab samples at each of three stations (MI01, MI02, MI03).

Species	MI01	MI02	MI03
Acanthohaustorius intermedius		381	39
Pseudoplatyischnopus floridanus	39	54	
Clymenella torquata		54	4
Polychaeta (undet.)	15	31	12
Tellina sp.		58	
Parahaustorius longimerus		4	54
Nemertina (undet.)	4	46	4
Travisia parva		39	12
Magelona sp.	8	8	8
Tellina alternata	23		
Pelecypoda (undet.)			23
Dissodactylus mellitae		19	
Nephtys picta		16	
Dosinia discus	8	8	
Pagurus brevidactylus		15	
Tharyx setigera		12	
Nephtys bucera		4	8
Onuphis eremita	12		
Spiophanes bombyx		12	
Donax variabilis			12
Chiridotea stenops	8	4	
Amphipoda (undet.)	8	4	
Euceramus praelongus		12	
Glycera dibranchiata		4	4
Axiothella catenata	8		
Terebra dislocata	8		
Oxyurostylus smithi	8		
Mellita quinquesperforata		8	

Table 4. (cont.)

Species	MI01	MI02	MI03
Renilla reniformis		4	
Nephtys sp.	4		
Nereis sp.		4	
Owenia fusiformis		4	
Oweniidae (undet.)	4		
Aricidea sp.		4	
Sabellaria vulgaris		4	
Dentalium eboreum	4		
Mercenaria mercenaria		4	
Olivella floralia		4	
Terebra concava	4		
Turbonilla curta	4		
Turbonilla dalli		4	
Solen viridis	4		
Ostracoda (undet.)	4		
Mysidacea (undet.)	4		
Edotea montosa		4	
Isopoda (undet.)		4	
Ampelisca holmesi	4		
Erichthonius brasiliensis	4		
Ophiuroidea (undet.)		4	
Branchiostoma sp.		4	

Source: S. C. Wildlife and Marine Resources Department.

Table 5. Benthic invertebrates from oyster dredge collections made at three stations (MI01, MI02, MI03) in the Entrance Channel.

Species	MI01	MI02	MI03
Phylum Bryozoa			
Membranipora tenuis			+
Phylum Sipunculida			
Siphonosoma cumanense	+		
Phylum Echiurida			
Thalassema hartmani		+	
Phylum Annelida			
Glycera dibranchiata		+	
Clymenella torquata		+	
Sabellaria vulgaris	+		
Phylum Mollusca			
Sinum perspectivum	+	+	
Oliva sayana		+	
Abra lioica		+	
Dentalium eboreum		+	
Phylum Arthropoda			
Unciola serrata		+	
Penaeus a. aztecus		+	
Euceramus praelongus		+	
Pagurus pollicaris		+	
Hepatus epheliticus		+	
Ovalipes ocellatus		+	
Portunus spinimanus		+	
Phylum Echinodermata			
Asterias forbesi		+	
Luidia clathrata	+		
Astropecten articulatus	+	+	
Hemipholis elongata		+	
Mellita quinquesperforata	+	+	
Spatangoidea (undet.)	+		

Source: S. C. Wildlife and Marine Resources Department.

Table 6. Species of macroinvertebrates collected in the Inner Channel, and their estimated densities in numbers m^{-2}. Estimates are based on two 0.13 m^2 Petersen Grab samples at each of seven stations (MI04, MI05, MI06, MI07, MI08, MI09, MI10).

Species	MI04	MI05	MI06	MI07	MI08	MI09	MI10
Parahaustorius longimerus	501	439	27				
Tellina sp.			4		39	135	135
Chione cancellata				166			
Polychaeta (undet.)	4	8	8	23	46	39	35
Acanthohaustorius intermedius		100	4			4	
Clymenella torquata			4	19	12	54	15
Nephtys bucera	27	27	4			8	39
Tharyx setigera				15		35	35
Nereis succinea			54	4	8	8	4
Nucula proxima			4	19	4	27	4
Capitellidae A (undet.)				50			
Glycera dibranchiata	4			15	8	15	8
Balanus amphitrite niveus				4	39	4	
Spiophanes bombyx			4	19	4	19	
Magelona sp.			31		4		
Paracaprella tenuis			4	27	4		
Arabella iricolor			4	19	8		
Pelecypoda A (undet.)				4	4	15	8
Ampelisca vadorum			8	19		4	
Ophiuroidea (undet.)	4			23			4
Batea catharinensis			4	23			
Glycera americana				4	19		
Onuphis eremita					19	4	
Brachidontes exustus			8			15	
Donax variabilis		4	19				
Isopoda (undet.)						8	15
Syllidae (undet.)			4	15			4
Ampelisca holmesi					19		

Table 6. (cont.)

Species	MI04	MI05	MI06	MI07	MI08	MI09	MI10
Erichthonius brasiliensis				19			
Unciola sp.				19			
Podarke obscura				8		8	
Sigambra sp.				8		8	
Lepidonotus sublevis				12	4		
Sabella microphthalma				12		4	
Amphipoda (undet.)				8	4		4
Hemipholis elongata						15	
Capitellidae B (undet.)				4			8
Molgula manhattensis				12			
Actiniaria (undet.)						8	
Nemertina (undet.)					4		4
Drilonereis longa							8
Heteromastus filiformis						8	
Pectinaria gouldii				4	4		
Sabellaria vulgaris				8			
Hydroides dianthus				8			
Sthenelais boa				4		4	
Polydora sp.					8		
Trachycardium muricatum				8			
Dosinia discus						8	
Pelecypoda B (undet.)				4		4	
Gammarus sp.					8		
Stenothoe sp.				8			
Lysianopsis alba						4	4
Pinnixa sayana					8		
Arabella iricolor			4				
Glycera asymmetrica						4	
Axiothella catenata			4				
Nephtys sp.					4		
Diopatra cuprea				4			
Scoloplos sp.							4

Table 6. (cont.)

Species	MI04	MI05	MI06	MI07	MI08	MI09	MI10
Phyllodoce arenae				4			
Phyllodocidae (undet.)				4			
Orbiniidae (undet.)	4						
Autolytus fasciatus				4			
Syllis gracilis			4				
Modiolus sp.				4			
Mulinia lateralis							4
Lyonsia hyalina						4	
Pelecypoda C (undet.)			4				
Cerithiopsis sp.						4	
Seila adamsi				4			
Terebra concava			4				
Terebra protexta					4		
Elasmopus laevis							4
Leucothoe spinicarpa				4			
Trichophoxus epistomus				4			
Lembos websteri				4			
Corophium sp.				4			
Euceramus praelongus					4		
Pagurus defensus			4				
Pagurus pollicaris			4				
Cancer irroratus				4			
Arbacia punctulata				4			
Ophiothrix angulata							4

Source: S. C. Wildlife and Marine Resources Department.

Table 7. Benthic invertebrates from oyster dredge collections made at seven stations (MI04, MI05, MI06, MI07, MI08, MI09, MI10) in the Inner Channel.

Species	MI04	MI05	MI06	MI07	MI08	MI09	MI10
Phylum Porifera							
Haliclona canaliculata				+			
Haliclona loosanoffi						+	
Lissodendoryx carolinensis				+		+	+
Axinella polycapella				+			
Homaxinella rudis		+					
Halichondria bowerbanki			+	+	+		+
Hymeniacidon heliophila			+	+			
Cliona celata			+	+	+	+	+
Phylum Cnidaria							
Ectopleura dumortieri							+
Halecium sp.			+	+			+
Campanulina sp.				+			
Lovenella sp.				+		+	+
Obelia bicuspidata							+
Dynamena cornicina				+		+	+
Schizotricha tenella				+		+	
Leptogorgia virgulata					+	+	+
Renilla reniformis				+	+		+
Astrangia danae				+	+	+	
Phylum Entoprocta							
Pedicellina cernua				+			
Barentsia gracilis				+		+	
Barentsia laxa				+		+	+
Phylum Bryozoa							
Alcyonidium hauffi						+	
Arachnidium sp.						+	
Sundanella sibogae				+			
Nolella stipata				+	+		
Anguinella palmata				+	+	+	+
Amathia convoluta						+	+
Amathia distans						+	
Bowerbankia gracilis				+			
Aeverrillia armata				+			
Aeverrillia setigera				+	+		+
Membranipora arborescens						+	
Membranipora tenuis			+	+	+	+	+
Electra monostachys			+		+		+
Bugula neritina			+	+	+	+	+
Bugula stolonifera					+		
Schizoporella errata				+	+	+	+
Hippoporina verrilli				+	+	+	
Microporella ciliata			+				
Parasmittina nitida, A-type				+	+	+	+
Parasmittina nitida, B-type			+	+	+	+	+
Cryptosula pallasiana			+	+	+		+

Table 7. (cont.)

Species	MI04	MI05	MI06	MI07	MI08	MI09	MI10
Phylum Sipunculida							
Themiste alutacea					+		
Phylum Annelida							
Nereis succinea							+
Lepidonotus sublevis						+	+
Sabella microphthalma							+
Hydroides dianthus				+		+	
Phylum Mollusca							
Diodora cayanensis				+			
Crepidula plana				+			
Urosalpinx cinerea					+		+
Anadara ovalis							+
Noetia ponderosa						+	
Modiolus modiolus squamosus				+			
Anomia simplex				+			
Atrina serrata				+			
Crassostrea virginica			+	+		+	
Ostrea equestris				+		+	
Mercenaria mercenaria					+		
Chione cancellata				+		+	
Phylum Arthropoda							
Anoplodactylus lentus						+	+
Tanystylum orbiculare						+	
Balanus amphitrite niveus			+	+	+	+	
Balanus improvisus			+		+	+	
Batea catharinensis				+			
Sicyonia laevigata							+
Alpheus normanni				+			
Pagurus longicarpus	+		+				
Pagurus pollicaris			+	+		+	+
Clibinarius vittatus						+	
Neopanope sayi				+			
Panopeus herbstii				+	+	+	
Menippe mercenaria			+	+			+
Libinia dubia						+	
Phylum Echinodermata							
Asterias forbesi							+
Sclerodactyla briareus					+	+	
Ophioderma brevispinum					+		
Ophiothrix angulata					+	+	+
Arbacia punctulata				+			+
Mellita quinquesperforata	+						
Phylum Chordata							
Amaroucium constellatum				+		+	
Didemnum sp.			+			+	
Perophora viridis				+		+	

Source: S. C. Wildlife and Marine Resources Department.

Table 8. Species of macroinvertebrates collected in the adjacent waterways, and their estimated densities in numbers m^{-2}. Estimates are based on two 0.13 m^2 Petersen Grab samples at each of eight stations (MI11, MI12, MI13, MI14, MI15, MI16, MI17, MI18).

Source: S. C. Wildlife and Marine Resources Department.

Species	MI11	MI12	MI13	MI14	MI15	MI16	MI17	MI18
Capitellidae A (undet.)	4	185			19	12		8
Lembos websteri		85	19		8		69	
Streblospio benedicti	85	23				4	31	8
Chione cancellata		8	6	4	31	27		
Prionospio pinnata	96	8					23	4
Polychaeta (undet.)	4	27	8	8	46	4	31	
Ophiuroidea (undet.)		92	19		15			
Clymenella torquata			4	4	4	69	19	4
Glycera dibranchiata		4	4		19	15	19	12
Ampelisca vadorum		4	50		4		12	
Arabella iricolor	4	42	8		8			
Nucula proxima		4	15	12	19	8		
Notomastus sp.							54	
Melita fresneli		42	12					
Tellina sp.	19		8			12	4	8
Nereis succinea		12			8		31	
Syllidae A (undet.)		31			19			
Panopeus herbstii		35			15			
Nemertina (undet.)	12	4	12			4	8	8
Tharyx setigera	4			4			31	
Corbula sp.	8	8	8	15				
Pista quadrilobata			12	4	19			
Mercenaria mercenaria				4	4	8	4	15
Pelecypoda A (undet.)		35						
			88					

Table 8. (cont.)

Species	MI11	MI12	MI13	MI14	MI15	MI16	MI17	MI18
Amphipoda (undet.)		15				4	15	
Ophiothrix angulata		35						
Sipunculida (undet.)		19		8	4			
Mulinia lateralis			4		4		15	4
Unciola serrata			4		8		12	
Sabella microphthalma		8			4		12	
Holothuroidea (undet.)			19		4			
Cirratulidae					12			8
Potamilla reniformis		8					12	
Syllidae B (undet.)					12			8
Abra lioica			8		4	4		4
Paracaprella tenuis			12		8			
Sthenelais boa		4	8		4			
Stauronereis rudolphi		12			4			
Nereis sp.					15			
Syllidae C (undet.)					15			
Trachycardium muricatum			15					
Maera sp.		15						
Orbiniidae	8						4	
Pectinaria gouldii			4				8	
Pinnixa sp.			8					4
Hemipholis elongata			4	8				
Capitellidae B (undet.)		8						
Glycera americana	4	4						
Podarke obscura				4		4		
Axiothella mucosa					8			
			89					

Table 8. (cont.)

Species	MI11	MI12	MI13	MI14	MI15	MI16	MI17	MI18
Phyllodocidae (undet.)							4	4
Polydora sp.							8	
Spionidae (undet.)					8			
Syllidae D (undet.)					8			
Seila adamsi		8						
Fasciolaria tulipa		8						
Bullidae (undet.)	4			4				
Ostrea equestris		4					4	
Crassostrea virginica		4						4
Trachycardium egmontianum			4					4
Semele proficua			8					
Martesia sp.		8						
Pelecypoda B (undet.)		4					4	
Oxyurostylus smithi					4	4		
Batea catharinensis			4		4			
Melita nitida								8
Gammaridae (undet.)			4					4
Leucothoe spinicarpa		4			4			
Neopanope sayi			8					
Eudendrium sp.							4	
Drilonereis longa							4	
Marphysa sanguinea		4						
Glycera sp.					4			
Maldanidae (undet.)		4						
Diopatra cuprea	4							
Lepidametria commensalis					4			

Table 8. (cont.)

Species	MI11	MI12	MI13	MI14	MI15	MI16	MI17	MI18
Sabellaria vulgaris								4
Spiophanes bombyx	4							
Eusyllis lamelligera							4	
Nucula sp.								4
Solemya velum			4					
Barbatia candida			4					
Semele sp.					4			
Chione grus			4					
Dosinia discus								4
Lyonsia hyalina					4			
Pelecypoda C (undet.)				4				
Callipallene brevirostris			4					
Cumacea (undet.)							4	
Trichophoxus epistomus		4						
Ampelisca holmesi				4				
Lysianopsis alba					4			
Erichthonius brasiliensis								4
Corophium acherusicum							4	
Corophium sp.						4		
Alpheus armillatus		4						
Pagurus annulipes						4		
Pagurus defensus		4						
Pagurus pollicaris							4	
Portunus gibbesi			4					
Pinnixa chaetopterana							4	
Decapod juv. (undet.)			4					
Leptosynapta tenuis			4					

Table 9. Benthic invertebrates from oyster dredge collections made at eight stations (MI11, MI12, MI13-14, MI15, MI16, MI17-18) in the adjacent waterways.

Species	MI11	MI12	MI13-14	MI15	MI16	MI17-18
Phylum Porifera						
Haliclona canaliculata			+			
Lissodendoryx carolinensis			+	+		
Microciona prolifera			+	+	+	+
Halichondria bowerbanki		+	+	+		
Hymeniacidon heliophila			+	+		
Cliona celata		+	+	+	+	+
Phylum Cnidaria						
Ectopleura dumortieri				+		
Halocordyle disticha			+			
Eudendrium carneum				+		
Halecium sp.		+		+		
Campanulina sp.		+				
Lovenella sp.		+		+		
Dynamena cornicina		+	+	+	+	
Schizotricha tenella		+	+	+	+	+
Leptogorgia virgulata		+	+			+
Renilla reniformis		+				
Phylum Entoprocta						
Loxosomella cricketae			+			
Pedicellina cernua		+	+	+	+	
Barentsia gracilis				+	+	
Barentsia laxa			+	+	+	+
Phylum Bryozoa						
Alcyonidium hauffi		+	+	+		+
Arachnidium sp.		+				
Anguinella palmata			+	+		+
Amathia distans			+	+		+
Zoobotryon verticillatum			+	+		+
Bowerbankia gracilis				+		+
Aeverrillia armata				+		
Aeverrillia setigera				+	+	
Membranipora arborescens			+			
Membranipora tenuis			+	+	+	
Bugula neritina	+	+	+	+	+	
Bugula stolonifera				+	+	+
Schizoporella errata		+		+	+	
Hippoporina verrilli		+	+	+	+	
Microporella ciliata					+	
Parasmittina nitida, A-type			+	+	+	
Parasmittina nitida, B-type		+	+	+	+	+
Cryptosula pallasiana		+			+	
Phylum Annelida						
Pectinaria gouldii				+		
Sabellaria vulgaris			+			

Table 9. (cont.)

Species	MI11	MI12	MI13-14	MI15	MI16	MI17-18
Sabella microphthalma						+
Hydroides dianthus		+	+			
Phylum Mollusca						
Chaetopleura apiculata			+			
Diodora cayanensis			+			+
Crepidula plana	+					+
Urosalpinx cinerea	+					
Pleuroploca gigantea			+			
Anadara ovalis	+					+
Noetia ponderosa					+	+
Brachidontes exustus			+			+
Anomia simplex		+				
Pteria colymbus						+
Crassostrea virginica				+		+
Ostrea equestris			+			
Mercenaria mercenaria					+	+
Chione cancellata		+	+		+	
Phylum Arthropoda						
Callipallene brevirostris			+			
Anoplodactylus lentus		+				
Tanystylum orbiculare				+		+
Balanus amphitrite niveus	+	+		+	+	
Balanus improvisus				+	+	
Melita fresneli			+	+		
Penaeus a. aztecus			+			+
Palaemonetes sp.			+			
Pagurus pollicaris						+
Hepatus epheliticus				+		
Callinectes sapidus				+		
Ovalipes ocellatus		+				
Hexapanopeus angustifrons				+	+	
Panopeus herbstii			+	+	+	+
Menippe mercenaria			+			
Pilumnus sayi			+	+		
Libinia emarginata			+			+
Phylum Echinodermata						
Asterias forbesi	+					
Echinaster serpentarius			+			
Sclerodactyla briareus			+			
Ophioderma brevispinum				+		
Ophiothrix angulata	+		+	+	+	+
Arbacia punctulata						+
Phylum Chordata						
Amaroucium constellatum		+	+			+
Didemnum sp.			+	+		+
Perophora viridis			+	+		+
Styela sp.						+
Molgula manhattensis			+			+

Source: S. C. Wildlife and Marine Resources Department.

Table 10. List of observed marsh plants in Murrells Inlet, July 1975.

SCIENTIFIC NAME	COMMON NAME	LOCATION
Spartina alterniflora	Smooth cordgrass	Low & high marshes
Spartina patens	Wiregrass	High marsh
Sporobolus virginicus	Dropseed	High marsh
Borrichia frutescens	Sea ox-eye	High marsh
Limonium carolinianum	Sea lavender	High marsh
Uniola paniculata	Sea oats	High marsh
Hydrocotyle sp.	Pennywort	High marsh
Croton punctatus		High marsh
Solidago sempervirens	Seaside goldenrod	High marsh
Suaeda linearis	Sea-blite	High marsh(spoil area)
Salicornia virginica	Glasswort	High marsh (spoil area)
Distichlis spicata	Spike grass	High marsh
Juncus roemerianus	Needlerush	High marsh
Iva frutescens	High tide bush	High marsh
Fimbristylis spadicea		High marsh
Sabatia stellaris	Sea pink	High marsh
Cyperus ovularis	Sedge	High marsh
Elymus virginicus	Wild ryegrass	High marsh
Opuntia drummondi	Cactus	High marsh
Bacopa monnieri		High marsh

Source: S. C. Wildlife and Marine Resources Department.

Table 11

Commercial Fishery Landings, 1969-1974[1/]

	1974		1973		1972		1971		1970		1969	
FINFISH	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Alewives	--	--	--	--	--	--	150,000	3,000	20,000	300	--	--
Bluefish	150	30	3,100	643	--	--	12,875	2,331	8,350	1,251	5,300	848
Croaker	36,000	3,600	450	54	83	16	400	40	2,050	183	--	--
Drum, Black	--	--	141	21	158	32	200	34	1,000	100	1,000	120
Drum, Red	125	50	--	--	--	--	100	20	--	--	--	--
Eels, Common	--	--	2,300	345	--	--	--	--	--	--	--	--
Flounders unclassified	7,402	2,113	9,487	2,417	5,890	1,181	6,310	1,387	1,500	240	--	--
Groupers	60,856	31,255	66,433	24,067	9,547	2,015	3,920	552	3,200	314	3,500	435
Grunts	--	--	3,500	530	775	1,591	1,250	125	3,200	260	3,700	490
Hickory shad	--	--	--	--	3,186	637	--	--	1,100	203	--	--
King mackerel	4,069	2,287	10,455	4,482	778	357	6,350	1,108	--	--	1,250	178
King whiting or "kingfish"	11,445	1,754	24,245	4,081	15,935	1,814	22,800	2,628	8,000	845	16,275	1,628
Menhaden	--	--	--	--	--	--	12,000	240	10,000	100	245,000	3,675
Mullet	840,693	--	239,935	26,690	508,900	22,794	673,750	44,739	859,000	17,180	842,000	76,285
Pompano	--	--	632	143	--	--	--	--	--	--	--	--
Scup or porgy, unclassified	2,819	727	18,459	3,757	15,107	3,338	121,500	12,300	239,118	24,442	9,215	922
Sea bass, unclassified	21,857	7,233	120,154	38,211	290,786	100,654	329,030	77,216	497,381	104,622	645,893	153,090
Seatrout, gray	1,800	696	1,823	469	--	--	--	--	3,700	308	5,000	375
Seatrout, spotted	1,322	566	2,060	674	7,995	2,390	19,923	4,944	4,700	1,175	7,935	2,451
Shad	21,799	10,925	25,318	11,312	116,223	34,195	80,086	31,328	93,626	26,269	86,596	28,939
Sharks	--	--	4,258	421	--	--	400	32	--	--	--	--
Sheepshead, saltwater	--	--	--	--	--	--	--	--	--	--	500	69
Snapper, Red	8,289	8,698	11,091	10,194	7,060	5,713	3,500	2,415	8,500	5,950	4,213	2,610
Snapper, Vermillion	1,750	918	4,878	2,302	11,221	4,521	9,850	3,188	--	--	--	--
Spanish mackerel	1,142	263	2,300	331	910	215	2,950	369	--	--	2,750	435
Spot	338,493	37,821	1,403,592	227,000	2,223,855	201,988	1,239,090	78,411	342,400	34,422	430,900	41,113
Sturgeon	46,837	19,780	44,365	13,178	68,019	18,208	76,499	14,672	3,808	762	35,172	6,396
Total finfish	1,406,848	128,716	1,998,976	371,322	3,286,428	401,659	2,772,783	281,079	2,110,633	218,926	2,346,199	320,059
SHELLFISH												
Crabs, Blue, hard	22,440	3,970	92,499	12,701	7,505	931	2,675	253	4,400	308	14,503	1,305
Shrimp, saltwater(heads-on)	888,821	533,906	1,193,533	1,352,225	745,296	475,466	955,220	496,428	476,672	262,213	339,851	187,348
Clams, Hard (meats)	9,481	8,951	14,769	7,347	16,730	7,360	256,210	118,533	23,600	10,620	69,313	27,509
Octopus	--	--	1,000	150	--	--	--	--	--	--	--	--
Oysters (meats)	62,876	33,506	56,137	29,662	38,675	19,180	39,299	19,420	32,542	16,573	27,877	14,447
Squid	712	221	1,347	202	--	--	--	--	--	--	--	--
Total Shellfish	984,330	587,462	1,359,285	1,402,287	808,206	502,937	1,253,404	634,634	537,214	289,714	451,544	230,609
Grand Total	2,391,178	716,178	3,358,261	1,773,609	4,094,634	904,596	4,026,187	915,713	2,647,847	508,640	2,797,743	550,668

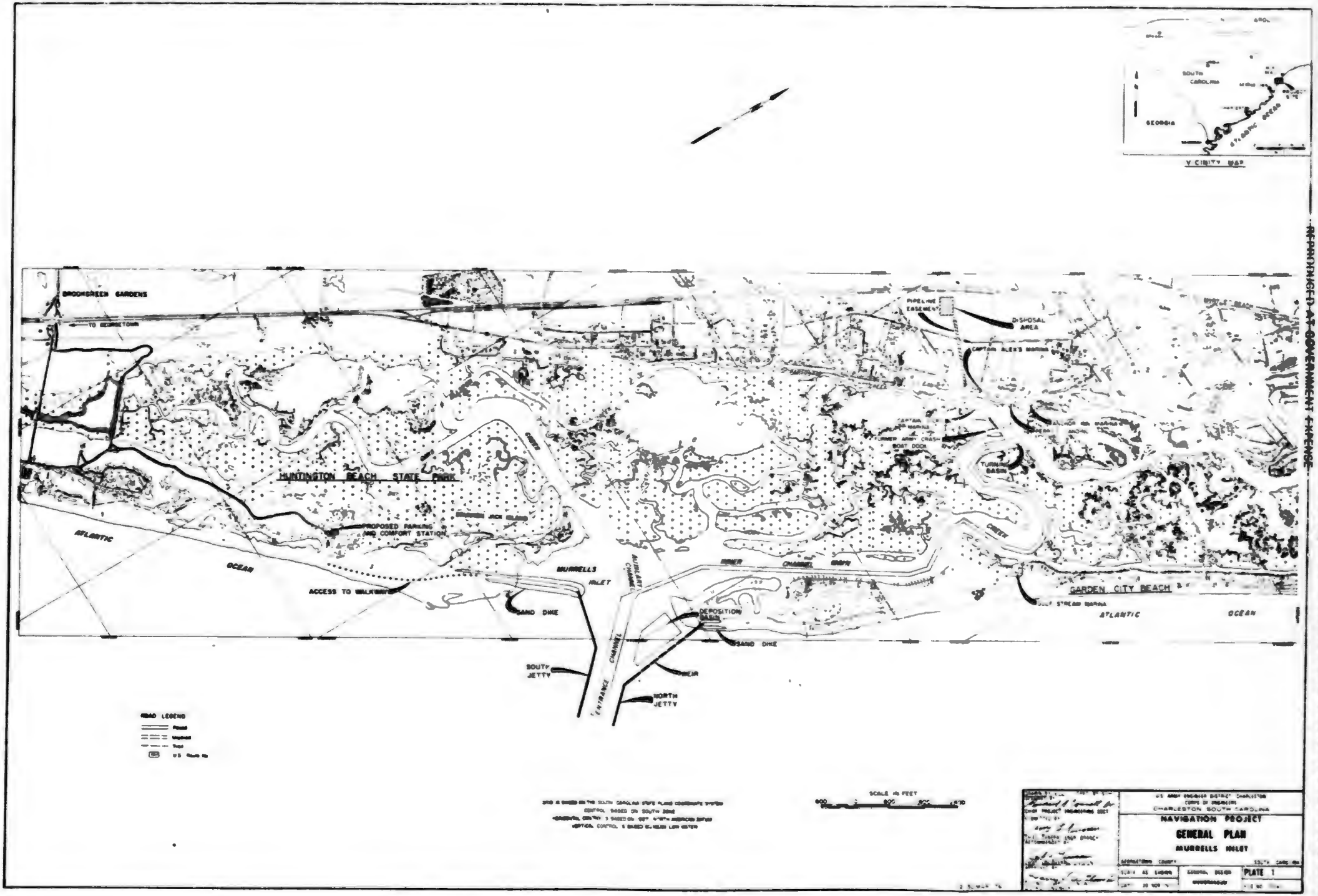
1/ Includes Georgetown, Horry, and Marion Counties
(From: S. C. Landings, Annual Summaries, U.S. Dept of Commerce in cooperation with the S.C. Wildlife and Marine Resources Dept.)

Table 12

CONSIDERED LEVELS OF IMPROVEMENT
FOR NAVIGATION FACILITIES

ITEM	Plans of Improvement			
	A	B[1/]	C	D
PERTINENT DATA				
Entrance channel depth	8 feet	10 feet	12 feet	14 feet
Inner channel depth	6 feet	8 feet[2/]	10 feet	12 feet
Initial dredging (C.Y.)	970,000	1,140,000	1,370,000	1,640,000
Deposition basin	600,000	600,000	600,000	600,000
Entrance channel	240,000	320,000	410,000	510,000
Auxilliary channel	30,000	64,000	30,000	30,000
Inner channel & turning basin	100,000	200,000	330,000	500,000
Annual maintenance dredging (C.Y.)	202,000	203,000	212,000	218,000
North Jetty length (ft)	2,945	3,455	3,685	3,825
South jetty length (ft)	2,750	3,330	3,610	3,750
PROJECT FIRST COSTS	$10,347,000	$13,972,000	$16,046,000	$17,558,000
AVERAGE ANNUAL COSTS				
Interest & amoritization	$ 668,000	$ 877,000	$ 1,036,000	$ 1,133,000
Maintenance Costs	431,000	460,000	490,000	507,000
TOTAL	$ 1,099,000	$ 1,337,000	$ 1,526,000	$ 1,640,000
BENEFITS				
Party boating	$ 619,700	$ 966,600	$ 1,019,200	$ 1,019,200
Charter boating	182,800	212,300	212,300	212,300
Recreational boating	219,800	232,500	250,100	250,100
Commercial fishing	294,600	430,900	464,100	465,500
Elimination of vessel damage	41,100	46,800	52,000	52,000
Harbor of refuge	13,000	13,000	13,000	13,000
TOTAL ANNUAL BENEFITS (Navigation Facilities)	$ 1,371,000	$ 1,902,100	$ 2,010,700	$ 2,012,100
Excess of benefits over costs	$ 275,000	$ 568,100	$ 487,700	$ 375,100
Benefit-to-cost ratios	1.2:1	1.4:1	1.3:1	1.2:1

1/ Recommended plan of improvement
2/ Inner Channel A



CHARLESTON SOUTH CAROLINA

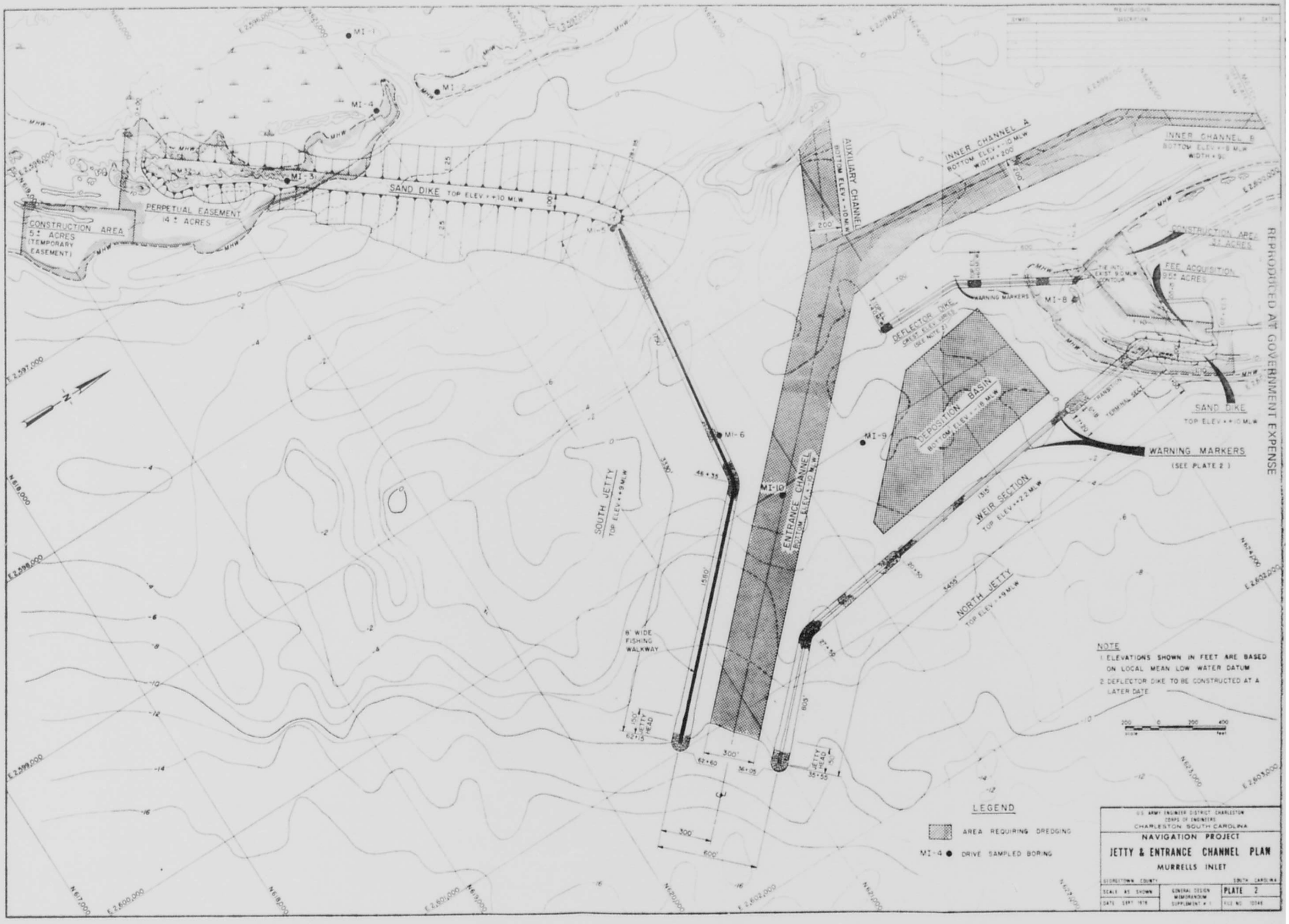
NAVIGATION PROJECT

GENERAL PLAN

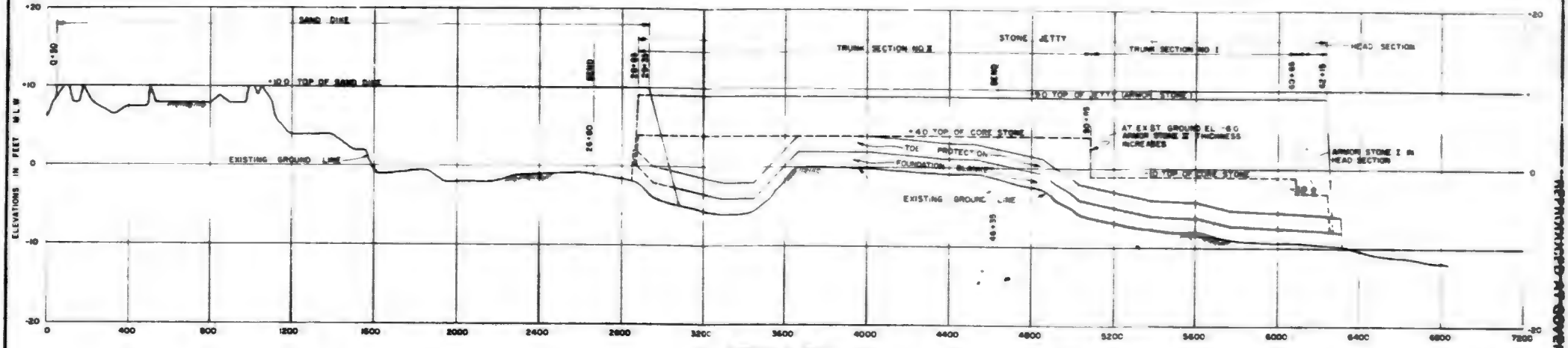
MURRELLS INLET

PLATE 1

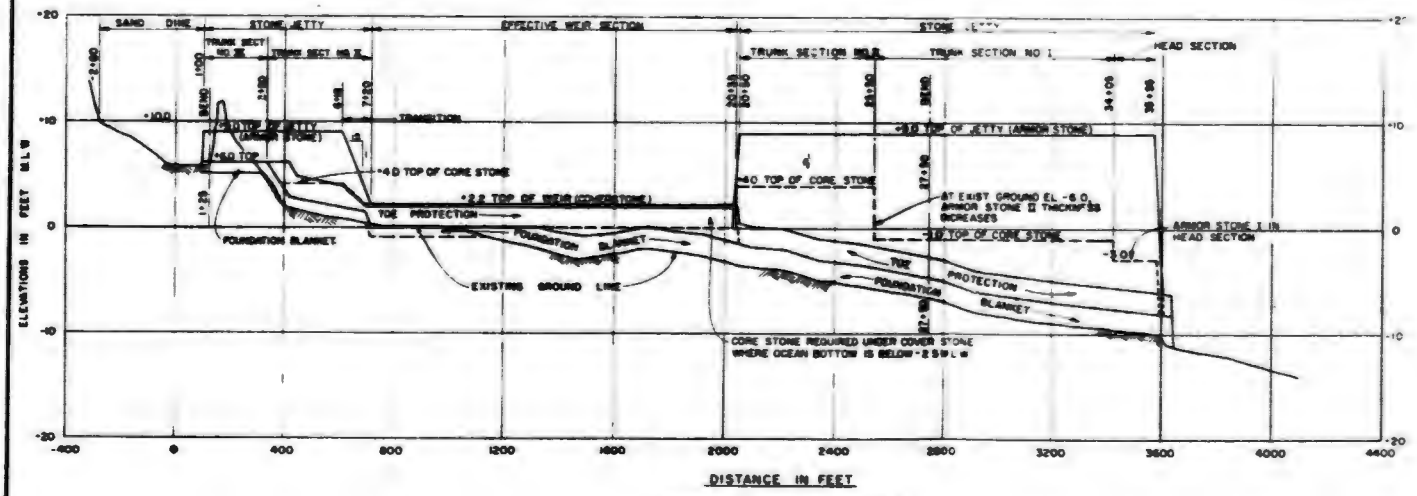
REPRODUCED AT GOVERNMENT EXPENSE



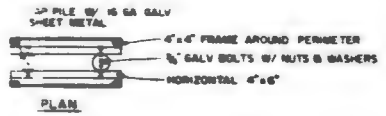

MATCH LINE
MATCH LINE
REVISIONS
NO. DESCRIPTION BY DATE
FORMER ARMY CRASH BOAT DOCK
S-2
S-4
S-6
S-8
INNER CHANNEL
BOTTOM ELEV. +-8 MLW
WIDTH +90'
PIPELINE EASEMENT (PERPETUAL)
PIPELINE EASEMENT (TEMPORARY)
BEACH DISPOSAL AREA 4 ± ACRES (TEMPORARY EASEMENT)
PIPELINE EASEMENT (TEMPORARY)
NOTE
CHANNEL PROFILE TAKEN FROM CROSS-SECTIONS, AUG 76
200 0 200 400
scale feet
US ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, SOUTH CAROLINA
NAVIGATION PROJECT
INNER CHANNEL PLAN
MURRELLS INLET
GEORGETOWN COUNTY SOUTH CAROLINA
SCALE AS SHOWN
DATE OCT 1976
PLATE 3
FILE NO. 10040

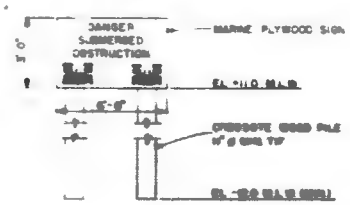


SOUTH JETTY PROFILE



NORTH JETTY PROFILE





WARNING MARKER AT WEIR SECTION

N.T.S.

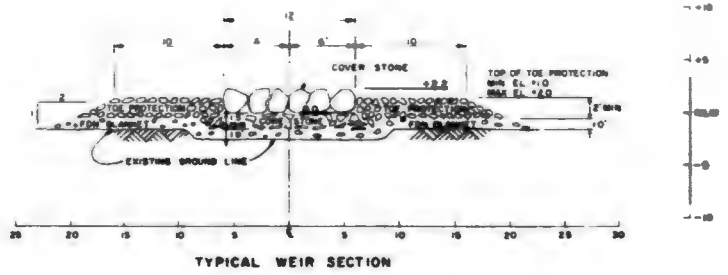
U.S. ARMY ENGINEER DISTRICT CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, SOUTH CAROLINA

NAVIGATION PROJECT

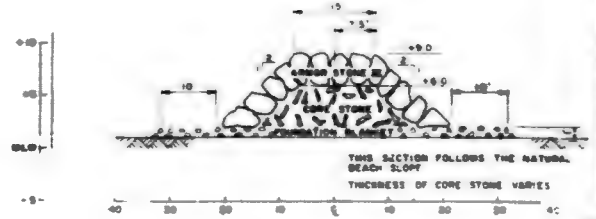
JETTY PROFILES

MURRELLS INLET

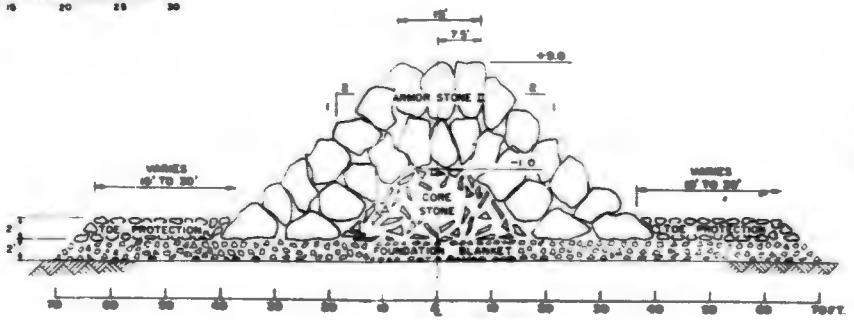
PLATE 4



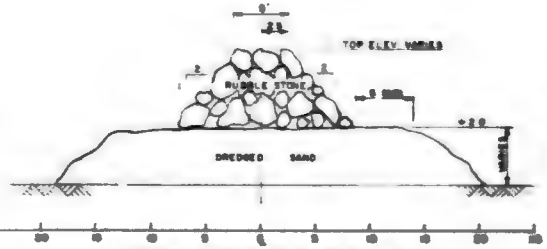
TYPICAL WEIR SECTION



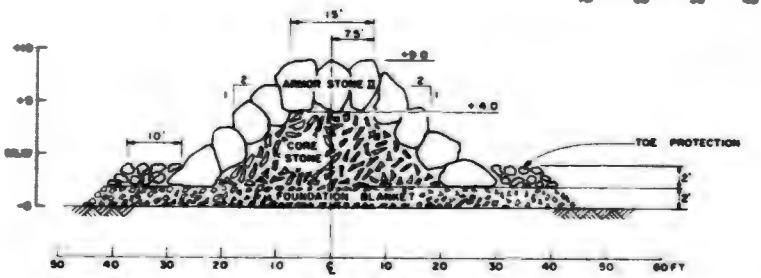
TYPICAL TRUNK SECTION
TYPE III



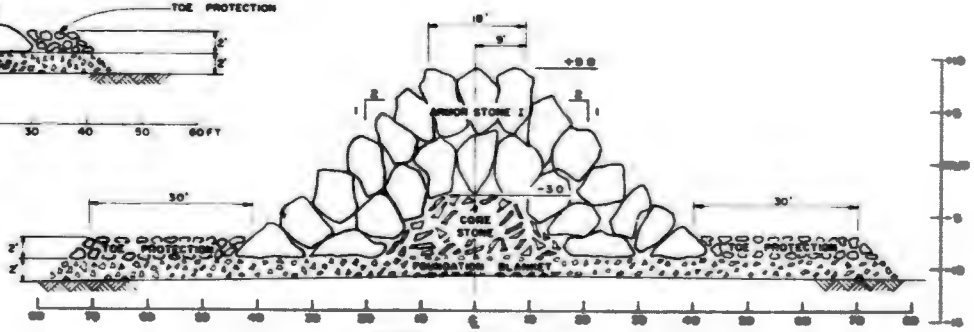
TYPICAL TRUNK SECTION
TYPE I



TYPICAL DEFLECTOR DIKE SECTION



TYPICAL TRUNK SECTION
TYPE II



TYPICAL HEAD SECTION

JETTY STONE*

TYPE	WEIGHT (TONS)	SIZE (INCHES)
ARMOR I	6 — 10	60 — 75
ARMOR II	4 — 7	50 — 60
ARMOR III	1 — 3	32 — 50
CORE	——	15 — 40
TOE PROTECTION	——	12.0 — 24.0
FOUNDATION BLANKET	——	0.25 — 6.0

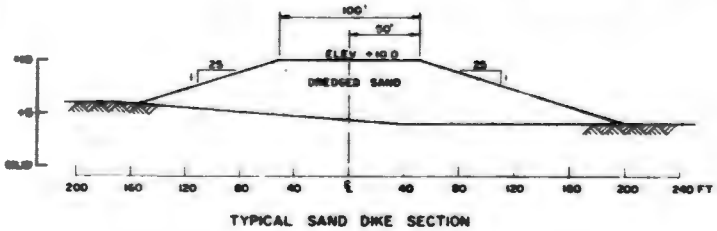
* ASSUMED SPECIFIC WEIGHT = 140 LBS PER CUBIC FOOT (SSD)

WEIR STONE*

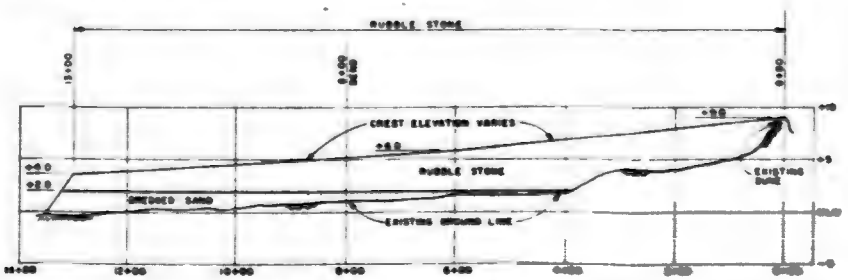
TYPE	WEIGHT (LBS)	SIZE (INCHES)
COVER STONE	1425 — 1975	96 — 24
TOE PROTECTION	650 — 900	13 — 24
CORE STONE	——	15 — 15
FOUNDATION BLANKET	——	0.25 — 6.0

DEFLECTOR DIKE STONE*

TYPE	WEIGHT (LBS)	SIZE (INCHES)
RUBBLE STONE	325 — 550	17 — 21



TYPICAL SAND DIKE SECTION

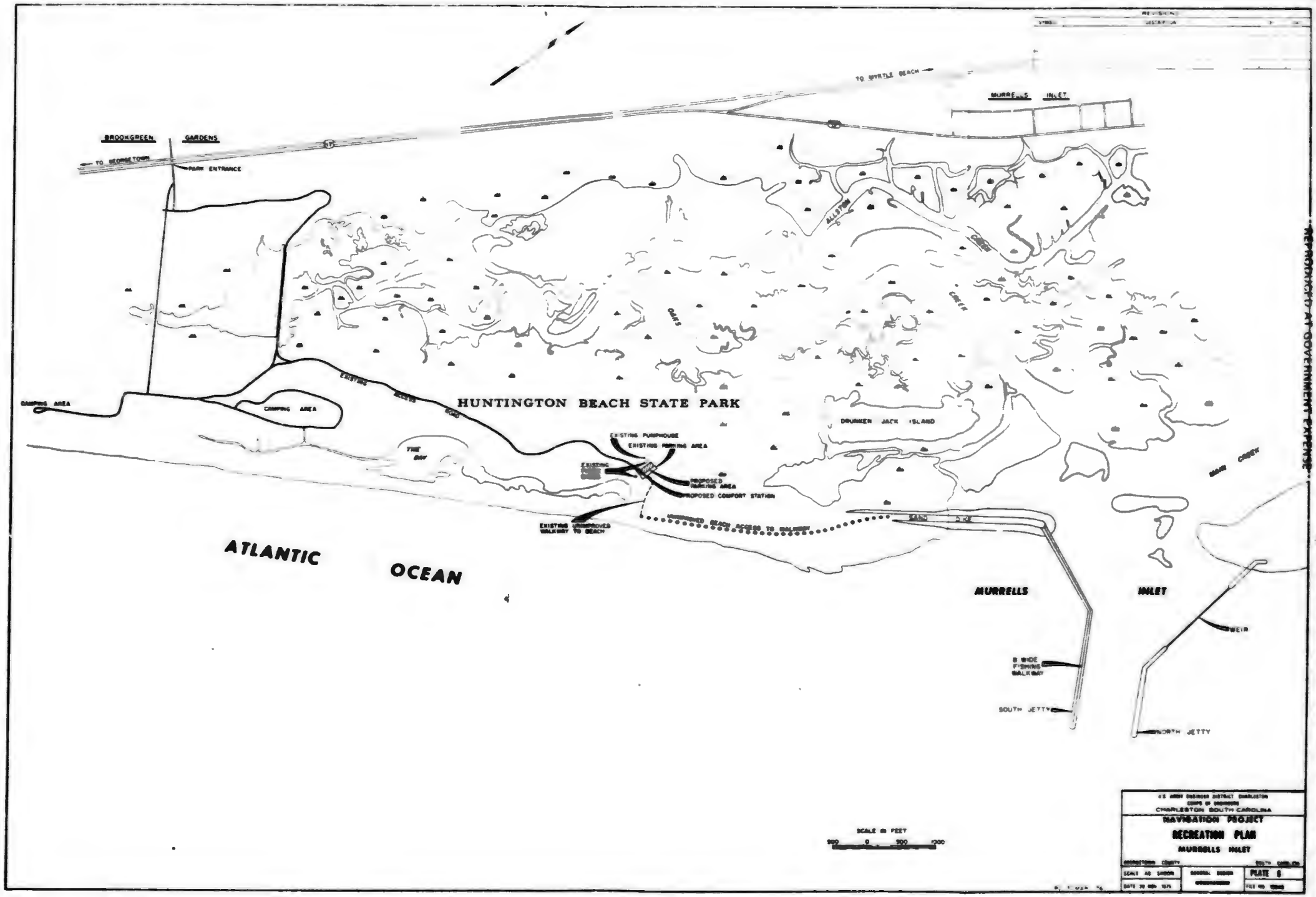


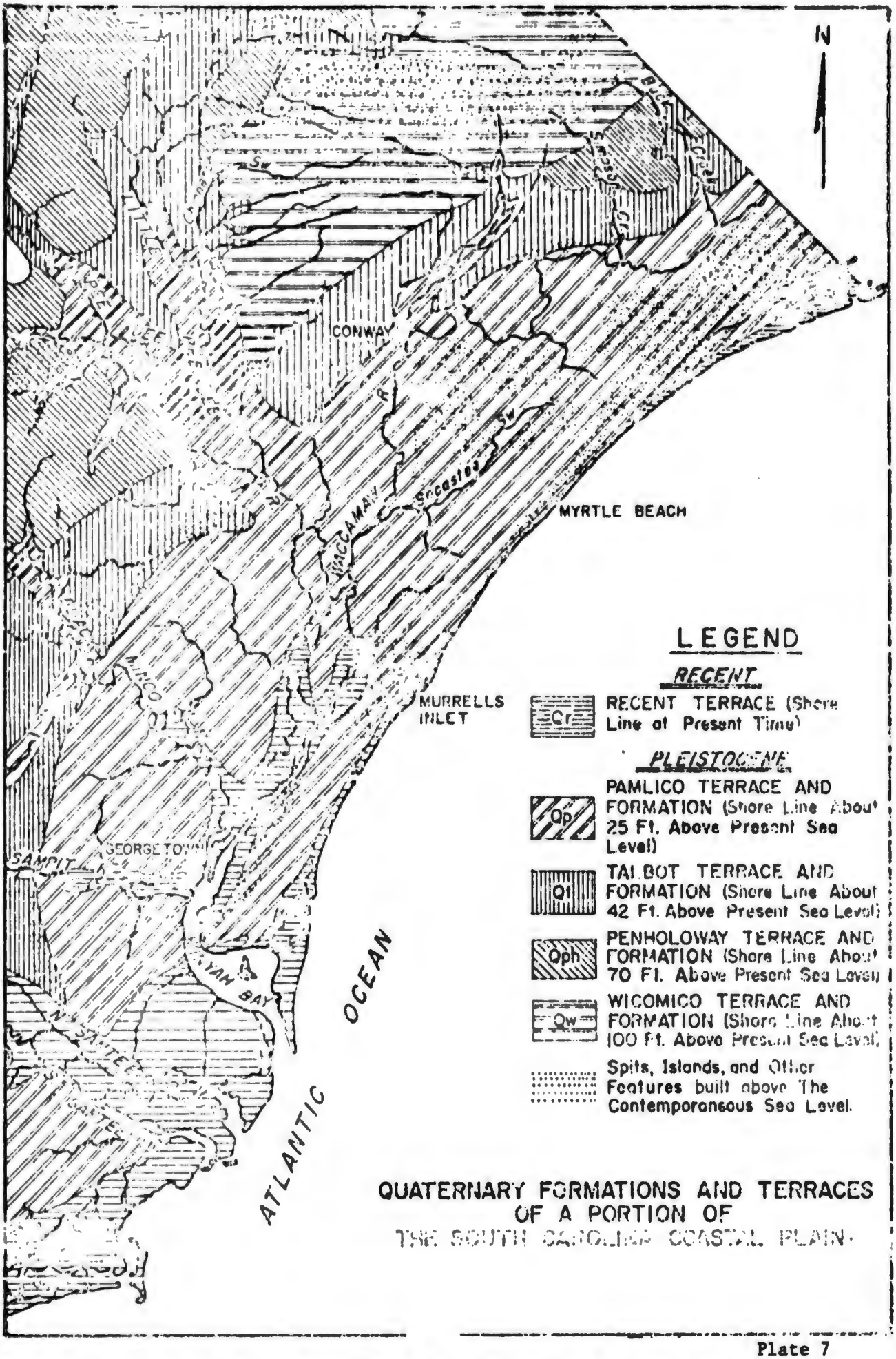
DEFLECTOR DIKE PROFILE

US ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, SOUTH CAROLINA

NAVIGATION PROJECT
JETTY & WEIR SECTIONS
AND DEFLECTOR DIKE DETAILS
MURRELLS INLET

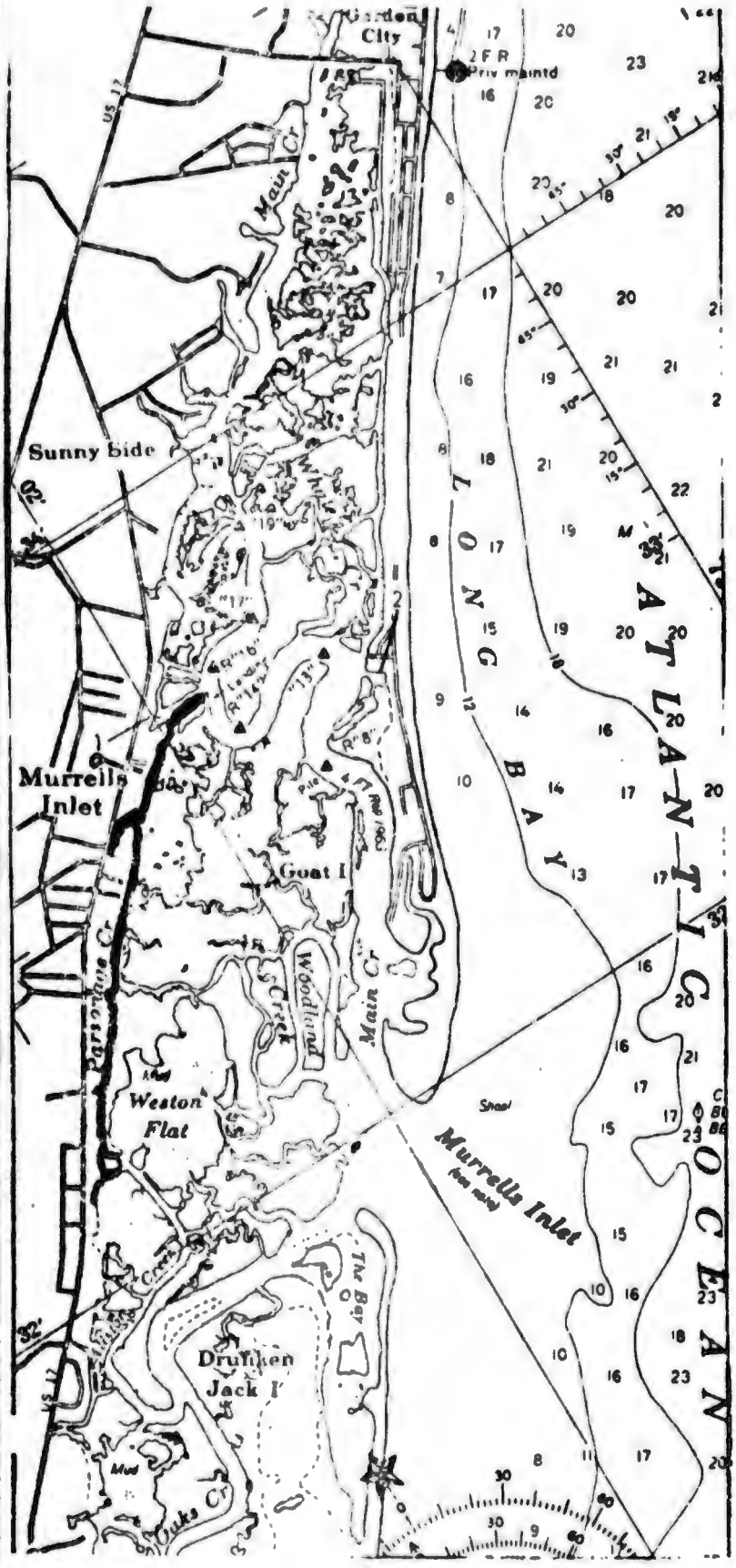
PLATE 5





QUATERNARY FORMATIONS AND TERRACES
OF A PORTION OF
THE SOUTH CAROLINA COASTAL PLAIN.

Plate 7



AREA 4

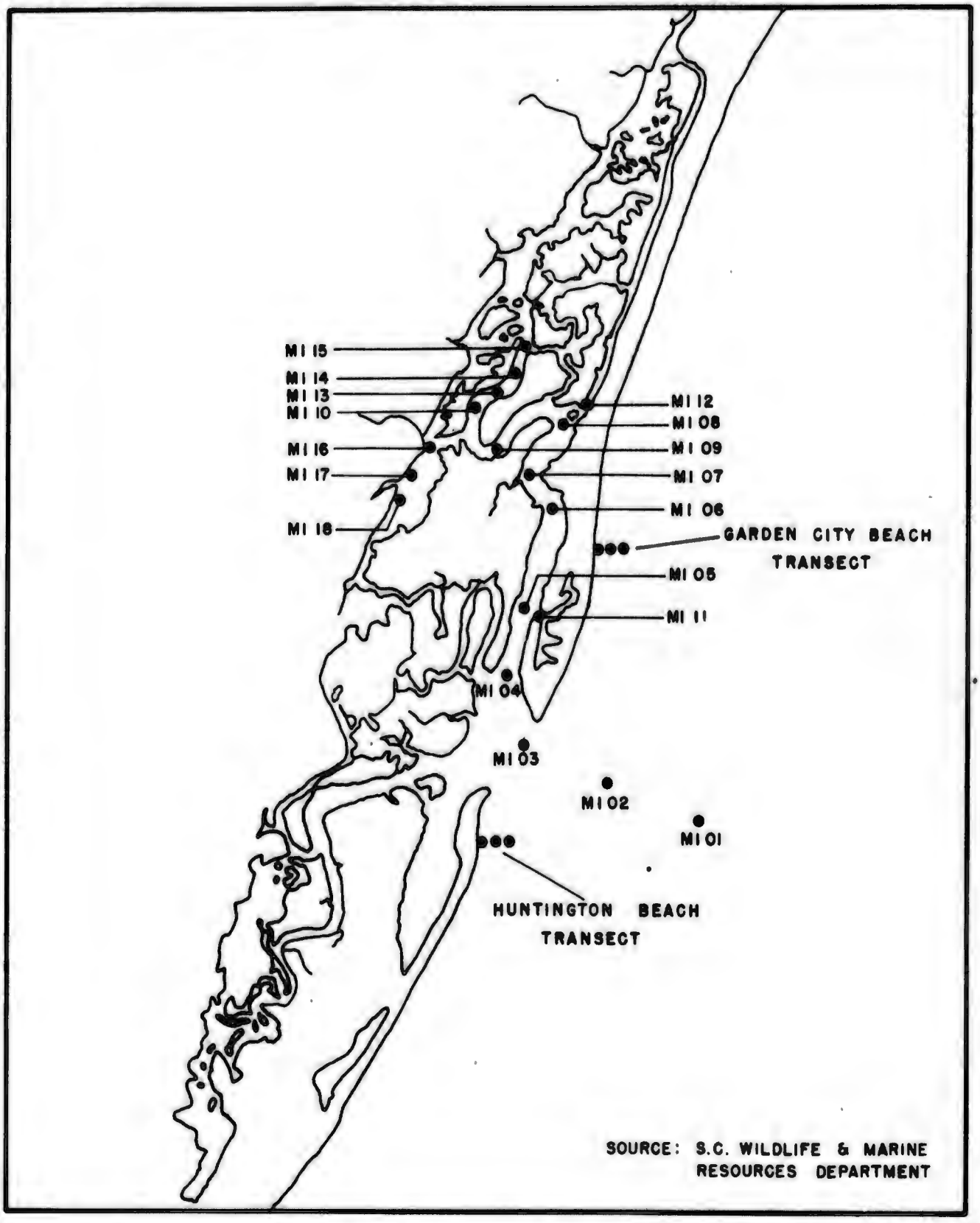
Re: C. & G. S. #835-SC
CLOSED AREA
MURRELLS INLET,
GEORGETOWN COUNTY

S. C. Department of Health and
Environmental Control
Bureau of Water Hygiene and
Special Services
Shellfish Section
February 1971

DESCRIPTION:

Plate 8.

ALL OF THE BLACK-BORDERED AREA STARTING AT THE GOVERNMENT DOCK AND INCLUDING ALL OF PARSONAGE CREEK TO ITS CONJUNCTION WITH ALLISON CREEK AT WESTON FLAT.



LOCATATION OF S.C. WILDLIFE AND MARINE RESOURCES
BENTHIC SAMPLING STATIONS

PLATE 9

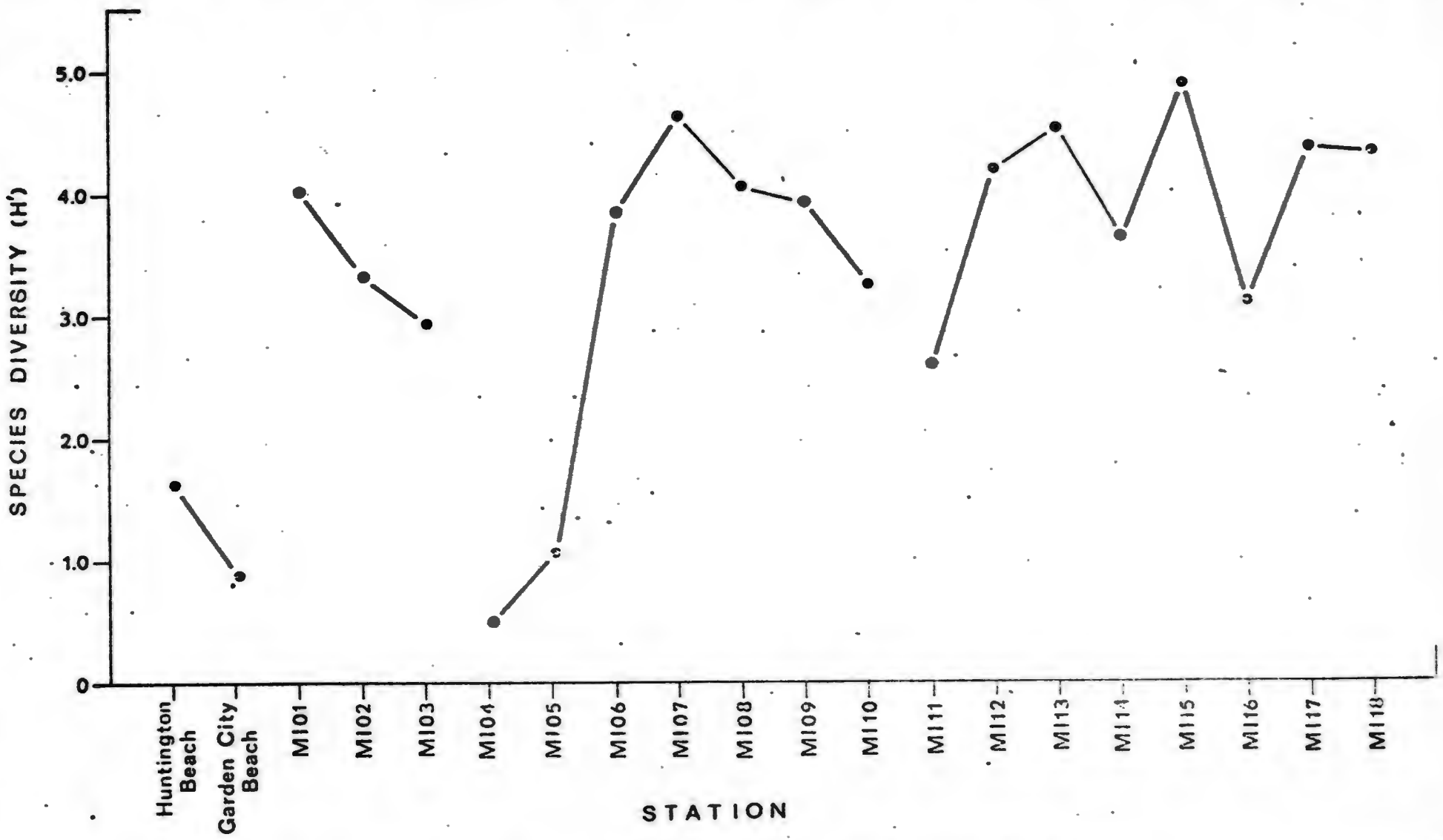


Plate 10. Species diversity (H') values for stations in the Murrells Inlet area.

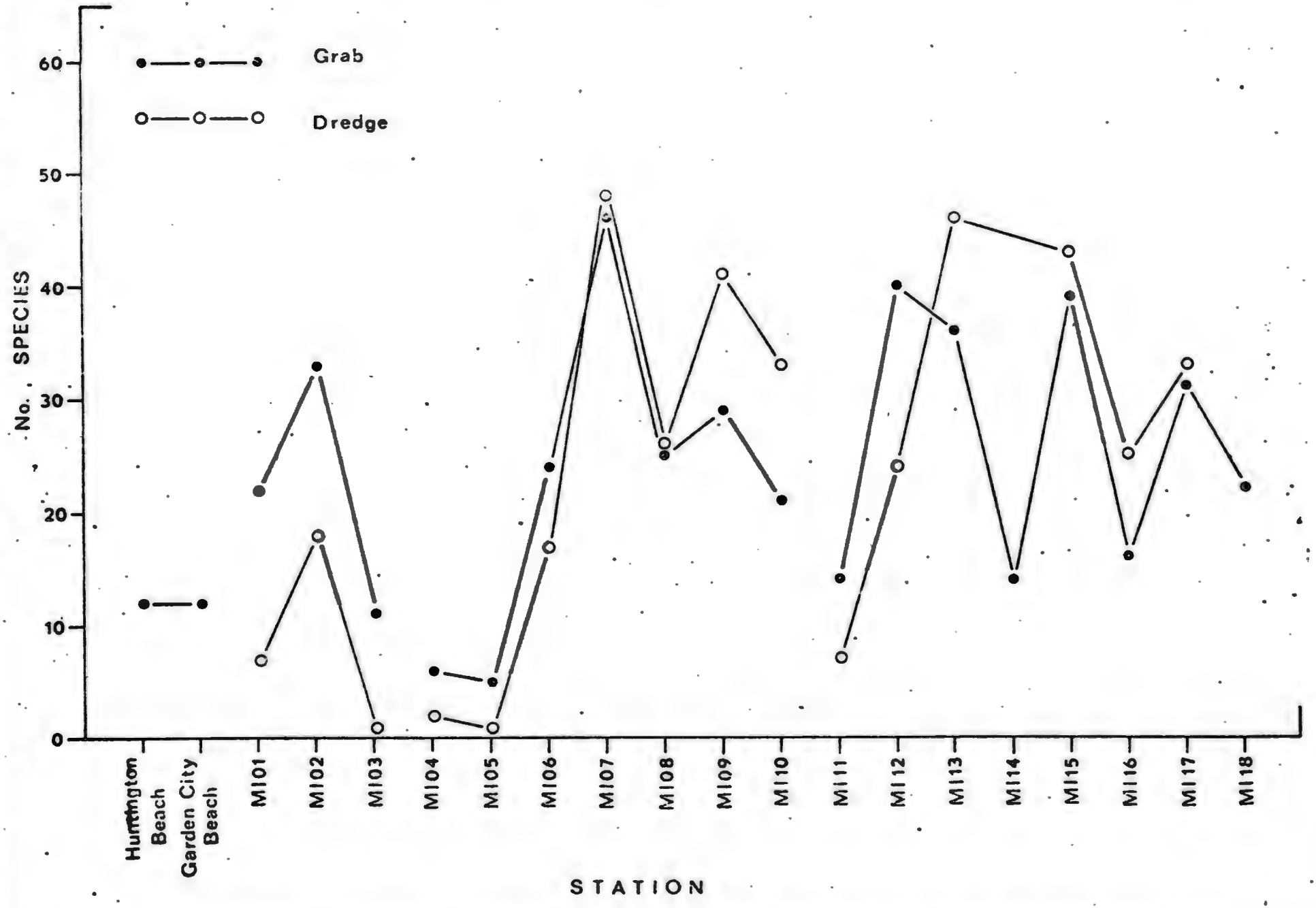
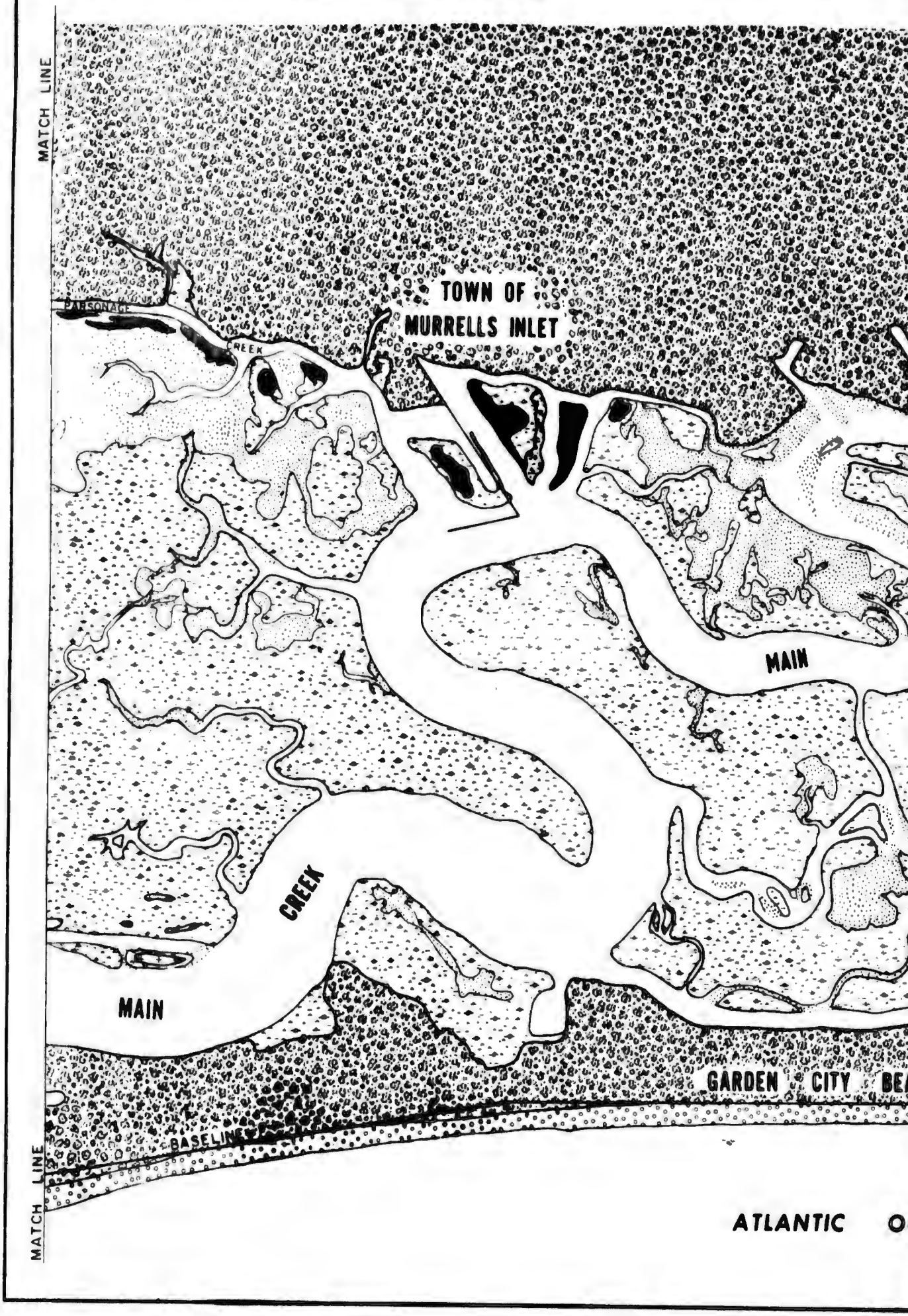
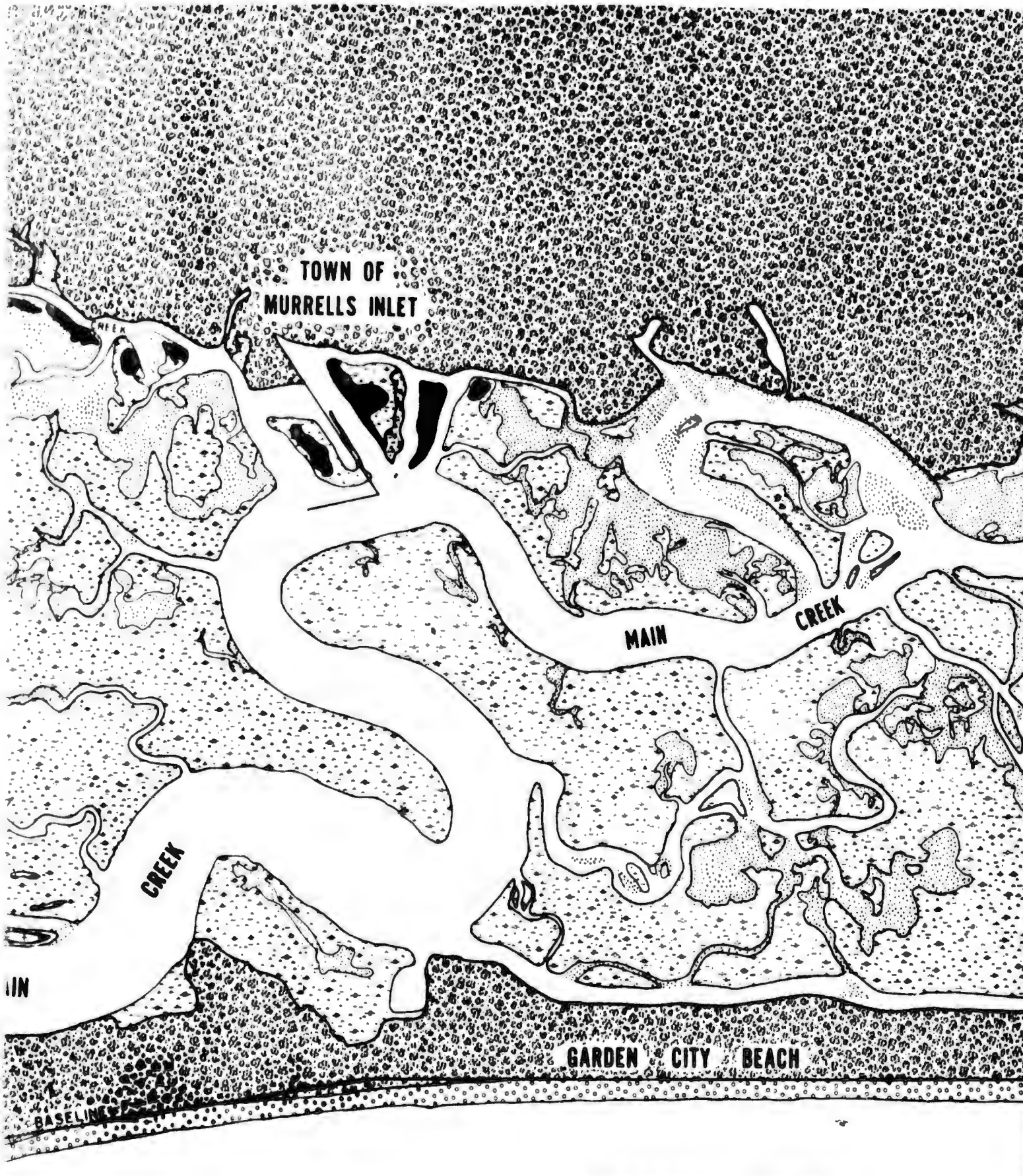
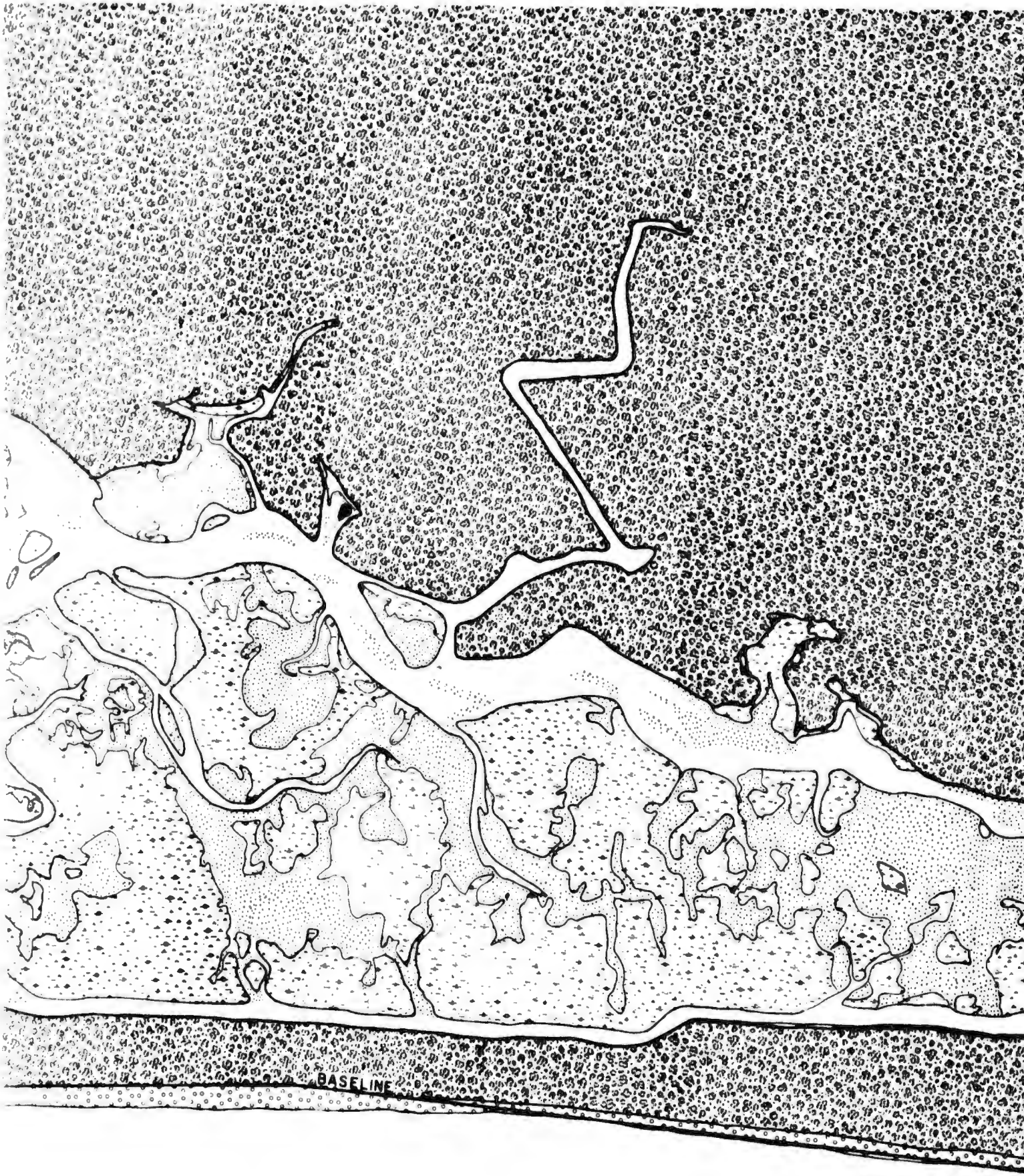


Plate 11. Number of species in dredge and grab samples at each station in the Murrells Inlet area.



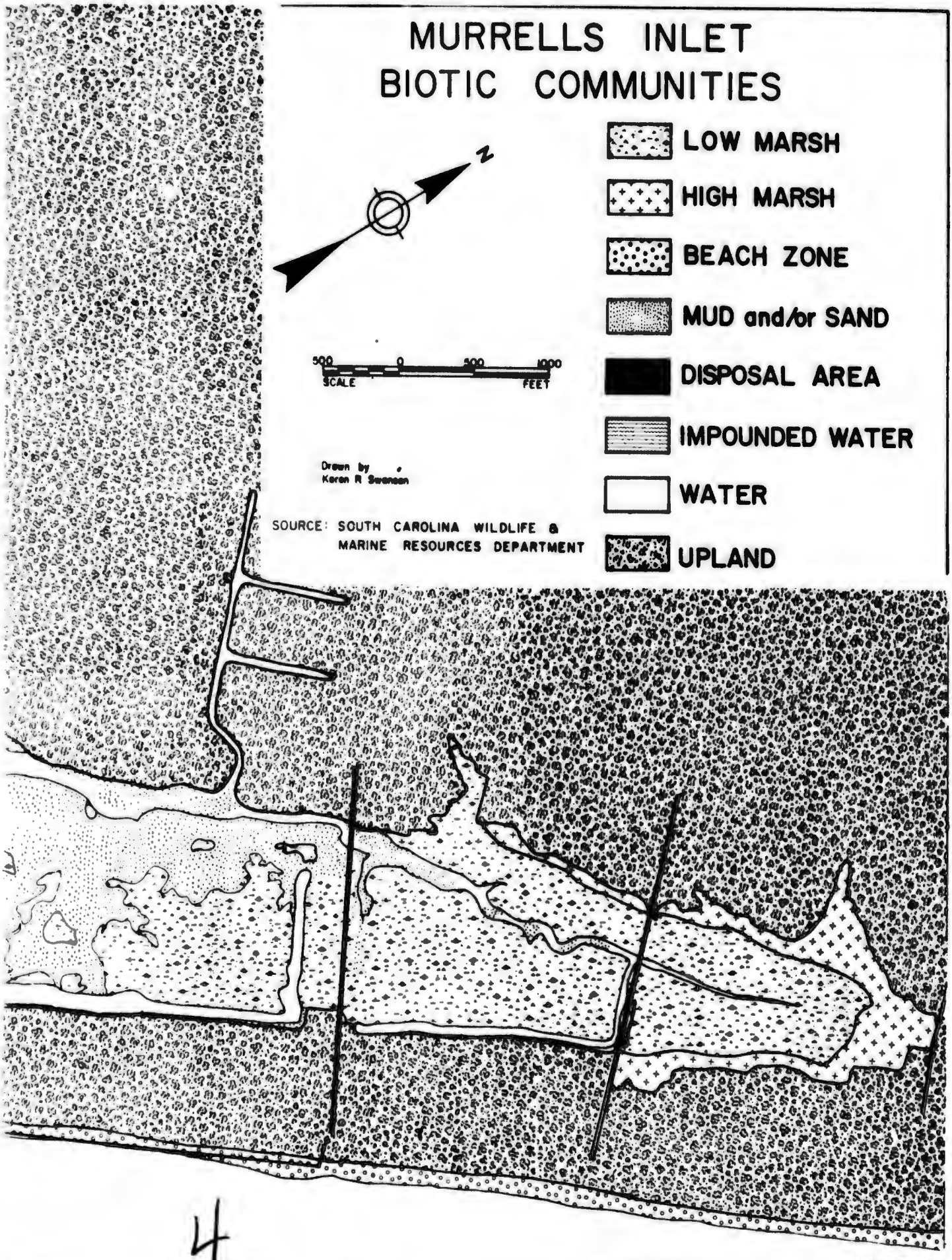


2



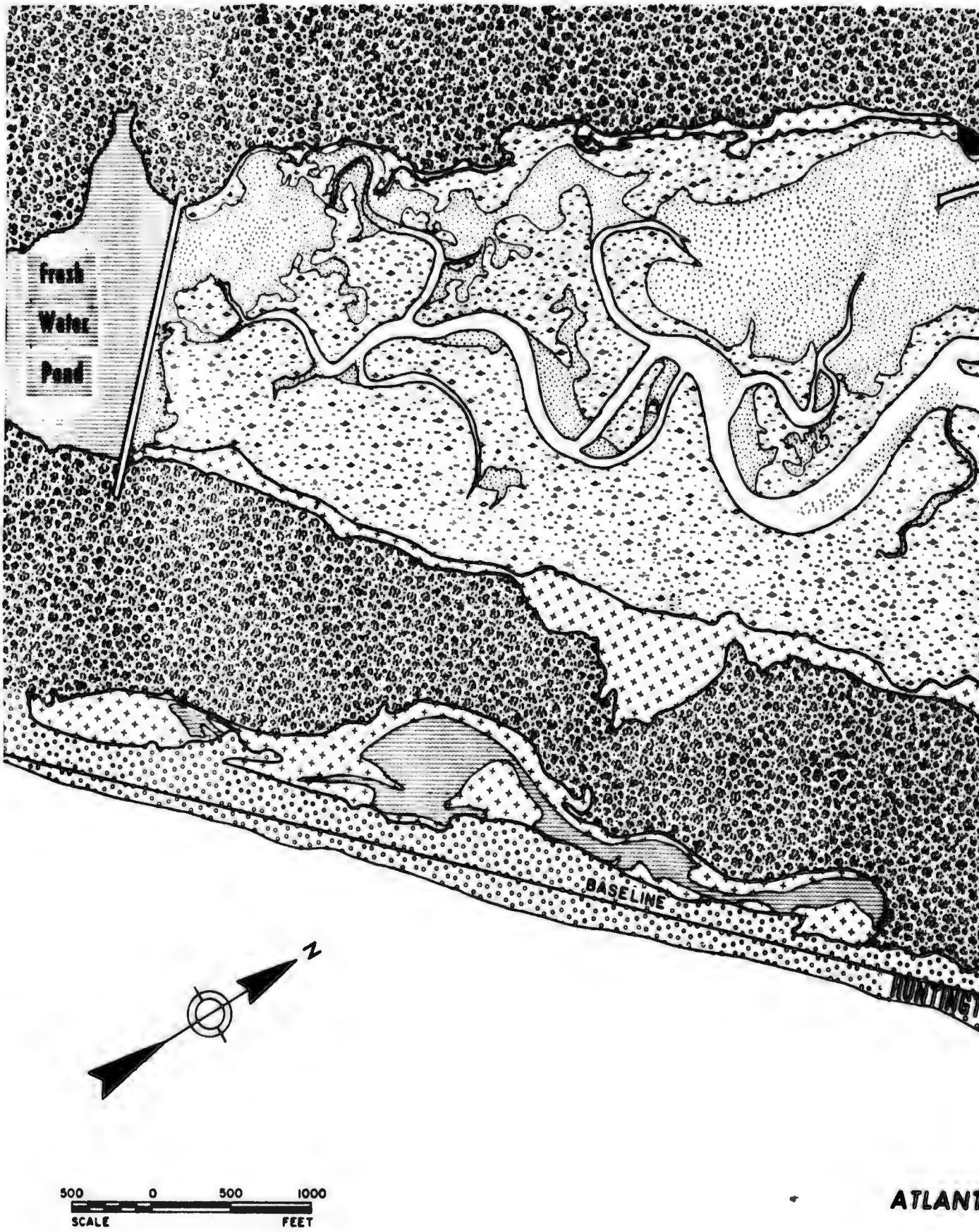
3

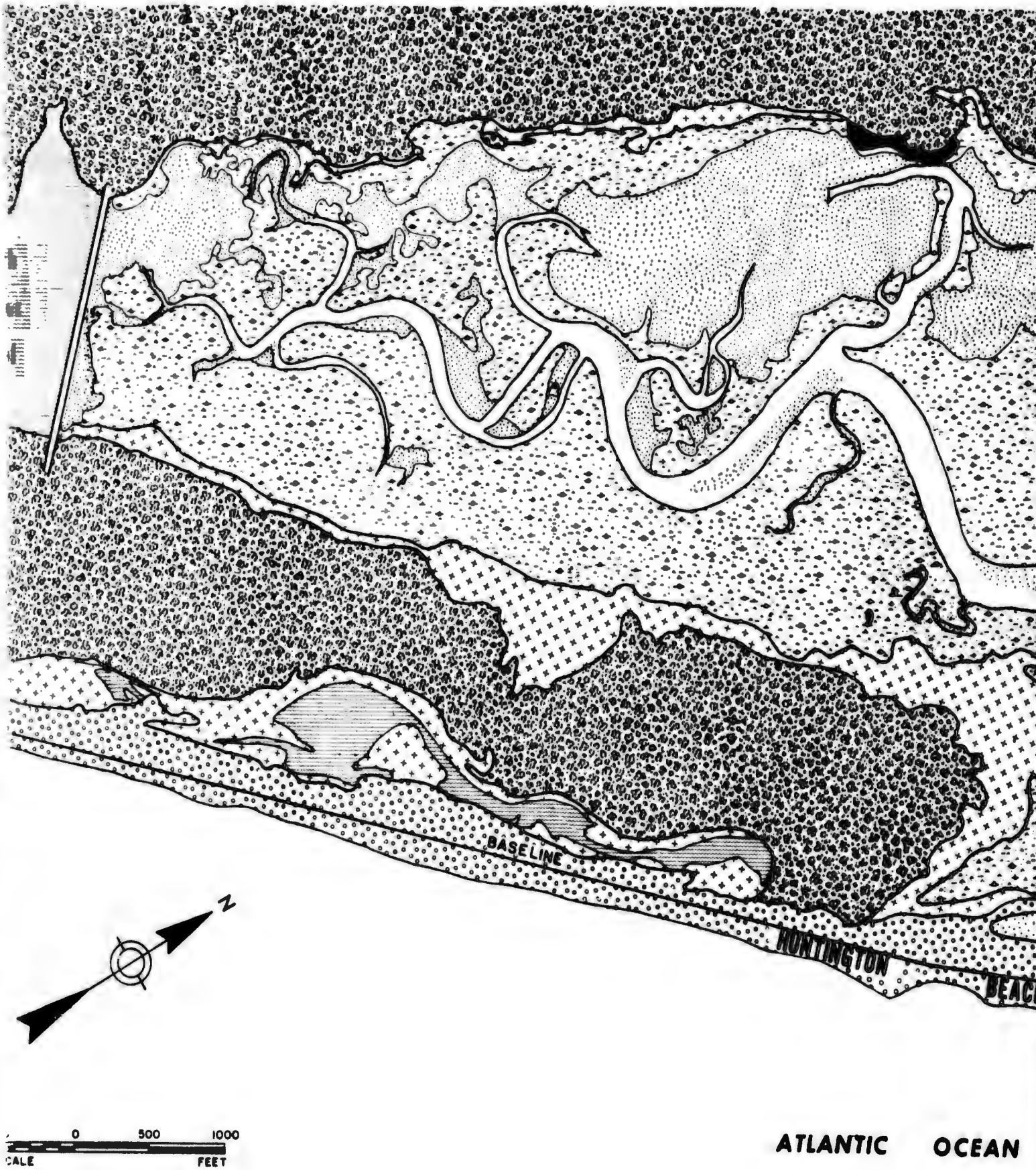
MURRELLS INLET
BIOTIC COMMUNITIES



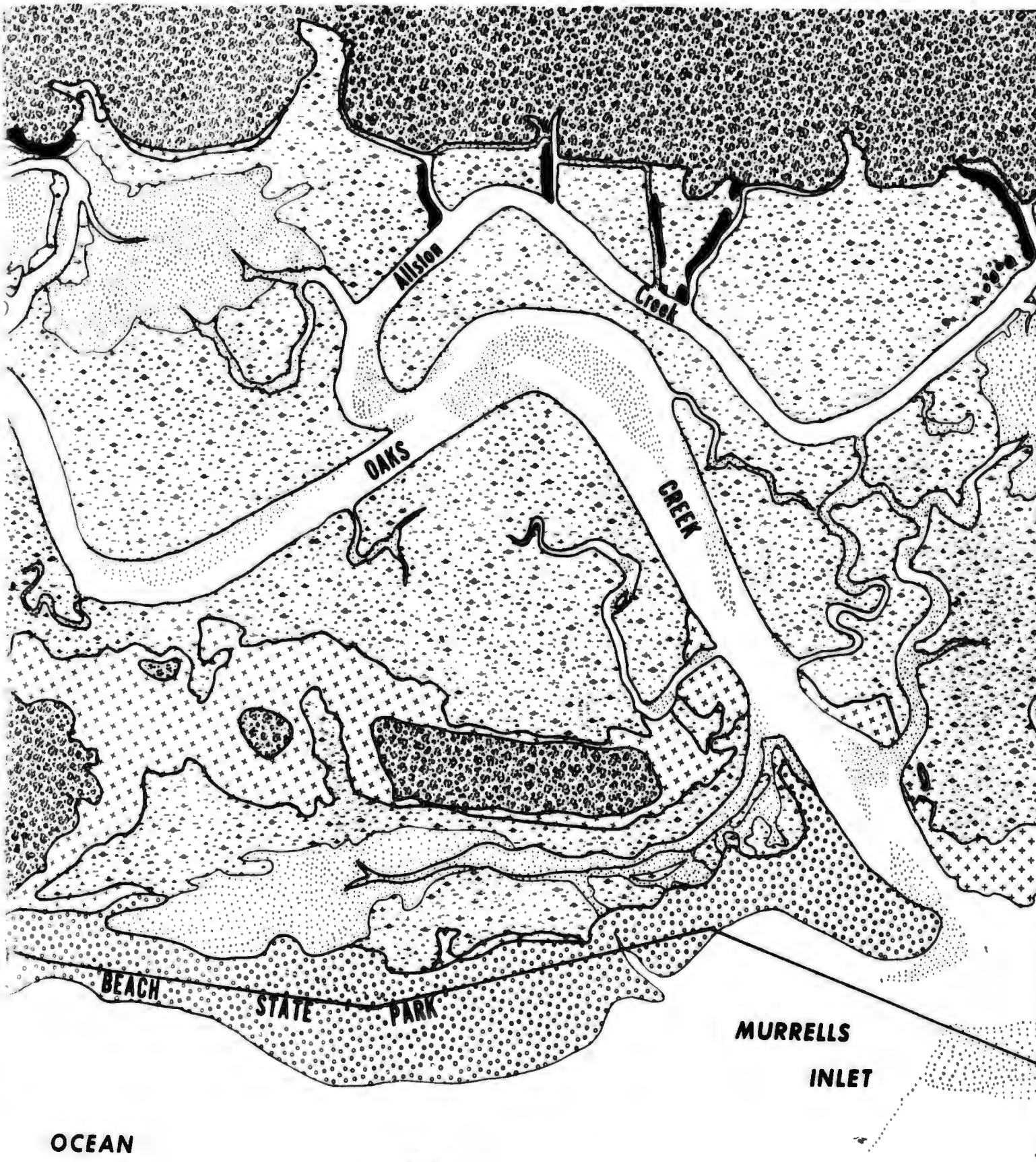
4

PLATE 13

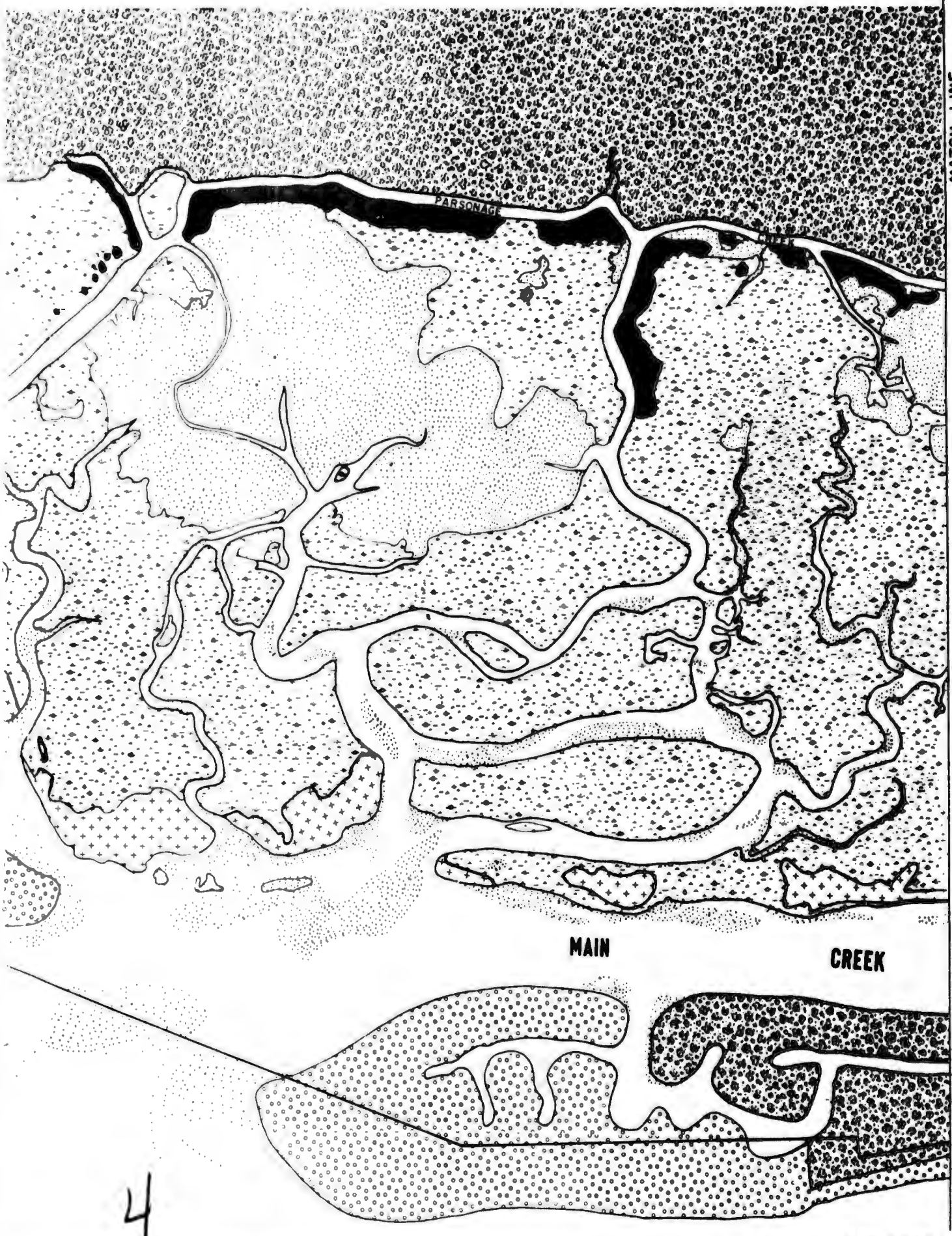




2

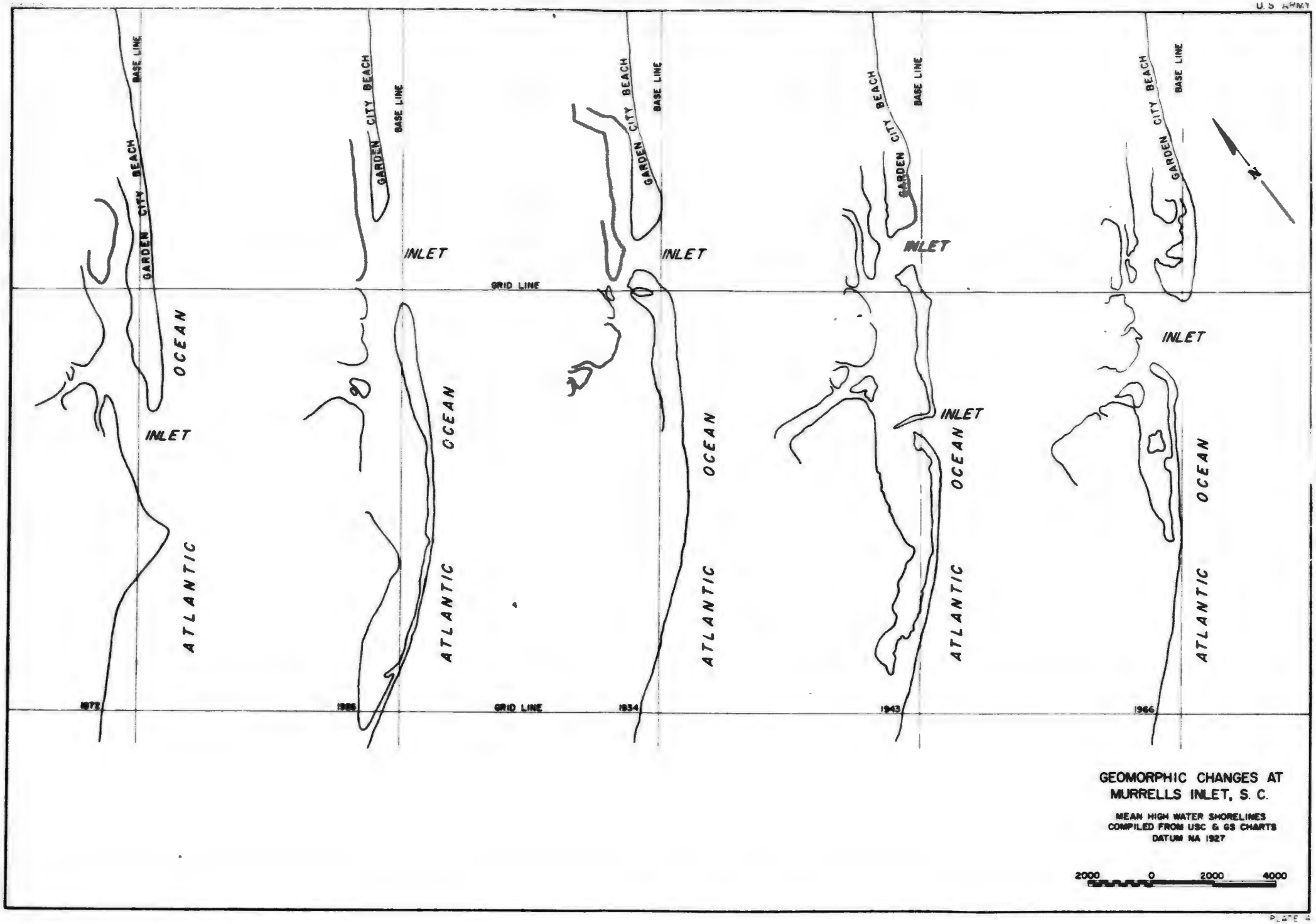


3



4

PLATE 13 CONTINUED



GEOMORPHIC CHANGES AT
MURRELLS INLET, S. C.

MEAN HIGH WATER SHORELINES
COMPILED FROM USC & GS CHARTS
DATUM NA 1927

2000 0 2000 4000

APPENDIX A

ECONOMIC DATA, EXTRACTED FROM U. S. ARMY, CORPS OF ENGINEERS GENERAL DESIGN MEMORANDUM, MURRELLS INLET, SOUTH CAROLINA. COMPLETE DOCUMENT IS AVAILABLE AT U. S. ARMY ENGINEER DISTRICT, CHARLESTON, SOUTH CAROLINA

SUMMARY OF ESTIMATED ANNUAL BENEFITS

Item	Annual Benefits
NAVIGATION FACILITIES	
Party boating	$ 966,600
Charter boating	212,300
Recreational boating	232,500
Commercial fishing	430,900
Elimination of vessel damage	46,800
Harbor of refuge	13,000
TOTAL ANNUAL BENEFITS (Navigation Project)	$ 1,902,100
RECREATION FISHING WALKWAY	34,500
REDEVELOPMENT	88,000
TOTAL PROJECT ANNUAL BENEFITS	$ 2,024,600

APPORTIONMENT OF FIRST COSTS

NAVIGATION FACILITIES	
Federal	$11,994,100
Non-Federal	1,977,900
TOTAL	$13,972,000
RECREATION FISHING WALKWAY	
Federal	$ 130,500
Non-Federal	130,500
TOTAL	$ 261,000
TOTAL PROJECT FIRST COST	$14,233,000

APPORTIONMENT OF AVERAGE ANNUAL COSTS

NAVIGATION FACILITIES	
Federal	$ 1,227,900
Non-Federal	109,100
TOTAL	$ 1,337,000
RECREATION FISHING WALKWAY	
Federal	$ 9,200
Non-Federal	17,200
TOTAL	$ 26,400
Benefit-Cost Ratio	1.4:1

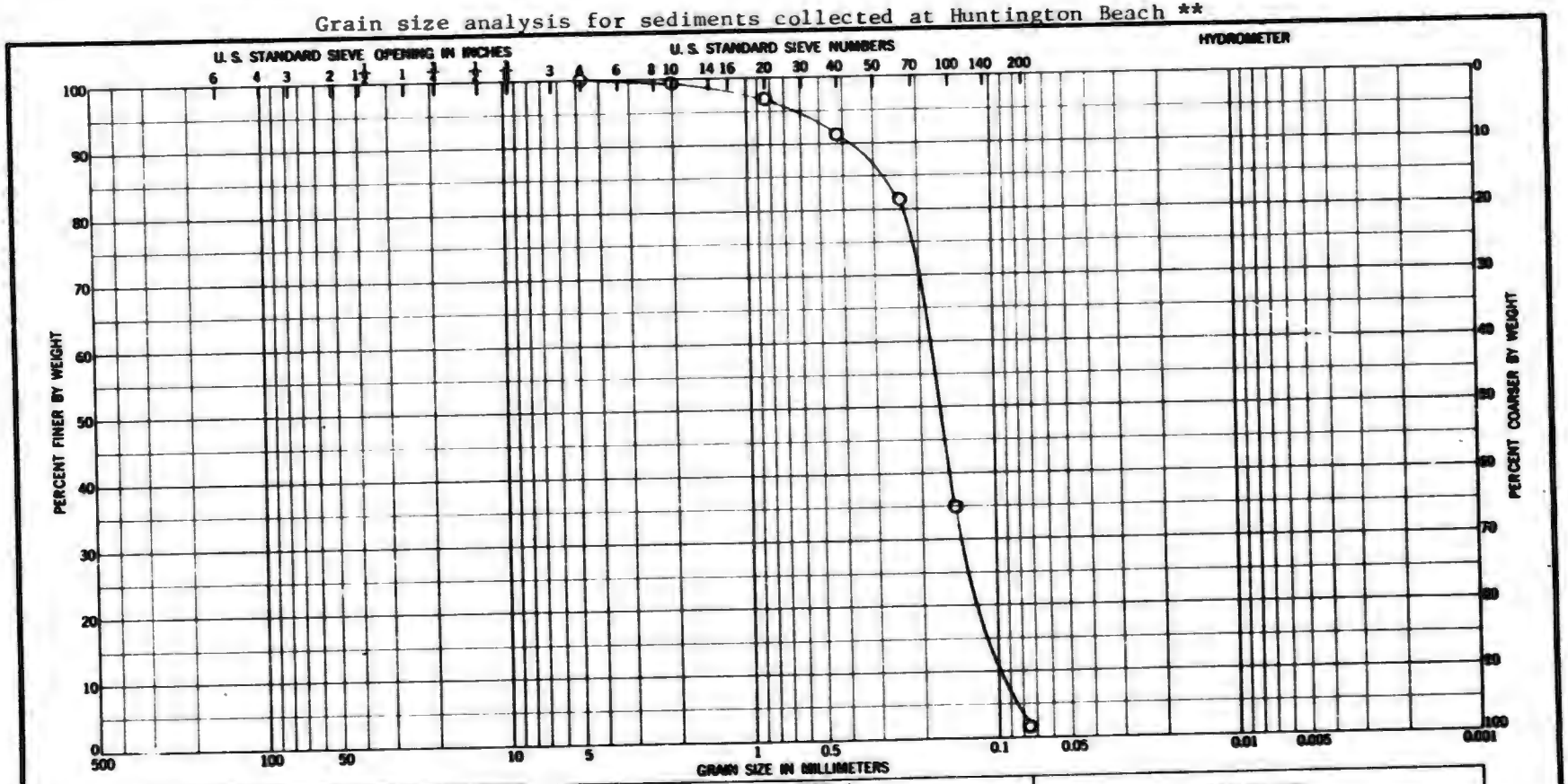
APPENDIX B

Grain Size Analysis Data

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 9299
Req. No. SAND-75-38

Grain size analysis for sediments collected at Huntington Beach **



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
75-019		Gray poorly graded sand (SP) w/tr shell Shell approx. 3%	--	--	--	--

GRADATION CURVES

CHARLESTON DISTRICT
Project Murrells Inlet, S. C.
Lab. No. 3M-570*
Area --
Boring No. -- Field Sample No. 75-019
Date 11 July 1975

B-1

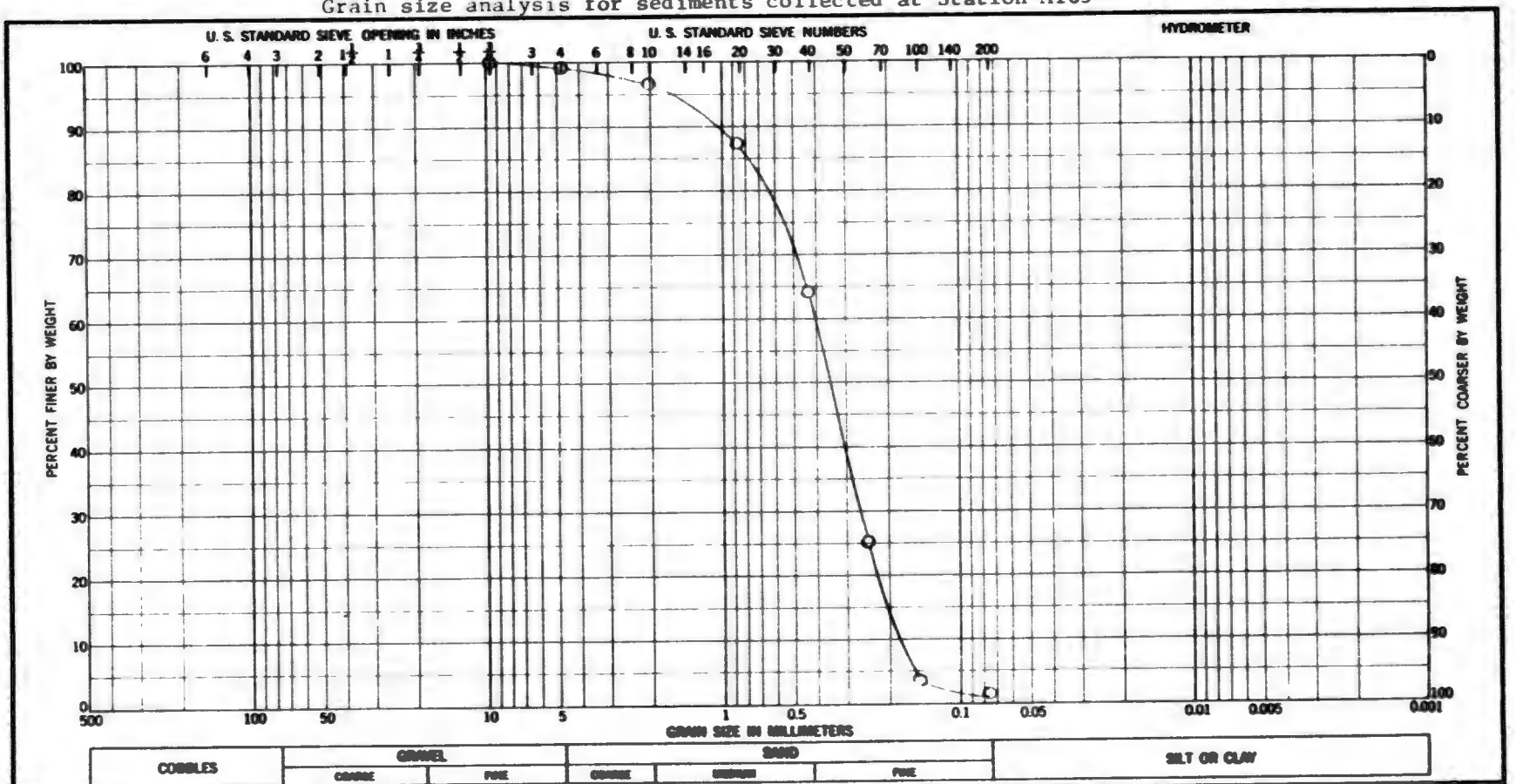
ENG FORM 1 MAY 63 2087

*Sediment Tests reported on SAD Form 158-R
**Station locations shown on Plate 9.

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 9299
Req. No. SAWGA-75-38

Grain size analysis for sediments collected at Station MI03**



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
02-75 026	--	Tan poorly graded sand (SP) w/a little coarse and medium sand size shell Shell approx. 12%	--	--	--	--

GRADATION CURVES

CHARLESTON DISTRICT
Project Currells Inlet, S. C.
Lab. No. 38-571*
Area --
Boring No. --Field Sample No. 02-75 026
Date 11 July 1975

B-2

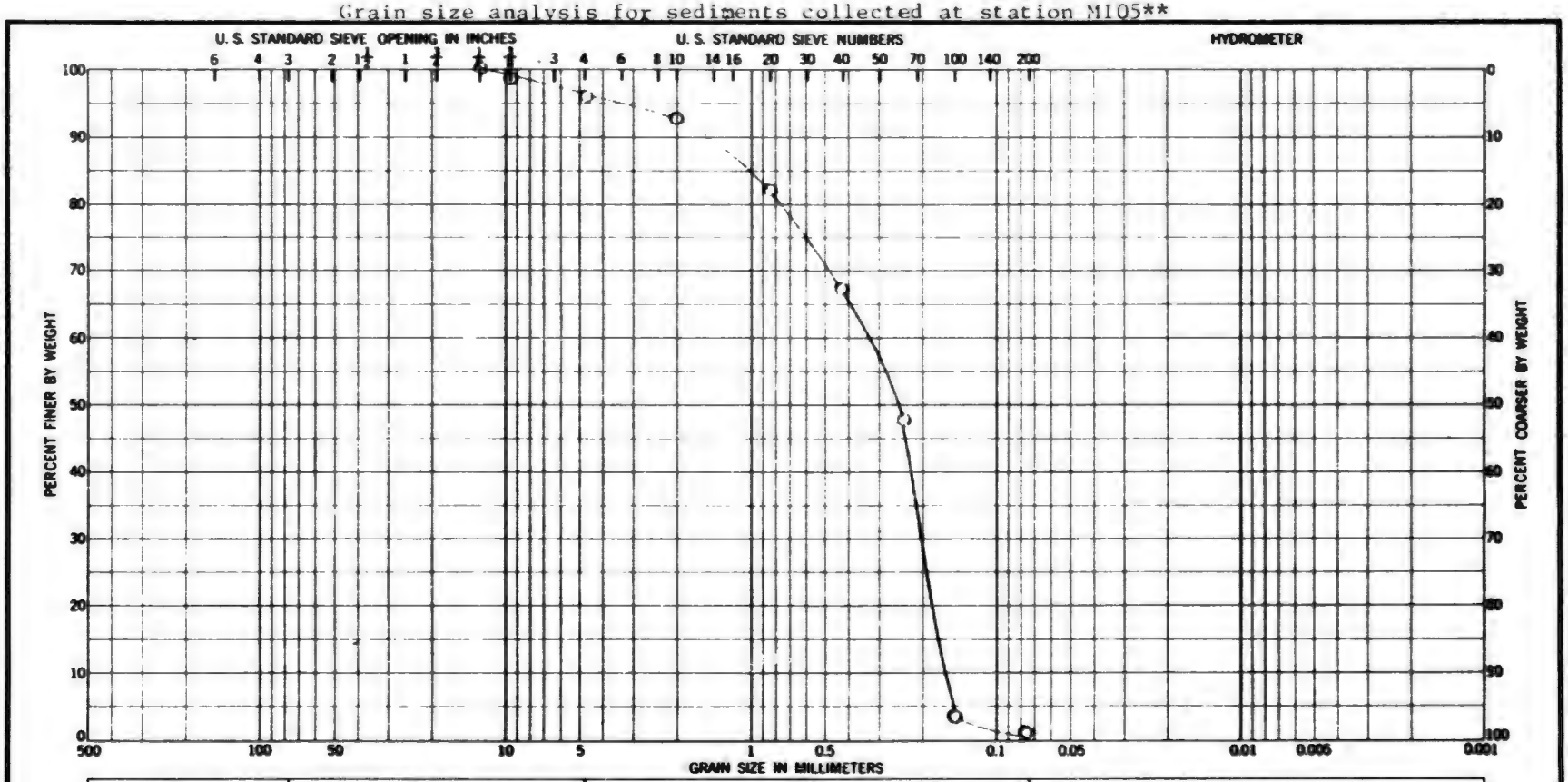
ENG FORM 1 MAY 63 2087

* Sediment Tests reported on SAD Form 158-R
** Station locations shown on Plate 9.

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 5299
Req. No. SAMCA-75-3.

Grain size analysis for sediments collected at station MI05**



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
02-75 028	--	Tan poorly graded sand (SP) w/a little gravel size, coarse and medium sand size shell Shell approx. 11%	--	--	--	--

GRADATION CURVES

CHARLESTON DISTRICT
Project Murrells Inlet, S. C.
Lab. No. 2X-572 *
Area --
Boring No. -Field sample No. 02-75 028
Date 11 July 1975

B-3

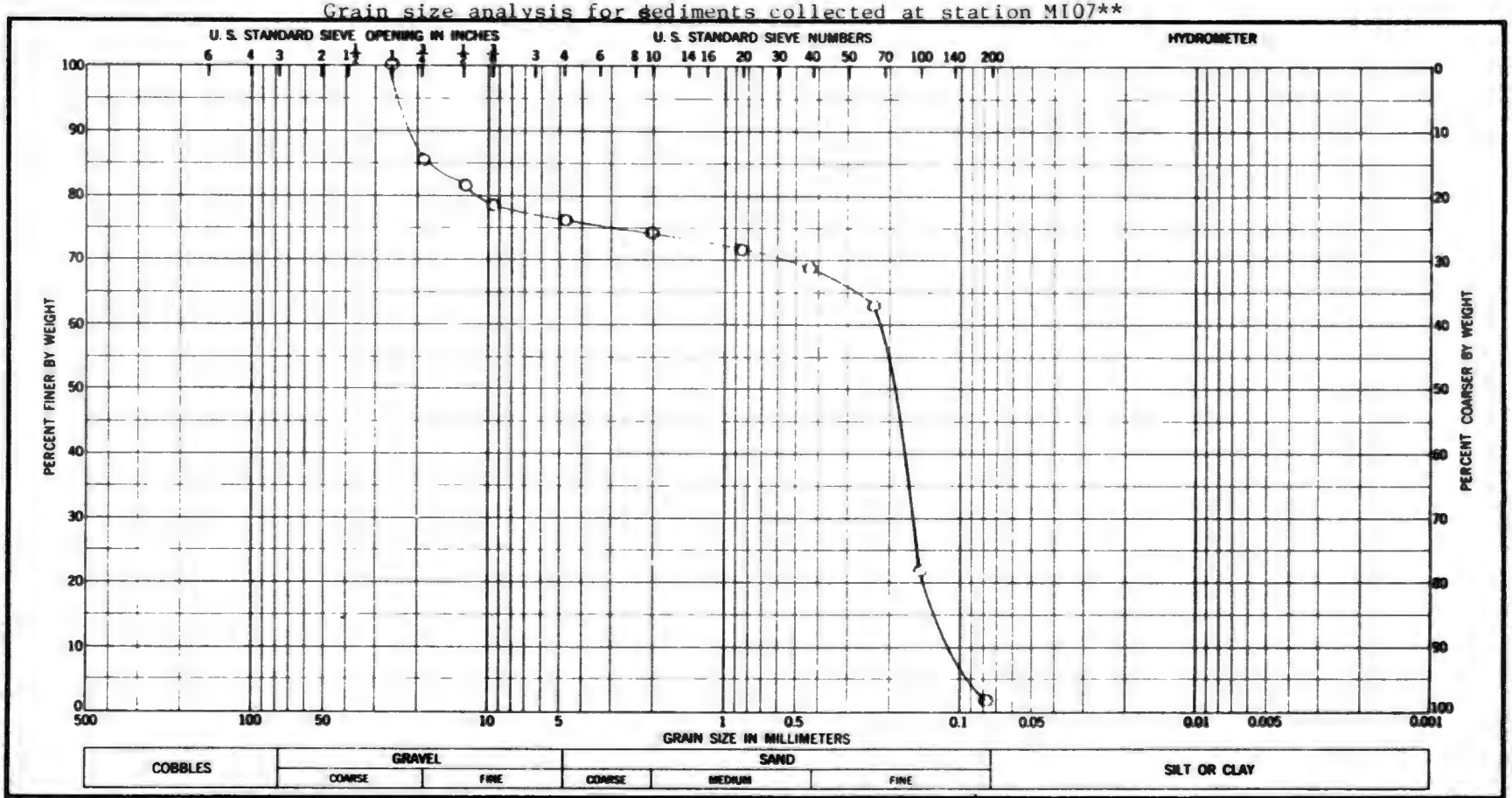
ENG FORM 1 MAY 63 2087

*Specific tests reported on SAD Form 158-R.
**Station locations shown on Plate 9.

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 9299
Req. No. S.[illegible]-75-3.

Grain size analysis for sediments collected at station MI07**



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
02-75 030	--	Gray poorly graded sand(SP) w/some gravel size, coarse and medium sand size shell Shell approx. 28%	--	--	--	--

GRADATION CURVES

Project: CHARLESTON DISTRICT
Murrells Inlet, S. C.
Lab. No. 3[illegible]-573*
Area: --
Boring No.: Field Sample No. 02-75 030
Date: 11 July 1975

B-4

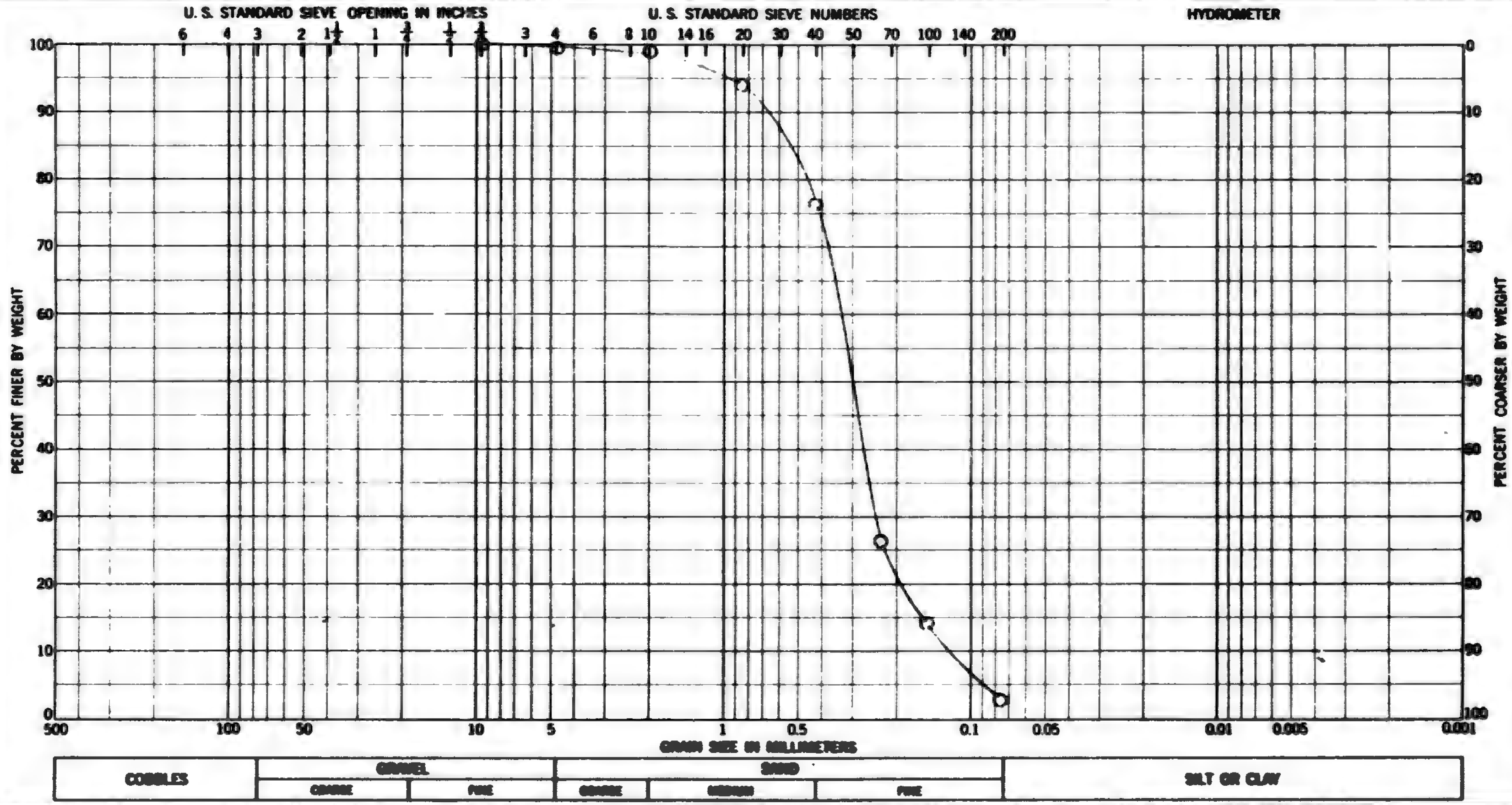
ENG FORM 1 MAY 63 2087

*Compliment Tests reported on SAD Form 153-R.
**Station locations shown on Plate 9.

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 9299
Req. No. [illegible] 75-39

Grain size analysis for sediments collected at station MI10**



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
02-75 033	--	Gray poorly graded sand (SP) w/tr shell	--	--	--	--
		Shell approx. 2%				

Project	CHARLESTON DISTRICT Murrells Inlet, S. C.
	Lab. No. 3M-5748
Area	--
Boring No.	Field Sample No. 02-75 033
Date	11 July 1975

GRADATION CURVES

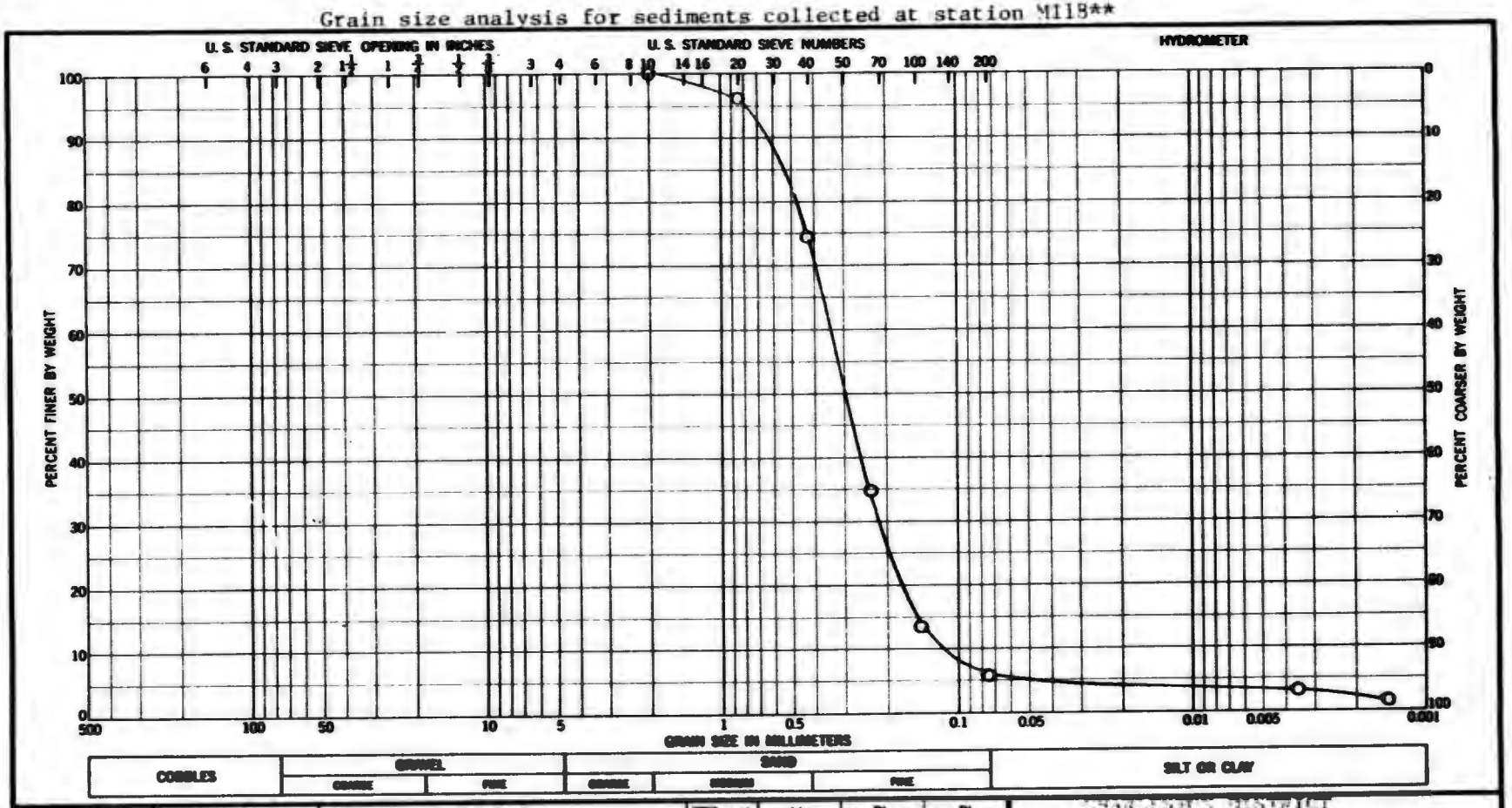
ENG FORM 1 MAY 63 2087

[illegible] reported on [illegible] Form [illegible]
**Station locations shown on Plate 9.

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30061

WORK ORDER NO. 9299
Req. No. SAMCA-75-38

Grain size analysis for sediments collected at station M118**



Sample No.	Elev or Depth	Classification	w %	LL	PL	PI
02-75 041	--	Gray poorly graded silty sand (SP-SM)	23.0	--	--	--

Project: Murrells Inlet, S. C.
Lab. No. 3M-575*
Area: --
Boring No.: Field Sample No. 02-75 041
Date: 11 July 1975

GRADATION CURVES

ENG FORM 1 MAY 63 2087

*Sediment tests reported on SAD Form 158-R.
**Station locations shown on Plate 0.

APPENDIX C

Letters of Comment on Draft EIS

APPENDIX C

United States Department of the Interior

OFFICE OF THE SECRETARY

Southeast Region / 148 Cain St., N.E. / Atlanta, Ga. 30303

ER-75/1077

District Engineer
U.S. Army Corps of Engineers
P.O. Box 919
Charleston, South Carolina 23402

Dear Sir:

As requested in your November 6, 1975, letter to the Assistant Secretary, Program Policy, we have reviewed the draft environmental statement for the proposed Draft Design Memorandum for Murrells Inlet Navigation Project, Georgetown County, South Carolina, for project effects on national park areas and historic sites, outdoor recreation, hydrology, geology, mineral, and fish and wildlife resources.

We offer the following comments for your consideration:

General Comments

The environmental impacts relative to outdoor recreation and geological conditions have been given adequate consideration in the draft environmental statement and general design memorandum. Implementation of the proposed actions will have no significant impact on supply of minerals to the project area.

(1) Huntington Beach State Park, situated immediately south of the inlet, was recommended as a potential natural landmark in the Atlantic Coastal Plain Natural Region Study done under contract to the National Park Service (NPS) by the Smithsonian Institute's Center for Natural Areas. A statement to this affect needs to be added to the final environmental statement. Enclosed is a copy of the report on Huntington Beach State Park submitted by the Smithsonian Institute.

(2) The final environmental impact statement should document the importance of the Huntington Beach least tern rookery (nesting colony) and the project's potential adverse impact on the rookery. For full disclosure the final statement should also address all project alternatives and disturbances and inconveniences to park visitors resulting from construction.

Specific Comments

Page 11, paragraph 2.06.02

(3) Owing to the coastal shoreline location of the project area and its exposure to hurricane and extratropical storms, an appropriate discussion should be included in the environmental statement regarding history of flooding resulting from storm tides and waves.

Page 15, paragraph 2.09.02.2.1

(4) The statement refers to the least tern colony located in the dunes just south of the inlet but does not discuss its significance. Least tern populations have decreased drastically in the South Atlantic due to human encroachment resulting in loss of nesting habitat. The critical nature of this nest site and its importance to the dwindling least tern population should be explained and the rookery should be sited on project maps in the final environmental impact statement.

Page 47, paragraph 2.11

(5) The final statement should note consultation with the latest edition of the National Register (February 4, 1975). We are enclosing a copy of Georgetown County National Register sites. Two historic districts and seven individual properties are listed.

Page 50, paragraph 3.0

(6) The construction of a larger parking lot and the addition of a comfort station as facilities for the new south jetty fishing area is an impact that should be discussed. This will involve at least the loss of a small amount of acreage within the potential landmark.

There is a potential for depletion or starvation of sand at the potential natural landmark as a result of the interruption of natural littoral drift due to the proposed jetty. Periodic beach nourishment proposed in the statement is probably the best remedy for maintaining adequate sand for the beach zone assuming the proper type and size of particles are used. Any serious long-term depletion of sand to this beach area would definitely affect the site's natural integrity and jeopardize its potential national significance. Further, if beach nourishment is used to remedy this problem, we would recommend that the nourishment projects be timed so as to avoid possible disturbance to nesting wildlife such as terns or sea turtles.

Page 54, paragraph 4.03.02

(7) The potential impact of the proposed project on Oaks Creek should be discussed. The final statement should assure that the construction of the jetty system and related dredging will not significantly reduce tidal flow and mixing in Oaks Creek which could result in the destruction or alteration of highly productive low marsh. We note the proposal to construct the auxiliary channel was done to aid the water flow in Oaks Creek. Unanswered is the question will this channel maintain tidal fluctuations comparable to the presently existing natural conditions and thus not affect the present natural marshland ecosystem. If the character of these marshlands is changed, the natural integrity of the site will be reduced possibly causing the site to be dropped from consideration as a natural landmark.

Page 55, paragraph 4.03.03.1

(4) It is stated that disturbed nesting least terns will move to other areas. Once disturbed these colonial nesters do not necessarily find alternative sites providing adequate ecological requirements; this is why populations have decreased in recent years. It is probable that the proposed construction activity will eliminate the colony completely. This potential adverse impact should be addressed in the final environmental impact statement.

C-2

Page 56, paragraph 4.05

(5) There will be a major aesthetic impact on the natural character of Huntington Beach State Park. The extreme length (3,985 feet) of this proposed jetty structure will clearly make it visible for a presumably long distance along the beach of the potential natural landmark. This man-fashioned structure will detract significantly from the naturalness of the beach zone. These various impacts need to be described in the final environmental impact statement.

Page 58, paragraph 6.0

(1) The alternative of stabilizing the inlet approximately 2 miles north of the existing inlet has not been discussed. Such an alternative would have far fewer environmental and ecological impacts, and would provide the shortest most direct access to the Atlantic Ocean. These advantages would prevail during both construction and maintenance.

Environmental advantages of this alternative would include elimination of dredging in 2 miles of Main Creek and the ability to do all construction from the north side of the existing inlet thereby eliminating all disturbance of Huntington Beach State Park. This alternative is

further supported by the fact that the present inlet location is temporary and remains unstable due to natural migration (see paragraphs .02 and 2.03.01). The next hurricane may relocate Murrells Inlet somewhere between the existing inlet and a point approximately 2 miles to the north. The final environmental impact statement should address the above aspects of the project.

(10) Alternate construction methods are not discussed specifically. If all equipment and material for the south jetty is trucked to the site, the impact on the park and inconvenience to park visitors will be profound. However, if these materials could be barged to the site, the impact would be greatly reduced. Various construction methods should be discussed in the final environmental impact statement.

Comments on General Design Memorandum

The draft comments to the environmental impact statement (section 6.0) are equally applicable to the general design memorandum.

We hope these comments will be useful in preparing the final statement.

Sincerely yours,

for (Miss) June Whelan
Special Assistant to the Secretary
Southeast Region

Attachments 2

Walterboro, *Walterboro Library Society Building*, 501 Wichman Street.
Williams vicinity, *Williams, Tom, House*, 0.25 mile west of Williams on North Street.

Darlington County

Bennettsville vicinity, *Welsh Neck-Long Bluff-Society Hill Historic District*, southwest of Bennettsville along U.S. 15/401 (12-16-74).
Hartsville vicinity, **Coker Experimental Farms*, west of Hartsville on South Carolina 151.
Hartsville vicinity, *Kelley, Jacob, House*, 2 miles west of Hartsville, Route 2, South Carolina 5-16-12.

Dillon County

Dongham vicinity, *Bethel Farm*, east of Dongham on old Cashua Ferry Road (7-24-74).
Dillon, *Dillon, James W., House*, 1303 West Main Street.
Latta vicinity, *Allen, Joel, House*, northeast of Latta (8-13-74).
Latta vicinity, *Early Cotton Press*, 0.5 mile west of junction of South Carolina 917 and 38.

Dorchester County

St. George vicinity, *Carroll Place*, intersection of [illegible] and Wire Roads (7-25-74).
St. George vicinity, *Indian Fields Methodist Camp Ground*, about 4 miles northeast of St. George on South Carolina 73.
[illegible] vicinity, *[illegible] Plantation*, W of [illegible] (9-17-74).
Summerville vicinity, **Middleton Place*, 10 miles southeast of Summerville on South Carolina 61.
Summerville vicinity, *Old Dorchester*, Dorchester State Park, including the ruins of the village and fort of Dorchester and St. George's Church, on the Ashley River near the mouth of Dorchester Creek.

Edgefield County

Edgefield, *Edgefield Historic District*.
Edgefield vicinity, *[illegible] House*, about 6 miles northwest of Edgefield on U.S. 25.
Edgefield vicinity, *Cedar Grove*, 5 miles northwest of Edgefield on U.S. 25.
Edgefield vicinity, *Darby Plantation*, southeast of Edgefield off U.S. 25 (8-13-74).
Edgefield vicinity, *Horn Creek Baptist Church*, south of Edgefield via Routes 25, 133, and a dirt road.
North Augusta vicinity, *Big Stevens Creek Baptist Church*, about 8 miles northwest of North Augusta on South Carolina 230.

Fairfield County

Jenkinsville vicinity, *Ebenezer Associate Reformed Presbyterian Church (Old Brick Church)*, 4.0 miles north of Jenkinsville on South Carolina 213.
Jenkinsville vicinity, *Kincaid-Anderson House (Fairfield)*, northeast of Jenkinsville off South Carolina 213 (9-30-74).
Jenkinsville vicinity, *Little River Baptist Church*, 2.5 miles north of Jenkinsville on South Carolina 215.
Longtown vicinity, *Mount Hope (Robertson Place)*, 10 miles northeast of Ridgeway.
Monticello vicinity, *Davis Plantation*, 0.75 mile south of Monticello on South Carolina 215.
Ridgeway, *Century House (Brick House)*, South Carolina 34, 1 block west of Main Street.
Ridgeway vicinity, *St. Stephen's Episcopal Church*, about 1 mile northeast of Ridgeway on County Route 106.
Ridgeway vicinity, *[illegible]*, about 3 miles northwest of [illegible] on County Route [illegible].
[illegible]

Winnsboro, *Rural Point (Robertson House)*, Old Camden Road.
Winnsboro, *Winnsboro Historic District*, bounded on the west by Garden Street; on the south by Buchanan Street, Fairfield Country Club, and Moultrie Street; on the east by Congress Street, Zion Street, Walnut Street, and Gooding Street, and on the north by a line running from Roosevelt Street to Woodland Terrace.
Winnsboro vicinity, *Blair Mound*, northwest of Winnsboro (8-23-74).
Winnsboro vicinity, *McMeekin Rock Shelter*, west of Winnsboro (8-23-74).

Florence County

Florence vicinity, *Burnell, James, House*, NE of Florence off SC 265 (10-9-74).
Johnsonville vicinity, *Snow's Island*, east of Johnsonville at the confluence of the Great Pee Dee River and Lynch's Creek.
Mars Bluff, *Slave Houses, Gregg Plantation*, Francis Marion College campus (7-30-74).

Georgetown County

Georgetown, *Georgetown Historic District*, the Old City of Georgetown, bounded on the south by the Sampit River; on the west by Wood Street; on the north by U.S. 17; and on the east by Meeting Street.
Georgetown, *Old Market Building (Georgetown County Rice Museum)*, Front and Screven Streets (12-3-69).
Georgetown, *Prince George Winyah Church (Episcopal) and Cemetery*, corner Broad and Highmarket Streets.
Georgetown vicinity, *Arcadia Plantation*, about 14 miles south of Georgetown between South Carolina 73 and South Carolina 18 (10-25-73).
Georgetown vicinity, *Chicora Wood Plantation*, about 12 miles northwest of Georgetown on South Carolina 52.
Georgetown vicinity, *[illegible] Lighthouse*, about 12 miles southeast of Georgetown on North Island (12-[illegible]-74).
Georgetown vicinity, **Hopsewee (Thomas Lynch House)*, 12 miles south of Georgetown on U.S. 17.
Pawleys Island, *Pawleys Island Historic District*, bounded on the north by Williams House property line; on the south by Pawleys House property line, on the east by the Atlantic Ocean, and on the west by Marshlands.
Plantersville vicinity, *Prince Frederick's Chapel Ruins*, southeast of Plantersville on Route 52 (8-26-74).

Greenville County

Greer, *McBee Methodist Church*, Main Street.
Greenville, *Beattie, Fountain Fox, House*, 1 Beattie Place (10-3-74).
Greenville, *Christ Church (Episcopal) and Churchyard*, 10 North Church Street.
Greenville, *Earle Town House*, 107 James Street.
Greenville, *Reedy River Falls Historic Park and Greenbelt*, both banks of the Reedy River from the falls to Church Street.
Greenville, *[illegible] Hall*, 310 West Earle Street.
Tigerville vicinity, *Pound [illegible] House*, about 6 miles north of Tigerville on County Route 42.

Greenwood County

Cokesbury and vicinity, *Old Cokesbury Historic District and Masonic Female College Conference School*.
Greenwood vicinity, *Brooks, J. Wesley, House*, 3 miles south of Greenwood on U.S. 25.
Ninety Six vicinity, **Old Ninety Six and Star Fort*, 2 miles south of Ninety Six, between South Carolina 248 and 34 (10-3-69).

Horry County

Conway, *Old Horry County Courthouse and Jail*, Main Street.

Jasper County

Gillisonville, *Gillisonville Baptist Church*, U.S. 278.
Robertville, *Robertville Baptist Church*, intersection of U.S. 321 and County Route 26.

Kershaw County

Camden, *City of Camden Historic District*, bounded on the south by the city limits, on the east and west by the Southern Railroad right-of-way, and on the north by Dicey Creek Road.
Camden, *Historic Camden Revolutionary War Restoration*, southern area of the city, DeKalb Township (7-30-69).
Camden vicinity, *Adamson Mounds Site*, c. 3 miles west of Camden, along the left bank of Mound Creek.
Camden vicinity, **Camden Battlefield*, 5 miles north of Camden on U.S. 521 and 601.
Camden vicinity, *McDowell Site (Chestnut Mounds)*, 2.5 miles south of Camden, surrounding the mouth of Big Pine Tree Creek on the Wateree River.

Lancaster County

Heath Springs vicinity, *Battle of Hanging Rock Historic Site*, about 3.5 miles south of Heath Springs off U.S. 522 (12-31-74).
Lancaster, **Lancaster County Courthouse*, 104 North Main Street (4-26-72).
Lancaster, **Lancaster County Jail*, 208 West Gay Street (8-9-71).

Laurens County

Clinton vicinity, *Duncan's Creek Presbyterian Church*, 5 miles northeast of Clinton off South Carolina 72 (11-15-73).
Laurens, *Dunklin, James, House*, 544 W. Main Street (10-1-74).
Laurens, *Laurens County Courthouse*, Laurens Courthouse Square.
Laurens, *[illegible] House*, 620 [illegible] Main Street.
Laurens, *Simpson, William Dunlap, House*, 726 West Main (7-24-74).
Laurens vicinity, *Sullivan House*, about 10 miles west of Laurens on U.S. 76.

Lexington County

Cayce, *Taylor Site*, Taylor Road (12-2[illegible]-74).
Cayce vicinity, *Congaree Historic District*, about 2 miles south of Cayce on Congaree River (12-31-74).
Lexington, *Fox House (Classical and Theological Seminary of the Evangelical Lutheran Synod of South Carolina and Adjacent States)*, 232 Fox Street.
Lexington, *Harman, Ernest L., House*, 325 Columbia Avenue.
West Columbia, *Saluda Factory Historic District (also in Richland County)*.

McCormick County

Parksville vicinity, *Price's Grist Mill*, E of Parksville on Stevens Creek (11-26-73).
Willington vicinity, *De La Howe State School*, 3 miles southeast of Willington on South Carolina 81.
Willington vicinity, *Gillebeau House*, about 2.5 miles southwest of Willington off South Carolina 81.

Marion County

Latta vicinity, *Old Ebenezer Church*, 3 miles south of Latta on South Carolina 38.
Marion, *Marion Historic District* (10-4-73).

Marlboro County

Bennettsville, *Jennings-Brown House*, 121 South Marlboro Street.
Bennettsville, *Magnolia (Townsend, William, House)*, [illegible] Street.
[illegible] vicinity, *[illegible]*, 6 miles [illegible]

SURVEY OF NATURAL AREAS

OF THE ATLANTIC COASTAL PLAIN

ECOLOGICAL THEMES

Center for Natural Areas
Office of International & Environmental Programs
Smithsonian Institution
Washington, D. C. 20560

PREPARED FOR THE

National Park Service, U. S. Department of the Interior

June 1974

PRIORITY RATING: P = 2

NAME OF SITE: HUNTINGTON BEACH STATE PARK

ONE-LINE DESCRIPTION: Three miles of fine sand beach, dunes, inlets, marshland, ponds, and maritime forests.

THEME/SUBTHEME CLASSIFICATION: 10, 24, 29, 30, 32/A, Ca, Fb, Gb, Ma, Ob, Oa

LOCATION: Georgetown County, SOUTH CAROLINA

LATITUDE - LONGITUDE: 33° 20' North/79° 20' West

USGS QUADRANGLE REFERENCE: Brookgreen, 7.5'
Magnolia Beach, 7.5', S.C.

SIZE: 2,800 acres

OWNERSHIP: State

ADMINISTERING AGENCY: Division of State Parks, Department of Parks, Recreation and Tourism

CURRENT LAND USE: 3047 recreational by public (swimming, fishing, surfing, picnicking).

DANGERS TO AREA OR VULNERABILITY: Overuse by public; sea erosion.

SENSITIVITY OF AREA: None

SIGNIFICANCE OF AREA:

Ecological diversity and one of finest beaches on East Coast. Magnificent seaside area with lush marsh growth. Three miles of sand beaches, dunes, and freshwater marshes. Unspoiled barrier beach and sand dunes. Abundant shells exposed on beaches.

PHYSICAL CHARACTERISTICS: Three miles of white sand beach.

OUTSTANDING GEOLOGICAL FEATURES:

ECOLOGICAL DESCRIPTION:

Area has sand beach, dunes, salt marsh, freshwater ponds and maritime forest.

DOMINANT SPECIES OF PLANTS: Live oak, hickory, pine

DOMINANT SPECIES OF WILDLIFE: raccoons, many shorebirds, waterfowl, terns

RARE OR ENDANGERED SPECIES OF PLANTS OR WILDLIFE:

Terns, Osprey, Southern Bald Eagles (no nests) and American alligators

SCIENTIFIC REFERENCES ON AREA:

South Carolina Tidelands Report, p.54, South Carolina Water Resources Comm., 1970

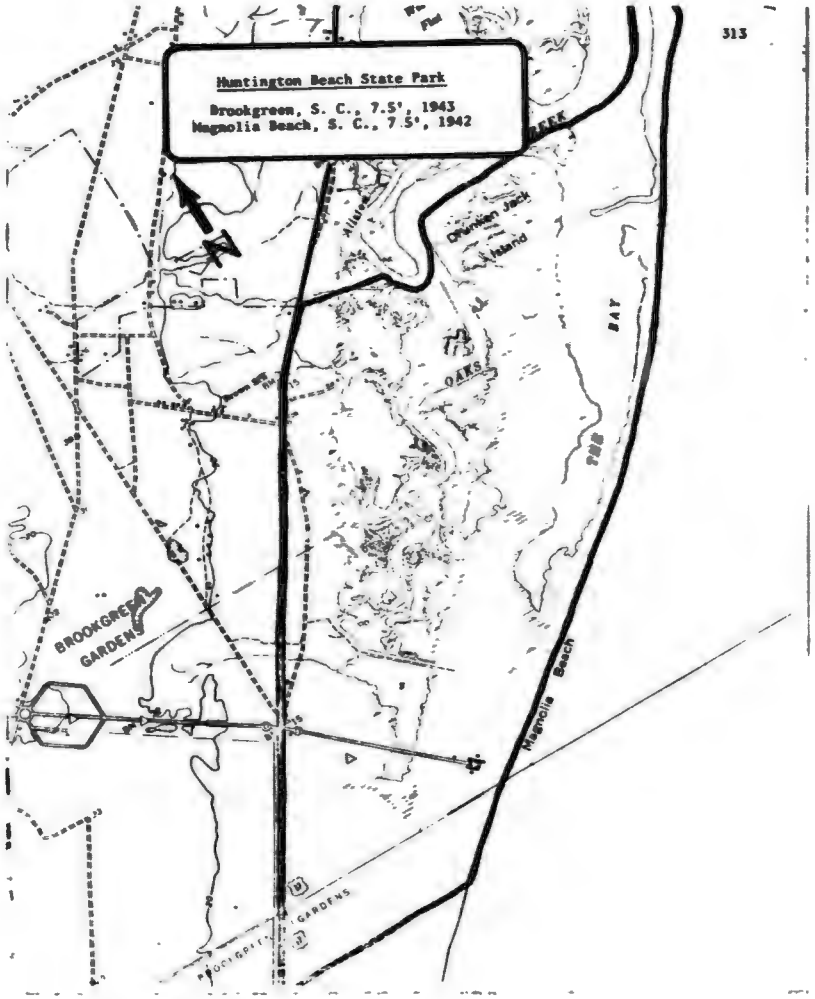
CONTACTS KNOWLEDGEABLE ABOUT AREA:

Mr. Van Stickle, Resident Manager, Huntington Beach State Park (803) 237-4440.

Mr. Bob Papenfus, Chief Naturalist, Division of State Parks, Department of Parks, Recreation and Tourism, Columbia, South Carolina.

RECOMMENDATION:

Recommended as potential Natural Landmark.



C-5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
1421 PEACHTREE ST. N. E.
ATLANTA, GEORGIA 30309

January 5, 1976

Colonel Harry S. Wilson, Jr., USA
District Engineer
Charleston District, Corps of Engineers
P. O. Box 919
Charleston, South Carolina 29402

Dear Colonel Wilson:

We have reviewed the Draft Environmental Impact Statement for Murrells Inlet Navigation Project in Georgetown County, South Carolina, and it indicates that a good job has been done in evaluating water quality aspects of the project.

In addition, an exceptional job has been done in planning the waterway so that marshlands and estuarine areas will receive minimal effects from dredging operations. The spoil is either deposited in an upland diked area, is used for beach nourishment, or is used for constructing sand dikes. However, it should be clearly stated that care is to be taken in maintaining the channel so that it is not necessary to use a sidecasting dredge in the interior channel. If this is done, minimal degradation of water quality will take place as a result of the project.

In view of the foregoing, we have rated the proposed action LO- (lack of objection) and 2 (insufficient information) to the Impact Statement.

If we can be of further assistance in any way, please let us know.

Sincerely,

John E. Hagan, III
Chief, EIS Branch

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

January 6, 1976

Colonel Harry S. Wilson, Jr.
Charleston District, Corps of Engineers
Department of the Army
Post Office Box 919
Charleston, South Carolina 39402

Dear Colonel Wilson:

This is in reference to your draft environmental impact statement entitled "Murrells Inlet, Navigation Project, Georgetown County, South Carolina". In order to expedite transmittal of the enclosed comments from the National Oceanic and Atmospheric Administration, we are sending them to you as they were received in this office.

Thank you for giving us an opportunity to provide these comments which we hope will be of assistance to you. We would appreciate receiving eight copies of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosures Memos from: Dr. Gordon Lill
National Ocean Survey

Mr. William M. Stevenson
National Marine Fisheries Service

C-6

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville Md 20852

C52/JLR

DEC 23 1975

TO: Dr. William Aron
Director
Office of Ecology and Environmental Conservation

FROM: Dr. Gordon Lill
Deputy Director
National Ocean Survey

SUBJECT: DEIS #7511.14 - Murrells Inlet, South Carolina
Navigation Project

The subject statement has been reviewed within the areas of NOS responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

(1) Tidal bench marks may be located in the vicinity of the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Duval Building
9450 Gandy Boulevard
St. Petersburg, FL 33702

December 15, 1975 FSE21/MPC

TO: Director,
Ofc. of Ecology & Environmental Conservation, EE

THRU: Associate Director
Resource Management, F3

FROM: William H. Stevenson
Regional Director

SUBJECT: Draft Environmental Impact Statement - Murrells Inlet Navigation Project - Georgetown County, SC (CE) (DEIS #7511.14)

The Draft Environmental Impact Statement for Murrells Inlet Navigation Project, Georgetown County, South Carolina, that accompanied your memo of November 13, 1975, has been received by the National Marine Fisheries Service for review and comment.

Our review has been limited to those sections of the DEIS pertaining to project effects on marine, estuarine, and anadromous fishery resources.

GENERAL COMMENTS:

In general the DEIS adequately addresses dredging, disposal of dredged material, and jetty construction. However, the impact, if any, of the proposed jetties on the movement of eggs and larvae of marine organisms from the ocean into the estuaries should be discussed.

SPECIFIC COMMENTS:

(a) 4.0 The Probable Impact of the Proposed Action on the Environment

Page 54, 4.03.01.3.3 - This section should include a discussion of the impact, if any, of extending jetties almost 4000 feet into the ocean on the movement of eggs and larvae of marine organisms into the estuaries.

It is requested that one copy of the Final Environmental Impact Statement be sent our area supervisor, Environmental Assessment Division, NMFS Center, Pivers Island, P.O. Box 570, Beaufort, North Carolina.

cc:
F34, NMFS, Washington, D.C. (3)
FSE211, Beaufort, NC

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
SA
1720 Peachtree Street, N.W.
Atlanta, Georgia 30309

December 12, 1975

Colonel Harry S. Wilson, Jr.
Department of the Army
Charleston District, Corps of Engineers
P. O. Box 919
Charleston, South Carolina 29402

Dear Colonel Wilson:

Here are United States Forest Service, State and Private Forestry comments on the draft environmental impact statement covering the Murrells' Inlet Navigation Project, Georgetown County, South Carolina.

Since disposal of dredged materials on upland sites will be confined to a sponsor furnished 16 acre tract, the direct impact of this project on forest lands and resources of the area should be minimal. We do recommend, however, that all merchantable timber on the disposal site be placed in commerce to help mitigate the timber resource loss. Local offices of the South Carolina State Commission of Forestry should be consulted regarding merchantability, volume, local markets and methods of sale of the timber.

Thank you for the opportunity to review and comment on this good draft EIS.

Sincerely,

ROBERT K. DODSON
Area Environmental Coordinator

C-6

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to
COMMANDER (mep)
Seventh Coast Guard District
51 S.W. 1st Avenue
Miami, Fla. 33130
Phone (305) 350 5276

5922/19
19 December 1975

Col. Harry S. Wilson, Jr.
District Engineer
U. S. Army Corps of Engineers
Charleston District
P. O. Box 919
Charleston, S. C. 29402

Re: Corps of Engineers Draft EIS for Navigation Project involving Dredging and Construction in Navigable Water, Murrells Inlet, Georgetown County, South Carolina

Dear Sir:

The U. S. Coast Guard's Seventh District Office has reviewed the above referenced project and finds no conflicts within our agency's jurisdiction.

Thank you for the opportunity to register our comments. If we may be of any further assistance, please do not hesitate to contact us.

Sincerely,

J. A. Montgomery
Captain, U. S. Coast Guard
Chief, Marine Safety Division
By direction of the District Commander

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N E
ATLANTA GEORGIA 30323

December 19, 1975

OFFICE OF THE
REGIONAL DIRECTOR
HEW-604-11-75

Harry S. Wilson, Jr., Deputy District Engineer
Department of the Army
Charleston District Corps of Engineers
Post Office Box 919
Charleston, S.C. 29402

Dear Mr. Wilson: (Murrells Inlet)

We have reviewed the subject draft Environmental Impact Statement. Based upon the data contained in the draft, it is our opinion that the proposed action will have only a minor impact upon the human environment within the scope of this Department's review. The impact statements have been adequately addressed for our comments.

Sincerely yours,

Philip P. Sayre

Philip P. Sayre
Regional Environmental Officer
DHEW - Region IV

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
240 Stoneridge Drive, Columbia, South Carolina 29210

November 25, 1975

Colonel Harry S. Wilson, Jr.
District Engineer
Corps of Engineers
P. O. Box 919
Charleston, South Carolina 29402

Dear Colonel Wilson:

Members of my staff have reviewed the draft environmental impact statement and design memorandum for the Murrells Inlet Navigation Project. We have no comments on either of these documents.

Sincerely,

Lawrence E. Shealy acting

G. E. Huey
State Conservationist

FEDERAL POWER COMMISSION
REGIONAL OFFICE
730 Peachtree Building
Atlanta, Georgia 30308
December 8, 1975

District Engineer
Corps of Engineers
Department of the Army
Post Office Box 919
Charleston, S. C. 29402

Dear Sir:

We have reviewed the draft environmental impact statement and draft General Design Memorandum for the Murrells Inlet Navigation Project, South Carolina, which were transmitted with your letter of November 6, 1975.

The Commission's responsibilities relate to the construction and operation of natural gas pipeline facilities under the Natural Gas Act, and the reliability and adequacy of electric service and the development of hydroelectric power under the Federal Power Act.

In reviewing this plan we noted nothing that should interfere with any licensed hydroelectric project under the Commission's jurisdiction. However, any natural gas pipelines or electrical transmission lines in a construction area should be protected.

We appreciate the opportunity to comment on this proposed project.

Very truly yours,

C. L. Fishburne

C. L. Fishburne
Regional Engineer

2cc: Div. Engr.
Atlanta, Ga.

C-10

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
COLUMBIA AREA OFFICE
1801 MAIN STREET, JEFFERSON SQUARE
COLUMBIA, SOUTH CAROLINA 29201

REGION IV
Peachtree-Seventh Building
50 Seventh Street, N.E.
Atlanta, Georgia 30323

January 9, 1976

IN REPLY REFER TO:
4.3SS, Room 602

Colonel Harry S. Wilson, Jr.
District Engineer, Department of the Army
Charleston District
Corps of Engineers
P. O. Box 919
Charleston, South Carolina 29402

Dear Colonel Wilson:

Subject: Draft Environmental Impact Statement, Murrells Inlet Navigation Project, Georgetown County, South Carolina

The subject document has been reviewed by our Area Office staff, and it is our determination that there will be no effect on existing or proposed HUD activities. We appreciate the opportunity to have reviewed this statement, and request one copy of the Final EIS as it becomes available.

Sincerely,

Franklin H. Corley
Area Director

State of South Carolina

Office of the Governor

JAMES B. EDWARDS
GOVERNOR

DIVISION OF ADMINISTRATION
Edgar A. Brown Building
Columbia, South Carolina 29201

January 5, 1976

Colonel Harry S. Wilson, Jr.
District Engineer
Corps of Engineers
Post Office Box 919
Charleston, South Carolina 29402

Subject: Murrells Inlet Navigation Project

Dear Colonel Wilson:

In addition to our comments made in my letter to you dated November 3, 1975, the enclosed comments from the Department of Parks, Recreation and Tourism, the Department of Archives and History, and the Wildlife and Marine Resources Department on the draft environmental impact statement on the Murrells Inlet Navigation Project.

Thank you for the opportunity to comment on the draft statement.

Sincerely,

Elmer C. Whitten, Jr.
State Clearinghouse

ECWjr/cs
Enclosures

C-11

"Safety Belts — Save Lives and Reduce Injuries"

South Carolina Wildlife & Marine Resources Department

James A. Timmerman, Jr. Ph.D.
Executive Director
Edwin B. Joseph, Ph.D.
Director of
Marine Resources Center

December 2, 1975

DEC 1 1975
DIVISION OF

Elmer C. Whitten, Jr.
State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Re: Control # 08-2001-6; Murrells Inlet Navigation Project

Dear Mr. Whitten:

We have reviewed the draft environmental impact statement for the Murrells Inlet Navigation Project and have found that, in general, the statement provides an accurate and comprehensive assessment of the Murrells Inlet environment and the effects of the navigation project upon this locality. We would, however, like to offer a few general recommendations concerning the work schedule of the project in reference to the biota and then make some specific comments regarding the draft environmental statement.

(1) We recommend that, if possible, dredging be performed during the winter which is the period of lowest biological activity. This would further lessen the adverse effects of the project on the resident biota. Furthermore, we suggest that general construction activities in the vicinity of the least tern nesting area near the northern tip of Huntington Beach be conducted prior or subsequent to the least tern breeding season which generally occurs from April through July, thereby reducing the negative impact of the navigation project on this species. (1)

The following are specific comments on the draft environmental impact statement:

(2) 1.) Section 1.03.04 (p. 2). We recommend the sand dikes be stabilized with native dune species, such as wiregrass (Spartina patens) to reduce possible erosion by wind and wave action, thereby maintaining the integrity of the dikes. (2)

P. O. Box 12559 ☐ Charleston, South Carolina 29412 ☐ Telephone (803) 795-6350

(3) 2.) Section 2.09.02.1.1 (p. 14). The physical and erosive force of wave action is only one of the primary factors operated to limit the distribution of vascular plants within the beach community.

(4) 3.) Section 2.09.02.2 (p. 15). American beachgrass (Ammophila graviligulata), although characteristic of North Carolina coastal dunes, does not occur naturally in South Carolina and cannot, therefore, be considered a typical dune plant in the subject area. Also, two other plants, russian thistle (Salsola kali) and seabeach orach (Atriplex arenaria) are commonly interspersed among the grasses of our coastal dunes and are worthy of mention.

(5) 4.) Section 2.09.02.3.2 (p. 17). The white-tailed deer, (Odocoileus virginianus) and marsh rabbit (Sylvilagus palustrus) are common mammals of the maritime forest and should be included in the list of representative maritime forest vertebrates.

(6) 5.) Section 2.09.04.1 (p. 21). Adult stages of several macro-invertebrates such as jellyfish (Chrysaora, Cyanea, Stomolophus, Rhopilema) and comb-jellies (Mnemiopsis) comprise an important segment of the plankton community and should be so indicated.

6.) Section 2.09.04.1.4 (p. 32-39).

(7) a.) Jellyfish, comb-jellies and copepods, which are designated as "animals with plaktonic larval stages" also are members of the plankton community as adults.

(8) b.) Arrow-worms, here described as nekton, should be listed as plankton, for these animals are common in marine plankton.

(9) c.) Among the more obvious commissions from the nekton list are the following: toadfish, tonguefish, silver perch, star drum, black drum, shrimps, pigfish, seabass, and whiffs.

(10) 7.) Section 2.09.04.3 (p. 42). The mud and/or sand flats depicted on plate 13 generally refer to those flats lying below the mean high water mark and thus subject to regular tidal inundation. The flats that are described as "generally fringed with slanted growths of glasswort, smooth cordgrass, and sea lavender" are those associated with the high marsh, above the mean high water mark and subject to irregular tidal flooding. In contrast, the intertidal flats, typically the home of myriads of oysters and infaunal invertebrates are usually fringed with stands of vigorously growing and highly productive smooth cordgrass and open water.

(11) 8.) Section 2.09.06.1 (p. 44). To the best of our knowledge, both the green turtle and the loggerhead turtle (Caretta caretta) have recently been nominated for inclusion in the list of native threatened species by the U. S. Fish and Wildlife Services and have not yet been officially designated as such.

C-12

Thank you for the opportunity to comment on the draft environmental impact statement.

Sincerely,

James A. Timmerman, Jr.
Executive Director

JATjr:lsb

South Carolina
Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: PRT

RECEIVED
DEC 03
DIVISION

STATE APPLICATION IDENTIFIER

Clearinghouse Use Only
CONTROL NUMBER
DIST. NO. FY
[ ] [ ] [ ]

SUSPENSE DATE
12/1

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946. Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature: Elmer C. Whitten, Jr.

Name: Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES

☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS

☑ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

The South Carolina Department of Parks, Recreation and Tourism has been active in the design and hearing stages of this project from the beginning. The southern jetty will be anchored to land owned by Brookgreen Gardens that is operated by this Department as Huntington Beach State Park, and is in compliance with our policies and procedures. Meetings have been held with the Corps of Engineers as to our requirements during construction and for maintenance of the beach after construction, and our views are included in the plans for this project.

Our Department is in favor of and fully endorses the proposed jetty project to provide safe passage for boats to and from the ocean and to further stabilize the location of Murrells Inlet. We have made statements at public hearings on this project that are part of the Corps of Engineers' record and feel that all necessary environmental aspects have been taken into account.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY:
SIGNATURE: [signature] DATE: 12/1/75

TITLE: _____ PHONE: 759-3654

DNR Form 7 (4/15/74)

C-13

08-2001-6

South Carolina Department of Archives and History
1430 Senate Street
Columbia, S. C.

P. O. Box 11,669
Capitol Station 29211
803—758-5816
November 12, 1975

Mr. Elmer Whitten
State Clearinghouse
Division of Administration
Edgar A. Brown Building
1205 Pendleton Street
Columbia, South Carolina 29201

Re: Preconstruction plans for Murrell's Inlet, South Carolina, navigation project

Dear Mr. Whitten:

We know of several historical properties in the area, but none that would be affected to any significant degree by this project; however, we are listing the properties below so that you may be aware of them.

1) Brookgreen Gardens, located on the west side of U.S. 17, is within a mile of the project area, but far enough away so that there would be no visual effects or other effects from the project.

2) Atalaya, the Huntington mansion, built in 1932, is located on Huntington Beach, opposite the main gates to Brookgreen Gardens, in Huntington Beach State Park. The access road leading to the parking area passes within several thousand feet of the house. However, the visual effect and noise from cars passing from U.S. 17 to the parking area would not be extreme enough to disturb the quiet atmosphere of the area, which is used for outdoor recreation and nature study.

No other historical properties, including National Register properties, appear to be in the area of potential environmental impact, although Murrell's Inlet was a focal point of several plantations and an important port for blockade runners during the Civil War.

Sincerely,

Charles E. Lee
State Historic Preservation Officer

CEL/sa

State of South Carolina

Office of the Governor

JAMES B. EDWARDS
GOVERNOR

DIVISION OF ADMINISTRATION
Edgar A. Brown Building
Columbia, South Carolina 29201

January 14, 1976

Colonel Harry S. Wilson, Jr.
District Engineer
Corps of Engineers
P. O. Box 919
Charleston, S. C. 29402

Subject: Murrells Inlet Navigation Project

Dear Colonel Wilson:

In addition to the comments you received in my letters dated November 3, 1975 and January 5, 1976, the enclosed comment is from the Department of Health and Environmental Control on the draft environmental impact statement on the Murrells Inlet Navigation Project.

Thank you for the opportunity to comment on the draft statement.

Sincerely,

Elmer C. Whitten, Jr.
State Clearinghouse

ECWjr/cs
Enclosure

"Safety Belts — Save Lives and Reduce Injuries"

South Carolina Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

STATE APPLICATION IDENTIFIER

Clearinghouse Use Only
CONTROL NUMBER
DIST. NO. FY
3 3 2 0 0 1 0

SUSPENSE DATE
12/1

TO: Dept of HEnC

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946. Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature: Elmer C. Whitten Jr.
Name: Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

- [ ] PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- [ ] AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- [x] AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

Comments on enclosed sheet.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY
SIGNATURE: [signature] DATE: 1-8-76

TITLE: Community Affairs PHONE: 758-5537

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

E. KENNETH AYCOCK, M.D., M.P.H., COMMISSIONER
J. MARION SIMS BUILDING — 2600 BULL STREET
COLUMBIA, SOUTH CAROLINA 29201

December 9, 1975

District Engineer
U.S. Army Engineer District
P.O. Box 919
Charleston, South Carolina 29402

Attn.: Colonel H.S. Wilson, Jr.

Dear Colonel Wilson:

This office has reviewed the Draft Environmental Impact Statement regarding the Murrells Inlet Navigation Project (Georgetown County, South Carolina) and submits the following comments for your consideration:

(1) The entrapment of littoral drift within the Murrells Inlet deposition basin will result in the enhanced starvation of downdrift Huntington Beach. Model studies should be conducted to ensure that the proposed sand by-pass scheme will be sufficient to stabilize the aforementioned shoreline.

(2) It is recommended that beach nourishment operations be conducted during the late spring season so as to take advantage of natural shoreline building processes.

(3) The project's impact(s) upon hydrologic conditions within the estuary (i.e., flushing time, current patterns, water quality, sediment accretion and erosion processes, altered tidal prism, etc.) should be more closely scrutinized. For example, a reduced low tide elevation may result in the increased flow of contaminated ground waters (i.e., septic tank leachate) into the estuary, thereby degrading ambient water quality.

(4) Consideration should be given to the environmental impact(s) of secondary development/utilization (recreational, commercial, residential) of the watershed following completion of the navigation project. For example, increased utilization of the estuary by pleasure/commercial craft may result in the deterioration of ambient water quality and subsequent condemnation of additional shellfish growing areas.

(5) Efforts should be made to ascertain the source of excessive sedimentary mercury levels detected in various locations throughout the estuary.

(6) Consideration should be given to planting the upland disposal site with some form of hydrophilic vegetation to dehydrate spoil materials and reduce standing water, thereby limiting conditions conducive to mosquito breeding. This practice will also serve to increase wildlife habitat and enhance recolonization of the area by indigenous flora.

(7) It is recommended that a comprehensive environmental study of the estuary be initiated just prior to construction of the navigation project and continue for a period of at least five years following completion of such. In this manner it will be possible to effectively define the adverse environmental impact(s) of the project and monitor the effects of any secondary development.

Thank you for the opportunity to offer comment on this matter.

Sincerely yours,

C. Barry Shedrow
Environmental Analysis Section
Programs Development Division
Bureau of Wastewater & Stream Quality Control

CBS/bc

C-15

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

R. KENNETH AYCOCK, M.D., M.P.H., COMMISSIONER
J. MARION SIMS BUILDING — 2600 BULL STREET
COLUMBIA, SOUTH CAROLINA 29201

December 2, 1975

Colonel Harry S. Wilson, District Engineer
Charleston District, Corps of Engineers
P. O. Box 919
Charleston, S. C. 29402

Dear Colonel Wilson:

We have reviewed the draft EIS for the Murrells Inlet Navigation Project, Georgetown County, South Carolina.

We noted that the problems associated with mosquito production on spoil areas has been addressed and that most of the dredged material will be utilized in other phases of the project and for beach nourishment.

This still leaves the question of responsibility for mosquito control on the upland 16 acre disposal area open to question. The EIS states that "Mosquito Control operations...are generally conducted by local government..." This is a de facto situation is which the local government has had to do the work to combat the problems associated with spoil areas because the Corps of Engineers has disclaimed responsibility and in no way represents an admission of legal responsibility.

Since this problem represents an ongoing maintenance type of expenditure rather than a single damages type of expenditure, it would seem logical that paragraph 1-b, the "hold harmless" clause, of the contract would not be pertinent.

Since the responsibility for mosquito control is not specifically apportioned in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the question of this responsibility is still open.

If the disposal area listed is the EIS is to be used, we feel that the Corps of Engineers has a responsibility to participate in mosquito control necessitated by the use of that area.

This participation should take the form of either funding of the local mosquito control program or actively participating in inspection and treatment of the spoil area, coordinating closely with the local control program.

C-16

Thank you for this opportunity to comment on this project.

Sincerely,

L. A. Williams, Jr., Director
Division of Vector Control

LAW,jr/ch

LITCHFIELD BEACHES
PROPERTY OWNER'S ASSOCIATION
POST OFFICE BOX 488
PAWLEYS ISLAND, SOUTH CAROLINA 29585

December 8, 1975

Colonel Harry S. Wilson, Jr.
District Engineer
U.S. Army Engineer District
Charleston, S.C. 29402

Dear Colonel Wilson:

This organization is in strong opposition to many considerations contained in the Environmental Impact Statement Draft for the proposed Murrells Inlet Navigation Project, along with the considerable **omissions**, which is deemed to be dangerously detrimental to the coastal ecology and to beach property of both the Huntington State Park and to the private beach front home owners, both to the north and south, i.e., Garden City, Surfside Beach, the Litchfield Beaches and Pawleys Island. We act here on behalf of the some five hundred property owners of this association and are anticipating that other such concerns will join us in a thorough participation.

Among some of the opposed issues are these:

1. There is no comment concerning adverse environmental effect of erosion of the beaches north and south of the project; Summary, paragraph 3b, and in paragraph 5.01.

2. No provisions are made for wave testing models for waves from the north-east, where the strongest winter storms are generated. These wave tests also apparantly do not consider the reflection of the wave fronts by the jetties and how these changes influence the beaches north and south of the Inlet. The model test does not involve a study of the development of large standing waves between jetties, which could be very hazardous to small boats; paragraph 1.07.02.1.

3. There is no explanation of the source of the sediments which cause the Murrells Inlet problem, particularly whether they are ocean generated; paragraph 2.05.03.

4. There is no consideration of the adverse influence that erosion would have on the economics of beach rental cottages, both north and south of the Inlet; paragraph 2.14 and 4.07.

5. There is no time scale for beach nourishment and no funding is projected or provided for this very costly, necessary and vital function on a constant basis.

6. At the third, post-authorization meeting, May 29, 1975, much concern and opposition was indicated by beach home owners, and by representatives of Brookgreen Gardens and Huntington State Park, over the erosional impact south of the project. No reference is made to this fact in your statement, Paragraph 9.04.

C-17

LITCHFIELD BEACHES
PROPERTY OWNER'S ASSOCIATION
POST OFFICE BOX 488
PAWLEYS ISLAND, SOUTH CAROLINA 29585

December 8, 1975

Colonel Harry S. Wilson, Jr.
District Engineer
Charleston, S.C.

7. The Draft Impact Statement is STRONGLY OVER-BIASED in favor of the commercial boat operators of Murrells Inlet and GROSSLY neglects the fact that this proposed project is an almost complete disruption of a naturally physically dominated system. Although there is a preponderance of material in the statement dealing with the biological structure and the danger thereto, the fact remains that this project will impose a dangerous posture to public and private recreational beach area property and homes, thereby placing literally millions of dollars in public and private jeopardy; this compared with the immense initial cost and subsequent maintenance dredging, etc., for the relatively small benefit of commercial boat operators and connected recreational activity to the few compared to **benefits** afforded to the many on the beaches north and south.

I refer you to coastal California and the horrendous results of jetty constructions there, whereby many, many homes vanished into the sea, millions of dollars in loss, hardship and deprivation of vital recreational areas. Are we not to profit by this lesson?

This association is asking to be kept fully apprised of development plans in order that we may be properly prepared to join with other civic groups on this coastal area in the proper protection of our common interests and whereby we may obtain both legal and environmental representation.

Please consider this letter a formal request to be represented at the hearings that will be conducted on this matter.

Yours truly,

J.C. Merchant, Jr.
President

C. R. May, III, M. D.
408 Lakeshore Drive
Bennettsville, S. C. 29512

December 17, 1975

U.S. Army Engineer District, Charleston
Corps of Engineers, P. O. Box 919
Charleston, South Carolina 29402

Dear Sirs:

I wish to register an objection to the proposed Murrells Inlet Navigation project. I have read the Environmental Impact Statement and find it generally quite complete - if not frankly verbose.

(1) My objection concerns an area that I can find no mention of in the Impact Statement, specifically what long term effect will the proposed dredging and jetty construction have on the tidal erosion of the existing beaches North and South of the proposed channel, and more directly yet, what effect is to be anticipated in the multitude of smaller creeks and sloughs inland of the proposed inner channel.

(2) I have observed a drastic errosion change in the Northern Huntington beach area since the Emergency Channel dredging began in March 1975. Large sand dunes on Huntington beach have been cut down with creation of a shelf-like drop off just beyond the low water mark. There are strong and un predictable currents just beyond the breaker line that were not present in years past. There has been a great deposition of sand across the outlet of several small "creeks", resulting in apparent stagnation of tidal flow of a large area just North of the present Northern camping area of Huntington.

That these changes are recent and not reasonably expected to have occurred in the natural process of re-contouring seems to be pointed out by the finding up and down the Northern Huntington beath of large numbers of .50 caliber machine gun bullets. These are of course from the time around and during World War II when that area was used as an Air Gunnery range. The point I make is that these projectiles were present in the numbers showed almost no sign of corrosion and only small areas of rust-sand encrustation, indicating that for the time they had lain in the dunes they were protected from the action of sea water. I feel that something caused the complete errosion of these dunes that had been high and dry for at least 25 years, and the most obvious something was the dredging of the channel in connection with the recent execution of the Garden City Causeway.

Briefly, I am opposed to the proposed dredging project because I feel it will result in rearrangement of tidal currents that will either wash away or silt up existing beaches and/or salt marsh physically located at some distance from the actual site of the project per se.

Respectfully submitted,

Dr. & Mrs. C. R. May, III

Mrs. C.R. May, III

29 DEC 1975

COTSWOLD MEDICAL CLINIC
300 GREENWICH ROAD
CHARLOTTE, NORTH CAROLINA 28211

FAMILY MEDICINE

THOMAS L. DULIN, M.D.
DONALD V. CHANDLER, M.D.

December 24, 1975

U. S. Army Engineer District
Box 919
Charleston, S. C. 29402

Dear Sirs:

(1) I am oppcsed to any dredging at Murrells Inlet, S. C. I hope you will reconsider your plans taking cost, long term effects, and loss of food chain into account.

It is my opionion that the mouth of Murrells Inlet cannot be stabilized without a major and costly effort--and for what purpose?

(2) I can see no justification for such an expense. The mouth is adequate for current use. Large fishing boats can use other existing ports.

I am writing my congressman, Jim Martin, and asking him to look into this matter also.

Sincerely,

Thomas L. Dulin, MD

TLD/jc

C-19

Marion, S.C.
Dec. 26, 1975

Gentlemen:

Having been advised of your proposed project at Murrells Inlet, I feel it necessary to object. I am opposed to any and all action that the Corps of Engineers proposes to take.

Please don't disturb one of the most beautiful areas of South Carolina by making it a "commercial area".

Very truly yours,

Mrs. Sequine H. Bostick

Mrs. Samuel F. Ervin, Jr.
Route 1, Box 344
Florence, South Carolina 29501
December 28, 1975

U.S. Army Engineer District
P.O. Box 919
Charleston, S.C. 29402

Dear Sirs:

After studying the draft environmental statement concerning the Murrells Inlet Navigation Project, we would like to register our strong objections to the proposals made therein.

① In particular, we find the proposed work highly objectionable because it would attract more people to a part of Huntington Beach that has been more beautiful because of its relative isolation. Furthermore, the influx of fishermen would certainly affect adversely the tern nesting area on this beach. As few natural beaches remain in the northern S.C. coastal region, we would like to see this portion remain untouched by man's "enhancements".

2.

② From an economical standpoint, this project would certainly not be feasible. According to your statements in Appendix A the cost of maintaining the project annually would almost equal the projected annual benefits and this does not include the initial cost. It would also question who would benefit from this dredging - would it be a limited group of commercial fishermen who have certainly not enhanced the lovely community of Murrells Inlet with their presence?

Please give this matter careful consideration before being swayed by a vocal group of commercial fishermen.

Sincerely,

Mrs. Samuel F. Ervin, Jr.

Rt. 1, Mt. Gilead,
Murrells Inlet, S. C. 29576
December 28, 1975

Commanding Officer,
U. S. Army Engineer District,
P. O..Box 919,
Charleston, S. C. 29402

30 DEC 1975

Dear Sir:

References:

1. Environmental Impact Statement, Murrells Inlet Navigation Project, Georgetown County, S. C.

2. "Murrells Inlet, Georgetown County, S. C." Letter of Transmittal and enclosures, Secretary of The Army to Speaker of The House of Representatives, June 23, 1971.

3. National Environmental Policy Act of 1969.

We protest the adoption of Plan C, Table 12, reference 1, and urge the adoption and execution of Plan A, same reference.

While your office has apparently made exhaustive study of the environmental impact of the project, it apparently has made several assumptions that we believe to be erroneous:

1. That offshore recreational fishing is of paramount importance to the Murrells Inlet community as opposed to inshore fishing.

2. That, after a dredging of the channel, there will be a significant influx of fishing boats to Murrells Inlet.

3. That ships expected to use Murrells Inlet will have drafts of up to ten feet.

4. That a maximum disturbance of the inlet channel floor is justified by an optimum cost to benefit ratio in dollars.

(1) Offshore versus Inshore fishing. If one would take a day-to-day survey of people using the inlet, not only for fishing, but for clamming, shrimping and water sports, for a full year, he would doubtless determine that many more people use the inlet for recreational purposes than use it as a means of egress and ingress to and from the ocean. Section 1, reference 3, requires, in part, that "xxx the Nation may --- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety or other undesirable and unintended consequences; xxx (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; xxx."

(2) If the project, in fact, would result in more large boats in and out of the inlet, a safety hazard to the hundreds of small craft using the inlet would definitely be enhanced. At the present, the incoming and outgoing of the charterboats and headboats are hazardous to the small craft fishing in the inlet because of the wave action they cause.

(3) Increase in Commercial Fishing. On page 31, paragraph 21, reference 2, your office states: "Due to the uncertainty as to the type and size of vessels which would be used, no attempt has been made to estimate the composition of the commercial fleet." In neither reference 1 or reference 2 is there any indication that this uncertainty has been resolved.

(4) Alternate Depths. In paragraph 4.07, reference 1, is stated: "This depth is inadequate for operation of the existing and projected fleet of commercial and recreational boats which require about 12 feet mean low water depth at the channel entrance and 10 feet mean low water depth in the inner channels for safe navigation." We cannot imagine, considering the limited docking facilities at Murrells Inlet, what size and type of ship coming into the channel would require a 10 foot depth. We know of no ship currently using these facilities that has a draft greater than five feet.

(5) Throughout paragraph 4, reference 1, there are allusions to the increased turbidity and siltation resulting from dredging and their adverse effect on the small estuarine life. In paragraph 5.02, you state: "In addition, some benthic organisms may be destroyed by the dredge cutterhead." A disruption of the esuarine life will have an adverse effect on offshore as well as inshore fishing, inasmuch as "A number of the fish species including many of importance to the sport and commercial fishing are considered to be estuarine dependent and utilize the coastal estuaries for at least a portion of their life cycle." (paragraph2.09.04.1.2, reference 1.) The unavoidable destruction and disruption of the food chain can be minimized by the adoption of Plan A. A rough scaling of the proposed dredging in Plan C, as depicted in Plate 3, reference 1, indicates that 72% of the inner channel would have to be dredged. If Plan A were adopted, less than 10% would be so disturbed. There would be a proportionate reduction in the destruction of estuarine life.

(6) While the economic benefits of all the plans are, in a sense, hypothetical, the Project First Costs are real costs. Plan A would save more than $1,000,000.00 over Plan C.

In reference 3, Congress recognizes the obligation of our Nation to: "fulfill the responsibilities of each generation as trustees of the environment for succeeding generations." Only by minimizing our disturbance of nature's balance can we carry out the terms of that trust. Use Plan A.

Yours very truly,

James D. McArthur
COL, FA, AUS (ret)

cc: Hon. Strom Thurmond
Hon.Ernest F. Hollings
Hon.John Jenrette

C-20

Mrs. James Judd Green
65 Old Field, Mt. Gilead
Murrells Inlet, S. C. 29576

December 30, 1975

U.S. Army Engineer District
P.O. Box 919
Charleston, S.C. 29402

Dear Sir:

① In an earlier letter I expressed concern to Colonel Wilson about the long-term impact that extensive dredging inside Murrells Inlet would have for individual boaters (fishermen) and residents. Having read the Environmental Impact Statement I am convinced that my concern is valid for both individual and commercial boaters. Restated, I should [illegible] that to any [illegible] read the [illegible] and talked with many persons, I am convinced it

is a plan detrimental for present and future generations — and totally unnecessary.

② Section 9.04 states that throughout the study the majority of people attending the meetings have been of favorable opinion. The majority of people in this area were totally unaware of the meetings and even those with some academic knowledge of the project were astounded to learn the massive scale dredging was intended — Everyone thought only the entrance and north [illegible] were to be dredged. I think — and hope — that Section 9.05 will have to be amended to say considerable opposition was expressed when the public was made aware of what was planned. Did you advertise in The Sun News? It is a Horry County paper but far more persons subscribe to it than

3/ the Grayton Mine, the county in which the project will take place, and in which the meeting was probably [illegible]. We still cannot [illegible] [illegible] but do find it interesting that a few know beyond the group in favor.

① An problem with going ahead with 10' dredging before trying a year – or with 6' depth (and much less dredging of the slob) is that the damage is irreversible – forever. Additional money would have to be spent on the 10' dredging, which is of great importance. However, preservation and improvement of the slob are beyond monetary value.

③ The commercial fishermen have had a rough time with the North depth and we need help them. But we feel our personal interest and use of the slob

4/ itself. ③ They are a minority. Those of us who love the slob would like to see money spent on cleaning up the polluted areas – not extending pollution and damaging feeding beds. We do not want to see extensive commercialization.

① My family has owned property for five generations. I have been around the marsh on crabbing, fishing, jigging my trout in the water to keep the slob clean. They are the envy of their out-of-town friends who do not have such beauty outlets. I am willing to bet that children who learned to swim, the slob and their association will not turn to them to drugs, shoplifting, etc. for their thrills. A good [illegible] is the best basis for all [illegible] these rules the children to be possible for all who enjoy it and those

9

Mrs. James Judd Green
65 Old Field, Mt. Gilead
Murrells Inlet, S. C. 29576

who will come to in the future. Please let Murrells Inlet have a future!

(5) I am sure many persons have given you all the reasons we feel Plan C is detrimental so I will not repeat all our arguments in favor of Plan A. But do be assured that thousands fervently hope you will analyze all their reasons to provide a [illegible] depth (aside from all [illegible]) we many and request your greatest consideration. If our [illegible] of this had not come during the Christmas season, I am sure many more people would

have taken time to write in favor of Plan A.

You are to be commended for your diligence in putting together such a comprehensive study on the project and I trust that the final decision will be made on the basis of what would be best for the Inlet itself — and a due reverence for this natural wonder and beauty that God gave to all of us when He made this and all else.

Sincerely,
Helen Salmon Green
(Mrs. James Judd)

Henry B. Powell
Box 783, S.P.O.
Sewanee, Tenn. 37375

Department of the Army
Charleston District, Corps of Engineers
P.O. Box 919
Charleston, South Carolina 29402

Colonel Wilson:

First let me introduce myself. I am a college student majoring in biology, with a good background in chemistry, as well, who understands, somewhat, the impact upon the ecosystem and biotic community of a region by changes in environmental factors. The particular region of my concern is Murrell's Inlet, S.C., and the specific project, the Navigation Project to be undertaken by your office. Another qualification I have to discuss this situation with you, is the fact that my family has had a cottage on the creek at Murrell's Inlet since 1953, with my parents having a much longer association going back to their childhood although not actually being property owners. Since my birth in 1956, I have spent every summer in Murrell's Inlet and have used the creek as both a recreational and a food source. I, as the rest of my family take only what we can eat and despise those who don't, and we try to teach newcomers the right methods of creek use. Besides knowing a large number of the seasonal families who own homes in the area, my employment in the local restaurant establishments has given me a chance to become good friends with some of the year-round residents.

I obtained recently, a copy of the EIS on this project, have read it thoroughly and have thought on the situation for some time.

I disagree totally with the project in several areas which are: impact of the project on the biological resources, the cost of the project, the number of individuals who will benefit from the project, and the lack of notification of individuals whose interests are effected by the project. Having read this EIS, I, in order to disagree with impact on the biological resources, would have to disagree with the interpretations of the statement as set forth in the EIS in the form of conclusions drawn from surveys of a varying nature which provided the information for its preparation. I find discrepancies in several areas, and in other areas I use the information provided by the EIS to show the detriment of the project.

(1) On page 42, the EIS states that tidal action provides a constant influx of particulate organic matter to tidal flats creating a rich nutrient supply for filter-feeding benthic invertebrates. These animals and nutrients are an important source for a variety of fish species and when they are exposed, the flats serve as a source for the wading birds and shore birds. On page 51, the EIS states that the preliminary model studies at the WES indicate that in some areas low tide levels may be lowered as much as 0.5 feet, by the project. Because of the sloping contour of the channel sides, the small decrease in low tide levels represents a much greater surface exposure than indicated, causing less fish than before to be able to feed, thus a decrease in the fish and an increase in the bird population. The decrease of feeding area is not as great along the main channel shores as in the small tidal creeks which feed into larger ones, which eventually flow into the main channel, because, even such a slight drop in low tide levels will make many such creeks much drier than they are or completely dry, and thereby close more feeding ground.

(a) On page 45 under the heading of sport and commercial fisheries, the EIS says that although inshore fishing is good in the area, Murrell's Inlet is perhaps better known for its offshore sport fishing. The choice of the word, perhaps is a good one, since Murrell's Inlet is better known for this, by whom-tourists. Undeniably, the tourist dollars are more important, and my summer employment in the restaurant business depends upon these dollars, since that business depends upon the tourist solely. But, for Murrell's Inlet, as well as the rest of the Grand Strand the sport fishing industry claims but a very small percent of the tourist vacation, and consequently-his dollar. This industry cannot be considered a major drawing force of the tourist trade. The EIS goes on further to state that there were 24 charter boats and numerous private boats utilising Murrell's Inlet as a home port in 1974. Of these boats only about 6 or 7 would run a grave risk when negotiating the mouth of the Inlet. Such large boats as the Flying Fisher, the Inlet Princess, the Captain Alex, the Carolina Princess, and several others whose names I am not familiar with are the only ones I am speaking of. This problem , therefore concerns only a small number of the people who live, own, and use boats in the Inlet.

(b) Further down the page, the EIS says the commercial fishing is essentially an offseason operation of the recreational fleet, and that the catches made by the fleet at Murrell's Inlet are consumed for the most part by the more than 100 restaurants along the Grand Strand. I find this last statement hard to believe. I have never seen nor heard of any fish or shrimp trawlers permanently based in Murrell's Inlet, and even if there is; there is not room for very many, at most only one or two. The recreational vessels carry the paying customers out to the fishing grounds, and these customers do the fishing. If these recreational vessels were to be utilized in the off season, then personnel would have to be employed to fish from

these boats, a seemingly uneconomical plan. Anyway, the amount of fish landed by these boats could not be of sufficient quantity to rival the other ports in South Carolina, and to be distributed to 100 restaurants, along the coast. Most, if not all the restaurants receive their seafood from a local distributor-if you can call Myrtle Beach Seafood local- and they get their supplies of shrimp from Carolina Seafood in McClellanville, S.C.; the oysters from the Chesapeake Bay companies, and the fish is fresh-but not from Murrell's Inlet. The crab in many cases comes from Charleston.

(c) Of the 5 marinas mentioned on page 47, four are in Murrell's Inlet, and the fifth-the Gulfstream Marina-is on the Garden City point, and would not benefit from all of the project. Also, the marina does not have any really large charter craft, and consists mostly of smaller private craft, I am not positive, but reasonably sure. Also mentioned on page 47 is the fact that there are 13 ocean fishing piers on the Strand, and the fishing provided by the jetty walkway would not be of great import.

(d) If PRT (Parks, Recreation, & Tourism) expects to increase its revenue by increased use of Huntington Beach State Park due to the fishing walkway, then a much cheaper fishing pier could be built in the north area of the Park at the cost of several thousands, instead of several million.

(e) On page 50, the EIS says the obvious-that development in the area is expected to continue to concentrate and intensity along the Atlantic coastline in Horry and Georgetown counties, with or without the project. The EIS states further down the page that the major adverse effects are on water quality and the ecosystems in the disposal area, the channel area and other areas within the Inlet which will be disturbed by construction activities but the beneficial effects go only to the offshore sport fish-

ing industry. Why should the natural quality of the Inlet be disturbed for such a special interest group? Why should the vast majority of the people who use the Inlet suffer even a supposedly temporary decline in abundance of fish and shellfish too such a special and insignificant group. (6) The fact that tidal levels may be lowered by the project and that possible aggravation of the current bacterial po;;ution in Parsonage Creek would occur closing additional areas to shellfishing is dismissed with such a vague statement that reeks of negligibility.

(7) Another such disgusting dismissal occurs in the following paragraph which concerns the release of mercury into the water column by dredging which will be performed in the areas already shown to have higher than tolerable levels.

(8) The increase in mosquito population is yet another distressing point since the proposed method of control is with Flit M.L.O., an oil larvicide that the EIS says has no effect on important aquatic forms-important to whom-commercial fisherman perhaps, and just what is considered important. The control program will require frequent inspection and respraying-is this cost included in plan estimates or is it an unforseen extra. The EIS gives no concrete proof of its safety-perhaps there is none.

(9) The EIS proposes this project will result in some increase in marina business. The number of marinas cannot increase nor can their facilities increase past the current status without destruction of tidal creeks and tidal marshes, the incipient detrimental effects can be seen by information given by the EIS itself on pages 18 and 40, which explain the invaluable use of those areas to their respective biotic communities and whose destruction and consequental effects can only be guessed at in horror. We can also view the effects of the past dredging and manipula-

C-26

tion of tidal areas by information given in the EIS. Using the species quantity tables and correlating the values with location of each sampling station and its alteration history we can see evident patterns developing.

(10) Species diversity means that the environment is stable and supports a varity of ecological niches and consequently a larger number of different types of organisms. A high valvue would indicate the presence of environmental forces and selection pressures resulting in fewer diverse species, and only the more adaptive surviving. The species number indicates, under the present conditions how many are able to live in each area or the abundance of materials to satisfy the species needs. MI 01 at some distance out from shore gives a high diversity value and an average number value. MI 02 which is closer in,but not in the mouth, shows a lower diversity value but a higher species number. Stations MI 03, MI 04, and MI 05 are subject to strong tidal current forces with resulting scouring which produced much lower values in both areas. But with MI 06, MI 07, MI 08, and MI 09 which were located within the twists and turns of the inner channel there are sharp increases in the diversity and number values for them. Stations MI 10 and MI 16 being nearest the marina area and the adjacent contaminated Parsonage Creek show some of the lowest values for both tables. Station MI 11, located at the mouth of a creek in the Garden City point area shows one of the well scoured areas when it should be the opposite as one would think. This area has been subject to the most recent development and disturbance in the last few years. Stations MI 12, MI 13, MI 15, MI 17, and MI 18 which are away from the areas with alteration histories and strong tidal influence show the highest values on both the tables as they should since disturbance here as always

minimal.

(11) The cost of this project is tremendous and the annual upkeep is prohibitive, and Plan A will cost more then it will contribute, and the best figure of a 1.14 : 1 ratio (p.60) does little more than break even. The attendance at meetings designed to obtain the views of the public concerned, shows the lack of notification of people. The majority of people who use the Inlet are seasonal, and the times of the meetings were when most of these people would not be present to know of such meetings, and therefore to attend, as shown by the decreasing attendance. This type of representation is not only unfair, but undemocratic to say the least.

C-27

(12) So far, the navigation problems have been attacked by so called 'Emergency dredging' which has been stated in the EIS to be uneconomically and physically infeasible. Surely any solution that does not completely solve the problem can be termed in this manner. Another point made, is that this type of solution provides more frequent disruptions of the benthic populations, but again we must think that the initial disruption of the project may be so great as to require recolonization time, much longer than before, only to be interupted by redredging every three years, and therefore prove as bad or worse than the present solution employed. The emergency dredging is a temporary solution, but in this case, the only type justified by the small realm of its beneficial effects.

(13) In essence, why should so much suffer for so small a group at such a great expense. The money, if already appropriated, should be channeled to meet existing problems of pollution in Parsonage Creek and the mercury levels. The opening up of more of the Inlet is analogous to

widening a street or highway, and the increase of use will strain the current facilities, which have peaked in developmental potential, already excluding a program of tidal marsh destruction and the effect will be further ruination of Murrell's Inlet, resulting in the end of food sources and enjoyment by those who have been there many years with the prospect of eventual abandonment of Murrell's Inlet all together.

I would very much like to discuss this project with you and will be glad to see you at any time that is convenient with you from now until 13 January, 1976, when I must return to school. I will be in Charleston on 5 Jan. to take care of some business, and any time that morning, or afternoon up until 3:00 p.m. would be excellent, however, any other time will suffice. I may be reached at this address during this time:

310 Cherokee Road
Florence, S.C. 29501 (803-662-5179)

Thank-you for your time.

Cordially,

Henry B. Powell

Henry B. Powell

30 December, 1975

JOSEPH H GASQUE Phone 205 870-4167

GASQUE AND ASSOCIATES
P. O. BOX 7675 MT. BROOK STA.
BIRMINGHAM. ALA. 35223

December 31, 1975

Mr. Jack J. Leseman
Department of Army
Charleston District Engrs.
P.O. Box 919
Charleston, S.C. 29402

Subject: Murrells Inlet, South Carolina

Dear Mr. Leseman:

Having been raised at Murrells Inlet, I have seen it come from a very small uninhibited area to a very large commercial area, over the last 50 years.

C-28

(1) Every time there is a dredge of any description doing dredging at Murrells Inlet we loose more and more of our seafood that is caught there. After dredging there is always that terrible black mud that seems to get all over the inlet and all of the little creeks. This kills our shellfish, such as, oysters and clams and makes it awfully tough to pull a shrimp net.

Their have been many families both black and white, that have made their living out of Murrells Inlet and a lot of families are still making a living today out of Murrells Inlet.

You being an engineer on this project, I am sure have been in a boat from the old army dock to the mouth of the Inlet and you have noticed on each side of the main creek, especially on each side of the mouth of Wale Creek, that there is nothing but dead oyster shells along these banks. This has been caused by the big fishing boats running in and out of there with their parties and their wake rolling against the banks has caused these banks to be bare of oysters.

The people that really want this dredging done are not really residents of Murrells Inlet, but are what you would call transplants from other sections up and down the coast.

I am there every summer for 3 to 4 weeks and I have not seen any of these big fishing boats get stuck at low tides in the main channel from the Army dock to the mouth of the inlet.

(2) As for the mouth of the inlet, I agree that it is terrible. I think that there should be jetty's put at the mouth of the inlet, so as to keep this channel open, but as for dredging the main creek into the inlet,

JOSEPH H GASQUE Phone 205 - 870-4167

GASQUE AND ASSOCIATES
P. O. BOX 7675 MT. BROOK STA.
BIRMINGHAM. ALA. 35223

I am totally against it.

If there is going to be some dredging, then I would vote for Plan 3.

Yours very truly,

J.H. Gasque
Gasque & Associates

JHG/pm

Thos. J. H. Carmichael
305 West Main Street
Bennettsville, South Carolina
January 1, 1976

U.S. Army Engineer District,
Box 919
Charleston, S C
Dear Sirs,

① As owner of a home at Murrells Inlet, S.C. since 1920 I beg of you if dredging must be done there, stick to plan A by all means.

② In my opinion, much damage to fishing, gathering of oysters, crabs & clams when Jordan City dredging was done years ago. The abundance of sea food of all kinds has never recovered.

There are too many people, too many boats, both pleasure and commercial already and gone is the peace and restfulness which have endeared Murrells Inlet to my family for many years.

Already three new projects have caused my taxes to go up from $900 in 1973 to $215.49 in 1975.

I protest that any more than Plan A be done.

③ I was not notified of any of the meetings; only local people who were out to make money by the dredging were there to say what they wanted.

Sincerely yours,

Wilkinson Carmichael.

Thos. J. H. Carmichael
305 West Main Street
Bennettsville, South Carolina

Jan 1, 1976

U.S. Army Engineer District
P.O. Box 919
Charleston, S.C.

Dear Sirs:

As a resident of Murrells Inlet I am opposed to Plan C of the Murrells Inlet Navigation Project.

① I think Plan A would be better not only for ecological reasons, but also for economic reasons.

② It is almost impossible to sit in Murrells Inlet in a small boat and fish now, when the 50ft. fishing boats come running through wide open. The only benefit of dredging the channel from the mouth to the government dock 12ft. deep, would be to allow larger fishing boats to come in at great speed. Not only is life and property endangered by these large speeding boats, but also damage to the

marsh and shell banks. The banks and marsh from the government dock to the mouth no longer have live oysters, and I believe this is partially due to the fact that the large boats come in at a high speed. Most of the beds from the dock south are dead.

I do believe the jetty should be placed at the entrance as that is the only way to keep the sand from washing back into the channel. The channel should also be dredged from the ocean to just inside the inlet. There are only several places inside the inlet which would need to be dredged if the inner channel was to be left. The left channel would be plenty deep if the large fishing boats would run at a safe reasonable speed.

I believe that plan II would be better for both economic and ecological reasons. It would save $2,088,000. from the start. It would also save $9,300. annually, and over a period of time would be a substantial savings to our tax payers.

As of this date, one part of the inlet has already been closed to shellfishing, and it looks as if the rest will be closed because of bacterial contamination. If the inlet is dredged all the way to the dock the water turbidity would increase greatly and would endanger the shellfish not only temporarily, but permanently.

If the mouth is dredged and the channel made left, it would make the water less turbid and increase the water flow into the inlet. I believe this would eventually help the

Inlet, as it would increase the water flow and clean out the sand left from earlier dredging.

Very truly yours,
William Strickland

310 Cherokee Road
Florence, S.C. 29501
1 January 1976

Col. Harry S. Wilson, Jr.
Dept. of the Army, Corps of Engineers
Charleston District, P.O. Box 919
Charleston, South Carolina 29402

Sir:

Thank-you for your letter of 18 November, 1975, and the copy of the draft environmental impact statement for the Murrell's Inlet Navigation Project, South Carolina.

About a year before I was born (1964), my parents bought a small house where a tidal creek came up at the back, at Murrell's Inlet, S.C. For 22 years we've stayed at the Inlet (in preference to the nearby beaches) to enjoy the shrimping, crabbing, fishing, swimming and boating. We stay from early May to early September.

The main purpose of this letter is to object in the strongest possible way to the proposed dredging, construction of jetties, turnaround basin, and boardwalk, etc. by the U.S. Corps of Engineers at Murrell's Inlet, S.C. as described and illustrated in the Draft Environmental Impact Statement Murrell's Inlet Navigation Project Georgetown County, South Carolina, prepared by the U.S. Army Engineer District, Charleston, South Carolina (October 1975).

After careful reading and studying of the entire EIS, I find I disagree with all proposed plans (Plan 1, 1A, 1B, 2, 4,6, and "; for a plethora of reasons: 1) cost and maintenance (1.5 million per ann-

um-lowest figure), 2) destruction and disturbance of breeding ground for aquatic and land animals (I disagree with the idea of rapid re-colonization as outlined in the EIS), 3) as stated in the EIS, the Grand Strand area will grow with or without the project-I do not see that the outlay of such a great amount of money for the benefit of so few is justified, the unnecessary traffic and confusion, though temporary, is neither justified.

(4) I feel that the 'emergency dredging' is the temporary solution to a problem that can only be solved by temporary solutions, because, though it is not "economically feasible or physically feasible p. 58", it is more feasible than any of the suggested plans and cheaper than the cheapest-1.5 million per annum plan. Its the least expensive answer to the 4, not 5, commercial fishermen. Light and more frequent dredgings are more preferable than one major heavy, deep upheavel.

C-12

(5) Col. Wilson-my major objection is that I feel not enough consideration has been given to the, all the people, who have for all these years paid taxes, lived, and vacationed at Murrell's Inlet. This project will destroy everything the Inlet is. Actually the Inlet is small, and the best place for small boatcraft. Because it is small, I feel only smalltime boating should be encouraged. We don't want or need any more marinas or deep-sea fishing boats or turn around basins luring large yankee yachts or Canadian tourists dollars. I'd venture to say the rental houses and the restaurant industry (with doesn't depend and could not survive on commercial catches from Murrell's Inlet) mean more to the Murrell's Inlet economy than the deep-sea fishing boats. For most of the people who go on the deep-sea fishing boats, its a one-time experience, and frankly I feel the 4 deep-sea fishing boats warrant no more than the absolute least amount of dredging necessary to permit ingress

and egress to and from the mouth with possible jetty construction only at the mouth if it will help to eliminate the shifting sand beds.

(6) Col. Wilson, I do not feel you have gotten a true representation of opinion concerning this project. So few people know about it, so few attended or knew to attend the 3 public meetings, and the people that have heard about the project have only heard the good things about it: the mouth is to be dredged, no more sandbars, jetties and a pier, etc. Many people have said to me: 'Gosh I'm glad you told me about it, from what I've heard it sounded like a pretty good thing"; these people hadn't heard about the destruction of breeding grounds, increase in mosquito population, the relocation and changing of channels and creeks, the anachronistic turn-around basin, etc.

(7) Col. Wilson, I think your department has done a responsible job compiling the EIS but not a thorough job. There are many points I question, and the EIS contains many fallacies, and erroneous guess&timates besides misinformation, particularly weak are the paragraphs about the Inlet ecosystem, biological control of the chemical environment, and homeostasis of the ecosystem. There is not enough information on what the project will do to the food chains, food webs, and trophic levels, nor size of individuals, trophic structure and ecological pyramids, but I don't have the time or space to outline or question every point I disagree with.

Col. Wilson I urge you to consider the ideas I have listed, and thank-you for your time.

I have the honor to remain

Most sincerely yours,

W. Willson Powell

W. Willson Powell

Jan. 2, 1976

Dear Col. Wilson:

My time at Murrells Inlet hasn't been much, just two summers but its been long enough for me to grow to love it.

① Its sad to think that such a place will soon be ruined beyond repair for the benefit of so few.

If you ever had a place where you grew up destroyed maybe you would understand how some of these property owners feel. Maybe someday you'll be in their shoes.

② The last meeting wasn't attended by most because no one was notified. I doubt our letters will do any good either, the whole affair seems very one sided.

-2-

I'm sure the people against the dredging would out number the "money grabbers" if they had the same chance to express them selves. Why don't you give us that chance?

If you would take the time to be introduced to the inlet as it was your whole view would change.

We're willing to fight for the wildlife not against it, what about you?

Sincerely,
Nicholas H. Bradley

F. I. Bostick, Jr.
210 Mackey St.
Camden, S. C. 29020
January 2, 1976

Gentlemen: Re: Murrills Inlet

(1) I have received notice of your proposed actions at Murrells Inlet. I feel that any work that the Corp does to promote or further the commercial interest at Murrells Inlet is not in the interest of South Carolinians.

(2) This area is one of the few that a man can appreciate the closeness of God, nature and "man." There all three blend into one - a person does not need a three century old cathedrial with a two hundred voice choir to sing the praises to God and listen to acholades by a $120,000 per year preacher to realize what a simple creature a man is.

It is a simple yet complex system God has devised there. We don't yet understand it, but we can appreciate it.

Dredging it 15,000 feet to a certain depth so boats won't get stuck can't enhance it. Shrimp have been using the mouth for more than 5,000 years to raise their young in and none have gotten lost or stuck. Oysters have been reproducing and feeding Americans since before Columbus. Crabs, in spite of pollutions, have been feeding there for generations.

I don't see how you can improve on one of the areas that God put here, certainly for the enjoyment for us during our short stay here.

Please don't do anything at Murrells Inlet.

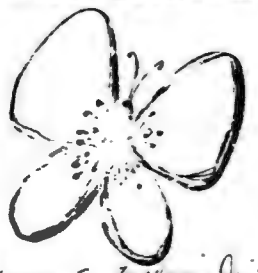
Very truly yours,

P J Bostick, Jr.

F. I. Bostick, Jr

PIB/mjb
cc: Senator Strom Thurman
cc: Senator Fritz Hollings

C-34



Jan 2, 1975
Roanoke, Va.
24018

Henry S. Wilson Jr.
Col. Wilson, Corps of Engineers
District Engineer

Dear Col. Wilson,

(1) I have studied the draft environmental impact statement and can only come to one conclusion. The extensive dredging of plan C will destroy Murrells Inlet.

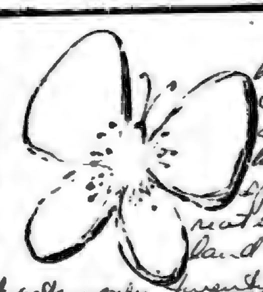
(2) As stated in the draft, Murrells Inlet is a small system, only 3,330 acres and can only accommodate so many. Presently there are so many boats that conditions are almost to a danger point now. The larger commercial boats have little regard for the ones in smaller boats and it is almost impossible to even remain anchored from their wake. The best oyster beds

and flounder places have already been destroyed from the turbidities from the larger boats and in the dredging that has been done in years past.

(3) A good example of this is stated in the Dept. of the station (M11) located in an altered area in the southwestern end of Garden City - conditions (black, silty muds and relatively few animals (Plate 11). This condition has existed since developers dredged the Garden City canal over eighteen years ago. A quote "Dredging may result in the destruction of a large number of organisms (446 organisms per square meter). How can this short term impact be expected to recolonize shortly after the dredging is completed?

(4) Another good example and a quote: "Dredging material islands comprise about 30 acres - the original benthic communities that were present prior to disposal have been obliterated. To my knowledge these islands have been present for at least fifteen years or longer.

(5) Economic impact, yes - purchase to



The Commercial Charter boats, the outside commercial fishermen and the marinas but what about the sport fishermen, recreational boaters and landowners? The charter boats - only twenty four do have trouble at times getting through the mouth, so some help is needed to make the mouth safe, but plan C is absurd. Taxes are already too high, federal give aways completely out of hand and so much need for the elderly and etc. in our society and to think of spending this kind of money for the benefit of a handfull of people!!!

(6) I beg to all concerned to leave Murrells Inlet like God made it or to make only the mouth safe or at least the less of the evil - use plan A to satisfy the greedy few that are thinking of money in

their own pockets.

Most Sincerely,
Betty Williams Carmichael

C-36

BUICK — OPEL
SALES & SERVICE

BLUE RIDGE MOTORS
INCORPORATED

OPEL

TELEPHONE 344-2001
525 W. CAMPBELL AVENUE
P. O. BOX NO. [illegible]
ROANOKE, VIRGINIA 24010

January 2, 1976
Roanoke, Va.

Harry S. Wilson, Jr.
Colonel, Corps of Engineers
District Engineer

Re: Draft Environmental
Impact Statement for
Murrells Inlet

Dear Col. Wilson:

(1) Come let me show you! After studing your impact statement for the navigation project at Murrells Inlet, South Carolina, I would like to review a few items of interest to both of us, 2.09.04.1.3.4.2 the bottom at stations M.104 M.105 was well scoured and the biota was sparce. This is a sample of what dredging has done twenty years ago for this section of the inlet. I would like to also refer you to your chart, page I- - refer to station M 13, 14, and 15, the above stations have never experienced a dredge. I think that an honest examination in the difference in a dredged and undredged section should prove that we need no more dredges in Murrells Inlet.

(2) If this project must be carried forward, I can see benefits by dredging of the entrance channel, auxillary channel and of the North and South jetties only. If the project has to go beyond this proposal, I would by all means favor plan A, which would be the least damage to the inlet, but would be of damage beyond the span of our lives to recall.

(3) In your paragraph 2.09.04.2, there are only two commercial fisheries that are interested in a channel at Murrells Inlet (meaning only two boats). Your commercial evaluation of fishing encompasses the entire Grand Strand from the North Carolina line and south to Georgetown. Again I would like to emphasize, of the total production of this area, only two boats fish out of this area!

(4) I refer to paragraph 4.03.01.1 and would like to quote: "As in the case of most dredging projects of this type, many of the benthic invertebrates in the path of the dredge cutterhead will be distroyed. This gross effect has been well documented in many studies conducted along the Atlantic and Gulf coasts. Again I say, that once the firm ground structure has been distroyed we will live with a mass of mud at Murrel's Inlet.

(5) I would like to request an up-datim on the local sponsor from Murrells Inlet, and to what his personal benefit by this project will be. Again to quote: 4.0 .04 "a 16 acre tract of wooded up-land will be provided by the local sponsor."

BUICK — OPEL

BLUE RIDGE MOTORS

(INCORPORATED)

OPEL

TELEPHONE 366-2051
609 W. CAMPBELL AVENUE
P. O. BOX NO. 2404
ROANOKE, VIRGINIA 24010

(5) My family and I have had the pleasure to enjoy the seafood, fishing and beauty at Murrells Inlet for over fifty years. I would appreciate some one having the consideration not to take it is away from my grandchildren and other deseendants for the years to come. We both know that most seafoods are spawned in the inlets and marshland.. This extensive dredgin operation would destroy most of the seafood life in this area.

I would like to volunteer my services to you, to come and meet with you and show you, and tell you what I have seen in the course of my life in this inlet. I am sure the experience would open a new view to you that you have never experienced before.

I could write more pages than your draft environment impact statement, many times indefense of preserving Murrells Inlet, but I will bore you no futher.

Again I say, 'Let me show you what you are destroying, and for the benefit of what?

Yours Very Truly,

J. W. Carrick Sel, Jr.

C-37

Copy to:

Coastal Environmental Center
Sierra Club, John Backman Chapter
The South Carolina Heritage Trust Program
Mr. Joseph E. Hudson, Chairman
Col. James D. McArthur
Mr. J. H. Gascue

(1) Friday
Jan. 2, 1976

Dear Col. Wilson:

In my twenty short years of life every summer has been spent in the family home at Murrells Inlet, S.C. Those have been the best times of my life. I can't think of anytime that I regretted riding for six hours just to spend a short weekend at the inlet.

(2) The crabbing, shrimping and fishing used to be fantastic until the last few years when the dredges came. Now every year the catches get smaller and smaller.

(3) You'll never understand how disgusting it can be to try to fish in a smaller boat near the mouth of the inlet. The so called "Captains" of the large commercial fishing boats seem to think they have battleships. They come into the inlet doing 14 knots and seem to enjoy wavds breaking across the front of small boats. I personally have no respect for these people at all, they care only for themselves

● I hate that you never had the opportunity to share in some of my wonderful times at the inlet, and that my children will never share in those experiences either because of a few "money hungry" individuals.

● You state that a recent — meeting was held on the subject of the dredging and that there were few people there to fight it. I think that is perfectly understandable since no attempt was made by anyone to notify property owners, especially those who live away from there. This I would say is just a wee bit unfair! It seems that only the people who benefit knew of the meeting.

● So far due to your dredging I have noticed less marine life and continuously muddier water. I can't really call anything that destroys life good. "Do you?"

(cont)

The dredging only disturbs the fish so they have to go out to sea to live (the ones that aren't killed in the process.)

● The disposal areas dumped on the marsh grass kills everything that breeds and thrives there, it ruins the resting area for the birds.

● The Harker City Canal dredging was done in the beginning of my lifetime and in your Environmental Impact Statement it says of the canal "black, silty mud and relatively few animals" (Plate 11.) A small project like this one and in nearly twenty years the damage still hasn't been repaired. With the size of the project of Plan C the marine life will surely never be the same in my lifetime nor my children's. The damage will never be repaired because of the yearly dredging.

People that feel this deliberate destruction of wildlife and (cont)

(4) marine organisms "just" are the same who bill endangered species. Or perhaps the same as those who carelessly start forest fires, or take the life of an unborn child not ever giving him the chance to live.

I think these birds, fish and marine organisms have a right to life just as my children someday will have a right to enjoy this beautiful place if it's not destroyed.

Those of us who have grown up at the inlet could each write you a book twice as thick as your study on the reasons the inlet should be left alone. And if given a fair chance at a hearing whole we could organize ourselves we could prove our point. Maybe this is why we never were told of the meeting until it was to late.

If the ones pushing this project feel that this destruction of life is right just for the benefit of a few money lovers (cont)

(5) then I pity them.

Please I beg of you, don't let this place we love become a muddy ditch. Let the commercial fishermen go somewhere else.

Sincerely,
Willonise Carmichael

Planters Hardware Co., Inc.
231 NORTH MAIN STREET P. O. BOX 724
MARION, SOUTH CAROLINA 29571
PHONE 803-423-1444

January 2,1976

U.S.Army Engineer District
Box 919
Charleston,S.C. 29402

Gentlemen,

As an interested property owner and long time summer resident(26 years) of Murrells Inlet,I would like to take this opportunity to express my thoughts on the proposed Murrells Inlet Navigation Project.

1. I believe that the stablization of the mouth would be in the best interests of all parties including property owners,all residents and commercial interests.

C-40

(1) 2. I do not feel that extensive dredging and channel expension would be in the interest of all parties concernedcbut would in fact be an invitation for larger and still larger commercial fishing boats to enter and attempt to use our already crowded facilities.

(2) 3.Murrels Inlet does not need more traffic but on the contrary less . The delicate balance in the marsh is already erroding and further encroachment would be inevitabe . I have observed this with alarm during my many years at this beautiful spot.

4.If there must be a realignment of the channel,then let me beg you to do so with the least amount of dredgeng. I believe that your Plan A would surely be the lessor of two evils.

(1) 5.Murrells Inlet has been a wonderful family place long before I became part of it. It behooves us to keep it this way and not allow it to turn into a commercial ditch devoid of living marsh.

Thank you for your attention.

Sincerely.
John A. Stedman
John A.Stedman
Box 905,Marion,S.C.

January 2, 1976

Col. Harry S. Wilson, Jr.
Department of the Army
Charleston District, Corps of Engineers
P.O. Box 919
Charleston, SC 29402

Dear Sir:

In reviewing the Draft Environmental Impact Statement for the proposed Murrels Inlet Navigation Project, I find several oversights which need to be resolved in the final E.I.S. statement.

(1) In regard to the building of the jetties, these jetties will alter the natural geological processes which occur in the ebb tidal delta just offshore from Murrels Inlet. The jetties will cause alteration of wave refraction in the area of construction which could in turn affect wave approach angles on beaches both north and south of the jetties. If this does occur, the change in wave approach angle could cause severe erosion problems in some beach areas. Does your modeling include the effects of the jetties in regard to this question?

(3) A second point of concern in regard to the jetty construction, is the frequency of hurricanes and/or extra-tropical cyclones in this area. Although the usual frequency of hurricanes along the S.C. coast is around 7 every 100 years (1 every 14.2 years); in the 1950's, there were several Hurricanes, Hazel (1954) in particular which caused wide spread destruction in this area. If a series of hurricanes should occur as in the 1950's causing damage to the jetties which can't be repaired before another storm hits, the possibility exists for the jetties to be severely destroyed. In their damaged state these jetties could pose a serious navigational problem.

(4) Another question of economic concern in regard to the south jetty; is this. If the south jetty is constructed so as to allow free fishing to anglers this will seriously jeapordize the future of pier owners at Surside Beach and Garden City Beach, S.C. Thus the imposition of some fee such as what is currently charged on these piers should be charged on the south jetty to prevent these private piers from going broke. The revenue gained from this could be used for jetty repairs.

continued

(4) The deposition of dredged sand on Garden City Beach seems like a fine idea. However according to recent work in Boston Harbor (i.e. Revere Beach), the majority of the dredged sand was eroded from the beaches within a few years (Hayes, 1975 - personal communication). If erosion occurs, as such, on Garden City Beaches, it is likely that the same sand dredged out of Murrels Inlet will return again due to the long shore drift (N+S) during storms. Dredged sand should be deposited down drift of the Inlet and not up drift.

(5) The use of plan A instead of plan C would seem much more beneficial to this area. For plan A will provide navigable waters for all fishing boats which operate out of Murrels Inlet at a cheaper cost for both initial construction and maintenance. Although there appears to be a deficit between total annual benefits and average annual costs under plan A, this deficit could be erased by charging a fishing fee on the south jetty and applying this money towards maintenance cost.

(6) Another good reason for using plan A, is that it will probably limit the number of charter and commercial boats which operate out of Murrels Inlet. This is important because increased boat traffic means more sludge and oil in the waters of this area. There is already a shellfish pollution problem in this area and increased boat traffic will just add to this problem. Therefore I feel plan A is the best plan to use under those being considered because it will have a smaller amount of environmental impact than the others.

(7) One final point should be raised and this is the effect of dredging on oyster communities in this area. Dredging should not take place during spring and summer months because there are larger amounts of biological pollutants in the water at this time. This compounded by the extreme turbidity of the water (caused by dredging) could cause considerable fouling in oysters especially those already (designated) polluted. Another reason for not dredging during the spring and summer is the presence of zooplankton which are light sensitive during this season. If dredging causes extreme turbidity these zooplankton's light sensing mechanism could become impaired which could result in higher than normal mortalities in crustacean larvae.

It is hoped that some of the points raised in this letter will be considered before final action is taken on this plan. Working in the area of shellfish pollution I am extremely concerned about the effects of the proposed dredging on these polluted oyster beds.

continued

C-41

If I can be of any help or assistance in regard to this environmental matter I will be glad to reply.

Sincerely,

Geoffrey I. Scott

Geoffrey I. Scott
Marine Science Program
University of South Carolina
Columbia, SC 29208

Florence, South Carolina
January 4, 1976

U. S. Army Engineer District
Box 919
Charleston, S. C.

Sir:

I wish to add my letter to the others you have received in opposition to the Murrells Inlet Navigation Project. Thank you for sending the Draft Environmental Impact Statement which I have read very carefully.

After reading the report I find that I cannot accept any of the proposed plans as described in the summary. First, there is not one plan which can give me proof that there will not be permanent damage to the water quality, the food-chain, the marsh and the bird life if there is dredging in the inner channel. Second, the entire project is designed to satisfy the large, deep-sea fishing boats and proposes too much of a sacrifice on the part of the individual or family who has been using the Inlet for recreation (small boat) and for a food source. Once the inner channel is dredged to such a depth, a turn-around basin built along with jetties at the mouth, I am almost certain this will be an invitation to more large boats. The activities for the property owners(residential) with small craft who have lived at the Inlet summer after summer will all but cease. I ask you - is this fair to the people who have paid taxes for lo these many years, traded with local merchants for 30 or 40 years? These same summer residents have not had the opportunity to vote in county elections nor the opportunity to attend meetings which concerned everyone at the Inlet. If the seafood is contaminated and the water, if the marsh and the bird life slowly destroyed then we might as well sell our property and go elsewhere because all of this is why we chose to live at the Inlet in preference to the mountains or the beach. We can all leave the Inlet and leave it to the big boat owners but Murrells Inlet is more than deep-sea fishing boats and restaurants. Third, if for no other reason, this project should come to a halt because of the prohibitive cost. It is absolutely prepostrous to think that millions should be spent for such a small special interest group. And to think that there is to be an initial cost and an annual up-keep cost to burden all the taxpayers for only a few and not to mention the state of the economy.

I hope you realize by now that the reason there hasn't been any opposition to the project is because not enough people are aware of the full impact of the project, many did not know about the meetings, including myself, and many do not still understand what it means to them.

C-42

The only reason Colonel McArthur and many others have written in favor of Plan A is because they thought it was the lesser of evils and that they could reach you with this plea. Actually, they and many others do not want the inner channel dredged, the turn-around basin, nor the jetties. All the people who really care about the Inlet want, is for the mouth to be dredged in order for the four or five deep-sea fishing boats and the larger charter boats to be able to navigate through the mouth - nothing else. The Inlet is already too crowded since the growth of Garden City and Surfside Beaches, to be safe or enjoyable in small craft.

The people who are in favor of the project are the few deep-sea fishing boat owners and the ignorant or the greedy and a few businessmen who have been brainwashed by the boat owners. These people do not realize the ones who go deep-sea fishing maybe go once a year or once in a lifetime and these people are not the backbone of the Murrells Inlet economy since they do not buy their groceries there or other merchandise nor do they eat in restaurants in that area.

It is my hope that the Corps of Engineers will occupy themselves with the work that needs to be done on the Charleston harbor and the Georgetown harbor and that they will continue the emergency dredging at the mouth of the Inlet until such time they can correct the problem at the mouth permanently but by limiting the dredging to the immediate area of the mouth. I suppose you are aware that there is a new mouth or another mouth forming. I can't help but think, especially after having survived Hazel, that one good hurricane can change a lot of things around the mouth and one or two greedy men with the help from other men and machines can totally destroy a God-given, natural feeding ground for His creatures in a matter of days. I have seen nature take care of a lot of matters in the forty years I have been going in the "creek". I wish you and your workers well.

Sincerely,

Anne B. Powell

Mrs. Anne B. Powell

4302 Cole Dr.
Pawleys Island,
S. C. 29585

5 January 1976

Charleston District,
Corps of Engineers
P. O. Box 919
Charleston, S. C. 29402

Gentlemen,

I am opposed to the draft environmental impact statement (EIS) for the proposed Murrells Inlet Navigation Project for the following reasons:

(1) a. I view the draft EIS as essentially a microscale analysis of a macroscale phenomenon. Specifically too much concern is focused on the immediate channel environs and too little on the potentially adversely affected areas extending out to as much as a 5 - 7 mile radius of the channel. In this connection a predominantly northeasterly laminar flow that roughly parallels the coastline will, when interrupted by a 3600 foot projecting jetty at nearly right angles to the flow, encourage beach erosion for several miles to the south and west.

(2) b. Although I am not specifically familiar with the physical model studies of Murrells Inlet as conducted at the Waterways Experimental Station in Vicksburg, Mississippi, I am aware of the limitations of such studies. The ability of model studies to realistically simulate certain limited observable phenomena at the actual site is all too frequently and erroneously construed and interpreted as a forecast of the resultant end products to be derived from the proposed completed construction.

Yours truly,

Frederick J. Cole

David M. Michaux
P.O. Box 103
Murrells Inlet, S. Carolina 29576 12/18/75

U.S. Army Engineer District.
Box 919.
Charleston, So. Car.

My dear Colonel:-

I have lived at Murrells Inlet for 40 years and I have seen it change from a wonderful quaint village to the [illegible] in So. Car. I have made the statement that only the very common people who care for nothing but the [illegible] [illegible] trying to take it [illegible]. We have [illegible] [illegible] in [illegible] [illegible] ... [illegible] I am glad I am 7[illegible] and won't live to see it go much [illegible].

Now I can see no earthly reason for other than plan "A". I understand that no [illegible] here, at this time, has a draft of over 5 ft. If that be true, but I [illegible] they [illegible] it will save $1,000,000 of the tax payers money. We do not need [illegible] boats in here to [illegible] their oil, grease and refuse.

I wrote Russell [illegible] [illegible] and he referred it to the court [illegible]. They wrote me a real [illegible] [illegible] you would have written a girl at age 10 and told me how pleased they were that I was interested in E.P.A. That is all!

Sincerely yours,

D M Michaux

HELP! HELP! HELP!

(and Many Thanks! Ed.)

SAVE THE FISHING AT MURRELLS INLET!

WRITE before January 3, 1976!! Form Letter Letter

The U. S. Army Corps of Engineers, in their plan C for The Murrells Inlet Navigation Project, proposes to dig a 15,000 feet channel WITHIN Murrells Inlet, 90 feet wide and 10 feet deep. About 72% of the present inner channel would have to be dredged. Their Plan A would dredge to a 6 feet depth. If the depth is kept to 6 feet, less than 10% of the inner channel would have to be dredged.

The mouth is to be opened, jetties built to stabilize the mouth, and a fishing walkway built on one of the jetties. This is great for all fishermen, both recreational and commercial, but the inshore dredging will destroy much of the food-chain on the bottom. Inshore and offshore fishing, as well as shrimping, crabbing and clamming depends on this food-chain.

Plan A - the 6 feet depth - will save more than $1,000,000 of your tax money in initial costs.

The public reviewing period for the Environmental Impact Statement ends January 3, 1976. Write now and don't let MURRELLS INLET become MURRELLS DITCH!

Write to: U. S. Army Engineer District
Box 919
Charleston, S.C. 29402

Ask the engineers to use Plan A - not Plan C - at Murrells Inlet Navigation Project.

Yours for better fishing,

James D. McArthur, Chairman
Committee To Save The Inlet
Pt 1, Mt. Gilead
Murrells Inlet, S. C. 29576

Please use
Plan A -

Walter L. Gary

20 DEC 1975

U S Army Engineer District
Box 919
Charleston, SC 29402

Dear Sirs. Re: Murrells Inlet Navigation Project

Please use Plan A limiting depth to 6 foot - saving tax payers money - and do no more dredging inshore than possible - thereby saving the fishing at Murrells Inlet

Thank you
Catharine W Crumbley.
(Mrs. Cleudy J Crumbley)
1521 - Providence Drive
Charlotte N C 28211

Dec 21st

24 DEC 1975 12/22/75

U.S. Army Engineer District
Box 919
Charleston SC 29402

Gentlemen:

I am writing to request that you choose Plan A for the Murrells Inlet Navigation Project. As one who is quite interested in this section of our South Carolina coast, I very much feel that your Plan C will cause serious damage to the main channel.

Plan A will accomplish the desired result at a much lower cost

Very truly yours,
J. L. Brown
15 Redbank Lane
Greenville SC 29607

C-45

75 Pompano Drive, Inlet Point
Garden City, South Carolina
December 22, 1975

U.S. Army Engineer District
Box 919
Charleston, S.C. 29402

Dear Sirs;

I would like to enter a statement regarding the Murrell's Inlet Navigation Project. As a property owner along the Murrell's Inlet channel, I am very concerned about the prospect of any massive disruption of the present form of the Inlet. Very few people, none of them private home owners along the channel, could benefit from the great enlargement of the channel proposed in the Army's Plan C. It could very well result in a tragic and irreparable disruption of a fine wildlife refuge. I believe Plan A is preferable in every way and I urge you to accept that proposal.

Yours sincerely,
John G. Conway
John G. Conway

253 Pinevale Road
Spartanburg, S C 29302
December 22, 1975

23 DEC 1975

U S Army Engineer District
Box 919
Charleston, S.C. 29402

Gentlemen.

The Murrells Inlet Navigation Project has just been brought to my attention

It is my opinion that Plan A - the 6 foot depth - should be used at Murrells Inlet.

Very truly yours
C H Holland

C-46

December 22, 1975
804 Evans Road
Marion, South Carolina 29571

U. S. Army Engineer District
Box 919
Charleston, South Carolina 29402

Dear Sir:

My brother Frank T. West and I own property situated at Murrells Inlet, South Carolina. We both are very interested in saving the fishing at Murrells Inlet and would appreciate the engineers using Plan A in the Murrells Inlet Navigation Project.

Cooperatively yours,

T. M. West Sr.
TMWSr/b

FURMAN UNIVERSITY

FOUNDED 1826

GREENVILLE, SOUTH CAROLINA

29613

December 23, 1975

U. S. Army Engineer District
Box 919
Charleston, S.C. 29402

Gentlemen:

Since about 1922 I have traveled with my parents and brothers to the coast, first in the Cherry Grove-Ocean Drive area and for the past thirty years to Murrell's Inlet or Pawley's Island. Skimping, and crabbing, as well as boat fishing both in the channel and out on the ocean have been a part of my life.

While I applaud your plan to open up the south of Murrell's Inlet, I am appalled at the encroachment your plan C would do to the Inlet itself. It is my understanding that that plan would call for dredging a 90 foot wide channel in effect nearly three miles long.

Therefore please register my total protest to plan C and record my support of your plan A, which will provide a 6 foot channel at mean low tide. I gather that this plan will both preserve the recreational and commercial fishing, the ecology (food chain) of the Inlet, and at the same time save the taxpayers in excess of one million dollars.

In sum, I ask that you use Plan A at the Murrell's Inlet Navigation Project and that you avoid the 90 foot wide, ten foot deep channel within the Inlet as called for by Plan C.

Sincerely yours,

L. C. McArthur, Jr.

C-47

12-23-75

Dear Sir

I am in favor of plan A for dredging the Murrels Inlet Channel which proposes to dig to 6 ft depth.

Please put my vote for plan A not plan C on Murrels Inlet Navigation Project

Sincerely Yours.

G E Hospital
RT1-Box 25-AA
Garden City SC
29576

P.S. I fish frequently in the Inlet and am actively engineering it.

Dec. 23, 75

Dear Sirs:

I urge you to do no dredging at Murrells Inlet, S. C.

If you decide that some dredging is absolutely necessary, I hope that you will use your plan A.

Thank you for your consideration.

Sincerely,

Howard Walters

Howard Walters

C-48

29 DEC 1975

Clairmore

8000 STRAWBERRY LANE · MATTHEWS, NORTH CAROLINA 28105

December 23, 1975

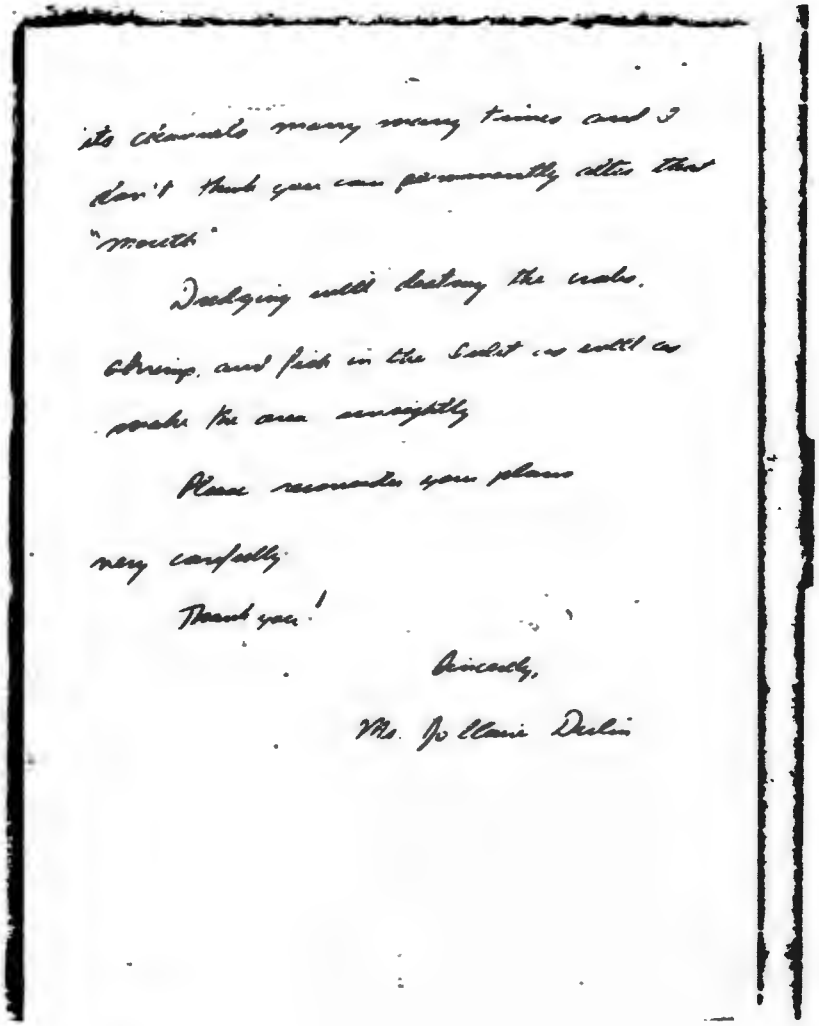
U S Army Engineer District
Box 919
Charleston, S C. 29402

Dear Sirs. Re: Murrells Inlet. S.C.

I urge you to do as little dredging as possible within Murrells Inlet. If some dredging is absolutely necessary, I urge you to use your plan A.

do care on the N.C. Outer Banks, man made projects are really not very practical and are very expensive.

I hope you will let Murrells Inlet alone. I have seen the "mouth" change



its channels many many times and I don't think you can permanently alter that "mouth."

Dredging will destroy the crabs, shrimp, and fish in the inlet as well as spoils the area unsightly.

Please reconsider your plans very carefully.

Thank you!

Sincerely,

Mrs. Jo Ellen Dulin

C-69

1010 Arden Way
Spartanburg, SC 29302
December 24, 1975

U. S. Army Engineer District
P. O. Box 919
Charleston, SC 29402

Gentlemen:

There has been considerable discussion on the Murrells Inlet Navigation Project. Most of those living around Murrells Inlet seem to be concerned about the ecology and the food chain that would be destroyed in digging a wide channel. Inshore and offshore fishing may be affected. I do know offshore fishing is better at Murrells Inlet than any area around Charleston.

My main concern, however, is the additional amount of tax money that would be spent in building a 90' wide and 10' deep channel that may not be necessary. The upkeep of such a large channel would certainly be more than one of a 6' depth.

In reviewing Plan A and Plan C, my recommendation--and that of several others with whom I have discussed this subject--would be Plan A for the Murrells Inlet Navigation Project.

Sincerely yours,

H. B. Risher

HBR:srw

J. CLYDE SIMMONS
BOX 1926
SPARTANBURG, SOUTH CAROLINA

29 DEC 1975

December 24, 1975

U. S. Army Engineer District
Box 919
Charleston, South Carolina 29402

Gentlemen:

I understand that the U. S. Army Corps of Engineers, in their plan C for The Murrells Inlet Navigation Project, proposes to dig a 15,000 feet channel within Murrells Inlet, 90 feet wide and 10 feet deep. About 72% of the present inner channel would have to be dredged. Their Plan A would dredge to a 6 feet depth. If the depth is kept to 6 feet, less than 10% of the inner channel would have to be dredged.

I strongly support the use of Plan A for this project and not Plan C.

Thank you.

Sincerely,

J. C. Simmons (s)

J. C. Simmons

/dg

Dec 27

Dear Sir:

Please do not do any more dredging than [illegible] necessary at Murrells Inlet, SC.

If you must dredge (?), please use Plan A.

Thank you.

[illegible]
[illegible]
Charlotte, NC

I am writing to beg that you don't destroy Murrell's Inlet by using your plan C but use plan A. Keep the real Murrells Inlet and don't [illegible] around [illegible]. Please.

Sincerely
[illegible]
808 [illegible]
[illegible]
SC 29512

Mrs. Paul Ingle
Box 1230, High Point, N. C. 27260

12/20/75

U.S. Army Corps of Engineers
U.S. Army Engineer District
Box 919
Charleston SC 29402

Dear Sirs

I want to protest vigorously your Plan "C" for Murrells Inlet. I have gone there each summer of my life and know it to be one of the last bastions of little people who enjoy simple pleasures. Plan A - 6 foot dredged - must suffice.

Sincerely,
Mary I. Ingle (Mrs. Paul)

12/29/75

US Army Engineer District
Box 919
Charleston, SC. 29402

Dear Sirs

We have recently moved into Mt. Gilead which is adjacent to Murrells Inlet, South Carolina. Our information leads us to believe that your Plan A would best serve the interests of the people in the area and we urge you to use that plan (A) in your dredging operation at Murrells Inlet.

Thank you,

R.W. Dupre, Jr.
Rt. 1
Murrells Inlet S.C.
29576

7450 S. W. 105th Terr.
Miami, Florida 33156
December 29, 1975

U. S. Army Engineer District
Box 919
Charleston, South Carolina 29402

Dear Sirs:

As owners of property bordering Murrells Inlet, South Carolina, we must strongly protest the Corp of Engineers' plan to dredge this estuary.

We reluctantly support Plan A as put forth by the Committee to Save the Inlet. However, in no instance will we support Plan C to dredge the Murrells Inlet inner channel.

Every scientific study which has been made shows that the devastation of our wetlands is one of the worst things attempted by man. The ecology system is too fragile to be tampered with, and we are horrified that the State of South Carolina will condone such a project after viewing the results of other areas.

Yours very truly,

John C. Quegan, Jr.
John C. Quegan, III

C-52

30 DEC 1975

JORD JORDAN

U.S. Army Engineering District
Box 919
Charleston, S. . 29402

Re: Murrells Inlet Navigation Project

Gentlemen:

As a resident of Murrells Inlet for over 30 years, please let me reccomend your plan A, the 6 foot depth channel item. For many years of observation, I know how damaging it can be to dredge within the inlet. A 6 foot channel will accommoda'e any vessells now using the inlet.

Previous dredging of the inlet channel has already filled the creek with sand and damaged the shell fish crop.

Yours truly,

Jord N. Jordan

JNJ/lp

FRANK R. THIES, JR.
SUITE 2024 WACHOVIA CENTER
CHARLOTTE, NORTH CAROLINA
28206

December 29, 1975

U. S. Army Engineer District
Box 919
Charleston, South Carolina 29402

Gentlemen:

As owner of residential property in Garden City, South Carolina, in the vicinity of Murrells Inlet, I wish to protest the channelization program proposed under your Plan "C".

The impact on aquatic life of Plan "C" would be detrimental to the resort and economic aspects of the Murrells Inlet-Garden City community. The proposal to dredge a 90-foot wide, 10-foot deep channel has, also, implications with respect to the use-in-safety of the inlet.

As a property owner in this area, I urge that you limit dredging to the 6-foot depth proposed under your Plan "A", and that any dredging work be coupled with a restriction of residential and/or commercial development of land areas created by this work.

With kindest regards, I am,

Very truly yours,

Frank R. Thies, Jr.

FRTjr:kc

cc: Mrs. Thomas L. Dulin
Clairmore
5500 Strawberry Lane
Matthews, N. C. 28105

C-53

EDWIN CRAIG WALL, JR.
P O BOX 839
CONWAY, SOUTH CAROLINA 29526

December 29, 1975

U. S. Army Engineer District
Post Office Box 919
Charleston, South Carolina 29402

Re: The Murrells Inlet Navigation Project

Dear Sir:

Regarding the above project may I request that consideration be given to utilizing Plan A, which I understand would involve the digging of a 15,000 feet channel, 90 feet wide and 6 feet deep, versus Plan C, which would involve the same dimensions except for a channel 10 feet deep.

The latter plan has the obvious disadvantage of the probable destruction it would do to the food chain existing within the inlet area. Although it would have greater commercial advantages than Plan A, the long term undesirable impact on fishing, both recreational and commercial, would be undesirable. In addition, I feel that commercial facilities at other ports in the general area are now adequate for commercial interests.

Finally, the apparent savings of more than one million dollars through the utilization of Plan A is the most obvious reason for its use. It is past time for all Americans, both in public and private service, to assume some physical responsibility.

Thanking you in advance for your consideration of my letter, I am

Sincerely,

E. Craig Wall, Jr.

rmh

C-54

509 E Main St
Bennettsville, SC
29512
Dec 30-1975

U S Army Engineer District
Box 919
Charleston, SC 29402

Dear Sirs:

A plea please - use plan A - the six foot depth at Murrells Inlet Navigation Project. Please - don't destroy our fishing + crabbing

Very Sincerely
Mrs W L Kenney

Rooney and McArthur

Insurance

T RUSSELL ROONEY CPCU
B PALMER McARTHUR CPCU
O WAYNE STONER
W SCOTT BRADLEY
LIFE INS ASSOCIATE

December 30, 1975

U. S. Army Engineer District
Box 919
Charleston, South Carolina 29402

Re: Murrells Inlet Navigation Project

Gentlemen:

I had an opportunity to look at the proposed alternate plan to dredge the channel into Murrells Inlet. As a sailboat operator, I am happy at the decision to put in the jetties and to stabilize the entrance to the Inlet. With nearly four feet draft on my boat, I have been hesitant to attempt to get into Murrells Inlet.

I do feel that Plan A is far more realistic than the proposed Plan C. I can't imagine ~~them~~ the need for a channel of 10 feet depth, and feel that 6 feet would be more than adequate for any boat that would be attempting to work out of, or lay over in Murrells Inlet. Accordingly, I hope that the Corps of Engineers will determine to use Plan A with a depth of 6 feet rather than Plan C with a depth of 10 feet.

Yours very truly,

ROONEY & McARTHUR

B. P. McArthur, CPCU

BPMc/ag

1000 N. Johns Ave. Columbia, South Carolina 29204
Middleburg Office Park - Phone 779-9490

104 Lorraine Court
Spartanburg, S. C. 29302
December 30, 1975

U. S. Army Engineer District
Box 919
Charleston, S. C. 29402

Re: The Murrells Inlet Navigation Project

Gentlemen:

I commend you on the thoroughness of your study of the work necessary at Murrells Inlet, the development of plans A and C, and the opportunity given to interested persons to comment on the proposals.

From my own knowledge and from questions I have asked in the Murrells Inlet area I believe that virtually all of the benefit sought would be achieved by dredging a six (6) foot channel and that the added benefit of a ten (10) foot channel would not justify the additional damage to the food-chain on the bottom or the added cost.

I hope that you will adopt Plan A, thereby conserving this valuable food source necessary to both inshore and off-shore fishing.

Yours very truly,

J. A. McArthur

JAMc:pw

C-55

HELP! HELP! HELP!

SAVE THE FISHING AT MURRELLS INLET!

WRITE before January 3, 1976!!

The U. S. Army Corps of Engineers, in their plan C for The Murrells Inlet Navigation Project, proposes to dig a 15,000 feet channel WITHIN Murrells Inlet, 90 feet wide and 10 feet deep. About 72% of the present inner channel would have to be dredged. Their Plan A would dredge to a 6 feet depth. If the depth is kept to 6 feet, less than 10% of the inner channel would have to be dredged.

The mouth is to be opened, jetties built to stabilize the mouth, and a fishing walkway built on one of the jetties. This is great for all fishermen, both recreational and commercial, but the inshore dredging will destroy much of the food-chain on the bottom. Inshore and offshore fishing, as well as shrimping, crabbing and clamming, depends on this food-chain.

Plan A - the 6 feet depth - will save more than $1,000,000 of your tax money in initial costs.

The public reviewing period for the Environmental Impact Statement ends January 3, 1976. Write now and don't let MURRELLS INLET become MURRELLS DITCH!

Write to: U. S. Army Engineer District
Box 919
Charleston, S.C. 29402

Ask the engineers to use Plan A - not Plan C - at Murrells Inlet Navigation Project.

Yours for better fishing,

James D. McArthur, Chairman
Committee To Save The Inlet
Rt 1, Mt. Gilead
Murrells Inlet, S. C. 29576

T. J. PERRITT
RT. 1, BOX 50-H
MURRELLS INLET, S. C. 29576

December, 30th, 1975

To, U. S. Army Engineer District
Box 919
Charleston, S. C. ~~29402~~ 29402

SUBJECT: MURRELLS INLET, NAVIGATION PROJECT

It appears to this writer, that PLAN A for MURRELLS INLET INSHORE DREDING would not destroy the food-chain or fishing for ~~shrimp, crabs~~, clams. This should have important consideration in this development.

Please help, Thanks.

T. J. PERRITT
RT Box 50H
MURRELLS INLET, S. C
29576

memo

to

From
WILLIAM H. SMITH
R-2 Box 390
Myrtle Beach
S C

U. S. Army Engineer District.

Please use Plan B - not Plan C - at Murrells Inlet Navigation Project.

William H Smith

WILLIAMS & WILLIAMS
1836 ST JULIAN PLACE
P. O. BOX 4166
COLUMBIA, SOUTH CAROLINA 29240
803 779-8785

December 30, 1975

U. S. Army Engineer
Post Office Box 919
Charleston, South Carolina 29402

Gentlemen:

I am writing to urge your approval of plan A under the Murrells Inlet navigation project. Please do not waste the money of the tax payers, nor destroy the delicate ecology of Murrells Inlet by doing anything more than plan A.

Sincerely,

WILLIAMS & WILLIAMS

John W. Williams

John W. Williams

tas

C-57

More than just a
"Merry Christmas"
wish for all of you -
Sincere and warmest
wishes
include the New Year too!
if you use PLAN A at
Murrell's Inlet Nav. Proj.
Seriously it seems
me Plan A is the only one
for our National Estate.
Martha Drake Potts
(Mrs. Wilson J. Potts)
2413 Hollingsworth Ter. Raleigh N.C.

Dear Sir
Please use Plan A
to save our Inlet
from loosing it's main
purpose and charm for
those of us who love it the
way it is. Mrs D M Campbell

Dec. 31, 1975

U. S. Army Engineer District
P O. Box 919
Charleston, South Carolina 29402

Dear Sir

After reading the Draft Environmental Impact Statement for Murrells Inlet Navigation Project pupsed by the U.S. Army Engineering District, Charleston, S C. we would like to request that Plan A level of improvement be adopted instead of the C Plan now being considered. It is our belief that Plan A as shown on Page 60, Table 12 is adequent for all parties Concerned and would be less expensive and less destructive to the Marine life.

Thank you for your Consideration.

Sincerely Yours,
Mr. & Mrs Warren N. Eadby
106 A Kuhn Street
Florence, S. C.

December 3, 1975

Dear Sir.

I'm writing in support of the Committee to Save the Inlet. I recommend that Plan A be implemented in Murrells Inlet to maintain as much of the present ecology as possible

Sincerely.

Mrs James D. McArthur, Jr.
Rt 1 Box 1 Head
Murrells Inlet, S.C. 29576

31 December 1975

Dear Sir,

I am writing in support of the Committee to have the Inlet. I recommend that plan A be implemented in Murrells Inlet to maintain as much of the present ecology as possible.

Sincerely,

James McCarthy

LT USN

Route 2, Mt. Gilead

Murrells Inlet, S.C. 29576

66-3

December 31, 1975

U. S. Army Engineer District
Box 919
Charleston, S. C. 29402

Dear Sir:

We are taking this opportunity to respond to the Environmental Impact Statement concerning the dredging of Murrells Inlet, S. C.

In view of the fact that your Plan C calls for inshore dredging which will destroy much of the food-chain for which fish, shrimp, crabs and clams depend upon, and the fact that Plan C will cost the taxpayers $1,000,000 more than Plan A, we would request that Plan C be disgarded and Plan A be put to use.

Our family enjoys visiting friends and relatives in Murrells Inlet, and we enjoy the fishing, on occasion, for which others depend on for their livelihood. Because of today's emphasis on and knowledge of ecology, it is a shame to deliberately destroy that which is not necessary to destroy. Please consider these things when making your decision and use Plan A.

Thank you for your attention in this matter of importance.

Sincerely,

Mr. and Mrs. Kenneth C Hanson

Mr. and Mrs. Kenneth C. Hanson, Sr.
1619 Handel Drive
Columbia, South Carolina 29210

Dec 31, 1975

Dear Sirs,

I am in favor of Plan A for the dredging of Townsend. Detail are in accompanying letter and opposed to Plan C.

Most sincerely,

Mrs. W. T. Jones

Summerville, SC
Dec. 30, 1975

U. S. Army Engineer District
Box 919
Charleston, SC 29576

Dear Sirs:

We have been property owners at Townsend Inlet for thirty years and have enjoyed the beauty and the privacy we have been quite concerned with the proposed plans for the Inlet and feel that Plan A would be the most intelligent plan for the dredging. If Plan C is used, we feel that the entire concept of the Inlet would be destroyed. The mouth does need to be dredged but not the entire channel. It would ruin us.

So please consider the property owners and adopt Plan A instead of Plan C.

Yours very truly,

Mrs. A. T. Jones

Rt 1 / Mt Gilead
Murrells Inlet S.C
Jan. 1, 1975

U S Army District Engineer
Box 919
Charleston, S C. 29402

Dear Sir:

There appears to be no reason for dredging the inner channel of Murrells Inlet to a depth of 10 feet. Since such an action would result in the needless destruction of much estuarine life, it is requested that you limit the dredging to a depth of 6 feet by adopting you Plan A rather than Plan C.

Thank you.

Yours very truly,
Mary P. McAuliffe

203 Dyson Ave.
Beaufort, SC
29902
January 1, 1976

U.S. Army Engineer District
Box 919
Charleston, S C 29402

Gentlemen:

We have studied your draft of the Environmental Impact Statement for the Murrells Inlet Navigation Project, Georgetown County, S C.

We, as property owners for 55 years at Murrells Inlet, are very concerned about this dredging project and would urge that the Corps of Engineers use Plan A, not Plan C.

Thank you for your consideration in our appeal to save the tax payers more than one million dollars and to preserve Murrells Inlet's food chain for future fishing, shrimping and crabbing.

Yours truly,
Mr. & Mrs J. F. McBride, Jr.

409 King John Cir.
Gastonia, N.C.

1-?-76.

U.S. Army. Engineer Dist.
Box 919-
Charleston, S.C. - 29402

Gentlemen:

We have studied your Dept. of the Environmental Impact Statement for the Murrells Inlet Navigation Project - Georgetown County, S.C

We, as family visitors, of property owners - at Murrells Inlet are very concerned about this Dredging project and would urge that the Corps of Engineers use plan A Not plan C

Thank you for your consideration.

Yours truly
Mr & Mrs J F McBride II

Rt 2 Box 106 D
Seneca, S C
Jan. 1, 1975

U S Army Engineer District
Box 919
Charleston, S C

Dear Sirs:

Please use Plan A, not plan C, at Murrells Inlet Navigation Project and save the shrimp and oyster beds. Many young fish feed food in the inlet and the shrimp there are a delicacy for us humans

Yours truly,
Gladys M. Sachs

Box 267, Route 3
Columbia, South Carolina
29206

3 January, 1976

U.S. Army Corps of Engineers, Charleston District
P.O. Box 919
Charleston, South Carolina 29402

Gentlemen:

After careful consideration of the Environmental Impact Statement, my family has decided to oppose the Murrells Inlet Navigation Project.

It appears that the Project would benefit only a few commercial fishermen and charter boat operators while actually damaging the interests of the great majority of property owners and small boat operators.

Sincerely,

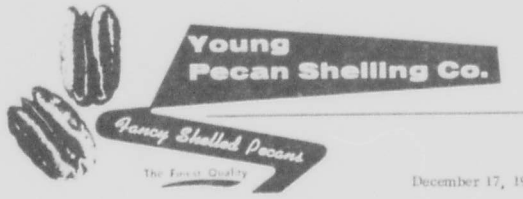
Rose M. Mazeberry

88 DEC 1975 Dec 20. 1975

Dear Sir:

Were heard that there are some fighting the dredging in Murrells Inlet we live on Mt Gilead and have about $20,000 tied up in a boat and fishing equip. There are three places between here and the Ocean that I hit the bottom on near low tide. Joe pulled my boat out three times this year to have my out drives marked on, On account of hitting sand. Now the only way I can go out is to go out on High tide and wait for another high tide to come back in.

Thank you
D. L. Livingston



P. O. Drawer 5779
FLORENCE
SOUTH CAROLINA
29501

December 17, 1975

Col. Harry S. Wilson, Jr.
District Engineer
Charleston District, Corps of Engineers
P. O. Box 919
Charleston, South Carolina 29402

Dear Col. Wilson:

Thank you for your communication of December 12 and for copy of Environmental Impact Study on Murrells Inlet Navigation Project.

I have a nice home on the water (creek side) at Garden City and not too far from the proposed jetty.

On the assumption that the Murrells Inlet Navigation Project will keep the channel open in the future, I would like to be on record as favoring the project.

Also, would like to ask if the Corps of Engineers can do anything to improve or deepen the channel entrance from Murrells Inlet Creek into Oyster Cove. You are probably aware that this entrance is gradually closing up and it affects a considerable number of people, both those who own homes on the waters of Oyster Cove and a great deal more who do not, but who use these waters for recreation.

Thank you for your interest in Murrells Inlet.

Cordially,

J. Givens Young

JGY:bc

Tyler Plywood Corporation

TELEPHONE 803/662-1573 • POST OFFICE BOX 5449 • FLORENCE, SOUTH CAROLINA 29501

December 29, 1975

Col. Harry W. Wilson, Jr.
U.S. Army Engineer District, Charleston
Corp of Engineers
P.O. Box 919
Charleston, S.C. 29402

Dear Col. Wilson:

I appreciate your sending me a copy of the draft environmental impact in the Murrells Inlet Navigation Project.

I have studied the draft completely.

As a front row property owner at Garden City Beach, I believe we will have the advantage of our beach being nourished during construction and I believe the whole beach will be stabilized after the project is completed.

As a pleasure boat owner it will be a pleasure to be able to get in and out of the inlet without running aground.

I am also concerned about the Charter and Commercial Boat owners and operators who depend on crossing the bar for a living.

Full speed ahead!

Yours very truly,

TYLER PLYWOOD CORPORATION

JACK S. TYLER

JST/bm

MURRELLS INLET FISHERMEN'S & MERCHANTS ASSOCIATION
Box 731
Murrells Inlet, S. C., 29576

December 22, 1976

Colonel Harry S. Wilson, Jr.
District Engineer
U. S. Army Engineer District
Charleston, S. C., 29402

Dear Colonel Wilson:

The Murrells Inlet Fishermen's & Merchants Association, a non-profit organization, was formed in 1972 for the purpose of advancing the economic, cultural, industrial, professional and civic welfare of the Murrells Inlet area. In general, to promote the welfare of area citizens, following always those policies intended to accomplish the greatest good for the greatest number; to support all those activities believed to be beneficial to the community and surrounding areas; to oppose those which might be detrimental. For this reason, this organization supports the plans for the jetties for Murrells Inlet, commonly called "Murrells Inlet Navigation Project". We oppose actions taken by individual(s) that take actions to suppress those plans - particularly if taken hisely and stated publicly without good cause or prudent considerations of the actual facts..

Referring to letter addressed to you, written by O. C. Merchants, Jr., President, Litchfield Homeowners Asso., Litchfield Beach, S. C. - this letter having been printed in the local papers, The Georgetown Times, Georgetown, and The Sun News, Myrtle Beach during the week of December 14, 1976.

Association members oppose his views on the subject concerning the Environmental Impact Statement Draft for the proposed Murrells Inlet Navigation Project. In making a complete study of his comments and comparing them with the actual written Draft, it appears his comments were unjustified, blantant, biased and not based on true facts and knowledge of the subject matter contained therein; and that his actions were taken to negate these plans. Specific issues alledged to have been omitted in his letter are clearly spelled out in the draft as follows:

Referring to his letter Para. 1. Quote, "There is no comment concerning adverse environmental affect of erosion of the beaches north and south of the project." Unquote. On the first page of the Draft - in the Summary, Para. 3a & b gives the environmental impacts both pro and con and alternatives. These summaries were made under an Environmental Study contract with the S. C. Wildlife and Marine Resources Dept. Comments concerning these studies were requested and recorded in the draft from some nineteen civic, local, state, historic, federal, enviromental, etc. organizations. On Page 5, Para. 1.07.01, under environmental studies, mention is made of the biological communities (In the Glossary section - community means, collectively, all of the organisms inhabiting a common environment and interacting with each other); thus, the Inlet and adjacent beaches just north and south is the community. Realistically, there is evidence within the Draft that beach erosion to areas adjacent to the Inlet, namely Huntington State Park and Garden City, are being affected NOW - continuously - in the Inlet's present condition. Specifically, on Page 9, Para. 2.05.04, subj. Littoral drift: Breaking waves create a longshore or littoral current. This current is predominately southwestward at Murrells Inlet, and is more visible in the breaker zone than in deeper water. This current or movement carries the beach sand, which is in suspension due to turbulence of the breaking waves, along the

shore parallel to the beach. The sand moved in this manner is known as littoral drift. The movement of littoral drift contributes to changes in the Inlet as well as the shoreline. As sand enters the Inlet, spits are formed causing a contraction of the Inlet throat (or mouth which it is locally called) erosion of the opposite shore, and migration of the Inlet. The predominate direction of littoral movement is southerly, therefore, most of the Inlet migration has been in that direction. Average annual recession of the shoreline in the near vicinity of Murrells Inlet has been 1.3' during the past 94 years. Since this has been continuous since 1872, it would appear that erosion is with us currently, and that the jetties would improve conditions, not hamper them.

Referring to his letter Para. 2, Quote, "No provisions are made for wave testing models for waves from the north-east, where the strongest winter storms are generated. The wave tests also apparently do not consider the reflection of the wave fronts by the jetties and how these changes influence the beaches north and south of the inlet. The model test does not involve a study of the development of large standing waves between jetties, which would be very hazardous to small boats." Unquote: Refer to Page 5, Para. 1.07.02 under Model Study having been conducted thusly: A physical model of Murrells Inlet and estuary was constructed at the Waterways Experiment Station (WES) in Vicksburg, Miss. to examine the effects of currents and wave conditions on different arrangements of project appurtenances under simulated prototype conditions. WES presented seven jetty alignments for preliminary testing using surface current photographs taken every hour (prototype) for one tidal cycle. From the seven alignments presented, Charleston District selected five for preliminary testing. A brief description of these plans and the results of the preliminary testing follows within this paragraph. Para. 1.07.02.1 states, however, that the results of all these plans are not contained within the draft pending the outcome of the DETAILED model testings.

Referring to his letter Para. 3, Quote, "There is no explanation of the source of the sediments which cause the Murrells Inlet problem, particularly whether they are ocean generated." Unquote. Firstly, sediments within the Inlet has to be ocean generated as that is the source of its water supply. (Sediment being defined as 1. any matter that settles to the bottom of a liquid., 2. in geology, and matter or mass deposited by water or wind).

Referring to his letter Para. 4, Quote, "There is no consideration of the adverse influence that erosion would have on the economics of beach rental cottages, both north and south of the Inlet." Unquote. The very absence of reference to further erosion problems after jetty construction within the studies that have been made and that are continually being made, makes this comment unnecessary at this point; further, studies made on the economics of the total Community (which includes beach rentals) is contained with Para. 2.12, Pages 47-49, and reveals projected economic statistics for the total community including Georgetown and Horry county. Thus the Murrells Inlet Jetty Project will benefit the Community as a whole.

Referring to his letter Para. 5, Quote, "There is no time scale for beach nourishment and no funding is projected or provided for this very costly, necessary and vital function on a constant basis." Unquote. Please refer to Para. 4.08, Page 57, Subj. Maintenance dredging: Maintenance dredging will be accomplished about every three years and will be required in the inner channel and deposition basin. Inner channel dredging will amount to about 36,000 cubic yards every three years with 24,000 cubic yards being used for Beach Nourishment and 12,000 cubic yards being pumped to the diked upland disposal area used for initial construction. Approximately 600,000 cubic yards of material will be removed from the deposition basin every three years and placed on adjacent beaches. Thus, if funds were appropriated for the Navigation Project, it would appear that maintenance would be inclusive.

Referring to his letter Para. 6, Quote.,"At the third, post-authorization meeting, May 29, 1975, much concern and opposition was indicated by beach home owners, and by representatives of Brookgreen Gardens and Huntington State Park, over the erosional impact south of the project. No reference is made to this fact in your statement." Unquote. It would appear that the Draft Environmental Impact Statement contains data from experts in their field of endeavor and should not contain statements expressed by individual(s) who do not have expertise in Navigational projects.

Referring to his letter, Para. 7., Quote, "The Draft Impact Statement is STRONGLY OVER-BIASED in favor of the commercial boat operators of Murrells Inlet and GROSSLY neglects the fact that this proposed project is an almost complete disruption of a naturally, physically dominated system. Although there is a preponderance of material in the statement dealing with the biological structure and the danger thereto, the fact remains that this project will impose a dangerous posture to public and private recreational beach area property and homes, thereby placing literally millions of dollars in public and private jeopardy; this compared with the immense initial cost and subsequent maintenance dredging, etc. for the relatively small benefit of commercial boat operators and connected recreational activity to the few compared benefits afforded to the many on the beaches north and south." Unquote. Murrells Inlet is the oldest and one of the most important fishing Inlets in the State of South Carolina. The Murrells Inlet inshore and offshore fishing is VERY SIGNIFICANTLY IMPORTANT to the Grand Strand and to the State. It has an intragal and stabilizing affect on tourism, whereby, to choke it off, would mean millions of dollars a year losses - not only to the fishing interest, but to all interest, recreation, accomodations and all other businesses that are directly or indirectly affected by tourist dollars - at the local and state level. To specify that one entity is being affected more than another such as commercial fishing is erroneous. To state that the Environmental Impact Statement indicates this is also erroneous. There is actually only two references specifically directly to inshore and offshore fishing in Murrells Inlet in the entire Draft which consists of 70 pages with additions. Therefore, it is impossible to believe the Draft is strongly over-biased in favor of commercial boat operators.

In the near closing of Mr. Merchant's letter to you, he makes reference to the California coast line. To compare the subject coast line navigational problems with problems encountered in California is like comparing climatic conditions of Alaska to Florida. It is assinine and further adds to our belief that Mr. Merchant has not been prudent with his comments or thorough in his research.

It has taken eight-long years of compiling data, holding meetings, studies, drafts, funds, local, state and federal legislation, red tape, etc. etc. etc. on the part of countless interested persons both within and with the COMMUNITY to obtain the much needed jetties for Murrells Inlet - persons who are concientious and interested in the betterment of the WHOLE COMMUNITY and not just a small segment.

We trust you will keep us informed. Respectfully submitted.

Herman W Martin
HERMAN W. MARTIN, President

APPROVED BY THE BOARD OF DIRECTORS, MURRELLS INLET, S. C. December 23, 1975.

(3)

C-43

MISS ELEANOR McCOLL
304 West Main Street, Georgetown, South Carolina 29512

December 29, 1975

Colonel Henry S. Wilson, Jr.
District Engineer
Charleston, S. C.

Dear Colonel Wilson,

Please record me as one who is definitely opposed to the Murrells Inlet Navigation Project. It made my blood run cold to read the statement prepared by the Corps of Engineers, much as I appreciated the opportunity of seeing it.

How I wish they had never let

Garden City be developed! Surely that has effected the silting problem of the inlet.

In my opinion this project should be abandoned. Let those interested only in commercialism go elsewhere.

Sincerely yours,

Eleanor McColl

29 DEC 1975

Dec. 23, 1975

Dear Sirs:

I am opposed to the plan to dredge the mouth and channel at Murrells Inlet, S. C. I do not think that you should do any dredging.

That is an unnecessary Federal expense.

Thank you for your consideration.

Sincerely,

Mrs Obbie Carter

(Mrs) Obbie Carter