FHWA-SC-EIS-95-01-DS

MARK CLARK EXPRESSWAY
CHARLESTON, SOUTH CAROLINA

DRAFT
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
AND DRAFT SECTION 4(F) EVALUATION

Submitted Pursuant to 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303 by the
U.S. Department of Transportation
Federal Highway Administration
and
S.C. Department of Transportation

Cooperating Agencies
U.S. Coast Guard
U.S. Army Corps of Engineers

7-14-95
Date

S.C. Department of Transportation

8/10/95
Date

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'oposed action consists of the construction of a freeway facility from SC 7 (Sam berg Blvd.) to SC 171 (Folly Road). This facility will cross the Stono River in two as and includes an interchange with Maybank Highway on Johns Island.

Const. PIN: 13806
Project No: NH-5264 (152)

SUMMARY

Description of Project

The proposed project is a seven-mile portion of the Mark Clark Expressway between Sam Rittenberg Boulevard (SC 7) and Folly Road (SC 171). It is the last portion of the Charleston Inner Belt Freeway to be constructed, which provides a circular route around the northern and western portion of the Charleston urban area. Because the Environmental Impact Statement for the entire route was approved in 1972, this Supplemental Environmental Impact Statement provides an update and validation of the project location and impacts analysis.

The project is proposed to be a four-lane divided freeway with a 48-foot-wide median. The proposed design speed is 65 miles per hour. Much of the route is proposed to be constructed on structure due to two crossings of the Stono River and its associated wetlands. Interchanges would be located at the two project termini and at Maybank Highway (SC 700). A future interchange could be provided near Maybank Highway at the proposed Johns Island Expressway.

Other Major Governmental Actions

This portion of the Mark Clark Expressway will connect with other completed freeways and with the newly opened James Island Expressway (SC 30). A planning study is currently underway for widening Maybank Highway (SC 700) in connection with replacing the existing Stono River swing bridge. The Mark Clark Expressway is being designed to accommodate both of those actions. The Charleston County Parks and Recreation Commission plans to expand its existing headquarters at James Island County Park. Two of the alternatives for this project conflict with that expansion.

Summary of Major Alternatives

A preferred corridor was selected from four major corridor alternatives as part of the studies conducted in the late 1960s and early 1970s and documented in the 1972 FEIS. The preferred corridor was determined still to be appropriate during this recent update.

The corridor (from south to north) begins at Folly Road north of Camp Road and extends westward across the Stono River, north across Maybank Highway, passing west of Headquarters Island and crossing the Stono River again (See Figure I-1). The corridor then passes through the Oakland Subdivision to an interchange near the intersection of Savannah Highway and Sam Rittenberg Boulevard.

Because of the development of James Island County Park in the preferred corridor, four design alternatives were developed. Three alternatives (Alternates A, C and D) are located on park property between the park's northern boundary and the power line, while the other (Alternate B) avoids the park property. The four alignment alternatives are shown in Figure III-2.

Summary of Major Impacts

Completion of the proposed action will provide needed east-west capacity to reduce congestion on arterial streets such as Savannah Highway, Maybank Highway, and Folly Road. It will provide for planned growth on James Island and Johns Island, and will reduce travel cost, congestion and air pollution.

The proposed action is compatible with locally adopted land use and transportation plans. Land use changes accelerated by this project would occur primarily in the vicinity of interchanges.

Several communities will be impacted by proximity to the project although only eight to eleven residences, five businesses, and potentially a park headquarters would be taken.

No public facilities other than James Island County Park would be adversely affected by the project. The proposed right-of-way would be 800 feet from one school property and 500 to 1,300 feet from another school, depending upon the alternative selected. The project would have a positive overall impact on the region's economy.

Alternate A would take approximately 40 acres of property from James Island County Park. Alternates C and D would take approximately 41 acres from the park. In addition, Alternate C would sever 45 acres and Alternate D would sever 64 acres from the park. A draft Section 4(f) evaluation is included with this document.

Noise levels would increase substantially at 65 to 95 residences, and Federal noise abatement criteria would be exceeded at 19 to 31 receptor locations. Two noise barriers are proposed for further consideration, one west of Eastshore Lane and one (for Alternate B only) south of Bradham Road.

Approximately 67 to 77 acres of upland habitat (including 19 to 30 acres of man-dominated uses) would be displaced by this project. Additionally, up to 109 acres of wetland habitat would be filled, including up to 62 acres of freshwater wetlands and up to 47 acres of salt marsh and other wetlands under the protection of the South Carolina Coastal Council. No endangered species would be impacted by this project.

Areas of Controversy

Most of the concerns raised regarding this project are in the area near James Island County Park in which there are four alternatives. Alternates A, C, and D would take park property, while Alternate B would take a house and most of a resident's property and would be near residences on Bradham Road.

The amount of wetlands taken by this project is expected to generate some controversy during the permitting process. General agreement on wetland impacts and mitigation will be reached prior to the adoption of a Final Supplemental EIS, and agreement on final design level details will be reached during the permit process.

Table S-1 summarizes the major impacts of this project.

TABLE S-1
ENVIRONMENTAL COMPARISON OF ALTERNATIVES

	TOTAL ROUTE USING ALTERNATE			
	A	B	C	D
Length (Miles)	7.0	6.9	7.1	7.1
Displacements				
Residences	12	11	10	9
Businesses	5	5	5	5
Other (Park Offices)	1	0	1	0
Distance From Murray-Lassaine School	1,000'	500'	1,200'	1,300'
Noise Impacts				
Substantial Increase	62	93	56	59
Exceed Noise Abatement Criteria	21	30	19	19
Park and Greenway Impacts	1	1	1	1
Acres of Parkland to be Acquired	40.3	0	40.9	41.1
Acres of Parkland Severed	0	0	45.0	64.3
Historic Impacts				
Properties Requiring Additional Work	1	2	2	2
Wetland Impacts (fill only, acres)				
OCRM Jurisdiction	47.1	43.9	46.8	46.8
USACOE Jurisdiction	57.1	47.7	61.6	62.0
Total	104.2	91.6	108.4	108.9
Upland Impacts (acres)				
Live Oak/Mixed Hardwood	19.5	20.8	19.0	18.0
Pine/Mixed Hardwood	17.9	14.1	18.4	19.0
Pine Forest	10.4	12.1	10.4	10.4
Man-Dominated	19.4	30.2	18.6	19.2
Total	67.2	77.2	66.4	66.6
Potential Hazardous Material Sites	0	0	0	0
Construction Costs ($ millions)	151.1	150.0	152.0	152.3
Construction Costs for Bridge Alternates($ millions)	204.5	196.3	206.9	208.1

Unresolved Issues with Other Agencies

Permits for fill in wetlands and for the Stono River bridges remain to be resolved. A potential Section 4(f) and Section 6(f) involvement will be resolved following the public hearing on this project and the designation of a preferred alternative.

Other Federal Actions Required

Wetlands have been designated as natural areas worthy of protection from activities which are not in the overall public interest (Section 10 Rivers and Harbors Act of 1899 [et seq.] and Section 404 of PL92-500). Alterations to jurisdictional wetlands such as fill for roadways, bridge approaches and artificial drainage patterns require permits from the U.S. Army Corps of Engineers (USACOE), Charleston District, and the Ocean and Coastal Resources Management (OCRM), as well as Section 401 water quality certification from the South Carolina Department of Health and Environmental Control (SCDHEC).

Structures in, on, or over the navigable waters of the United States, including the Stono River, are regulated by Section 10 of the Rivers and Harbors Act and require construction permits. The construction of bridges and causeways in or over navigable waters is also subject to the permit provisions of Section 9 of the same act. Because of a written agreement between the USACOE and U.S. Coast Guard as well as nationwide permits issued by the USACOE, duplication of both permit requirements contained in the Rivers and Harbors Act of 1899 is frequently, but not always, avoided for the construction of bridges. However, discharges of dredged or fill material associated with the construction of causeways or bridge approaches can subject a project to the separate permit requirements of both agencies. The General Bridge Act of 1946, as amended, is the authority for construction, maintenance and operation of bridges. The Coast Guard has the authority and responsibility to issue bridge permits.

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CHAPTER I
PURPOSE AND NEED

A. Project Status

The Final Environmental Impact Statement (FEIS) for the Charleston Inner Belt Freeway (Mark Clark Expressway) was approved by Federal Highway Administration (FHWA) in May 1972. This document updates the FEIS for the seven-mile portion of the Mark Clark Expressway between Sam Rittenberg Boulevard and Folly Road to reflect changes in land use and demographics, refinements to the selected corridor, and changes in statutory requirements. This segment, which is included in the Charleston Area Transportation Study (CHATS) long-range transportation plan, is the last to be constructed in a system including the Inner Belt Freeway, the continuation across the Cooper River to Mount Pleasant as the Mark Clark Expressway, and the James Island Expressway from Folly Road across the Ashley River to the Charleston peninsula. It provides an important freeway link between the terminus of I-526 at Sam Rittenberg Boulevard and Savannah Highway, and James Island Expressway at Folly Road. These freeways are shown in Figure I-1.

B. Capacity and Transportation Demand

Major arterial streets in the vicinity of the project currently carry volumes exceeding their capacities. Such streets that would have traffic diverted to the proposed expressway include Savannah Highway, Ashley River Road, St. Andrews Boulevard, Folly Road, and Maybank Highway. Table I-1 compares the average daily traffic volumes carried by those roads in 1990 with their capacities.

With projected growth in the Charleston region, these volumes would increase substantially and the level of service would worsen without either major improvements to those streets or construction of the proposed expressway. The Mark Clark Expressway between Sam Rittenberg Boulevard and Savannah Highway is projected to carry between 40,000 and 50,000 vehicles per day in 2015. This traffic demand would exist with or without the proposed highway, and would have to be served on existing roads if the highway were not built.

The existing roads in the project area would require substantial widening to accommodate projected traffic volumes without the project. Such widening would be extremely expensive and disruptive due to the extensive commercial and residential development along these arterial streets. Even with such widening, traffic would be carried at relatively slow speeds, with frequent stops at traffic signals. Many more accidents could result due to conflicts (at-grade intersections and driveway openings) present on arterial roads that do not exist on freeways. Additionally, auto exhaust emissions are far higher under such stop-and-go circumstances than under smooth flow on freeways.

TABLE I-1
EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

Road Segment	ADT	Through Lanes	Capacity	Level of Service
Savannah Highway				
West of Sam Rittenberg Blvd.	36,197	6	56,000	C
East of Sam Rittenberg Blvd.	56,189	4	37,000	F
West of Folly Road	45,000	4	37,000	F
Ashley River Road				
East of Sam Rittenberg Blvd.	27,252	4	37,000	C
St. Andrews Blvd.				
South of Ashley River Rd.	41,806	4	37,000	F
Folly Road				
South of Savannah Hwy	54,975	6	56,000	E
South of Maybank Hwy	42,436	4	37,000	F
Maybank Highway				
West of Folly Rd.	22,666	4	37,000	C
West of Riverland Rd.	15,542	2	16,000	E

Source: 1990 average daily traffic (ADT) volumes from CHATS

C. Modal Interrelationships

While designed primarily to connect other highways of regional importance, the Mark Clark Expressway will provide an important connection from James Island and Johns Island to the Charleston Airport. The expressway will also provide a freeway connection between western Charleston, Johns Island, and James Island to port facilities in the City of Charleston, via the James Island Expressway.

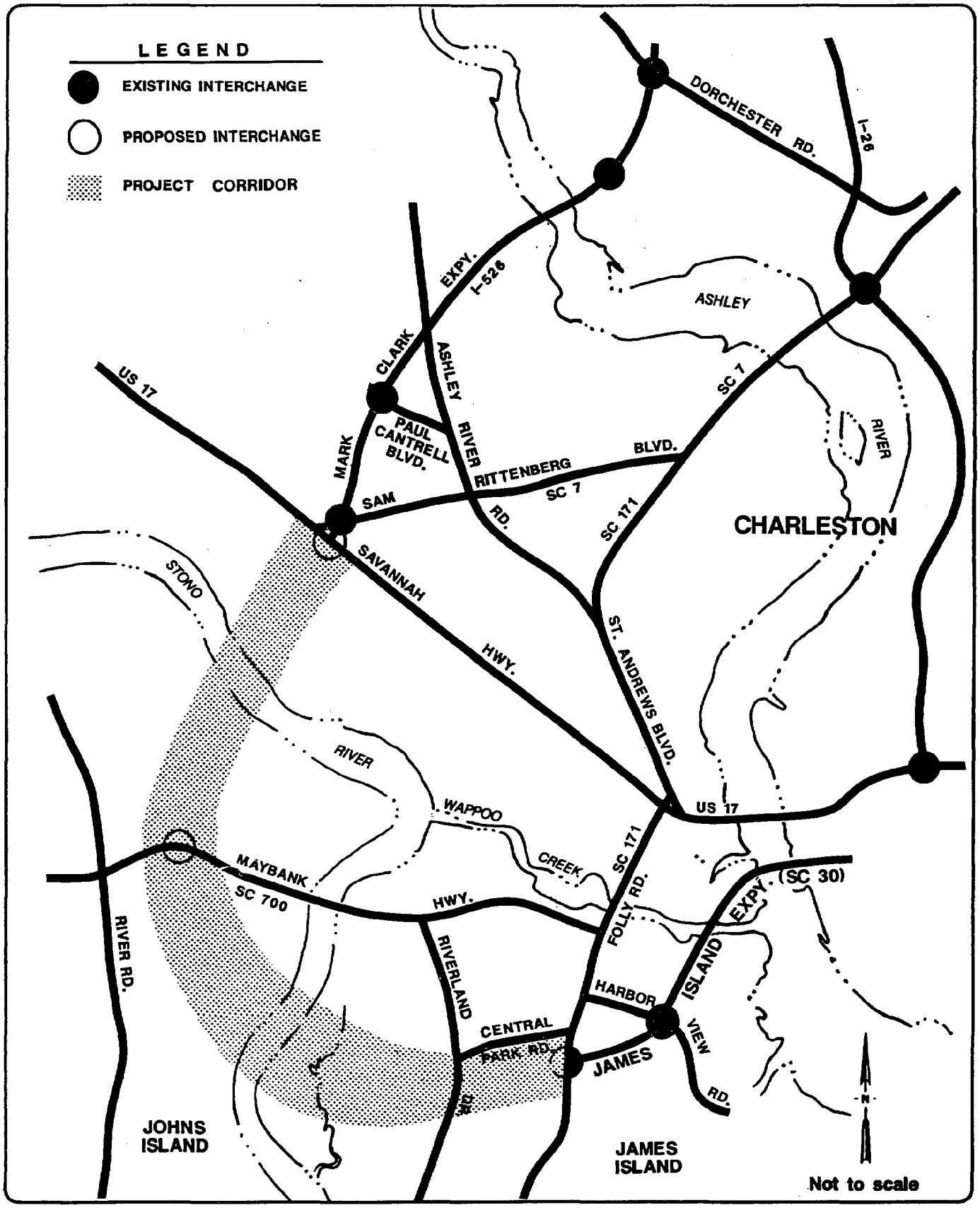
D. Economic Development

North Charleston is expected to have continued growth in employment, commercial development, and housing, while James Island and Johns Island will have increased residential development. The proposed expressway will link these areas, helping to serve this planned growth and connect housing and employment growth areas.

E. Summary of Need for Action

The proposed action is compatible with local, regional, and statewide planning. It has been a portion of an approved corridor for over 20 years, and has been shown on local and state plans since that time.

The project will improve travel conditions for motorists in the areas south and west of central Charleston by providing a safe, high-speed route that will relieve existing routes that already operate under extremely congested conditions during peak traffic hours. Without this project, conditions on existing roads will worsen, causing increased motorist delays, user cost, accidents, and air pollution.



MARK CLARK EXPRESSWAY

PROJECT LOCATION

FIGURE I-1

This route would serve the existing and future development in the southern and western Charleston area by providing a safe, direct route between residences, business, and public facilities. Economic development would continue in this growing portion of the urbanized area with adequate transportation to serve it. The route would decrease total travel in the region, in terms of hours spent travelling, allowing time for people to pursue other activities.

In summary, this route will help to fulfill local, regional, and state transportation goals; will increase safety; will save energy; will improve overall urban mobility; will help to improve air quality; will serve and promote existing and planned development; and will help to maintain the quality of life in Charleston.

CHAPTER II
ALTERNATIVES

In 1972, the South Carolina State Highway Department (now the Department of Transportation) produced a Final Environmental Impact Statement, approved May 18, 1972, which examined corridor alternatives for the proposed Mark Clark Expressway. In developing alternative concepts for a roadway facility, several options were considered. These options included consideration of several roadway cross-sections, access control types, bridge types, bridge lengths, and design speeds, as well as route locations to serve traffic demand and yet minimize environmental, social, and financial impact.

A number of alternative routes and route segments were developed, from which four corridor alternatives were identified. Two of the proposed corridors began at Folly Road near Grimball Road on James Island and extended northerly between the Stono River and Folly Road. Both alignments crossed Wappoo Creek, extended through St. Andrews, and tied back in near Savage Road. These alternatives were not feasible due to the displacement of many residences. The other two alternatives began at Folly Road north of Camp Road and extended westward crossing the Stono River and northward to Maybank Highway. Both alternatives then crossed the Stono River again. One extended northerly between Myrtle Grove and Sylcope subdivisions to an interchange with Savannah Highway near Savage Road, while the other alternative crossed the Stono River in a more easterly location and extended through Oakland Subdivision and Dupont Area subdivision to an interchange with Savannah Highway at Sam Rittenberg Boulevard.

The selected corridor alternative was the Eastern Alternative, which crosses the Stono River in two locations, extends through the Oakland Subdivision to Savannah Highway at Sam Rittenberg Boulevard. That corridor selection was re-examined during this study and was determined still to be appropriate. The other corridors are even more highly developed than they were in the early 1970s. No other corridors were found to be superior to the selected corridor.

The selected corridor alternative has been refined as part of this Supplemental Environmental Impact Statement. Since the corridor was selected in 1972, the 640-acre James Island County Park has been acquired and largely developed within and alongside the corridor, with future plans for additional park development. Since Section 4(f) of the Department of Transportation Act of 1966 prohibits the taking of park land if other prudent and feasible alternatives are present, an alternative alignment within the corridor that avoids the park property has been developed. In addition, two modifications of the original alignment have been developed that could reduce impact to the park Thus, four design alternatives, all within the original corridor approved in 1972, are under consideration in the vicinity of the park.

The four alternative alignments generally cover the eastern portion of the approved corridor between Folly Road and Maybank Highway. The alternatives separate about 2,200 feet southwest of Folly Road and join together at a common point west of the Stono River and about 3,000 feet east of Maybank Highway.

Alternate C is the original alignment established in 1972. It is parallel to a power line right-of-way, with its centerline located 370 feet north of the power line towers. (This alignment actually preceded construction of the power line, which was constructed south of and parallel to the proposed right-of-way.) A second alternative (Alternate B) avoids park property completely, traversing

property approximately 500 feet north of the park. Alternate A modifies the original alternative by shifting it to the north slightly so that the northern right-of-way line coincides with the park's northern property line, thereby avoiding privately-held parcels adjacent to the park and also minimizing damage to the park by not severing any park property outside the right-of-way. This shift was developed in consultation with park officials. Alternate D is another variation of the original alignment, which shifts the right-of-way to the south so that it is adjacent to the power line right-of-way, with the centerline 245 feet from the towers. The Section 4 (f) implications of Alternatives A, C, and D are discussed in Chapter V.

CHAPTER III
AFFECTED ENVIRONMENT

A. Population and Demographics

Of the ten largest cities in South Carolina, three are in Charleston County. Charleston ranks as the second-largest, North Charleston as the third-largest, and Mt. Pleasant as the eighth-largest in the state. Charleston County's population and economy have displayed steady growth during the recent years. Overall, the population in Charleston County grew from 276,974 in 1980 to 295,039 in 1990, for an increase of 6.5%. More specifically, from 1980 to 1990, the West Ashley population increased by 14.3%, the James Island population increased by 12.8%, and the Johns Island population increased by 13.7%. Table III-1 indicates the historical population trend for Charleston County.

TABLE III-1
HISTORICAL AND PROJECTED POPULATION

Year	West Ashley	James Island	Johns Island	Charleston County
1980	51,738	25,962	5,004	276,974
1990	59,122	29,284	5,690	295,039
1995*	61,462	30,199	5,883	305,800
2000*	63,895	31,143	6,083	314,200

*Projected

Source: South Carolina Budget and Control Board General Population and Housing Data, BCD Council of Governments

The proposed Mark Clark Expressway will begin in James Island, travel through a portion of Johns Island, and terminate in the West Ashley area. More specifically, the alignment will pass through Census tracts 28, 21.01, 19.01, 19.02, and a small portion of 21.02 (see Figure III-1). In 1990, Census tract 28 in West Ashley was 89% white and 10% black with a 72% owner occupied rate. Census tracts 19.01 and 19.02 on James Island were 82% white, 18% black, and had 68% and 47% owner occupied rates, respectively. Census tract 21.01 on Johns Island was 60% white and 39% black and had an 83% owner occupied rate. In 1990, the median home value was $80,100 in Census tract 28, $64,600 in Census tract 19.01, $89,300 in Census tract 19.02, and $51,900 in Census tract 21.01.

B. Existing Land Use

Existing land use in the study area is shown in Figure III-2. Commercial and multi-family residential developments predominate near the project's southern terminus at Folly Road. Emmanuel-Morris-Brown-Ebenezer Apartments, a primarily minority apartment complex, is located

near the corridor. Several greenhouses that have already been purchased by SCDOT are located nearby within the study corridor. Along the rest of the corridor on James Island, existing development is largely low-density or rural, including a minority community along Bradham Road, Murray-Lassaine Elementary School west of Riverland Drive, James Island County Park, and scattered dwellings off Riley Road.

Across the Stono River on Johns Island, Headquarters Plantation subdivision is located near the center of the study corridor. This subdivision, consisting of large single-family homes, is only partially built. The remainder of the corridor on Johns Island passes through largely undeveloped land.

Crossing the Stono River again to the West Ashley area, the new Citadel Woods subdivision and the older Oakland subdivision are located near the study corridor, as well as Waterway South Condominiums. The northern project terminus with Savannah Highway at Sam Rittenberg Boulevard is surrounded by commercial uses. Citadel Mall and adjacent commercial uses are just north of the project near Sam Rittenberg Boulevard. Advantage Auto Parts, Food Lion shopping center, and a self-storage center are near the study corridor. Mother Care Day School, St. John's Episcopal Church, and Oakland Elementary School are located west of the corridor off Arlington Drive.

C. Parks and Recreation

Mark Clark Expressway is proposed to cross the West Ashley Greenway. The route follows an abandoned railroad right-of-way south of Savannah Highway. The Commissioners of Public Works of the City of Charleston own the path, which is used by walkers, joggers, and bicyclists, as well as for a utility right-of-way. The property is leased to the City of Charleston.

James Island County Park, located off Riverland Drive, is owned and operated by the Charleston County Parks and Recreation Commission. This 640-acre park includes camping areas, a conference center, rental cottages, picnic areas, playgrounds, bike paths, and hiking trails.

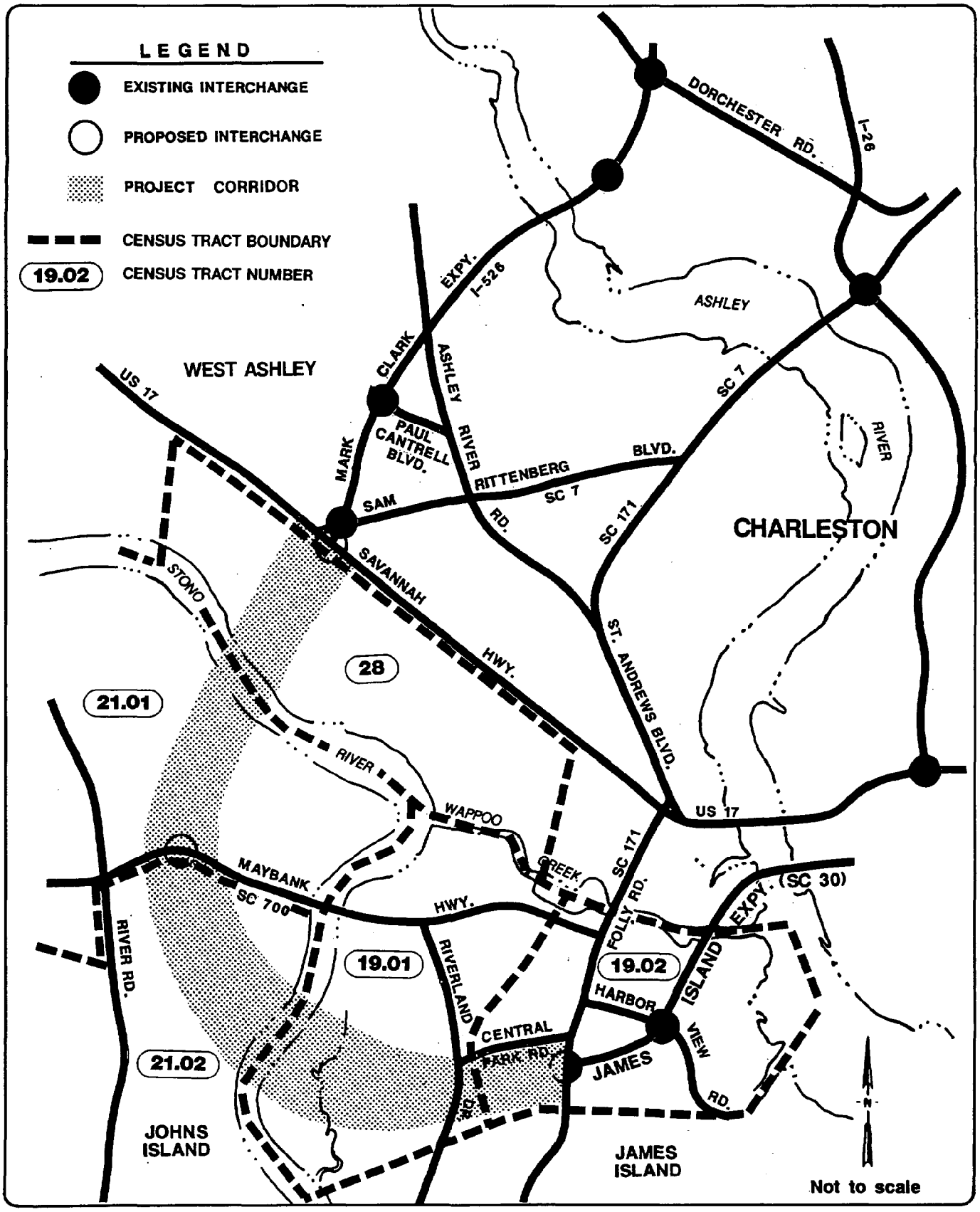
D. Natural Resources

1. Biotic Communities

Nine biotic community types have been identified within the project area. Each of the community habitats are described according to their plant and animal constituents in the Natural Resources Technical Memorandum for the Mark Clark Expressway Supplemental EIS (CZR, Inc., December 1994). The biotic community types occurring in the project consist of low marsh, high marsh, brackish marsh, live oak/hardwood mixed, pine/hardwood mixed, pine forest, oak hammock, man-dominated and open water (fresh and salt). The communities are shown in Figure III-3. The biotic communities are categorized as uplands or wetlands and assigned a qualitative ranking using the U.S. Fish and Wildlife Service Resource Category numerations.

2. Wetlands

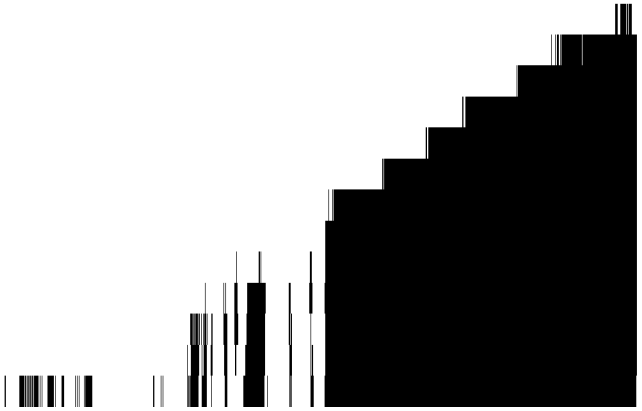
Wetlands have been designated as natural areas worthy of protection from activities which are not in the overall public interest (Section 10 River and Harbor Act of 1899 [et seq.] and Section 404 of PL92-500). Wetlands are considered sensitive habitats due to such functions and values as providing essential breeding, rearing, and feeding grounds for many species of fish and wildlife; recreation; flood protection; and pollution control. Alterations to jurisdictional wetlands such as fill

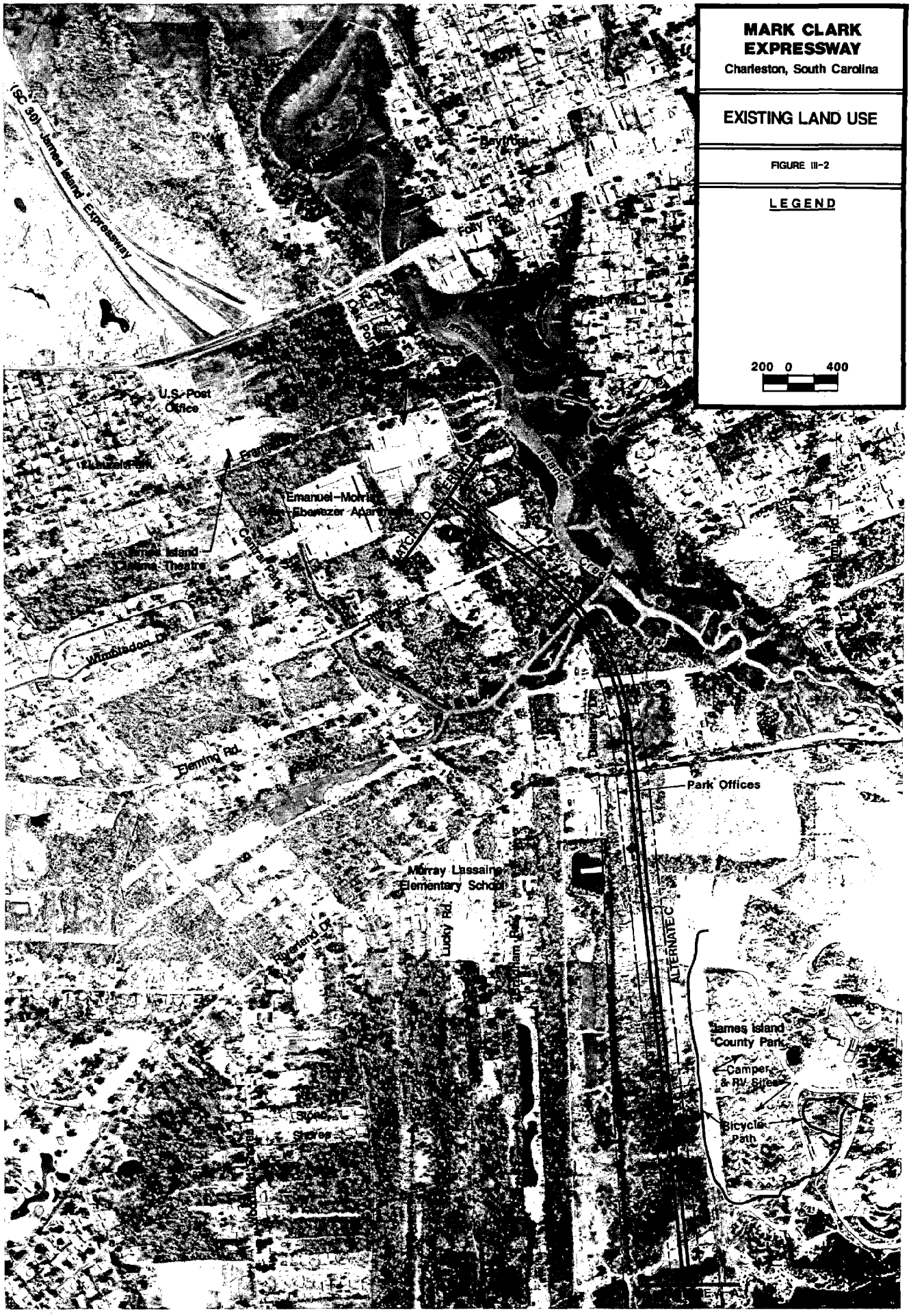


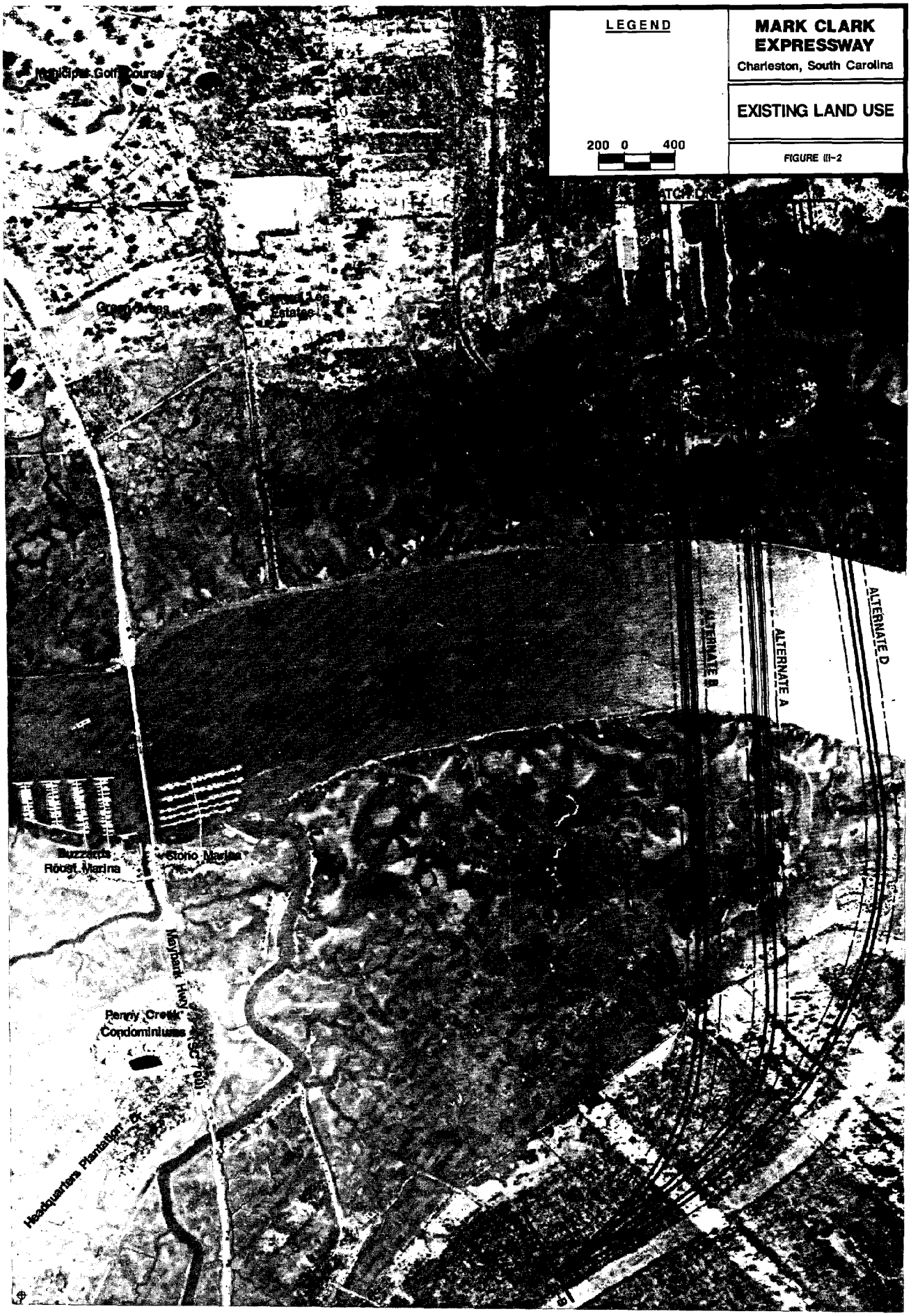
MARK CLARK EXPRESSWAY

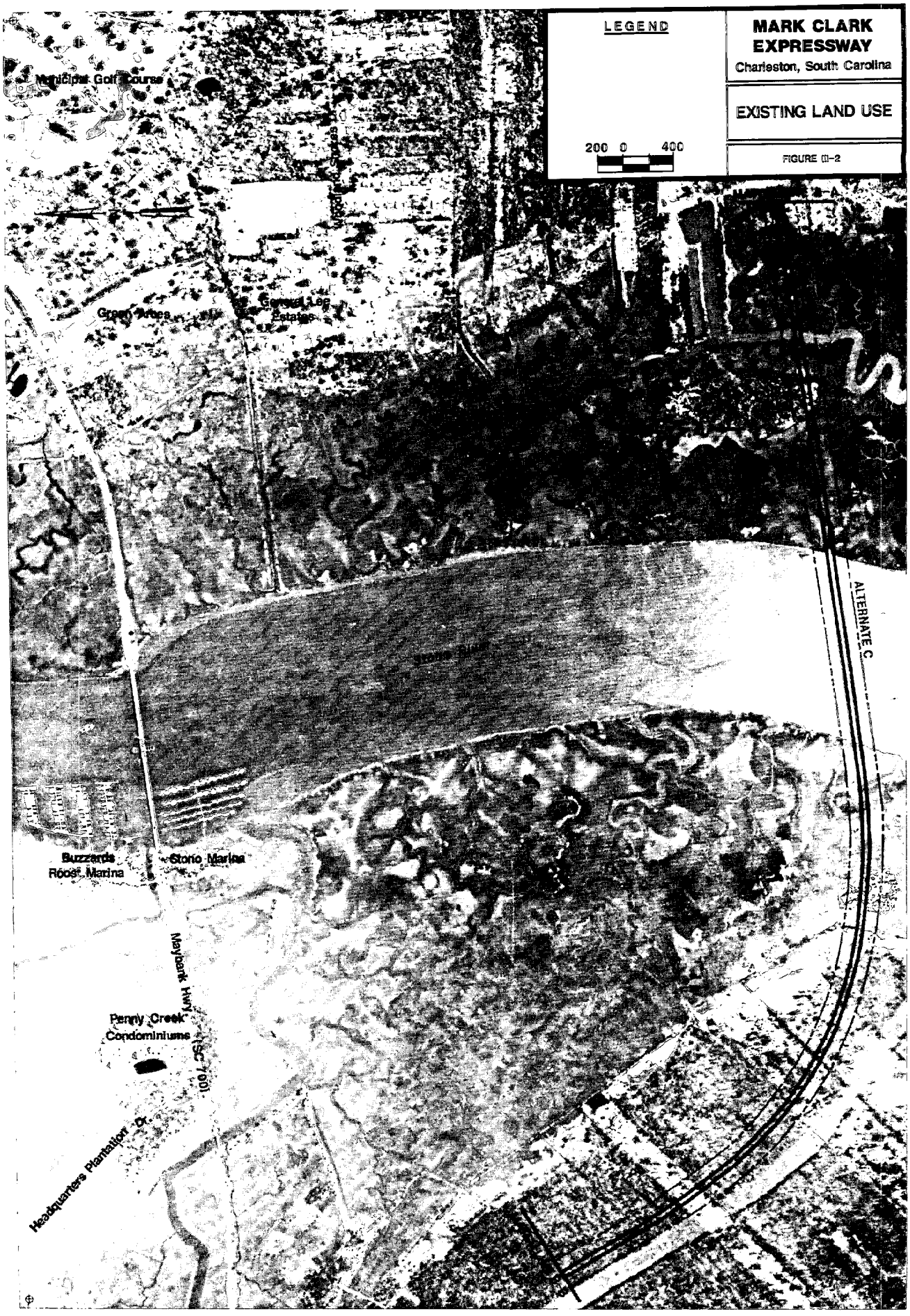
CENSUS TRACT BOUNDARIES

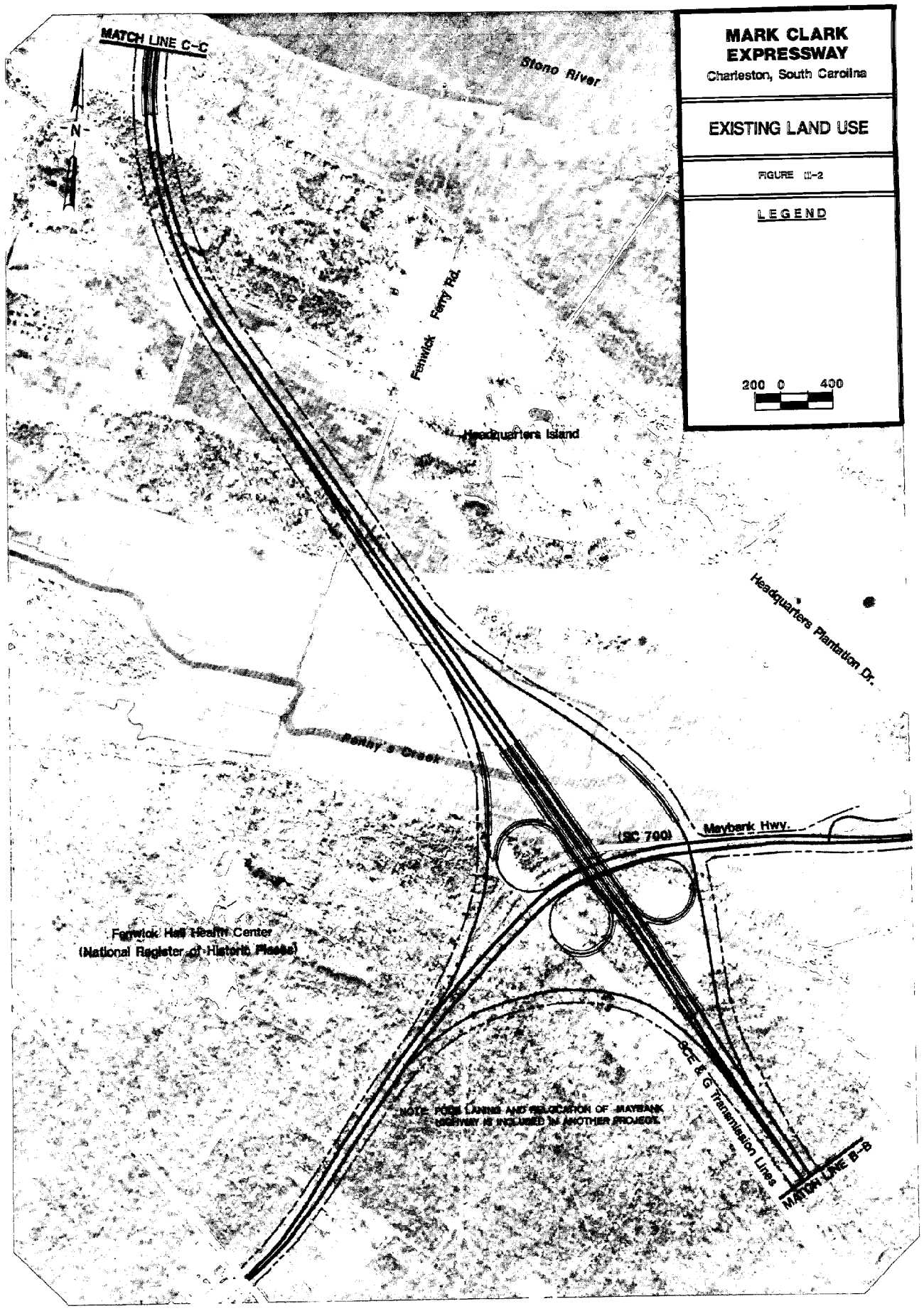
FIGURE III-1

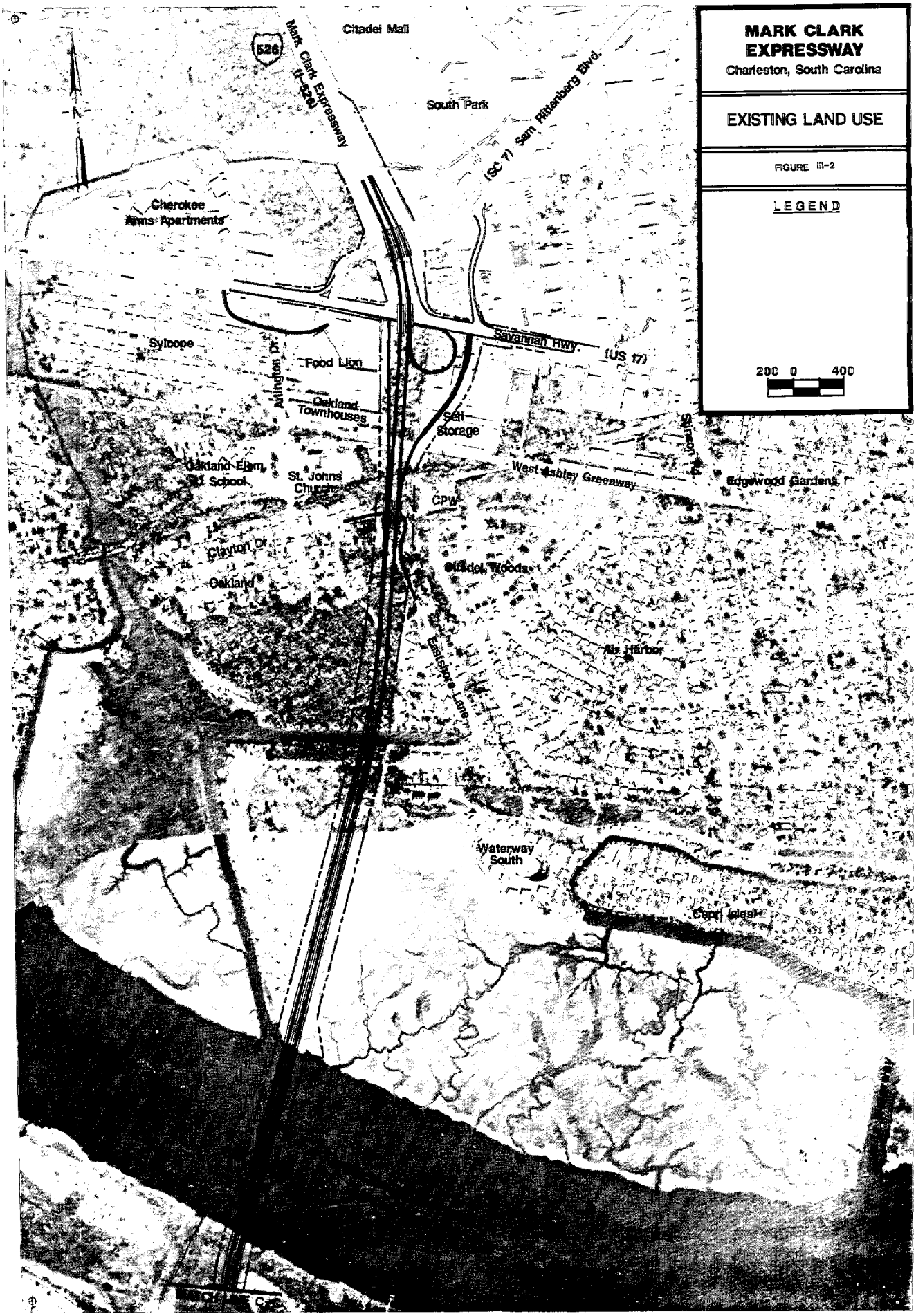


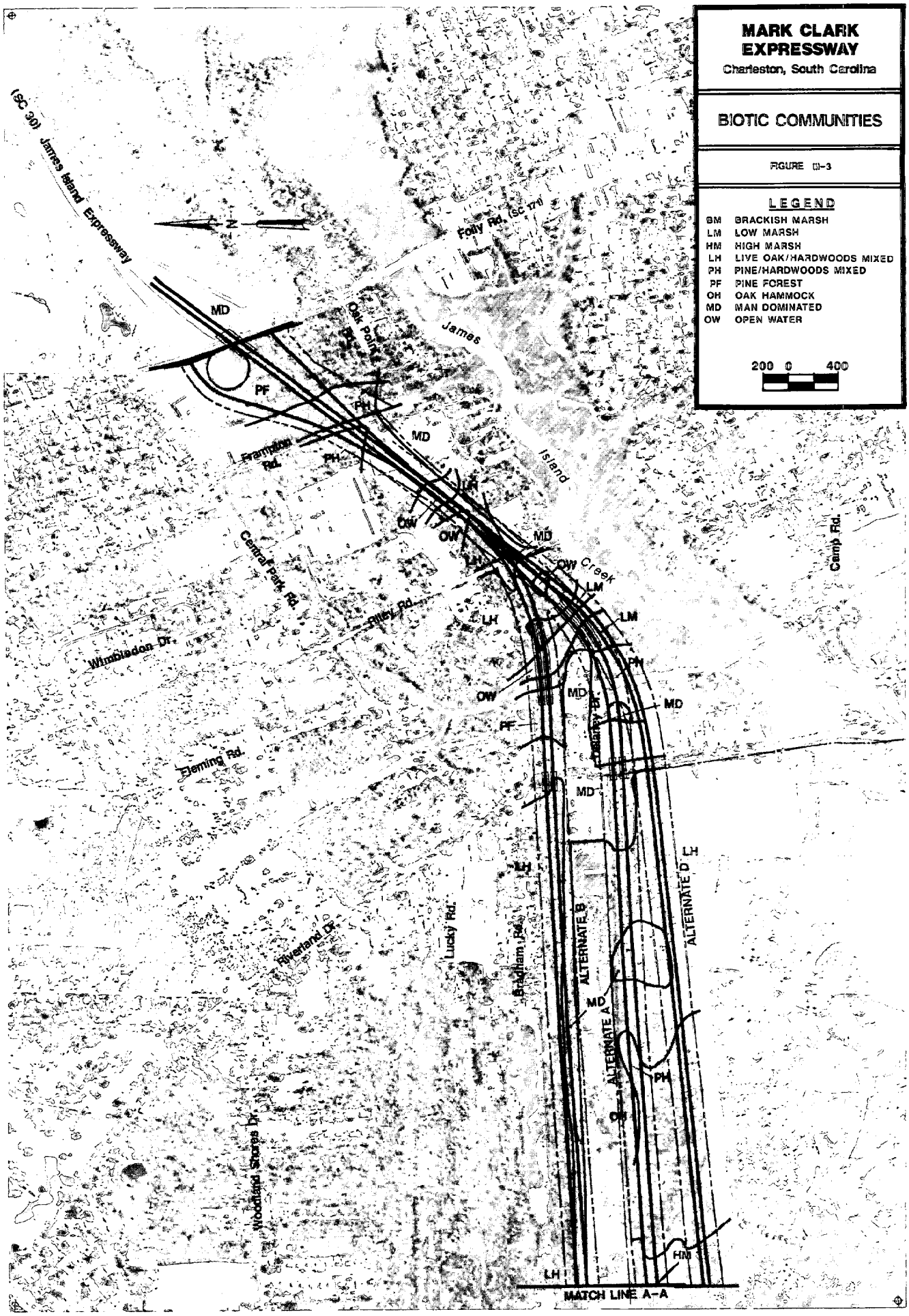

MARK CLARK EXPRESSWAY
Charleston, South Carolina
EXISTING LAND USE
FIGURE III-2
LEGEND
200 0 400
(SC 30) James Island Expressway
Folly Rd.
Dark Point
U.S. Post Office
Emanuel-Morris Ebenezer Apartments
James Island Cinema Theatre
Central Park Rd.
Whaleboat Dr.
Fleming Rd.
Park Offices
Murray Lassaine Elementary School
Lucky Rd.
Ryeland Dr.
Fordham Blvd.
ALTERNATE C
James Island County Park
Camper & RV Sites
Bicycle Path

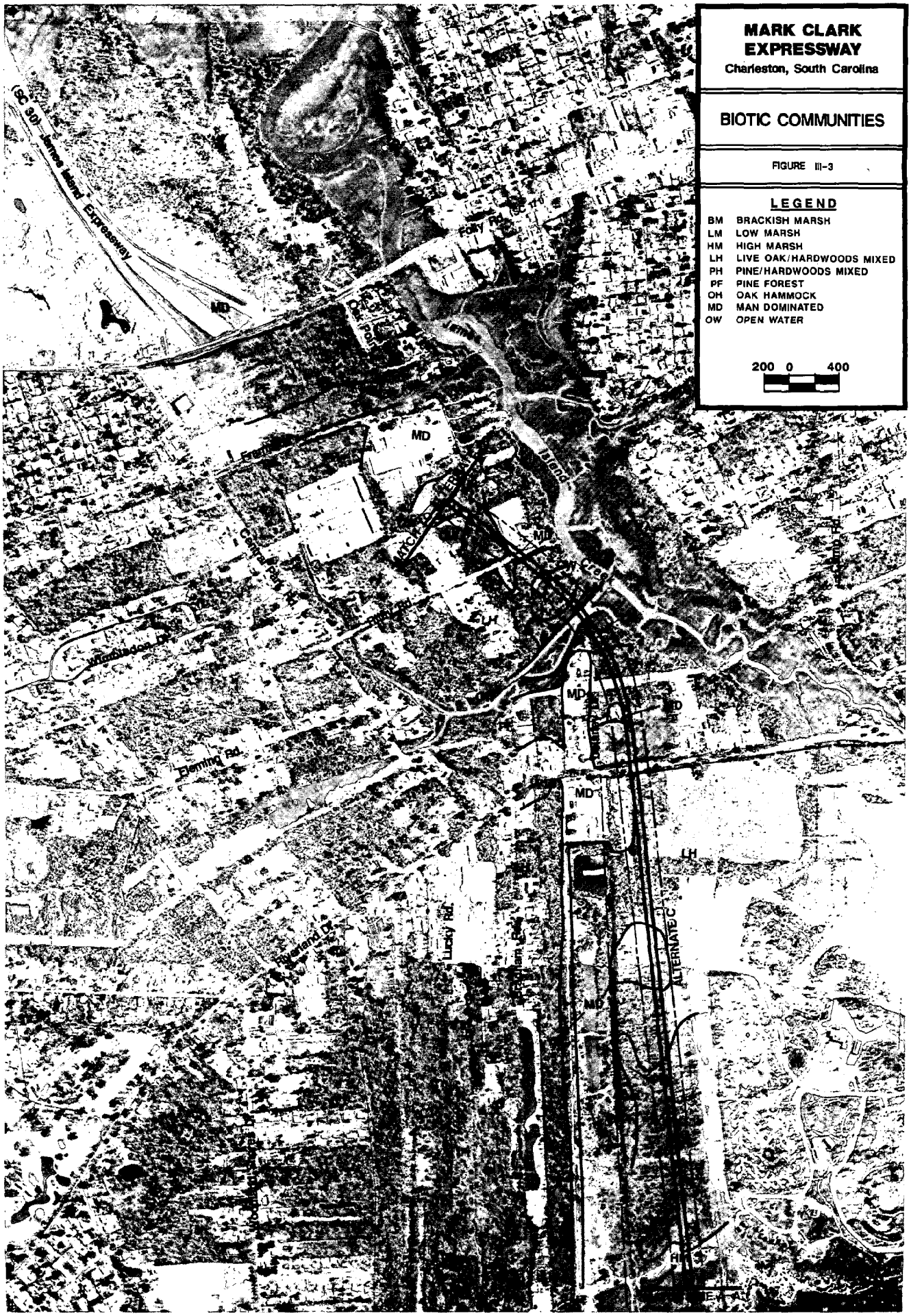

LEGEND
MARK CLARK EXPRESSWAY
Charleston, South Carolina
EXISTING LAND USE
200 0 400
FIGURE III-2
Municipal Golf Course
Creighton
General Lee Estates
ALTERNATE B
ALTERNATE A
ALTERNATE D
Buzzards Roost Marina
Stono Marina
Maybank Hwy
Penny Creek Condominiums
Headquarters Plantation Dr.


LEGEND
MARK CLARK EXPRESSWAY
Charleston, South Carolina
EXISTING LAND USE
200 0 400
FIGURE III-2
Municipal Golf Course
Green Acres
General Lee Estates
Grande Dunes
ALTERNATE C
Buzzards Roost Marina
Storio Marina
Maybank Hwy. (SC 700)
Penny Creek Condominiums
Headquarters Plantation Dr.


MARK CLARK EXPRESSWAY
Charleston, South Carolina
EXISTING LAND USE
FIGURE III-2
LEGEND
200 0 400
MATCH LINE C-C
N
Stono River
Fenwick Ferry Rd.
Headquarters Island
Headquarters Plantation Dr.
Henry's Creek
(SC 700)
Maybank Hwy.
Fenwick Hall Health Center
(National Register of Historic Places)
SCE & G Transmission Lines
MATCH LINE B-B

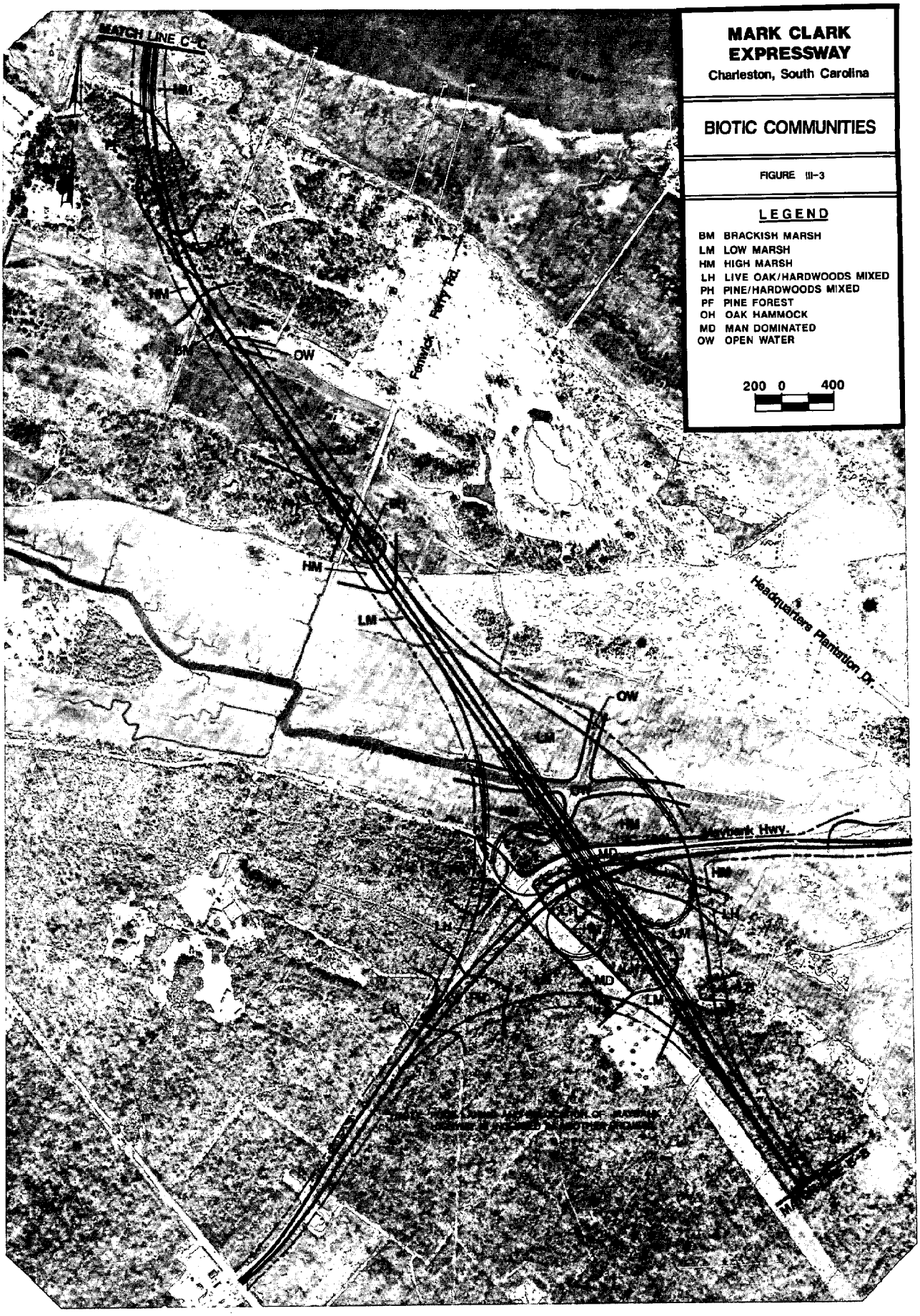

MARK CLARK EXPRESSWAY
Charleston, South Carolina
EXISTING LAND USE
FIGURE III-2
LEGEND
200 0 400
N
526
Mark Clark Expressway (I-526)
Citadel Mall
South Park
(SC 7) Sam Rittenberg Blvd.
Cherokee Arms Apartments
Sylcope
Arlington Dr.
Food Lion
Savannah Hwy. (US 17)
Oakland Townhouses
Self Storage
Oakland Elem. School
St. Johns Church
West Ashley Greenway
Edgewood Gardens
CPW
Clayton Dr.
Oakland
Glidden Woods
Eastshore Lane
Ris Harbor
Waterway South
Capri Isles

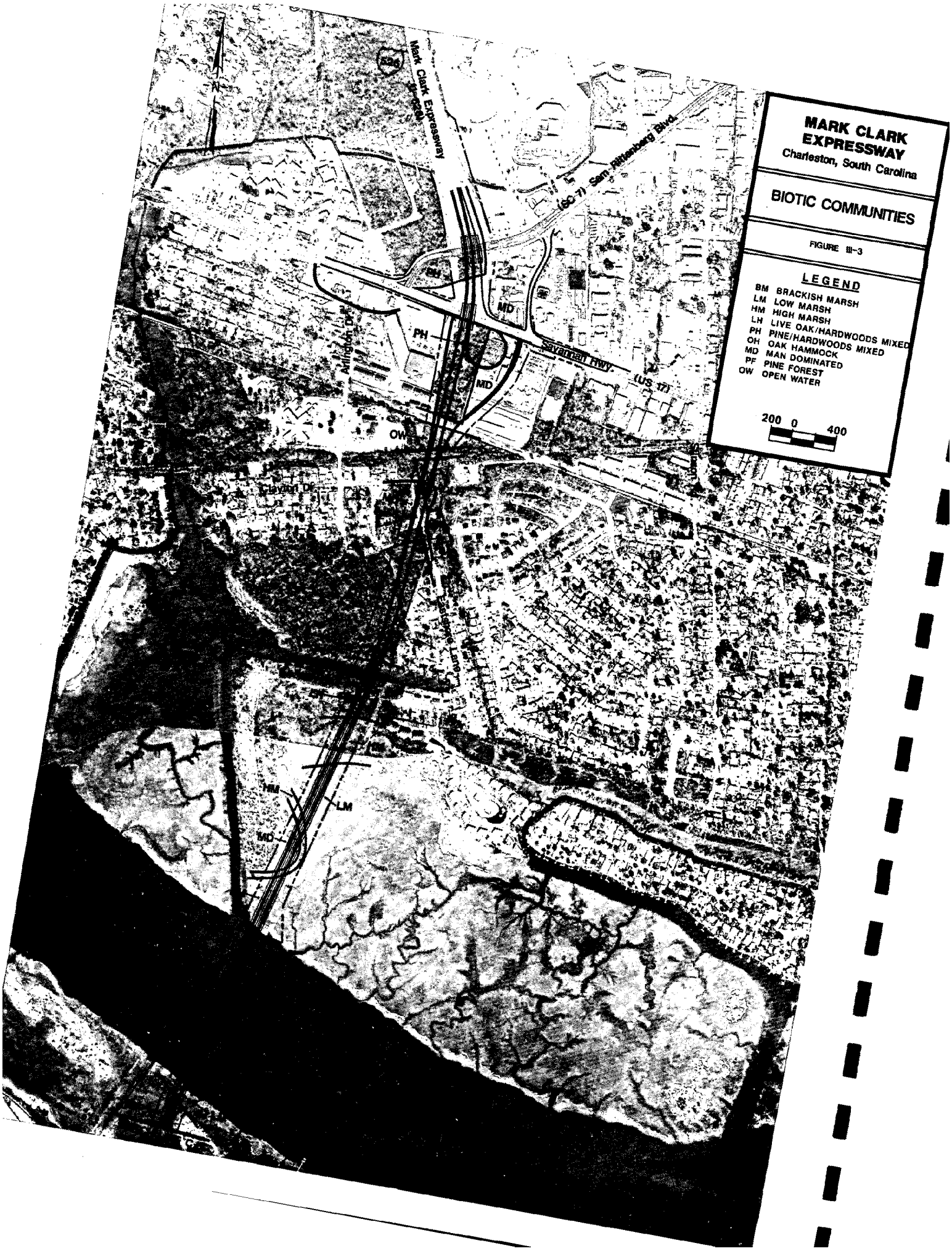

MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE II-3
LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
PF PINE FOREST
OH OAK HAMMOCK
MD MAN DOMINATED
OW OPEN WATER
200 0 400
(SC 30) James Island Expressway
N
Folly Rd. (SC 171)
James Island
Oak Point
Frampton Rd.
Central Park Rd.
Riley Rd.
Wimbledon Dr.
Fleming Rd.
Riverland Dr.
Lucky Rd.
Woodland Shores Dr.
Camp Rd.
Creek
Bridgham Rd.
ALTERNATE A
ALTERNATE B
ALTERNATE D
MATCH LINE A-A


MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE III-3
LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
PF PINE FOREST
OH OAK HAMMOCK
MD MAN DOMINATED
OW OPEN WATER
200 0 400
(SC 90) James Island Expressway
Folly Rd.
Dorchester Rd.
Fleming Rd.
Lucky Rd.
Riverland Dr.
ALTERNATE C
MD
LH

LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
PF PINE FOREST
OH OAK HAMMOCK
MD MAN DOMINATED
OW OPEN WATER
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE III-3
ALTERNATE C
OW
LM
HM
LH
MD
Maybank Hwy. (SC 700)
Headquarters Plantation Dr.

LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
PF PINE FOREST
OH OAK HAMMOCK
MD MAN DOMINATED
OW OPEN WATER
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE III-3
ALTERNATE B
ALTERNATE A
ALTERNATE D
OW
LM
HM
LH
MD
Maybank Hwy (SC 700)
Headquarters Plantation Dr.


MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE III-3
LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
PF PINE FOREST
OH OAK HAMMOCK
MD MAN DOMINATED
OW OPEN WATER
200 0 400
MATCH LINE C-C
Fenwick Ferry Rd.
Headquarters Plantation Dr.
Hwy.


MARK CLARK EXPRESSWAY
Charleston, South Carolina
BIOTIC COMMUNITIES
FIGURE III-3
LEGEND
BM BRACKISH MARSH
LM LOW MARSH
HM HIGH MARSH
LH LIVE OAK/HARDWOODS MIXED
PH PINE/HARDWOODS MIXED
OH OAK HAMMOCK
MD MAN DOMINATED
PF PINE FOREST
OW OPEN WATER
200 0 400
N
Mark Clark Expressway
(SC 7) Sam Rittenberg Blvd.
Savannah Hwy. (US 17)
Arlington Dr.
Clayton Dr.
Tanglewood Lane
BM
PH
MD
OW
PF
HM
LM

for roadways, bridge approaches, and artificial drainage patterns may require permits from the U.S. Army Corps of Engineers (USACOE), Charleston District, and the Ocean and Coastal Resources Management (OCRM), as well as Section 401 water quality certification from the South Carolina Department of Health and Environmental Control (SCDHEC).

Wetland boundaries in the vicinity of the proposed highway corridor have been identified and mapped according to jurisdictions. The proposed road alignment and improvements cross the following wetland habitats: low marsh, high marsh, brackish marsh, live oak/hardwood mixed, pine/hardwood mixed, pine forest, oak hammock, and open water. Wetlands identified as Critical Area (CA) are tidal salt marsh wetlands under the permit jurisdiction of the OCRM. Freshwater wetlands within the permit jurisdiction of the USACOE are delineated as freshwater wetlands (W). These wetland areas are shown in Figure III-4.

3. Endangered and Threatened Species

The project is within the historical range of 25 federally listed endangered, threatened, or candidate species potentially occurring within Charleston County. Literature reviews and coordination with wildlife resource agencies (Appendix B) provided the base data collection. Field investigations were performed for each potential habitat in the project corridor during the most active season for the majority of target species. Habitat descriptions, locations, and results of the evaluation are presented in Appendix B.

4. Water Quality

An evaluation of surface water quality data indicated no contraventions of state water quality standards for pH or temperature for stations in the Stono River near the project. Dissolved oxygen levels for some stations in the study area were below the state minimum quality criteria; however, levels were indicative of natural estuarine systems.

The Stono River within the project area is classified as SFH (shellfish harvesting water - tidal salt waters protected for shellfish harvesting) as of October 10, 1991 Regulations 61-68 and 61-69 Water Classification and Standards and Classified Waters (SCDHEC 1991). The SCDHEC has currently designated the project area as "restricted" for shellfish harvesting. This classification is due to localized water quality concerns and prohibits shellfish harvesting for direct consumption.

5. Water Body Modification

Surface waters of the project area consist of the Stono River, two tidal creeks, two open water ponds of three acres or less in size, two man-made drainage ditches, and one canal. The Stono River is navigable via a maintained and marked channel and is used for recreation. The mouth of the river is subject to shoaling and is used by local fishermen and some recreational boaters. The portion of the river west of the Wappoo Cut is part of the Intracoastal Waterway and is used for interstate commerce. The proposed project crosses the Stono River twice, at approximately 11 and 14 miles from its mouth at the Atlantic Ocean. The northernmost bridge crosses the Intracoastal Waterway. The riverine ecosystem of the Stono River may be further classified as an intertidal estuarine subsystem based on tidal changes, vegetative composition, and proximity to the ocean inlet. Penny's Creek and James Island Creek are tidal creeks which may also be classified as intertidal estuarine subsystem under the influence of tidal changes. Evidence of channel dredging in these tidal creeks has been observed. Additionally, numerous shallow, non-navigable tidal creeks wind through the low marshes and empty into the Stono River.

6. Coastal Zone

The policy of the State of South Carolina under the Federal Coastal Zone Management Act of 1972 is to protect the quality of the coastal environment and to promote the economic and social improvement of the coastal zone. In order to meet Federal and State requirements, the OCRM has established Geographic Areas of Particular Concern (GAPC) in its coastal zone in terms of four broad categories: areas of unique natural resource value, areas offering substantial recreational value, areas where activities depend on proximity to coastal waters, and areas of special historical, archaeological, and cultural significance. GAPC's identified within the project corridor include wetlands, shellfish harvesting areas, endangered or threatened species, groundwater resources, navigational channels, and cultural resources.

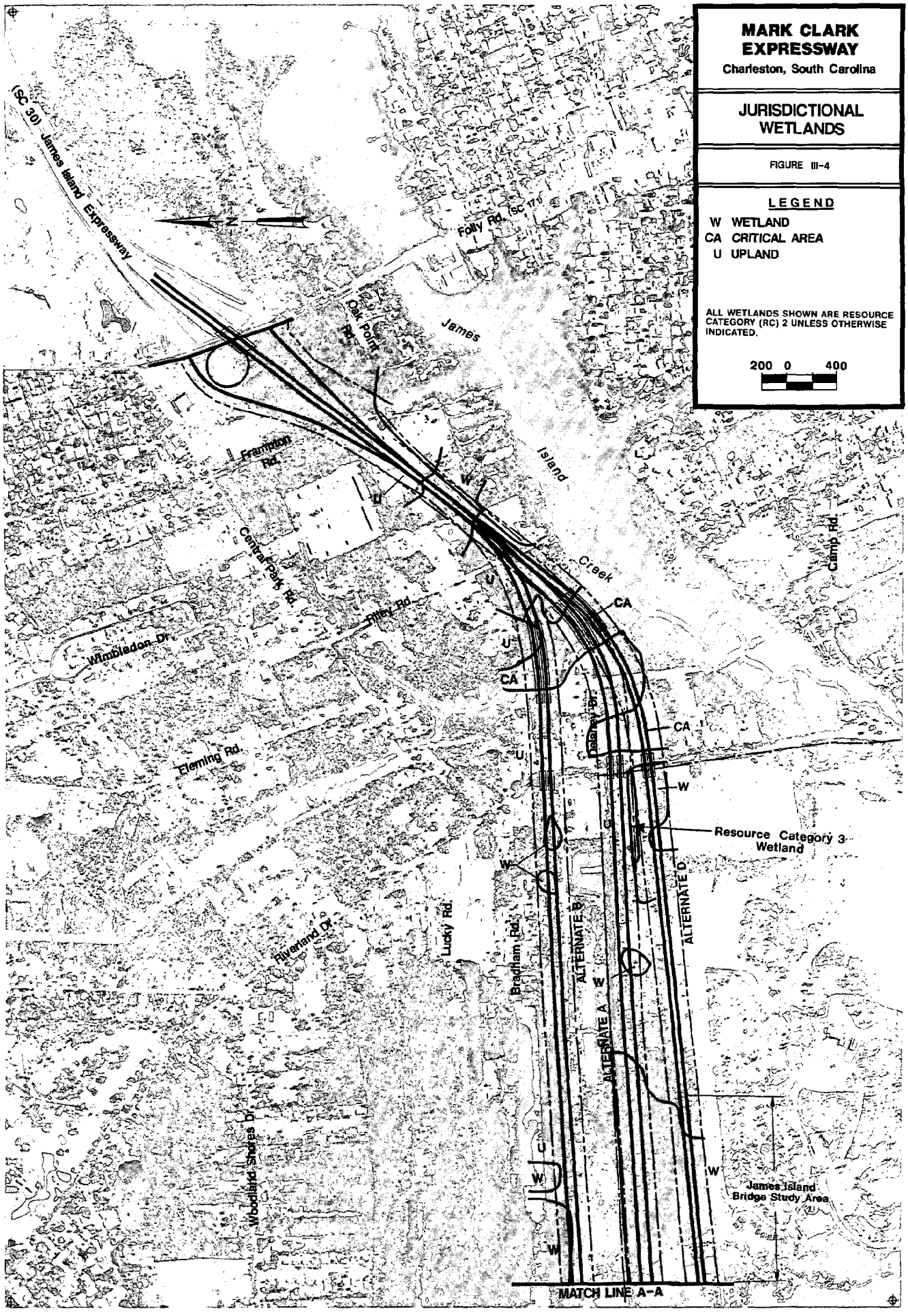
E. Ambient Noise

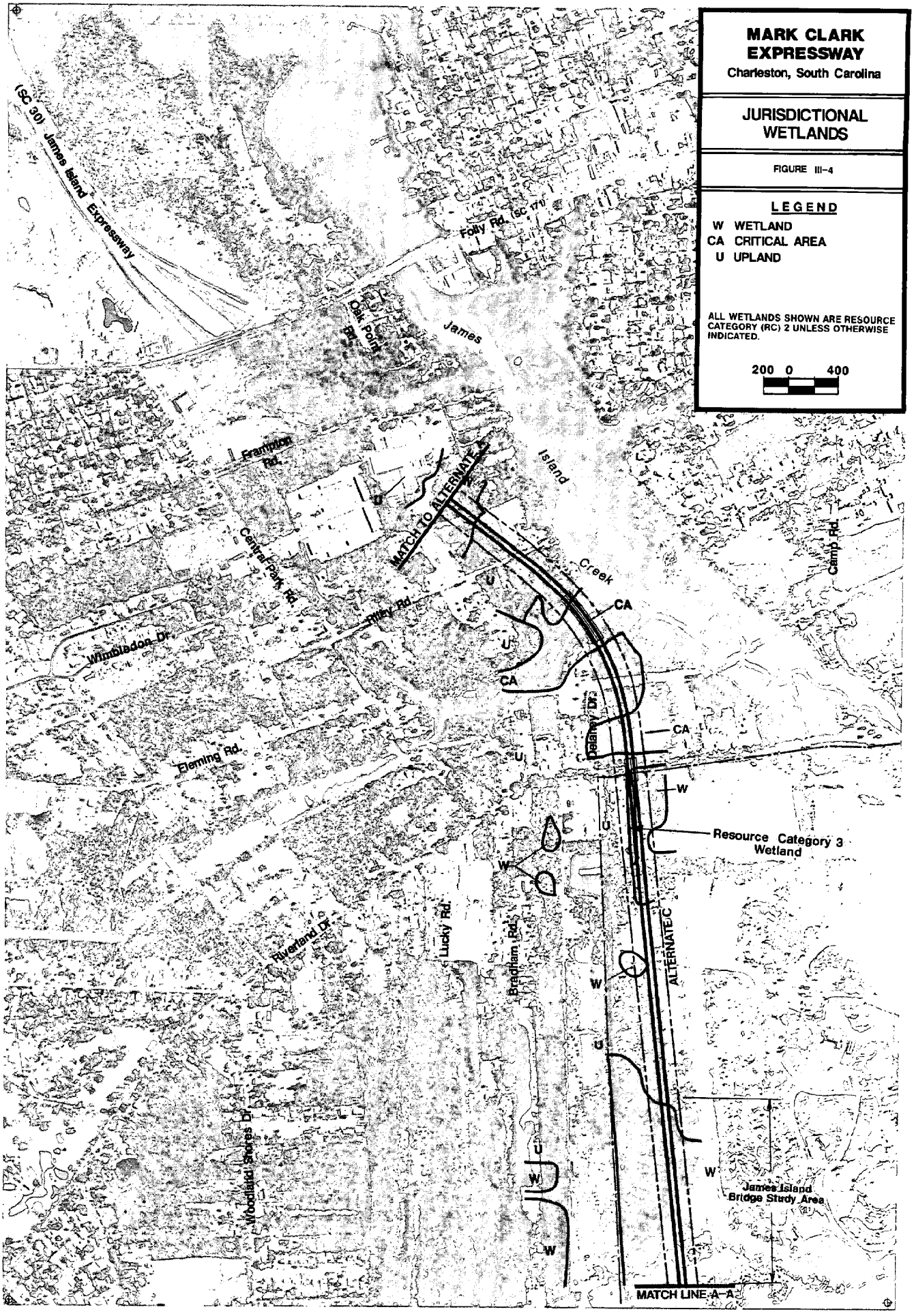
To determine if highway noise levels are compatible with various land uses, the FHWA has developed noise abatement criteria and procedures to be used in the planning and design of highways. These abatement criteria and procedures are in accordance with Title 23 Code of Federal Regulations (CFR), Part 772, U.S. Department of Transportation (USDOT), FHWA, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. A summary of the FHWA Noise Abatement Criteria (NAC) for various land uses is presented in Table III-2.

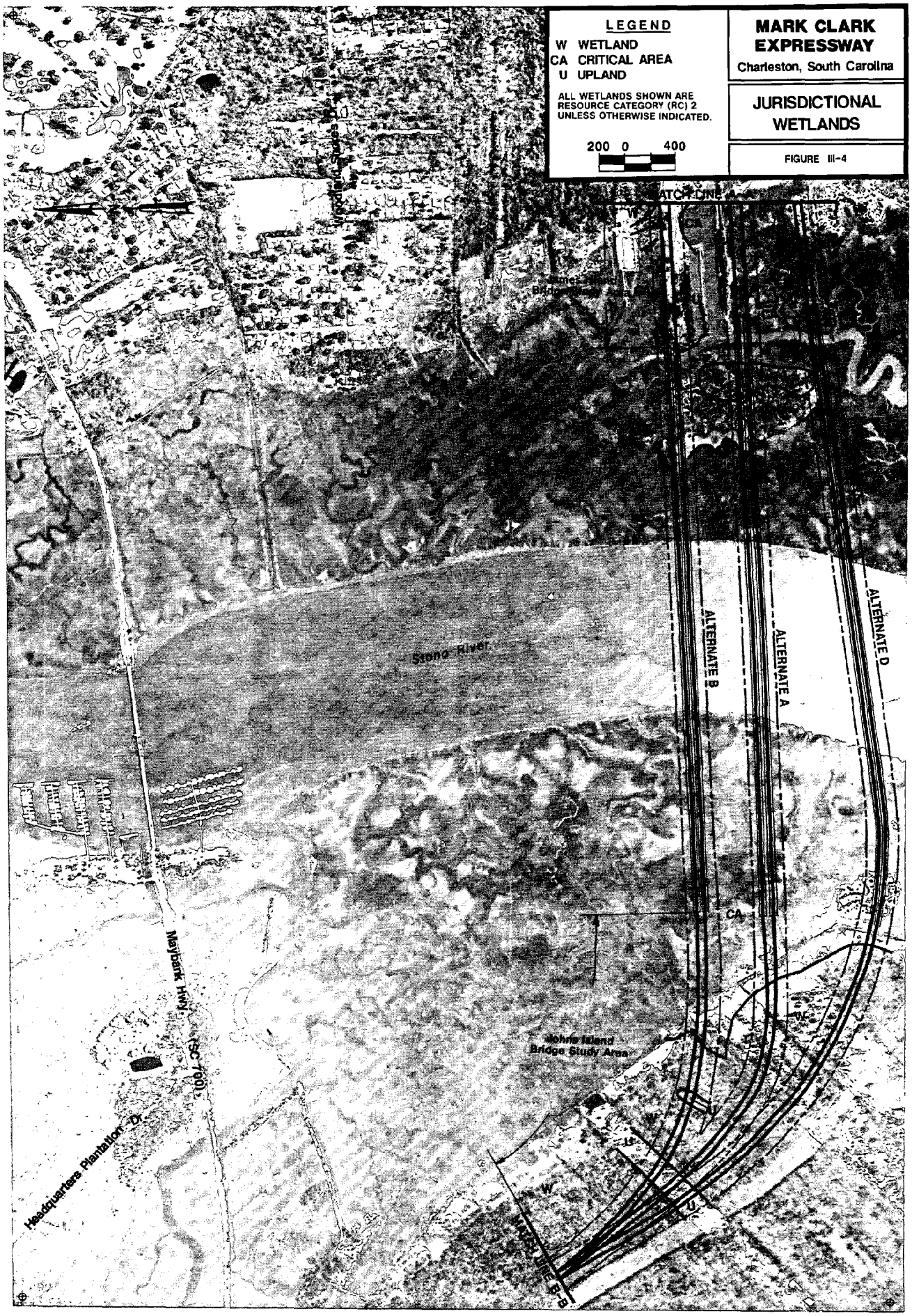
TABLE III-2
NOISE ABATEMENT CRITERIA
Hourly A-Weighted Sound Level -- Decibels (dBA)

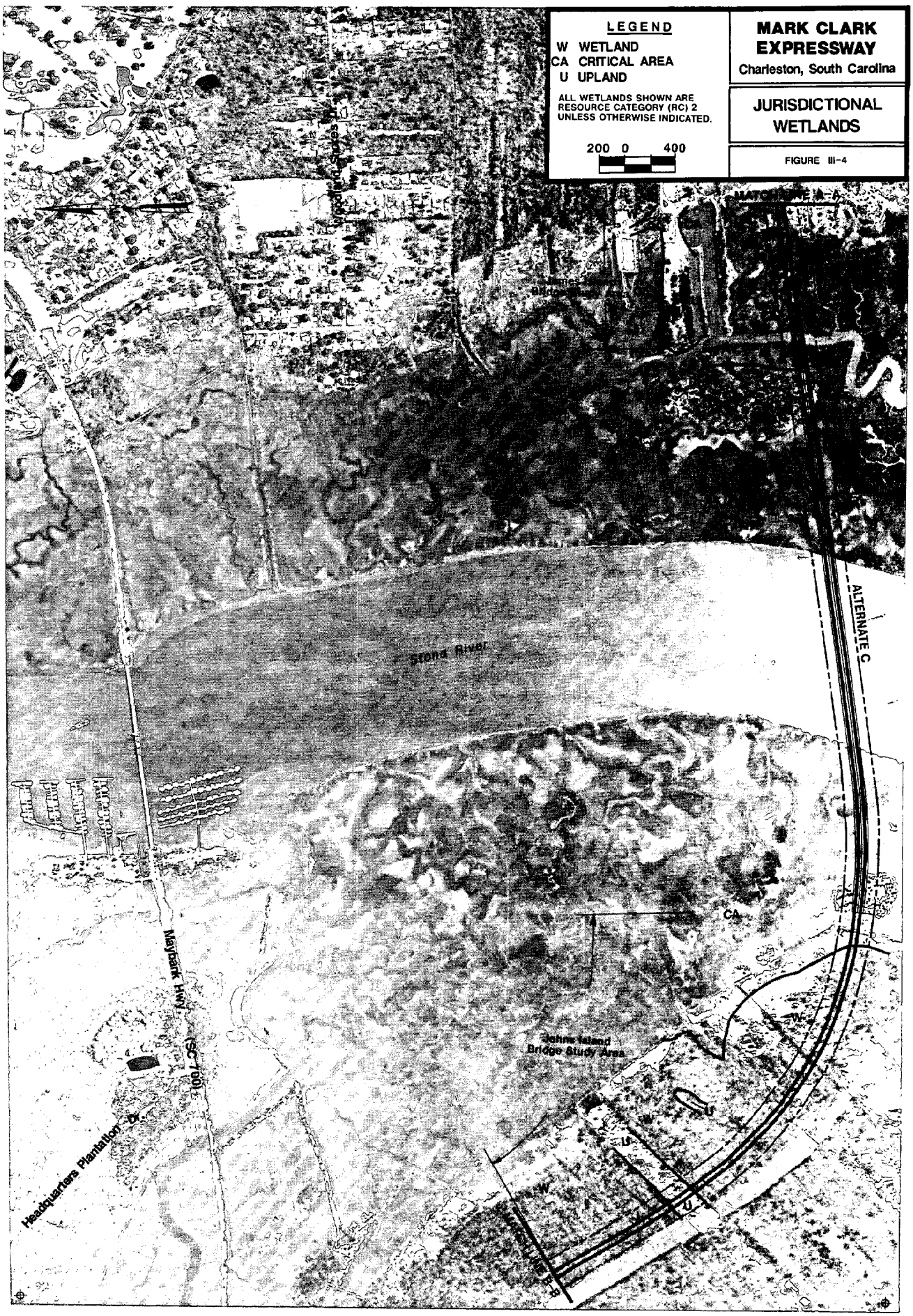
Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

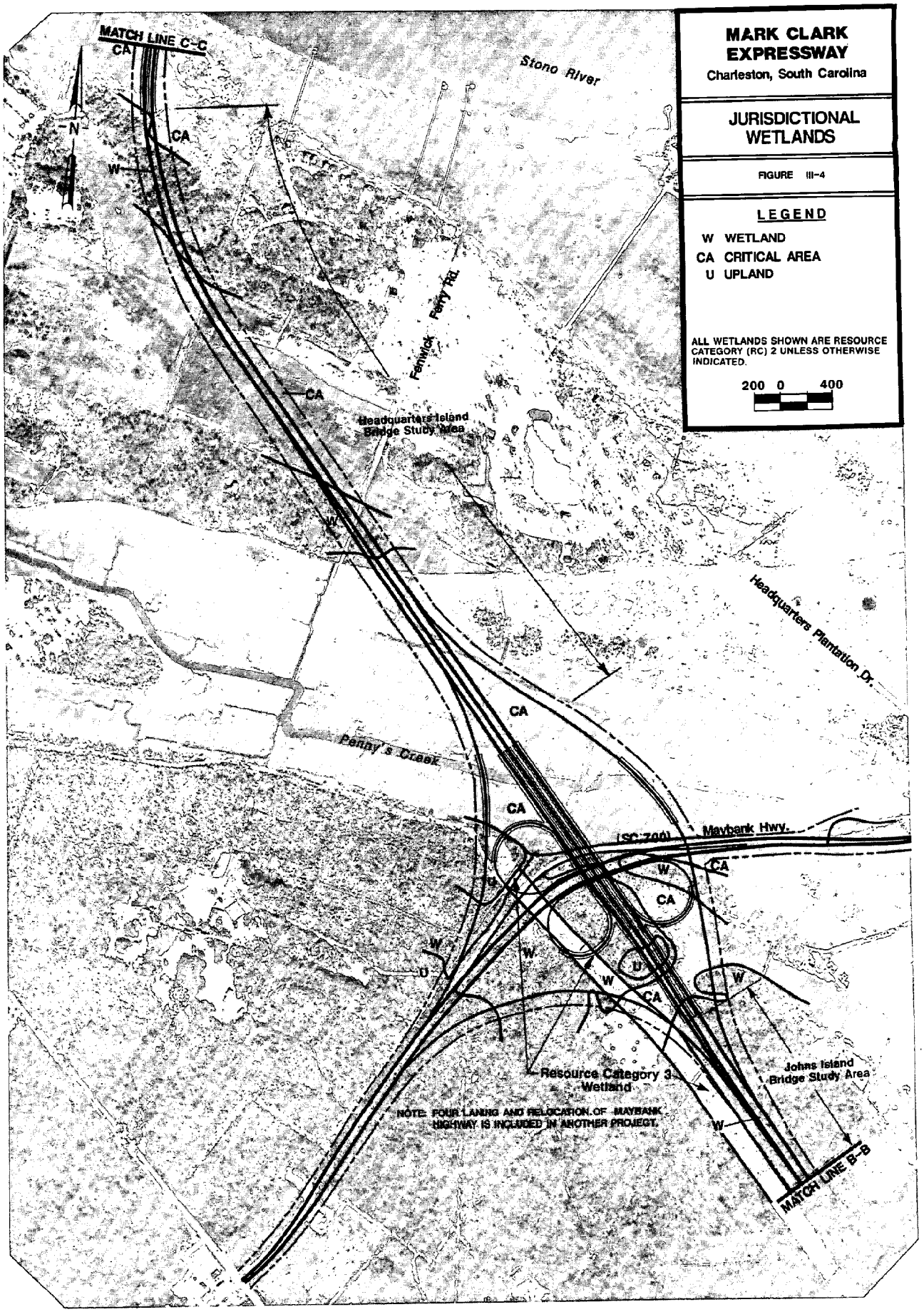
One factor for considering traffic noise mitigation is when future noise levels either approach or exceed the criteria levels for each activity category. Title 23 CFR, Section 772.11(a) states, "In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit." For this project, all of the identified receptors fit within categories B and C. Therefore, Category E was not applicable. No category A receptors were identified.

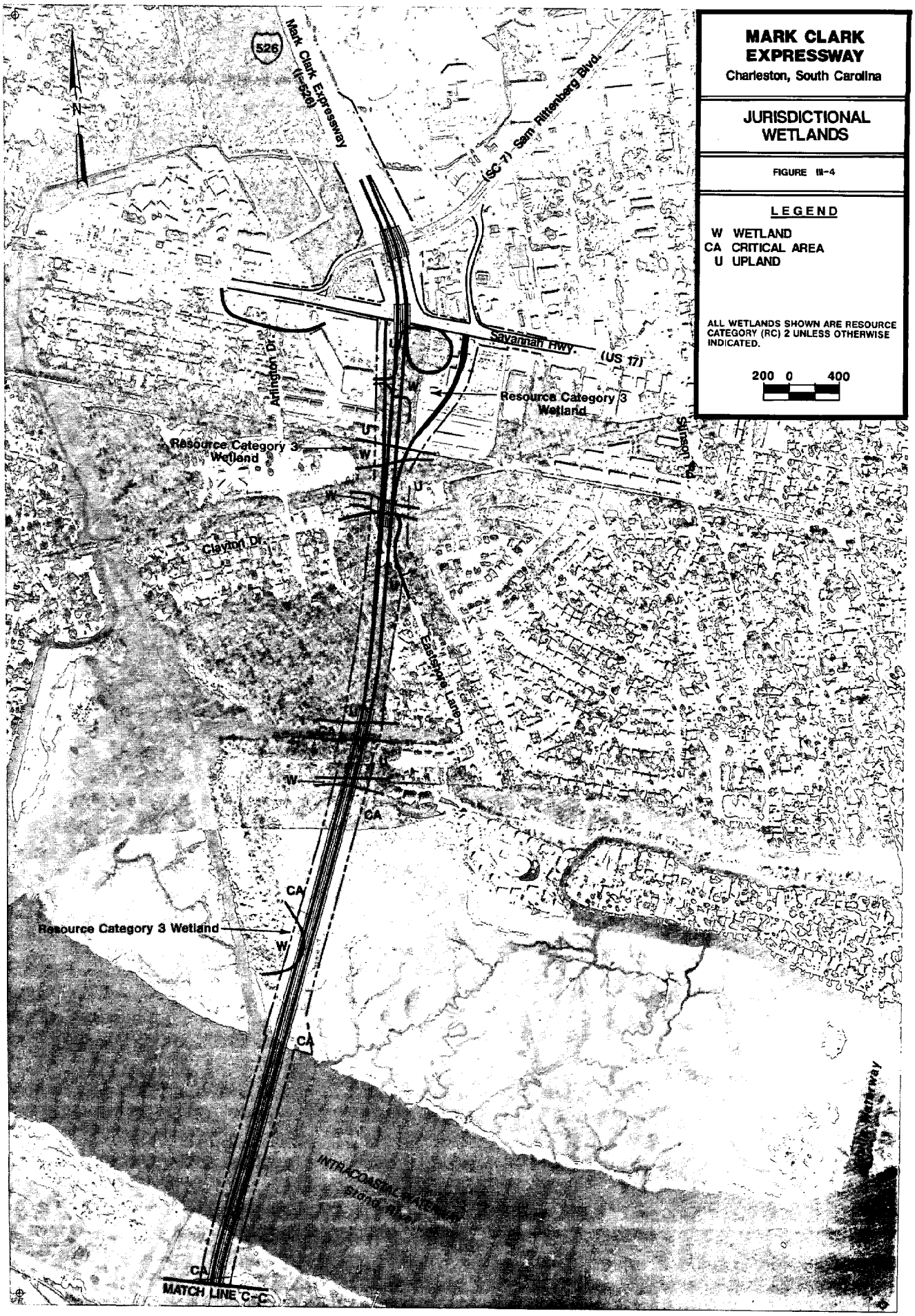

MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
(SC 30) James Island Expressway
Folly Rd. (SC 171)
Oak Point Rd.
James Island Creek
Frampton Rd.
Central Park Rd.
Riley Rd.
Wimbledon Dr.
Fleming Rd.
Riverland Dr.
Lucky Rd.
Bradham Rd.
Woodland Shores Dr.
Camp Rd.
Resource Category 3 Wetland
ALTERNATE B
ALTERNATE A
ALTERNATE D
James Island Bridge Study Area
MATCH LINE A-A


MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
(SC 30) James Island Expressway
Folly Rd. (SC 171)
Oak Point Rd.
James Island Creek
Frampton Rd.
MATCH TO ALTERNATE A
Central Park Rd.
Tiffley Rd.
Wimbledon Dr.
Fleming Rd.
Riverland Dr.
Lucky Rd.
Bradham Rd.
Woodland Shores Dr.
Camp Rd.
Parallel
ALTERNATE C
Resource Category 3 Wetland
James Island Bridge Study Area
MATCH LINE A-A
W
CA
U


LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
ALTERNATE B
ALTERNATE A
ALTERNATE D
Stono River
Maybank Hwy. (SC 700)
Headquarters Plantation
Johns Island Bridge Study Area
CA
W
U


LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
Stono River
ALTERNATE C
Maybank Hwy. (SC 700)
Headquarters Plantation Dr.
Johns Island Bridge Study Area
CA
U
W


MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
MATCH LINE C-C
MATCH LINE B-B
Stono River
Fenwick Ferry Rd.
Headquarters Island Bridge Study Area
Headquarters Plantation Dr.
Penny's Creek
Maybank Hwy.
(SC 700)
Resource Category 3 Wetland
NOTE: FOUR LANING AND RELOCATION OF MAYBANK HIGHWAY IS INCLUDED IN ANOTHER PROJECT.
Johns Island Bridge Study Area
N
CA
W
U


MARK CLARK EXPRESSWAY
Charleston, South Carolina
JURISDICTIONAL WETLANDS
FIGURE III-4
LEGEND
W WETLAND
CA CRITICAL AREA
U UPLAND
ALL WETLANDS SHOWN ARE RESOURCE CATEGORY (RC) 2 UNLESS OTHERWISE INDICATED.
200 0 400
526
Mark Clark Expressway (I-526)
(SC-7) Sam Rittenberg Blvd.
Savannah Hwy. (US 17)
Arlington Dr.
Resource Category 3 Wetland
Resource Category 3 Wetland
Stinson Dr.
Clayton Dr.
Eastshore Lane
Resource Category 3 Wetland
INTRACOASTAL WATERWAY
Stono River
MATCH LINE C-C
W
U
CA

Noise sensitive areas in the vicinity of the project consist primarily of residential developments. Some of the subdivisions or apartments that could be affected by noise from the expressway include Emmanuel-Morris-Brown-Ebenezer Apartments, Bradham Road, Headquarters Plantation, Waterway South, Eastshore Lane, Air Harbor, Citadel Woods, Oakland, and Oakland Townhouses. Business near the corridor are primarily on Savannah Highway (US 17) and Folly Road (SC 171). Headquarters Plantation is platted but only partially developed. Murray Lassaine Elementary School, James Island County Park, Fenwick Hall Health Center, Oakland Elementary School, and St. Johns Church are also located near the proposed corridor. All of these potentially noise-sensitive uses are shown on Figure III-2. Field measurements were taken in accordance with FHWA procedures at seventeen locations in or near noise-sensitive areas to determine existing noise levels at receptors along the project. The noise measurement locations are shown on Figure III-5 and existing noise levels are listed in Table III-3.

TABLE III-3
SUMMARY OF EXISTING NOISE LEVELS

Number	Location (close to centerline)	Existing Level Leq dB(A)
1	350 feet east of Arlington Drive, Oakland Townhouses (800 feet from Savannah Highway)	51
2	300 feet east of Arlington Drive, St. Johns Church (1200 feet from Savannah Highway)	50
3	200 feet east of Eastshore Lane, Citadel Woods Subdivision	50
4	East of Lynwood Drive, Residential Area (300 feet from Eastshore Lane)	52
5	West of Northside Drive, at end of cul-de-sac (450 feet from Eastshore Lane)	53
6	West of Southshore Lane, at end of cul-de-sac	44
7	South of Fenwick Ferry Road, at dead end road	43
8	North of Marshview Circle, County Park	46
9	South of Bradham Road, Residential Area (900 feet from Riverland Drive)	46
10	South of Lucky Road, Murray-Lassaine Elementary School (500 feet from Riverland Drive)	47
11	West of Bradham Road, at dead end road	48
12	North of Delaney Road, at dead end road (900 Feet from Riverland Drive)	46
13	South of Central Park Avenue, EME Apartments (1,000 feet from Central Park Road, 1,400 feet from Folly Road)	52
14	South of Oak Point Road, at dead end road (900 feet from Folly Road)	53
15	55 feet north of Maybank Highway (East of Headquarters Plantation)	67
16	80 feet west of Riverland Drive North of Delaney Drive)	56
17	85 feet east of Folly Road (South of Proposed Mark Clark Expressway	67

Ambient noise is the noise resulting from natural and mechanical sources and human activity considered to be usually present in a particular area. The purpose of this information was to quantify the existing acoustic environment, thus providing a base for assessing the impact of noise levels for residences and other noise-sensitive receptors. Differences in the measured noise levels are attributed to variations in site conditions and traffic volumes. For the purpose of impact assessment, a baseline ambient sound level of 45 dBA was established. This level is applicable to the quiet areas of the study corridor where no influence from traffic occurs.

Ambient noise levels for all receptors were developed based on the noise levels at the monitored locations. A 4.5 dBA decrease in noise with each doubling of distance was assumed.

F. Ambient Air Quality

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six pollutants: particulate matter (PM-10), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). In addition, the South Carolina Department of Health and Environmental Control (SCDHEC) has established state standards for gaseous fluorides (HF). Monitoring of these pollutants is performed statewide by SCDHEC. Table III-4 is a summary of the EPA and SCDHEC air quality standards. Primary standards were established allowing an adequate margin of safety for protection of public health. Secondary standards were established with an adequate margin of safety to protect the public welfare from adverse effects associated with pollutants in the ambient air. When these standards are exceeded as outlined, an area is labeled as non-attainment for that pollutant.

TABLE III-4
SUMMARY OF EPA AND SCDHEC
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	EPA Primary Standard	EPA Secondary Standards	SCDHEC Standard
PM-10	Annual Arithmetic Mean	50 $\mu g/m^3$	Same as primary	50 $\mu g/m^3$
	24 hour[a]	150 $\mu g/m^3$	Same as primary	150 $\mu g/m^3$
SO_2	Annual Arithmetic Mean	80 $\mu g/m^3$	None	80 $\mu g/m^3$
	24 hour[b]	365 $\mu g/m^3$	None	365 $\mu g/m^3$
	3 hour[b]	None	1,300 $\mu g/m^3$	1,300 $\mu g/m^3$
NO_2	Annual Arithmetic Mean	100 $\mu g/m^3$	Same as primary	100
CO	8 hour[b]	9 ppm	None	9 ppm
	1 hour[b]	35 ppm	None	35 ppm
O_3	1 hour[a]	0.12 ppm	Same as primary	0.12 ppm
Pb	Quarterly Arithmetic Mean[b]	1.5 $\mu g/m^3$	Same as primary	1.5 $\mu g/m^3$
HF	12 Hour	None	None	3.7 $\mu g/m^3$
	24 Hour	None	None	2.9 $\mu g/m^3$
	1 week	None	None	1.5 $\mu g/m^3$
	1 month	None	None	0.8 $\mu g/m^3$

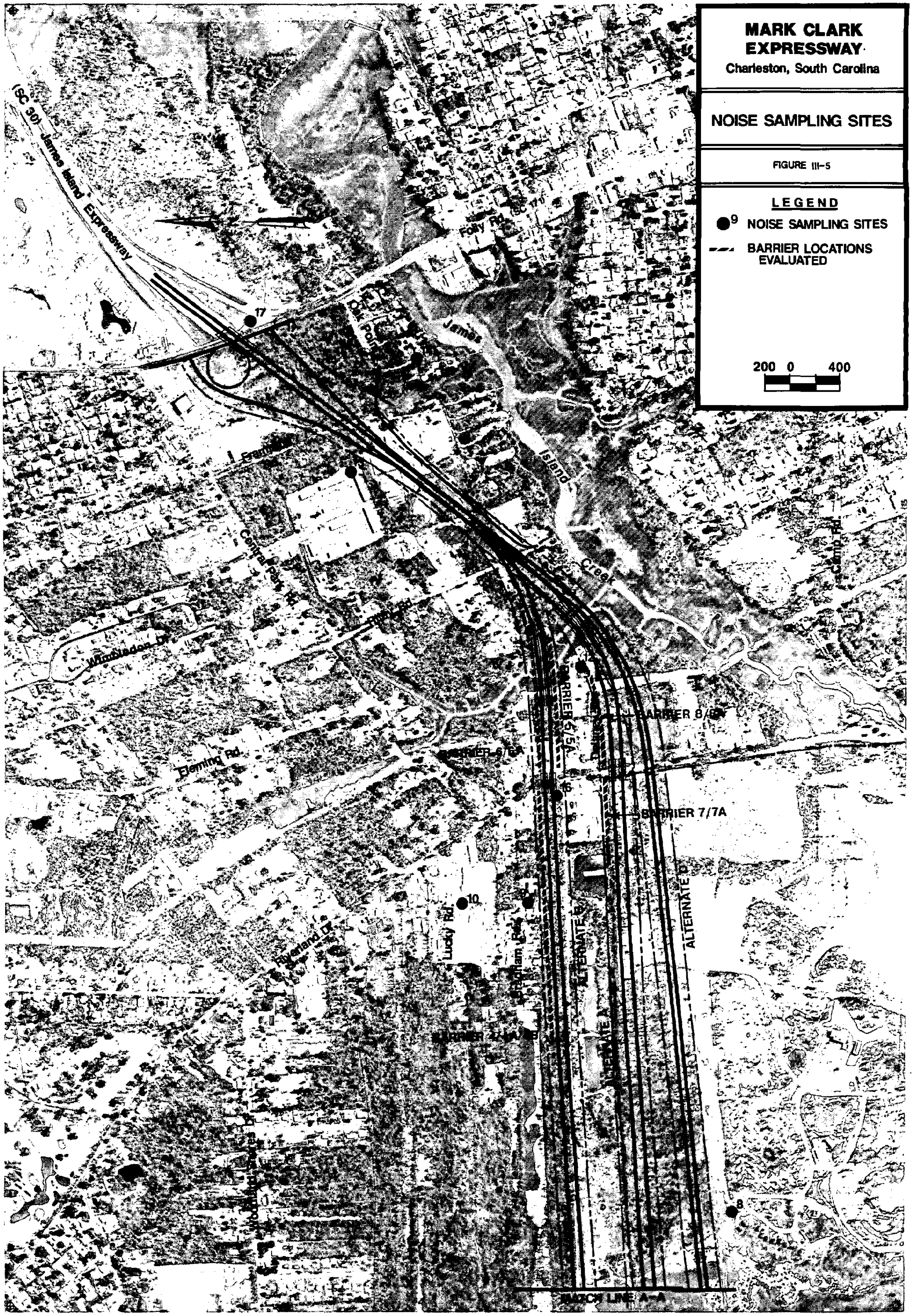
a. Not to be exceeded more than one day per year averaged over a three year period.
b. Not to be exceeded more than once per year.
$\mu g/m^3$ - Micrograms per cubic meter of air
mg/m^3 - Milligrams per cubic meter of air
ppm - Parts per million
Microgram - One millionth of a gram, where 454 grams = 1 pound

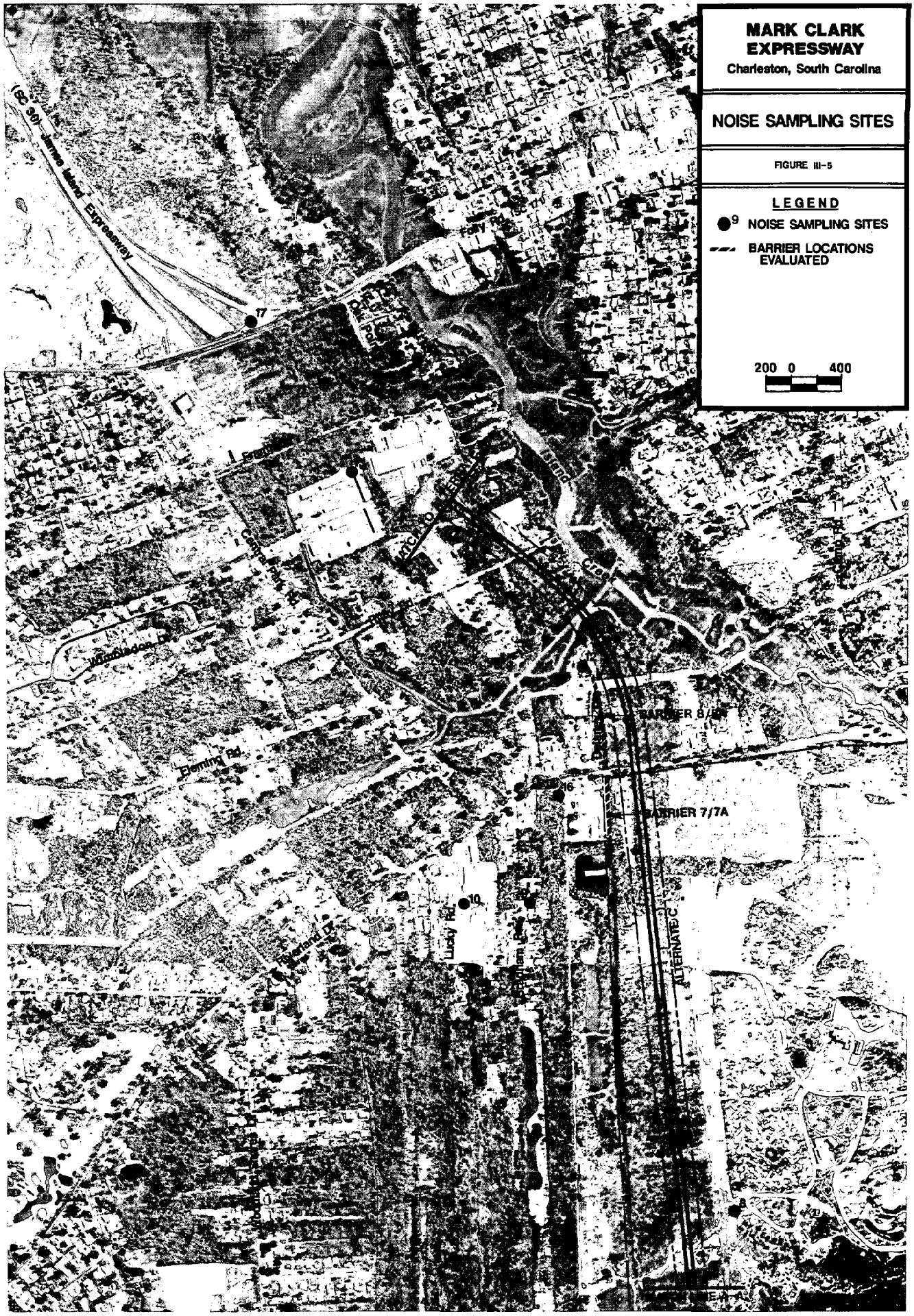
Source: 1989 South Carolina Air Quality Annual Report, Volume IX, South Carolina Department of Health and Environmental Control.

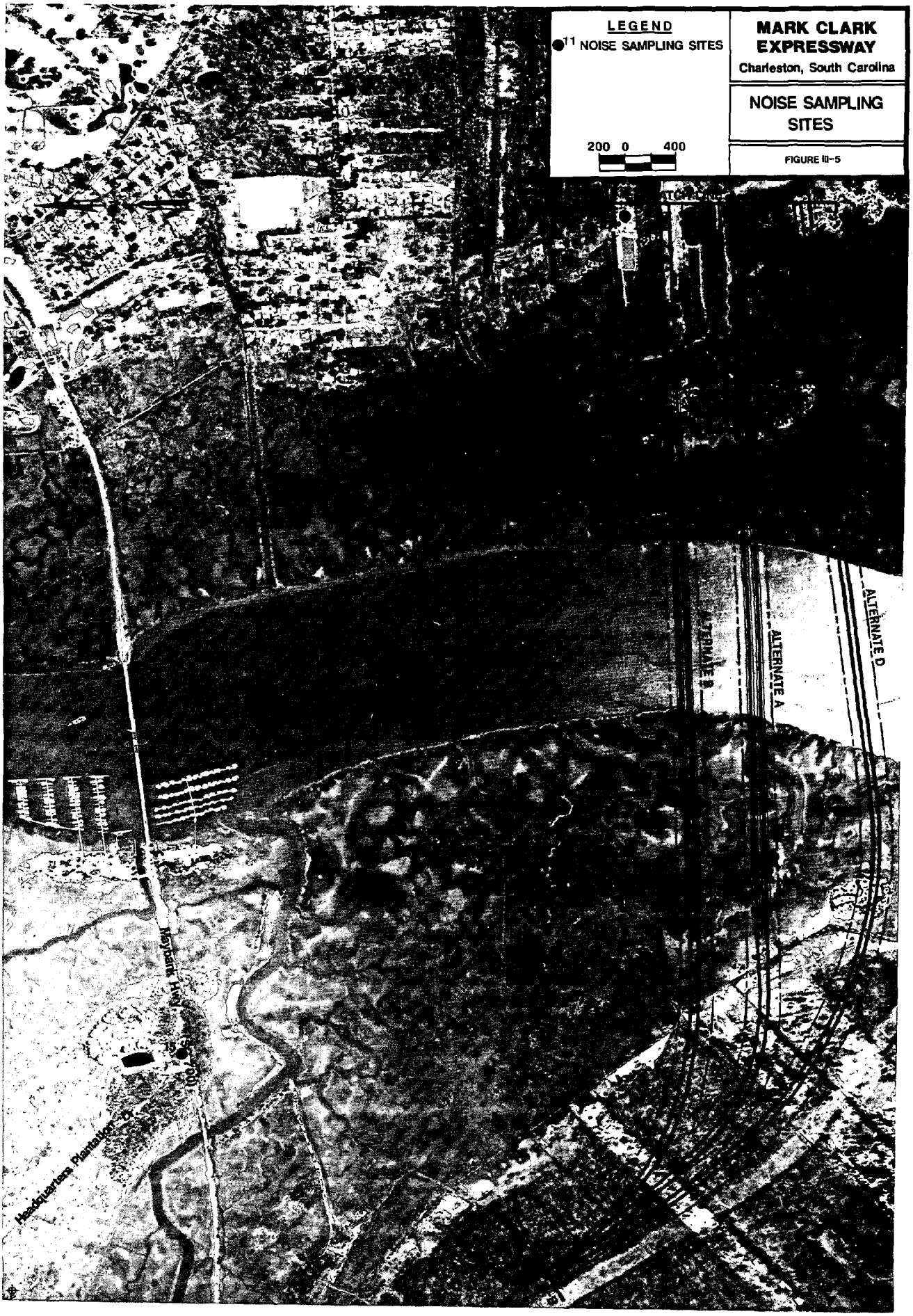
G. Potential Hazardous Material Sites

Potential hazardous waste sites include generators, treaters, and disposers of hazardous wastes, landfills, sewage treatment facilities, garbage dumps, abandoned service stations with underground storage tanks, fuel oil and gasoline storage tanks, and lagoons.

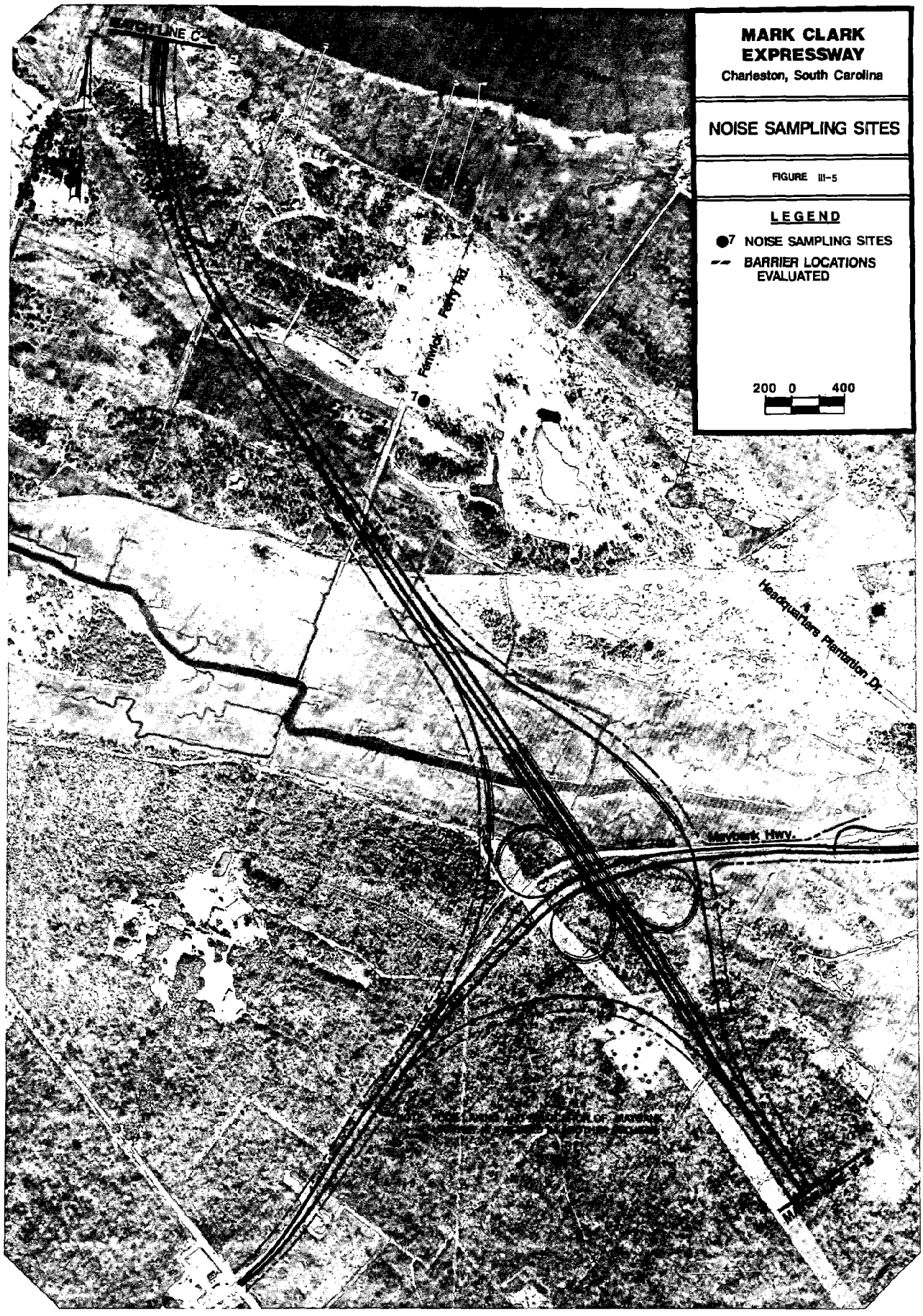
State and local officials were contacted to determine whether hazardous waste sites existed in the project study area. The study corridor was inspected in the field to ascertain the likelihood of

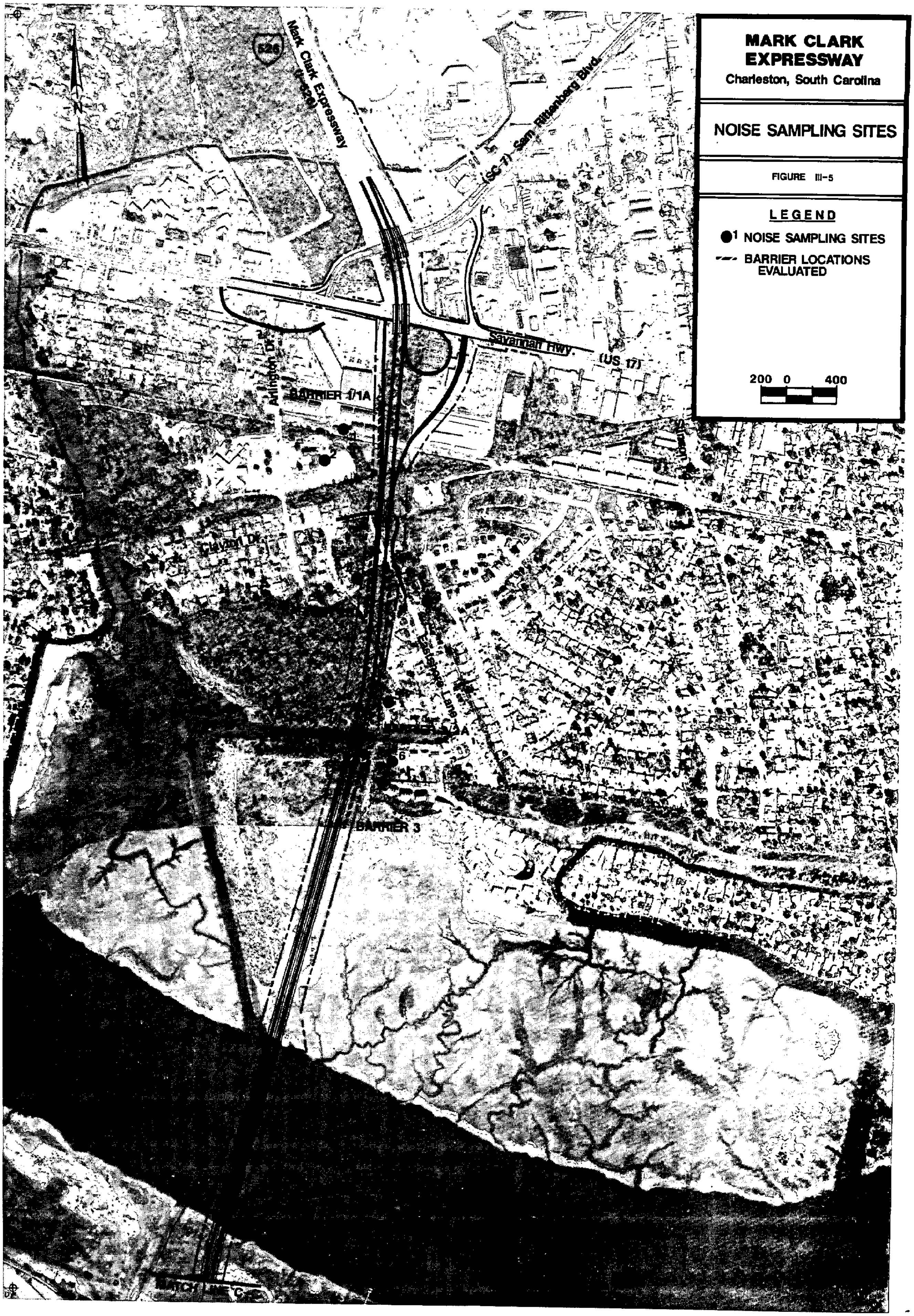

MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
LEGEND
9 NOISE SAMPLING SITES
BARRIER LOCATIONS EVALUATED
200 0 400
(SC 30) James Island Expressway
Folly Rd.
James Island Creek
Central Park Rd.
Wimbledon Dr.
Fleming Rd.
Camp Rd.
Lucky Rd.
Riverland Dr.
BARRIER 8/8A
BARRIER 7/7A
BARRIER 5/5A
ALTERNATE A
ALTERNATE B
17
10
8
MATCH LINE A-A


MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
LEGEND
9 NOISE SAMPLING SITES
BARRIER LOCATIONS EVALUATED
200 0 400
(SC 30) James Island Expressway
Folly Rd
Central Park Rd
Fleming Rd
Lucky Rd
Riverland Dr
Folly Creek
BARRIER 8/8A
BARRIER 7/7A
ALTERNATE C
17
16
12
10
8


LEGEND
11 NOISE SAMPLING SITES
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
ALTERNATE D
ALTERNATE B
ALTERNATE A
Headquarters Plantation Dr.
Maybank Hwy.


LEGEND
11 NOISE SAMPLING SITES
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
ALTERNATE C
Meybank Hwy
Headquarters Plantation Dr


MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
LEGEND
7 NOISE SAMPLING SITES
BARRIER LOCATIONS EVALUATED
200 0 400
Parkway
Headquarters Plantation Dr.
Maybank Hwy.


MARK CLARK EXPRESSWAY
Charleston, South Carolina
NOISE SAMPLING SITES
FIGURE III-5
LEGEND
1 NOISE SAMPLING SITES
BARRIER LOCATIONS EVALUATED
200 0 400
Mark Clark Expressway
Sam Rittenberg Blvd.
(SC 7)
Savannah Hwy.
(US 17)
Arlington Dr.
BARRIER 1/1A
Calvert Dr.
BARRIER 3
MATCH LINE C

hazardous waste sites. No reported or suspected areas of contamination were encountered. No industries using hazardous materials are believed to exist in the study corridor. However, Charleston Public Works operates the West Ashley sewer pump station which is located just east of the proposed alignment, approximately 1,300 feet south of US 17. This area is contained within the railroad right-of-way. Several businesses with underground storage tanks exist in the study area and are listed below and shown in Figure III-6.

1 Charleston County Police Station
617 Riverland Dr.
James Island, SC 29412

2 Westside Volkswagen, Inc.
1980 Savannah Hwy.
Charleston, SC 29407

3 Glidden Coatings & Resins
2020 Savannah Hwy. at Orleans St.
Charleston, SC 29407

4 American Mutual Fire Insurance
One Southpark Circle
Charleston, SC 29407

5 Stop N' Go #1
River Rd. and Maybank Hwy.
Johns Island, SC 29455

6 Fuel Express
707 Dupont Rd.
Charleston, SC 29407

7 Bayfront Shell
772 Folly Rd.
Charleston, SC 29412

8 Charleston Ford Tractor, Inc.
2097 Savannah Hwy.
Charleston, SC

9 Amoco Station
1917 Savannah Hwy.
Charleston, SC 29407

10 Budget Car and Truck Rental
Corner of Dupont and Savannah Hwy.
Charleston, SC 29407

11 Hess Station
2245 Savannah Hwy.
Charleston, SC 29407

12 Exxon Station
2209 Savannah Hwy.
Charleston, SC 29407

13 Texaco Station
Corner of Wappoo & Savannah Hwy.
Charleston, SC 29407

14 Speedway Service Station #388
737 Folly Road
Charleston, SC 29407

Three spills that have been reported near the study area are listed below:

-- S.C. Department of Transportation, Savannah Highway at Savage Road, 75 gallons of tar on 6-8-88
-- Brigman Foods, Savannah Highway near Savage Road, 100 gallons of diesel fuel on 8-14-89
-- Unknown source, Savannah Highway at Savage Road, 48 gallons of diesel fuel on 7-14-89

The results of this survey are based upon preliminary information only and are not intended to replace more detailed technical studies which deal with subsurface field investigations. Rather, this information is intended for use as a guide in identifying potential hazardous materials sites which may require technical studies to determine the existence of contamination prior to right-of-way acquisition or utility construction. Finally, it should be noted that hazardous materials sites may extend beyond those identified in this survey because of limited historical information and

illegal dumping practices. In addition, some of the small farms within the study area may contain individual underground storage tanks, previously undetected. The sources which have been reviewed to gather the hazardous materials information are listed below:

S.C. DHEC - Spills Inventory Report
S.C. DHEC - Underground Storage Tank Information
S.C. DHEC - Hazardous Waste Activities Reported in South Carolina for 1990
State CERCLA Site Inventory
RCRA Treatment, Storage, and Disposal Facilities in South Carolina
National/State Priority List Sites

H. Prime and Important Farmlands

Farmland is classified by the Farmland Protection Policy Act (FPPA) as either prime farmland, state and locally important farmland, or other lands. Because all of the study area is planned for urban uses, the provisions of the FPPA do not apply.

I. Floodplain

Flood Insurance Studies prepared by the Federal Emergency Management Agency (FEMA) have designated much of Charleston County as floodplain. The project location is totally within designated floodplain with the exception of the northern terminus which is between limits of the 100-year flood and the 500-year flood. The majority of the project length is in Zone V5 with the remainder divided between Zones B, A5, and A7.

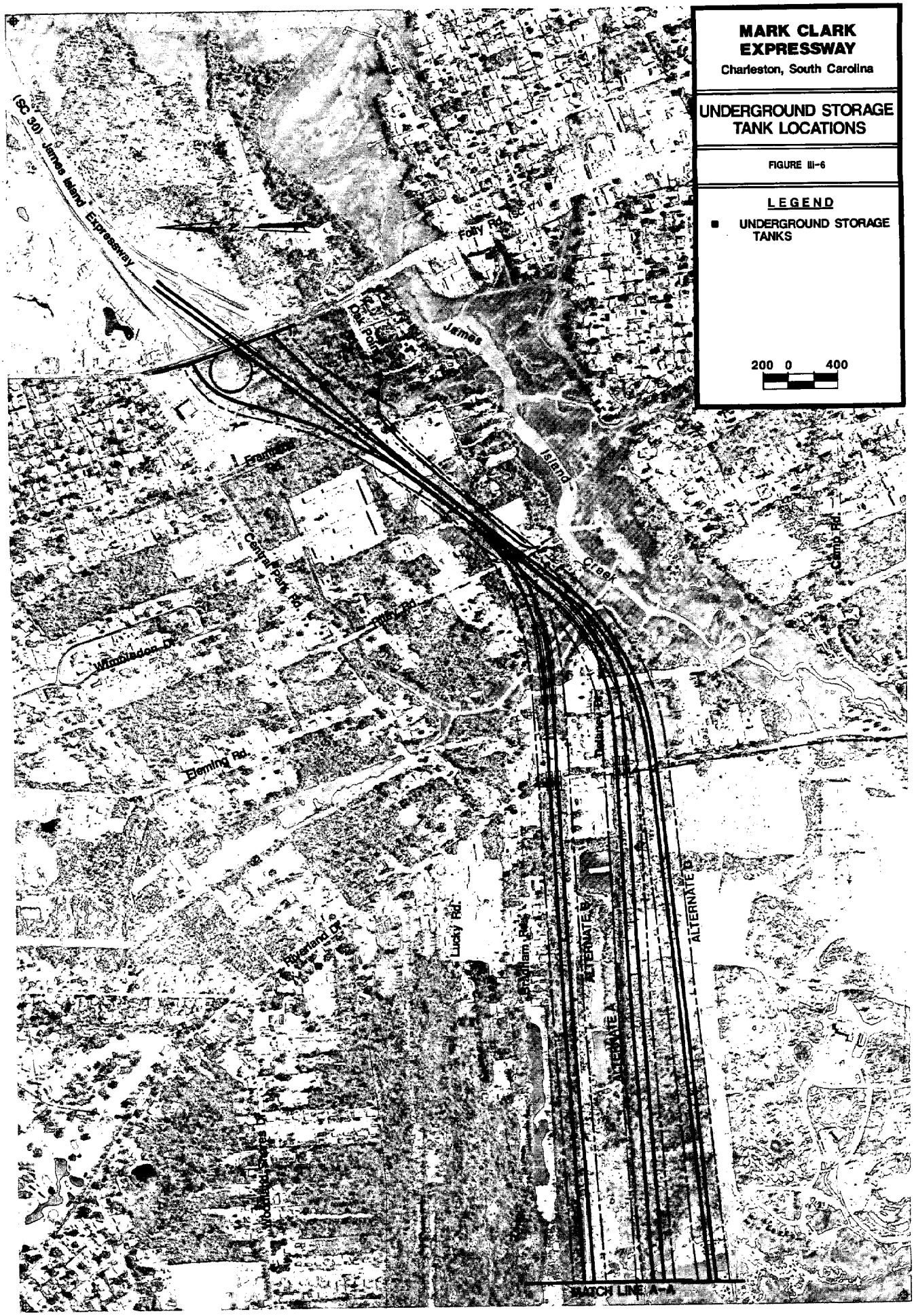
Zone V5 is defined as areas of 100-year coastal flood with velocity (wave action), with base flood elevations and flood hazard factors determined. Flooding of much of the study area is coastal flooding, caused by storm surge from the Atlantic Ocean, and does not relate to runoff.

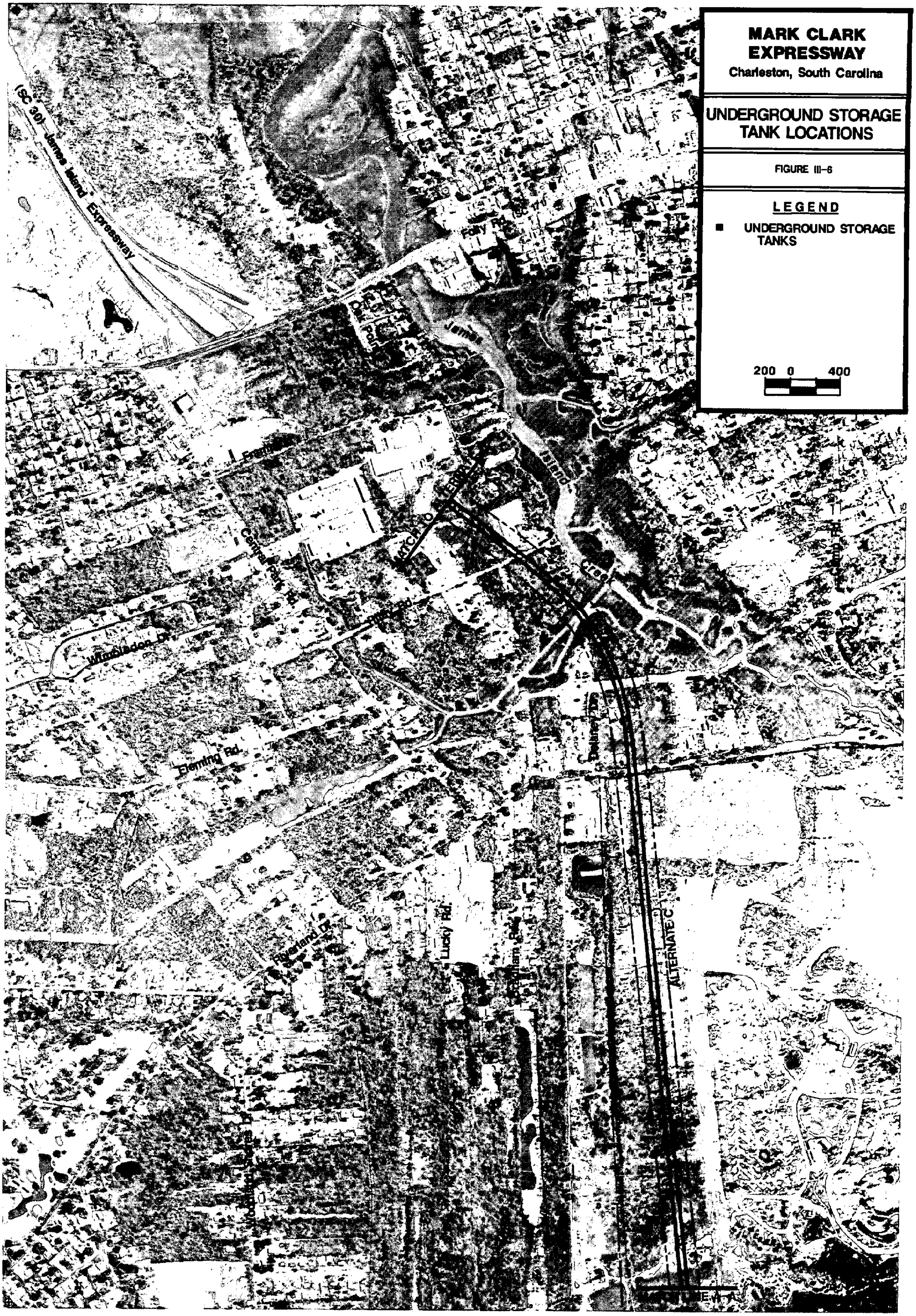
Zone B is defined as one of the following:
-- Areas between the limits of the 100-year flood and 500-year flood.
-- Certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile.
-- Areas protected by levees from the base flood.

Zones A5 and A7 are defined as areas of 100-year flood, with base flood elevations and flood hazard factors determined.

J. Cultural Resources

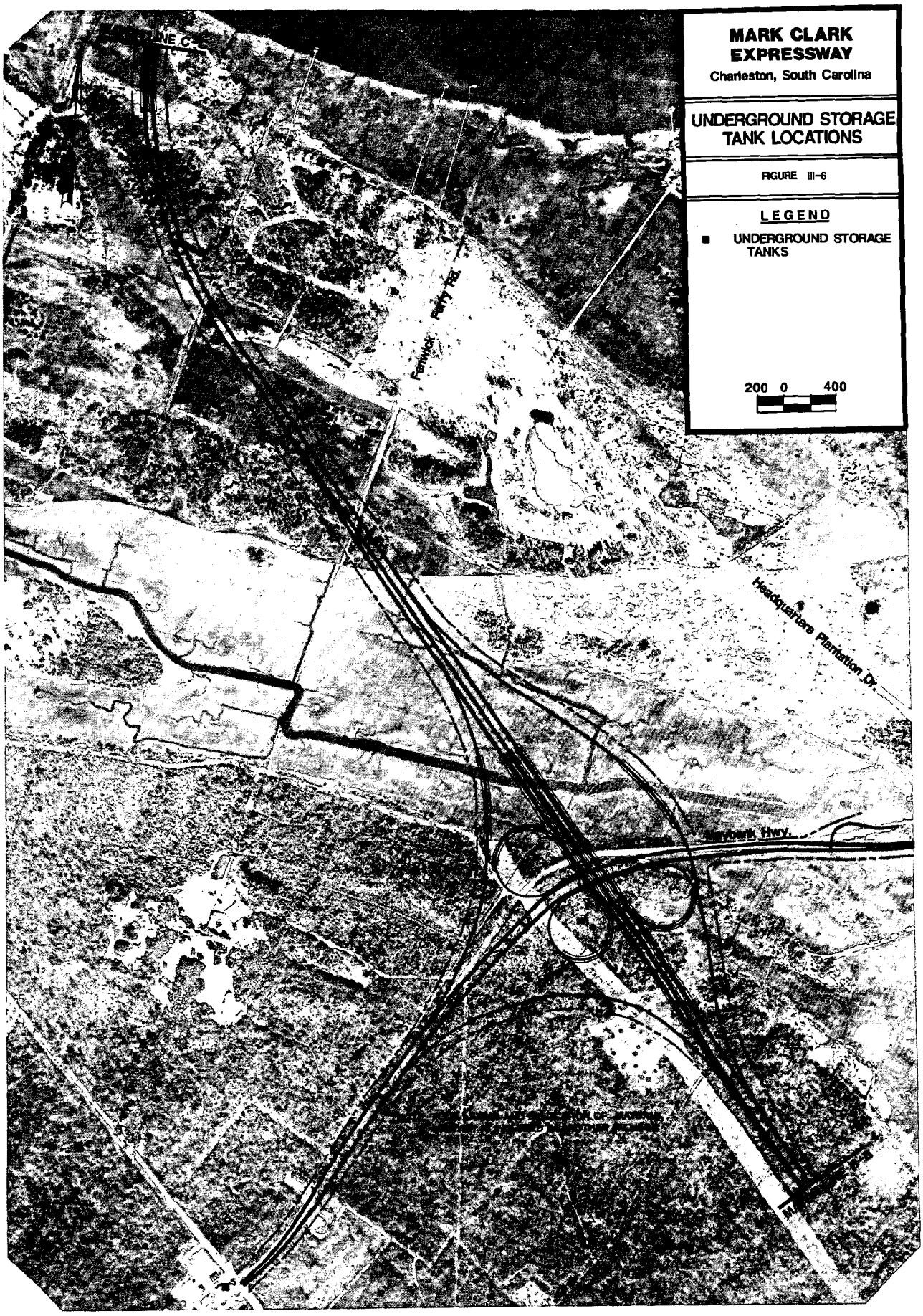
During the summer of 1992 and early 1993, a multi-task investigation of the cultural resources was conducted for this project, in compliance with Section 106 of the National Historic Preservation Act. Three tasks were completed: a historic architectural survey and evaluation, a remote sensing underwater investigation of the two Stono River crossings, and a terrestrial archeological survey of the two original alternatives, A and B. A detailed description of the survey and results is included in the technical memorandum: *An Architectural, Underwater Archaeological, and Terrestrial Archaeological Survey of the Mark Clark Expressway Project US Highway 17 to Folly Beach Road* (New South Associates, April 1993). This report was revised in September 1994 to include additional testing for Alternates C and D.

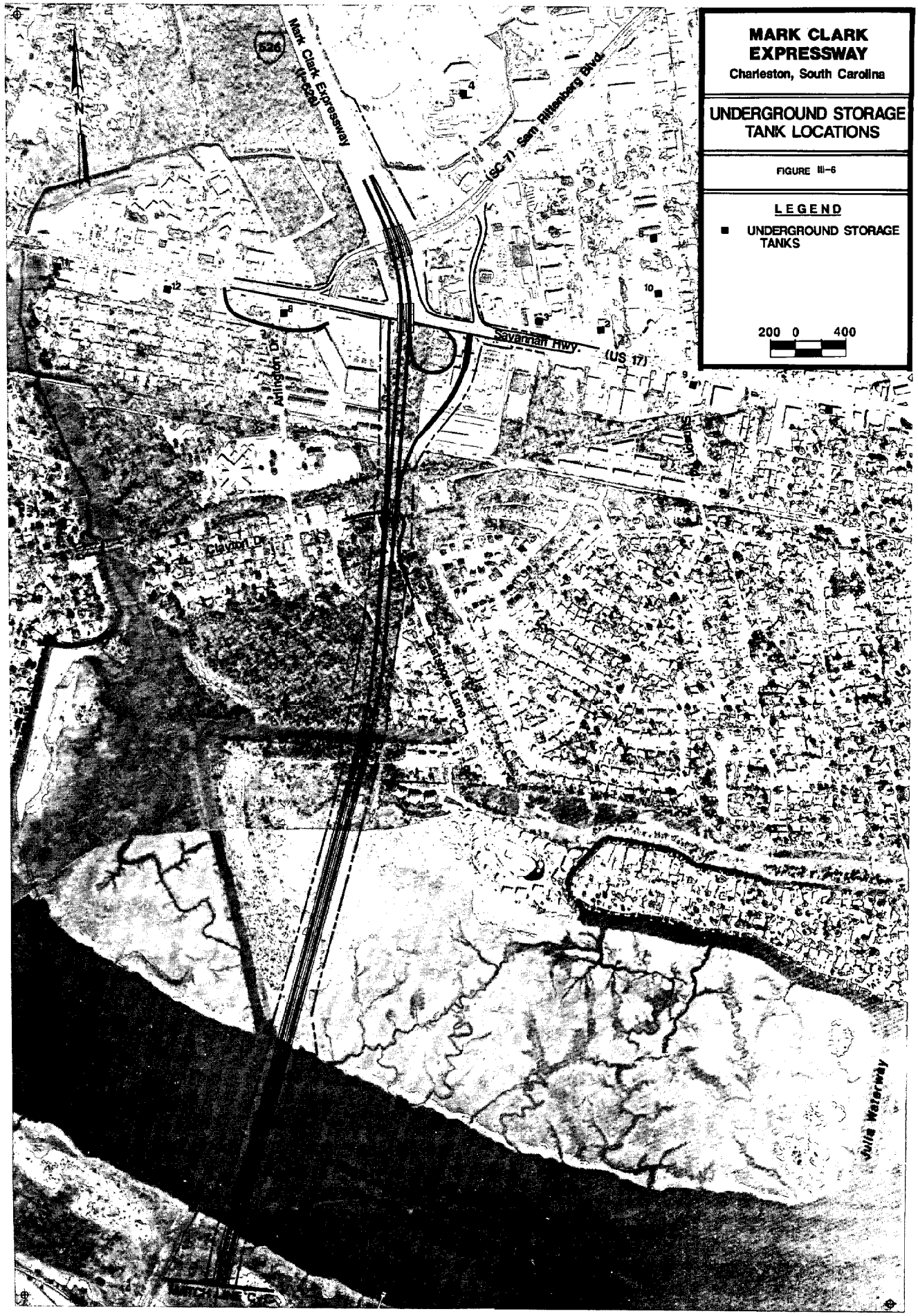

MARK CLARK EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE TANK LOCATIONS
FIGURE III-6
LEGEND
UNDERGROUND STORAGE TANKS
200 0 400
(SC 30) James Island Expressway
Folly Rd.
Dark Point
James
Island
Creek
Camp Rd.
Central Park Rd.
Tilley Rd.
Wimbledon Dr.
Fleming Rd.
Delaney Dr.
Lucky Rd.
Graham Rd.
Riverland Dr.
ALTERNATE B
ALTERNATE A
ALTERNATE D
MATCH LINE A-A


MARK CLARK
EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE
TANK LOCATIONS
FIGURE III-6
LEGEND
UNDERGROUND STORAGE
TANKS
200 0 400
(SC 30) James Island Expressway
Folly Rd.
Wimbledon Dr.
Central Park Rd.
Fleming Rd.
Riverland Dr.
Lucky Rd.
ALTERNATE C

LEGEND
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE TANK LOCATIONS
FIGURE III-6
ALTERNATE B
ALTERNATE A
ALTERNATE D
Headquarters Plantation Dr.
Maybank Hwy. (SC 700)


LEGEND
200 0 400
MARK CLARK EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE TANK LOCATIONS
FIGURE III-6
ALTERNATE C
Maybank Hwy
Headquarters Plantation Dr


MARK CLARK EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE TANK LOCATIONS
FIGURE III-6
LEGEND
UNDERGROUND STORAGE TANKS
200 0 400
Fenwick Ferry Rd.
Headquarters Plantation Dr.
Savannah Hwy.


MARK CLARK EXPRESSWAY
Charleston, South Carolina
UNDERGROUND STORAGE TANK LOCATIONS
FIGURE III-6
LEGEND
UNDERGROUND STORAGE TANKS
200 0 400
N
526
Mark Clark Expressway (I-526)
(SC-7) Sam Rittenberg Blvd.
Savannah Hwy. (US 17)
Arlington Dr.
Clayton Dr.
Eastbrook Lane
Ashley River
1
2
3
4
5
6
7
8
9
10
11
12

Early coordination with the State Historic Preservation Office (SHPO) was accomplished during the scoping process (see letter dated 20 May, 1992 in Appendix A.) Coordination continued during preparation of the technical memorandum. SHPO approved the original report on July 23, 1993 (see letter in Appendix A.)

Fenwick Hall, a 1730 two-story Georgian brick building, is listed on the National Register of Historic Places. Nine acres of property were listed on the nomination form, although the site boundaries were not delineated. The building site has been modified extensively to include parking and tennis courts. The building is 2,800 feet from the proposed expressway and 2,000 feet from the closest interchange ramp at Maybank Highway.

The architectural survey encountered seven houses in the vicinity of Riverland Drive that are over 50 years old. These houses appear to be part of an African-American community dating from the early twentieth century. They have been determined not to be eligible for the National Register of Historic Places, individually and as a district.

The underwater survey included a 1,000-foot-wide corridor at each proposed Stono River crossing. Documentary research conducted prior to the survey revealed no recorded underwater sites in the project area. Magnetic and acoustic remote sensing was used along the crossing. One potentially historic object was found in the south crossing of the Stono near Alternate C. This object appears to be a 60-foot-long boat. If Alternate C is selected and if the site is impacted, additional investigation of this object is recommended to determine its eligibility for the National Register.

The terrestrial survey located several cultural resources, three of which may require further work. One (38CH1146) is a causeway associated with Fenwick Hall, a National Register site, which is intact and considered to be eligible for inclusion on the National Register of Historic Places.

Avoidance of this site is recommended, or data recovery if avoidance is impossible. The second (38CH1148) is a protohistoric to twentieth-century site located at Riverland Drive on James Island in the Alternate B alignment that is potentially eligible for the National Register. Further work is recommended at the site to determine its eligibility. The third site (38CH1150) is a late eighteenth to nineteenth century domestic site. It would also require further testing to determine this site's eligibility for the National Register.

CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

This chapter presents the probable social, economic, and environmental effects of the proposed action for the alternatives selected for more detailed study. Direct and indirect (secondary) environmental consequences of these alternatives are presented. The impacts described in this chapter include land use and transportation planning, social impacts, economic impacts, and visual impacts as well as impacts on the natural environment. Also, construction impacts, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitments of resources are discussed as environmental consequences.

A. Land Use and Transportation Planning

The 1988 Johns Island Plan indicates that existing and future land use in the study area is almost strictly residential. The majority of the area is zoned C, which is a conservation district that permits one residential unit per 1.5 acres. The purpose of this district is largely to "retain areas unlikely to develop in the reasonable near future." The proposed interchange of Mark Clark Expressway with Maybank Highway, which is zoned GO (General Office) and DR9 (Diverse Residential), is the only part of Johns Island near the highway likely to have commercial development.

The plan also recommends that the Mark Clark Expressway from Sam Rittenberg Boulevard to Folly Road be completed within ten years. The reasons given for this recommendation are that Charleston County has the highest number of traffic accidents and fatalities in South Carolina and that many of the existing road facilities in the study area are over capacity.

The portion of James Island adjacent to the Stono River is largely zoned residential and for recreational use and open space (the James Island County Park is located in this tract). The area near the interchange of Mark Clark Expressway and Folly Road is zoned primarily for commercial, office, and residential uses.

The 1987 James Island Land Use Policy Recommendations recommends that the Mark Clark Expressway from Sam Rittenberg Boulevard to Folly Road be completed within 10 years.

The Mark Clark Expressway has been shown on the CHATS long-range transportation plan since the early 1970's. The original alignment has been revised to provide an alternative that would avoid the James Island County Park. All alternatives generally follow the alignment shown in the transportation plan.

Charleston 2000, a comprehensive plan, was adopted in 1991 and provides a long-range guide for decisions about the physical, economic, and social development of the Charleston area over the next ten years. Mark Clark Expressway is compatible with the Charleston 2000 traffic and transportation plan.

The proposed alternatives are compatible with land use planning and planned economic development. An improved infrastructure often helps attract industry and related development.

Because a large portion of the area to be traversed by this facility is classified as wetlands, while much of the remainder is planned for development (Headquarters Island), future land use changes accelerated by the construction of this highway are expected to be limited to the Savannah Highway area, the Folly Road area, and portions of Johns Island. Local government will be responsible to see that such future development is compatible with the region's land use plan, while state and Federal agencies will enforce regulations that protect wetlands and other environmentally critical areas.

B. Social Impacts

From Folly Road west, the alignments generally pass between the Laurel Park and Tidal View subdivisions. All four alternatives take an individual residence located adjacent to the marsh on the east side of the river. Alternate A would take two residences on Riley Road, two residences on the south side of Delaney Drive just east of Riverland Drive, and one residence on the east end of Delaney Drive. These residences are associated with a minority community that has existed in this area since the 19th century. Alternate A passes inside and adjacent to the northern boundary of the James Island County Park. Its right-of-way includes a strip of parkland 250 feet wide across the entire northern border of the park. It would take approximately 40 acres of park land, including the park offices located at the northeast corner of the property near Riverland Drive.

Alternate B would take one residence on the west side of Riley Road and two residences on the east side of Riverland Drive. It continues just south of and parallel to Bradham Road. Due to the number of dwellings located on Bradham Road adjacent to the proposed alignment, a noise barrier is likely to be provided in this area to mitigate the noise impact of the proposed Alternate B alignment. Alternate B would also take one residence west of Riverland Drive near the edge of the marsh.

Alternate C takes one residence on the west side of Riley Road, one residence on the east side of Riley Road, and one residence on the east side of Riverland Drive. It would take approximately 30 acres of park land, including the park offices located at the northeast corner of the property near Riverland Drive, and would sever another 31 acres of park land.

Alternate D takes one residence on the west side of Riley Road and another residence on the east side. It would take approximately 30 acres of park land and would sever another 46 acres.

All four alternatives would increase north-south accessibility through the study area. The total project from Folly Road to Sam Rittenberg Boulevard using Alternate A would displace 11 residences and 40 acres of park property, including the park offices. The total project using Alternate B would displace 10 residences, miss the park property, and pass within 100 to 200 feet of about 16 residences on Bradham Road. The total project using Alternate C would displace nine residences and 41 acres of park property, including the park offices. The total project using Alternate D would displace eight residences and 41 acres of park property, while avoiding the park office.

1. Community Facilities

Due to improved traffic service, the Mark Clark Expressway will have an overall positive impact on police and fire protection, emergency vehicle access, and school transportation, regardless of

the alternative selected. No churches, libraries, police or fire stations, or other similar public facilities would be taken or adversely affected by the proposed project.

2. Schools

No school property would be taken by any of the alternatives. The edge of the right-of-way for the proposed alignment would be approximately 800 feet from Oakland Elementary School property. The edge of the right-of-way for Alternate A would be about 1,000 feet from the Murray-Lassaine Elementary School; for Alternate B, approximately 500 feet; for Alternate C, approximately 1,200 feet; and for Alternate D, approximately 1,300 feet. None of the alignments would have a substantial noise impact on the school.

3. Parks and Recreation

Approximately 40.3 acres of James Island County Park property would be taken by Alternate A. Alternate C would take 40.9 acres and sever another 45.0 acres, while Alternate D would take 41.1 acres and sever another 64.3 acres. Alternates A and C would both take the park offices, while Alternate D would sever the park offices from the majority of the park property. Alternate B would not take any land from James Island County Park. The right-of-way for Alternate A would pass within 625 feet of the vacation cottages located on the western boundary of the park; Alternate C, within 305 feet; and Alternate D, within 180 feet. Also, the West Ashley Greenway on the abandoned Seaboard Coastline Railroad will be crossed by the northern part of the proposed alignment. An underpass would be provided for the bikeway, either on existing alignment or at Clayton Drive. No other public park land, recreational area, wildlife refuge, or greenway will be taken by any of the alternatives. Accessibility to James Island County Park from the West Ashley area would improve with any alternative.

4. Churches

The edge of the right-of-way of the northern part of the proposed alignment passes approximately 500 feet from St. Johns Episcopal Church and about 700 feet from Charleston Harbor Bible Church, both on Arlington Drive. No churches would be taken by any of the proposed alignments.

5. Businesses

The greenhouse business near Folly Road, which is owned by the SCDOT and leased to the occupants, and several businesses on or near Savannah Highway would be taken by the construction alternatives (see IV.D). Other businesses would be impacted by the project, particularly with the widening of Savannah Highway and Skylark Road near the interchange. These impacts include property taking and some access revisions. The overall impact of the Mark Clark Expressway would be positive for businesses in the project area because of the ability to serve increased traffic and improve access to southwest Charleston County, particularly Johns Island and James Island. It would also provide benefits for the entire Charleston urban area.

6. Safety

Construction alternatives would have an overall positive impact on highway safety in Charleston and Charleston County due to traffic being diverted from less safe arterial streets to a safer, controlled access highway.

7. Bicycle Impacts

Each construction alternative will benefit bicycle traffic by diverting major traffic volumes, including most trucks, from existing surface arterials and collectors within the project area. The

proposed expressway is a control-of-access freeway on which bicycles will not be permitted. An underpass at the Eastshore Lane crossing will provide cyclists in the Oakland subdivision and surrounding areas continued access to Oakland Elementary School and to the rest of the community. Similarly, the overpass at Riverland Road will maintain access to adjacent areas for bicyclists. The West Ashley Greenway, located on the northern abandoned railroad tracks parallel to and just south of Savannah Highway, will be crossed by the Mark Clark Expressway. An underpass will be provided to maintain the bikeway traffic.

C. Economic Impacts

Construction of the Mark Clark Expressway will affect the region's economy by providing employment during the construction, by removing some land from property tax rolls, and by changing the development potential of other land. On a longer-term basis, the construction alternatives will accelerate planned economic development in southern Charleston County by increasing access; providing a direct, high-speed route for through and local traffic; and relieving congestion on existing streets.

The Mark Clark Expressway also would have positive local economic impact by providing improved north-south circulation of traffic in the area, alleviating congestion on existing arterials, providing access at interchanges for commercial and industrial activities, and accommodating growth in southern Charleston County.

The majority of the construction costs for the project would be spent in the Charleston area by the contractors and suppliers engaged to build the Expressway.

D. Relocations

The construction alternatives under consideration will require the relocation of residences and businesses and other land uses within their respective right-of-way limits. Table IV-1 compares the relative impacts of the four alternative in terms of the number of residences and businesses taken. The number of households containing minorities, elderly persons, and handicapped persons are also indicated.

Between two and five residences would be taken in the Riverland Drive area depending upon the alternative selected. In addition, three residences on Eastshore Drive and two on Arlington Drive would be taken.

Five businesses would be taken by any of the alternatives:

- greenhouses near Folly Road (currently owned by SCDOT)
- portion of American Storage on Savannah Highway
- Advantage Auto Parts on Savannah Highway
- Auto detail shop on Savannah Highway
- Henry Kuznik's Construction and Real Estate Company on Savannah Highway

In addition, four other businesses would be affected by right-of-way acquisition:

- strip shopping center at 2065 Savannah Highway
- 1st Federal of Charleston Branch on Savannah Highway

- Charleston Antiques and Fair on Savannah Highway (Currently vacant)
- Hardees on Savannah Highway

The relocation program will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Public Law 91-646, 49 CFR Part 25). The program will provide relocation resources to all residential and business relocatees without discrimination.

TABLE IV-1

NUMBER OF DISPLACEMENTS FOR THE CONSTRUCTION ALTERNATIVES

Alternative	Residences *	Businesses	Other
Savannah Highway to Alternates A, B, C, and D	6 (2/0/0)	4	0
Alternate A	6 (5/3/2)	0	1 (Park Office)
Alternate B	5 (3/2/0)	0	0
Alternate C	4 (3/2/2)	0	1 (Park Office)
Alternate D	3 (2/2/1)	0	0
Alternates A, B, C, and D to Folly Road	0	1	0
Total with Alternate A	**12 (7/3/2)**	**5**	**1 (Park Office)**
Total with Alternate B	**11 (5/2/0)**	**5**	**0**
Total with Alternate C	**10 (5/2/2)**	**5**	**1 (Park Office)**
Total with Alternate D	**9 (4/2/1)**	**5**	**0**

* Total residences (Households with minority/elderly/handicapped persons)

E. Visual Impacts

The general character of the project study area ranges from heavily developed arterial streets and suburban residential subdivisions at the northern end, to undeveloped marshland in the central portion, to scattered residential development at the southern terminal. The views for the traveller offered by the raised roads through the marshland and the two Stono River crossings will be quite pleasing.

Each of the construction alternatives will offer opportunities for creating excellent views from the highway. Conversely, each alternative will, to some extent, detract from the existing views of and from neighborhoods and undeveloped wetlands.

The northern section will be viewed by residents of the Sylcope, Oakland, Air Harbor, and Edgewater Gardens subdivisions. The raised highway will be particularly visible where it passes through marshland and across the Stono River. Headquarters Island residents will see the highway, and the raised bridges across the Stono River will be visible for long distances across the marsh and river.

Alternates A, C, and D would be visible to some users of the James Island County Park, as well as to residents of the Centerville and Tidal View subdivisions near the terminus at Folly Road. Alternate B would be visible to these same subdivisions, as well as to residents on Bradham Road. It would also be visible from the park due to its elevation across the marshlands north of the park. Alternate D would have the greatest adverse visual impact on the park, due to its location adjacent to the cleared power line right-of-way.

The aesthetic quality of the adversely affected areas will be improved by:

- curvilinear design to blend with landscape
- landscape planting and natural re-vegetation of the fill slopes
- structural design with consideration to enhance visual appearance, particularly for the two high bridges crossing the Stono River
- preservation of existing vegetation, particularly live oaks, to the extent practical

F. Air Quality

This project would be consistent with the South Carolina State Air Quality Implementation Plan (SIP), which does not presently contain any transportation control measures (TCMs). Charleston County is currently designated as "attainment" for all automotive related pollutant standards. Therefore, no further studies are deemed necessary.

G. Noise

An analysis of noise impact on noise sensitive areas, as described in Chapter III, was conducted for the alternative alignments based on projected 2015 traffic volumes. This analysis includes only residential receptors outside James Island County Park. Noise impacts within the park are discussed in Chapter V.

The SCDOT defines a "substantial noise increase" as being a 15 dBA (or greater) increase over ambient noise levels. The northern section of the proposed alignment (between SC 7 and the beginning of the two alternatives) would have 51 receptors with a substantial increase. Combined with the northern section, Alternate A would have 62 substantial increases, Alternate B would have 93, Alternate C would have 56, and Alternate D would have 59 such increases. In addition, combined with the northern section, 21 total receptors for Alternate A, 30 total receptors for Alternate B, and 19 each for Alternates C and D would approach or exceed FHWA noise abatement criteria. This information is summarized in Table IV-2.

The noise impact analysis was conducted based on the STAMINA 2.0 model for determining receptors (within 600 feet of the project centerline) that would be impacted during the peak hour of the design year 2015. The barrier locations shown in Figure III-5 were analyzed. The results of the analysis are given in Table IV-3. Those barriers which would exceed a cost of $15,000 per dwelling unit were removed from consideration. Barrier 1A was also removed from consideration because the apartments it would benefit have no outdoor activity areas. The analysis led to the recommendation of two noise barriers in the study area: one would be located west of Eastshore Lane, would be 1,000 feet long and 16 feet high, and would benefit 14 receptors; and the other would be located south of Bradham Road (for Alternate B only), would be 1,900 feet long and 13 feet high, and would benefit 20 receptors. If during final design these conditions substantially change, the noise barriers might not be provided. A final decision on the installation of a noise barrier will be made upon completion of the project design and the public

involvement process. The noise impact of the Mark Clark Expressway is described in detail in the Technical Memorandum on Noise Analysis (Kimley-Horn and Associates, Inc., February 1993 and January, 1995).

TABLE IV-2
SUMMARY OF NOISE IMPACT

Alternative	Exceeds or Approaches Criteria	Substantial Noise Increases	Total*	Ambient Noise Level dB(a)	Future Noise Level dB(A)
Sam Rittenberg Blvd. to Maybank Highway	18	51	51	46-52	61-69
Maybank Highway to Folly Road (Alternate A)	3	11	11	46-52	61-68
Maybank Highway to Folly Road (Alternate B)	12	42	44	46-55	61-70
Maybank Highway to Folly Road (Alternate C)	1	5	5	46-50	63-67
Maybank Highway to Folly Road (Alternate D)	1	8	8	46-50	63-69
Total with Alternate A	**21**	**62**	**62**		
Total with Alternate B	**30**	**93**	**95**		
Total with Alternate C	**19**	**56**	**56**		
Total with Alternate D	**19**	**59**	**59**		

*Excluding Double Counting

TABLE IV-3
NOISE BARRIER ANALYSIS

Barrier No.	Location	Length	Height	Cost	Number of Receptors w/≥ 5 dBA Decrease	Cost per Benefitted Receptor
1	So. of Savannah Hwy (US 17) (Edge of ROW)	400'	18'	$93,960	4*	$23,490
1A	So. of Savannah Hwy (US 17) (Edge of shoulder)	500'	13'	$73,950	10*	$7,395
2	Eastshore Lane (Edge of ROW)	1450'	16'	$284,780	6	$47,460
2A	Eastshore Lane (Edge of shoulder)	1000'	16'	$196,400	14	$14,030
2B	Oakland Subdivision (Edge of shoulder)	600'	12'	$79,980	2	$39,990
3	Waterway South (Edge of shoulder)	600'	20'	$163,980	0	> $163,980
4	Bradham Road -- Alt. B (Edge of ROW)	2200'	16'	$432,080	7	$61,725
4A	Bradham Road -- Alt. B (Edge of shoulder)	1900'	13'	$281,010	20	$14,050
4B	Bradham Road -- Alt. B (Edge of shoulder)	1300'	15'	$230,360	15	$15,360
5	Delaney Drive -- Alt. B (Edge of ROW)	1200'	20'	$327,960	0	> $327,960
5A	Delaney Drive -- Alt. B (Edge of shoulder)	550'	16'	$108,020	2	$54,010
6	Riverland Dr. to Riley Rd. Alt. B (Edge of ROW)	1500'	16'	$294,600	2	$147,800
6A	Riverland Dr. to Riley Rd. Alt. B (Edge of shoulder)	400'	20'	$109,320	0	> $109,320
7	Bradham Road -- Alt. A (Edge of ROW)	650'	13'	$96,135	1	$96,135
7A	Bradham Road -- Alt. A (Edge of shoulder)	650'	20'	$177,645	0	> $177,645
8	Delaney Drive -- Alt. A (Edge of ROW)	900'	13'	$133,110	0	> $133,110
	Delaney Drive -- Alt. B (Edge of shoulder)	900'	13'	$133,110	1	$133,110

* Multi-family units in apartment complex

H. Natural Resources

1. Biotic Communities/Upland Wildlife and Habitat

The vegetative or biotic communities that comprise wildlife habitats are described in the Natural Resources Technical Memorandum for the Mark Clark Expressway Supplemental EIS, (CZR, Inc., December 1994). Direct effects of the project on terrestrial and aquatic wildlife resources will consist primarily of habitat displacement. A measure of the impacts to wildlife and their habitat is the amount of direct loss and the quality of the habitat lost. A total of 47.1 to 47.6 acres of forested upland habitats categorized as live oak/hardwoods, pine/hardwoods, and pine forest occur within the project construction limits. About 10.7 to 30.0 acres of the forested native habitats are assigned the U.S. Fish and Wildlife Resource Category 2 (habitat of high value to wildlife species). Approximately 26.7 to 36.4 acres of the native forested habitats are considered low or poor quality. Table IV-4 compares upland impacts of the four alternatives.

Man-dominated areas such as agricultural fields, power lines, and residential lawns are not suitable as natural habitats for most native wildlife. From 18.6 to 30.2 acres of these man-influenced areas occur throughout the project impact area.

TABLE IV-4
UPLAND IMPACTS
(acres)

Upland Community Type	RC	Alternate A	Alternate B	Alternate C	Alternate D
Live Oak/Hardwoods	2	17.4	10.7	16.9	15.9
	3	2.1	10.1	2.1	2.1
Pine/Hardwoods	2	3.8	0	4.3	4.9
	3	14.1	14.1	14.1	14.1
Pine Forest	3	10.4	12.1	10.4	10.4
Man Dominated	4	19.4	30.2	18.6	19.2
TOTALS	2	21.2	10.7	21.2	20.8
	3	26.6	36.3	26.6	26.6
	4	19.4	30.2	18.6	19.2
	ALL	67.2	77.2	66.4	66.6

RC = U.S. Fish and Wildlife Service Resource Category

Secondary impacts to wildlife include possible kills of immature birds, small mammals, amphibians, and reptiles during construction clearing. The new road location may present an additional travel barrier to animal movements and occasional road kills would be expected.

2. Wetlands

Complete wetland avoidance is not possible due to the nature of the new route location completing the Mark Clark Expressway loop around Charleston through the Stono River basin. Impact of salt marshes and freshwater wetlands were avoided and minimized through alignment location selection to the extent practicable given design constraints. All four alternatives avoid impacts to larger contiguous natural freshwater wetland systems near James Island County Park. Where wetlands cannot be avoided, all practicable measures will be taken to minimize impacts including design and construction techniques. Construction techniques that are proposed to be used to minimize wetland impacts include use of 2:1 fill slopes where feasible, use of a reduced (48-foot) median width, erosion control measures in conformance with 23 CFR 650 (B), and other construction provisions that will minimize wetland loss.

Between and adjacent to the high level Stono River bridges, extensive stretches of the planned project will cross salt marsh and freshwater wetland areas. Throughout these areas, located mainly on Johns Island, the minimum elevation is determined by the FEMA designated 100-year flood levels. The result of such placement is long lengths of level facility located at an elevation of 18-20 feet above mean sea level, and about 15-16 feet above the level of the marsh. These conditions could be accommodated by using either long bridges or continuous embankments placed directly on the marsh.These two bridge length alternatives were evaluated in terms of the amount and type of wetland impacted by each and the cost of each alternative. These issues were also discussed with the permitting agencies during early coordination. (See Chapter VIII.)

Three analysis sections were considered. Two major sections are located on Johns Island adjacent to the proposed Maybank Highway interchange. The section located south of Maybank Highway is designated as Johns Island, while the area north of Maybank Highway is called Headquarters Island after a nearby development. The third section analyzed is located on James Island east of the Stono River within James Island County Park. This third section considers bridging only if Alternates A, C, or D are selected for the roadway alignment, as no such extensive wetland areas are located on Alternate B.

The Bridge Alternate includes continuous bridges across the marshland areas, thereby providing minimal disruption to the marshes and related tidal inundation. Since bridges are generally supported on piles or drilled shafts, there are no geotechnical restraints on this type of construction. Although environmental resource agencies prefer bridging to minimize environmental impacts, the construction costs are much higher for bridging. Construction of bridges could have temporary impacts to the wetland areas crossed, depending on the construction technique used. Forested wetlands cleared for bridge construction would require mitigation.

The Embankment Alternate is more sensitive to subsurface conditions, since it is a requirement that the underlying soils be competent to handle the weight of the embankment. In addition, care must be taken to provide adequate hydraulic capacity across the project, and localized flows must be anticipated and provided for. Wetland areas impacted by embankment must be mitigated through creation of new wetlands or enhancement of existing wetland areas in a manner and quantity acceptable to the agencies responsible for the issuance of wetland permits.

Environmental studies have determined that the wetland areas impacted by the proposed project are not considered unique or rare nor are they prime or designated critical habitat for endangered species. Because of the large areas of wetland on either side of the potential embankment areas, and because drainage structures would be included to provide for cross drainage, no substantial habitat fragmentation impact would occur.

For the purposes of this analysis, the unit costs of wetland mitigation have been assumed to be $2,500 per acre for acquisition, $10,000 per acre for enhancement, and $10,000 per site per year for monitoring. (A five-year monitoring period is assumed.) All mitigation is assumed to be enhancement of existing wetlands. These figures are approximations used for comparative purposes. Actual costs could vary substantially, depending upon the specific sites selected for mitigation and conditions for the permits. Mitigation ratios are assumed for this analysis to be 0.5:1 for clearing of forested wetlands to be bridged, 1:1 for filling in tidal wetlands, and 2:1 for filling freshwater wetlands. The ratios could also vary from those assumed here. One mitigation site for each type of wetland impacted per study area is assumed.

The following summarizes the cost comparison developed for the three separate areas. The detailed analysis of cost and wetland savings was conducted and documented in the technical report Bridge vs. Embankment in Wetland Areas (Kimley-Horn and Associates, Inc., May 1995). Mitigation cost as shown here includes the five-year monitoring period as well as acquisition and enhancement.

Johns Island

Bridge Alternate	
Bridge Cost	$ 27,526,000
Mitigation Cost	$ 198,000
Total Bridge Cost	$ 27,724,000
Embankment Alternate	
Roadway Cost	$ 6,700,000
Mitigation Cost	$ 824,000
Total Embankment Cost	$ 7,524,000
Additional cost of bridge alternate	$ 20,200,000
Additional wetland acreage avoided	34.4 Acres
Cost/acre of wetland avoided by bridging	$587,000/Acre

Headquarters Island

Bridge Alternate	
Bridge Cost	$ 32,038,000
Mitigation Cost	$ 101,000
Total Bridge Cost	$ 32,139,000

Embankment Alternate	
Roadway Cost	$ 7,200,000
Mitigation Cost	$ 686,000
Total Embankment Cost	$ 7,886,000
Additional cost of bridge alternate	$ 24,253,000
Additional wetland acreage avoided	38.8 Acres
Cost/acre of wetland avoided by bridging	$625,000/Acre

James Island County Park

Bridge Alternate	
Bridge Cost	$ 11,637,000
Mitigation Cost	$ 98,000
Total Bridge Cost	$ 11,735,000
Embankment Alternate	
Roadway Cost	$ 5,100,000
Mitigation Cost	$ 360,000
Total Embankment Cost	$ 5,460,000
Additional cost of bridge alternate	$ 6,275,000
Additional wetland acreage avoided	13.1 Acres
Cost/acre of wetland avoided by bridging	$479,000/Acre

Total Project

Bridge Alternate	
Bridge Cost	**$71,201,000**
Mitigation Cost	**$ 397,000**
Total Bridge Cost	**$ 71,598,000**
Embankment Alternate	
Roadway Cost	**$ 19,000,000**
Mitigation Cost	**$ 1,870,000**
Total Embankment Cost	**$ 20,870,000**
Additional cost of bridge alternate	**$50,728,000**
Additional wetland avoided	**86.3 Acres**
Cost/Acre of wetland avoided by bridging	**$588,000/Acre**

The above comparisons indicate that the cost of the embankment option, consisting of the cost of all embankment items plus estimated probable mitigation costs for the displaced wetland areas, is considerably less than the cost of the bridge option at each location. Further, the cost per acre of wetland impact avoided by the bridge option is extremely high.

As the worst case condition, the embankment alternative is included in the summary comparisons of alternatives in this document. The actual lengths of bridges, fill areas, mitigation ratios and techniques, and construction details and techniques will be determined during the permit review process for this project. Tables IV-5A and B compare the wetland impacts of the

four alternative alignments for the entire length of the project, for both embankment and bridge alternatives. Table IV-5B also includes extending bridges over salt marsh areas near Riverland Drive and at the tributary to James Island Creek. The small amount of salt marsh impacted by the bridge alternatives is at the edge of the fill slope for Alternate B and at ramp intersections with Maybank Highway.

Unavoidable wetland impacts have been quantified by habitat type and quality. The total unavoidable wetland impacts due to fill for the project are, for the embankment alternative, 104.2 acres for Alternate A, and 91.6 acres for Alternate B, 108.4 acres for Alternate C, and 108.9 acres for Alternate D. For the maximum bridge alternatives, the wetland impacts from fill are 17.0 acres for Alternate A, and 18.4 acres for Alternate B, 19.4 acres for Alternate C, and 18.6 acres for Alternate D. With the embankment alternatives, the construction on embankment for Alternate A will involve 47.1 acres of salt marsh wetlands and 57.1 acres of freshwater wetlands, while Alternate B will involve 43.9 acres of salt marsh wetlands and 47.7 acres of freshwater wetlands, Alternate C will involve 46.8 acres of salt marsh wetlands and 61.6 acres of freshwater wetlands, and Alternate D will involve 46.8 acres of salt marsh wetlands and 62.0 acres of freshwater wetlands. Additionally 3.0 to 3.8 acres of forested freshwater wetlands would be impacted by clearing only for bridge construction.

In addition to the greater quantity of wetlands impacted by Alternates A, C, and D, the salt marsh areas impacted by those alternatives are associated with more complex drainage patterns than those impacted by Alternate B. Freshwater forested wetlands in Alternate A, C, and D are also of greater quality and quantity than in Alternate B.

Compensation as a mitigation measure for unavoidable wetland impacts involves preserving, enhancing, restoring, or creating wetlands to replace the functions and values of wetlands lost. The South Carolina Department of Transportation and the Federal Highway Administration are committed to achieving no net loss of wetland functions and values. The general habitat functions and values of impacted wetlands will be replaced through wetland mitigation and will involve the regulatory agencies in the planning process. Mitigation design determinations will be made during the permit phase for the selected alignment using the U.S. Army Corps of Engineers' Wetland Evaluation Technique (WET 2.0). The FHWA sponsored document A Guide to Wetland Functional Design (A.D. Marble, 1990) will be employed in the design of the Wetland Mitigation Plan. Twenty-one candidate mitigation sites have been identified. These sites are listed and briefly described in Table IV-6, and are shown in Figure IV-1.

Based upon the above considerations, it appears that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

Several early coordination efforts have been conducted regarding the project's potential impact on wetlands. A summary of the key points discussed at these meetings may be found in section VIII-A .

TABLE IV-5A
WETLAND IMPACT - EMBANKMENT ALTERNATE
(Acres of Fill)

Wetland Community Type	Agency	Resource Category	Alternate A	Alternate B	Alternate C	Alternate D
Low Marsh	OCRM	2	22.4	20.2	22.1	22.7
High Marsh	OCRM	2	15.1	14.1	15.2	14.6
Brackish Marsh	OCRM	2	9.1	9.1	9.1	9.1
Live Oak	COE	2	33.4	32.6	39.2	41.1
		3	0.9	0.0	1.1	0.0
Pine/Hardwoods	COE	2	10.8	3.4	9.6	9.4
		3	1.8	1.8	1.8	1.8
Pine Forest	COE	2	2.6	2.6	2.6	2.6
Oak Hammock	COE	2	2.4	2.2	2.2	2.2
Open Water (Fresh)	COE	2	1.9	1.9	1.8	1.7
		3	0.9	0.9	0.9	0.9
Open Water (Salt)	OCRM	2	0.4	0.4	0.4	0.4
Man Dominated	COE	3	2.4	2.4	2.4	2.4
Subtotal	COE	2	51.1	42.7	55.4	57.0
Subtotal	COE	3	6.0	5.1	6.2	5.1
Subtotal	COE	All	57.1	47.7	61.6	62.0
Subtotal	OCRM	2	47.1	43.9	46.8	46.8
Subtotal	All	2	98.2	86.5	102.2	103.8
Subtotal	All	3	6.0	5.1	6.2	5.1
Total	All	All	104.2	91.6	108.4	108.9

COE = US Army Corps of Engineers OCRM = SC Ocean and Coastal Resource Management

TABLE IV-5B
WETLAND IMPACT - BRIDGE ALTERNATE
(Acres of fill)

Wetland Community Type	Agency	Resource Category	Alternate A	Alternate B	Alternate C	Alternate D
Low Marsh	OCRM	2	0.0	0.9	0.0	0.2
High Marsh	OCRM	2	1.4	1.4	1.4	1.4
Brackish Marsh	OCRM	2	0.0	0.0	0.0	0.0
Live Oak	COE	2	8.9	10.3	11.3	11.4
		3	0.9	0.0	1.1	0.0
Pine/Hardwoods	COE	2	0.0	0.0	0.0	0.0
		3	1.8	1.8	1.8	1.8
Pine Forest	COE	2	0.0	0.0	0.0	0.0
Oak Hammock	COE	2	0.0	0.0	0.0	0.0
Open Water (Fresh)	COE	2	1.9	1.9	1.8	1.7
		3	0.9	0.9	0.9	0.9
Open Water (Salt)	OCRM	2	0.0	0.0	0.0	0.0
Man Dominated	COE	3	1.2	1.2	1.2	1.2
Subtotal	COE	2	10.8	12.2	13.1	13.1
Subtotal	COE	3	4.8	3.9	5.0	3.9
Subtotal	COE	All	15.6	16.1	18.0	17.0
Subtotal	OCRM	2	1.4	2.3	1.4	1.6
Subtotal	All	2	12.2	14.5	14.5	14.7
Subtotal	All	3	4.8	3.9	5.0	3.9
Total	All	All	17.0	18.4	19.4	18.6

COE = US Army Corps of Engineers

OCRM = SC Ocean and Coastal Resource Management

TABLE IV-6

CANDIDATE MITIGATION SITES

Map Site #	Location	Present Land Use	Mitigation Type	Acres	Soil	Vegetation	Hydrology
1	Burden Creek, 1.5 miles from project, in-basin	Old field/pasture	Salt marsh-creation	10-20	Fill	Field	Tidal Creek
2	Hut Creek, 4 miles from project, in-basin	Agriculture	Salt marsh-creation	20-30	Upland	Field	Hut Creek
3	Hut Creek headwaters, 4 miles from project, in-basin	Silviculture	Forested hardwood restoration	5-10	Dahoo (hydric)	?	Hut Creek
4	Abbapoola Creek, 5 miles from project, in-basin	Agriculture	Salt marsh-creation/ restoration	20-30	WnB-upland Sk-Hydric	?	Abbapoola Creek
5	Alligator Creek, 5 miles from project, in-basin	Agriculture	Salt marsh-restoration Fresh water forested	20-30 5	Ts-hydric, Da, Ka, Sk-Hydric	?	Alligator Creek
6	Spoil island northwest of Headquarter Island, adjacent to project, in-basin	Former agriculture	Salt marsh-creation	50-60	Cg-hydric Yo-hydric Wa-hydric Ch-trans HoA-trans	Field	Stono River tidal creeks
7	Brickyard Road, 1 mile from project, in-basin	Rural	Salt marsh-creation	10	Yo-hydric Cg-hydric	Field	Penny's Creek
8	Penny's Creek headwaters, 3 miles from project, in-basin	Old field former strip mine	Forested hardwood creation	20	Phosphate spoil WgB-upland S+-hydric Sk-hydric	Field	Penny's Creek Tributary
9	Penny's Creek headwaters, 2.5 miles from project, in-basin	Dredged tidal/lagoon	Salt marsh-restoration	5	Ed-Transitional Ch-Transitional	Deep Water	Penny's Creek
10	Shipyard Shoal, near Fort Sumter, "Spider Island" out-of-basin	Accreting shoal	Salt marsh-creation	40	Upland	Austral Pine	Chas. Harbor
11	Penny's Creek headwaters, 2 miles from project, in-basin	Agriculture	Forested hardwood restoration	20	Yo-hydric HoA-Trans	Fields	Penny's Creek

TABLE IV-6

CANDIDATE MITIGATION SITES

Map Site #	Location	Present Land Use	Mitigation Type	Acres	Soil	Vegetation	Hydrology
12	Dill property/Charleston Museum site	Wildlife management	Saltwater marsh and forested hardwood restoration/ creation	60	Ed-Trans Sk-hydric	Field	James Island Creek; Heron rookery
13	Station 330 & 340, adjacent to project, severed by project	Forested hardwoods	Forested hardwood restoration	?	Wa-hydric Cg-hydric	Forested Wetland	Groundwater
14	Tom Fullmore property, adjacent to project	Rural/residential	Salt marsh-restoration Public boat access to County Park	?	Mp-mine pit Yo-hydric Cg-hydric	Field	Stono River
15	James Island Creek, project severs residential road, in-basin	Rural/residential	Public boat access	N/A	?	?	James Island Creek
16	Spoil island northeast of Holiday Inn on US 17, 2 miles from project. Ashley River out-of-basin	Dredge spoil site	Salt marsh-restoration	< 10	Ts-hydric	Barren	Ashley River
17	Canal spoil bank, adjacent to project, near Oakland Subdivision	Spoil bank	Salt marsh-restoration	5-10	Spoil	Barren or upland	Stono River
18	Black River Swamp, mitigation bank, out-of-basin, 65 miles from project in Clarendon County	Cleared for agriculture	Fresh water forested hardwood restoration	3000	Hydric	cleared of canopy trees	Black River
19	Pee Dee Swamp, out of basin	?	Freshwater hardwood restoration	?	Hydric	?	Pee Dee River
20	Vandross Bay Mitigation Bank out-of-basin/Georgetown Co.	?	Freshwater hardwood restoration	790±	Hydric	?	Vandross Bay groundwater
21	Penny's Creek spoil bank north of Maybank Hwy, in-basin	Canal containment	Salt marsh-creation	?	Spoil	Barren	Penny's Creek

3. Endangered and Threatened Species

No impacts to protected species will occur as a result of project activities based upon evaluations conducted and described in the Natural Resources Technical Memorandum for the Mark Clark Expressway (CZR, Inc., December 1994). Coordination with the South Carolina Wildlife and Marine Resources Department, the U.S. Fish and Wildlife Survey, and the National Marine Fisheries Service and on-site investigation has resulted in a determination of the potential for the occurrence of protected species in the project area.

Potential habitats for the shortnose sturgeon (*Acipenser brevirostrum*) federally listed as endangered occur in the Stono River. Adherence to Best Management Practices for road and bridge construction in the Stono River will compensate for potential impacts to this species or its habitat.

Occurrences of listed reptile, the island glass lizard (*Ophisaurus compressus*), have been reported on Morris Island and Folly Island. Field surveys of this study resulted in the location of the related eastern glass lizard (*Ophisaurus ventralis*) within the project area; however, no occurrences of the island glass lizard were documented.

The West Indian manatee (*Trichechus manatus*) occurs in coastal waters throughout the southeastern United States. Conversations with SCWMRD officials indicate the manatee is an occasional summer migrant within the Stono River. A reported occurrence in the Stono River was documented by the SCWMRD in February 1985. The potential to impact the manatee by project activities is considered minimal.

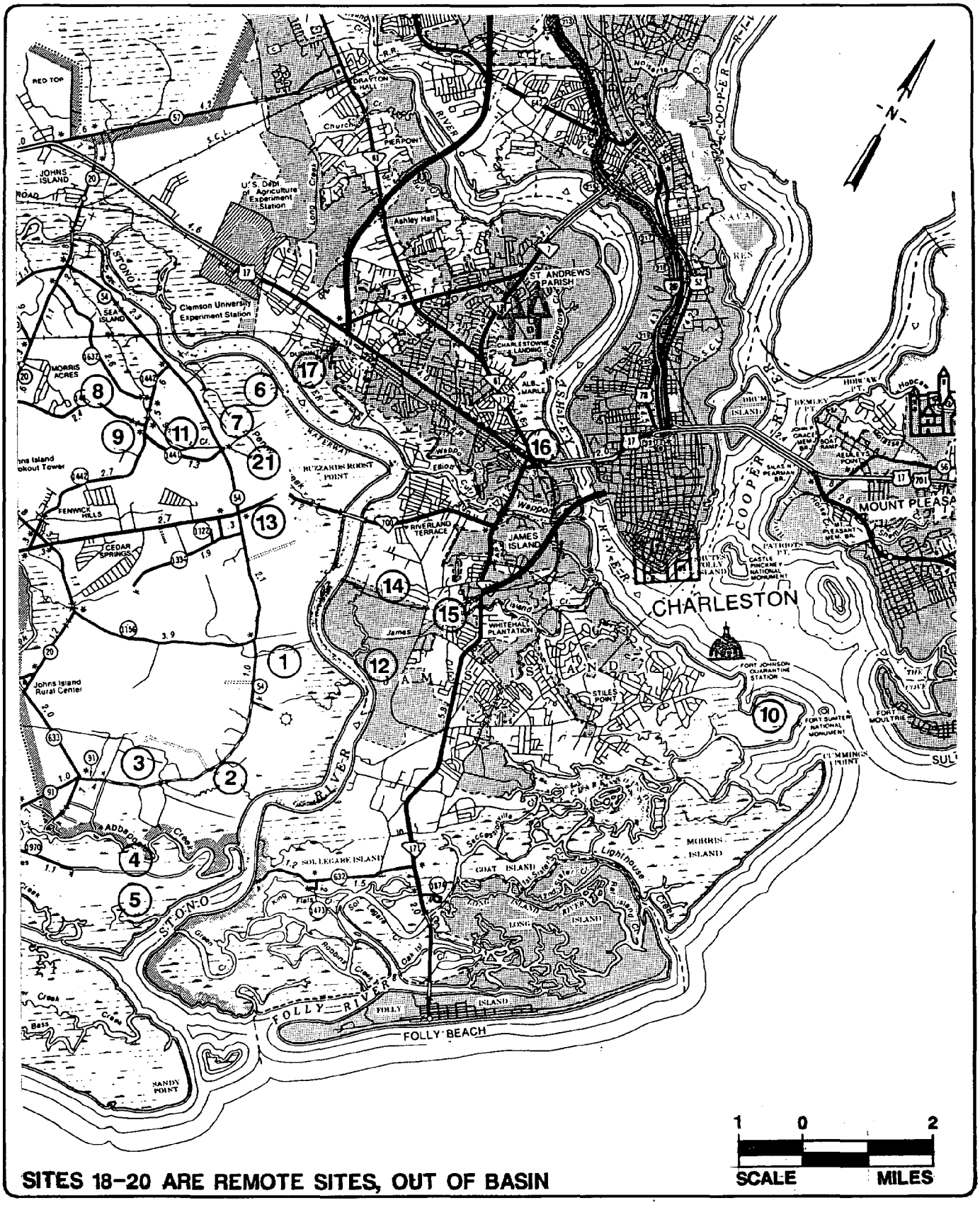
The black rail (*Laterallus jamaicensis*) is a secretive bird found in many salt marsh areas. There were no black rails observed and no distinct call notes heard during field observations within the project area. The potential for the project to impact the black rail is considered minimal.

There is a potential for occurrence within the project area for the pondspice (*Litsea aestivalis*), Boykin's lobelia (*Lobelia boykinii*), pondberry (*Lindera melissifolia*), and chaffseed (*Schwalbea americana*). Suitable habitat exists, and there are documented occurrences of these four listed species within several miles of the project. Field observations within the corridor for the presence of these species were initiated during the flowering and/or fruiting season (May-June-July) for a higher probability of identification. There are no known occurrences or observations of the above species within the project corridor.

Two nests of osprey (*Pandion haliaetus*), a state-listed species of special concern, were identified on power poles near the project's Maybank Highway interchange but will not be impacted by the project.

4. Water Quality

The results of computations in accordance with Pollutant Loading and Impacts from Highway Stormwater Runoff, Volume 2, Design Procedures (FHWA, 1990) indicate that the estimated concentrations of copper, lead, and zinc pollutants do not exceed target concentrations (acute criteria values) during the duration of one storm event or on average of once every three years for the project. Therefore, the proposed project will not concentrate heavy metal pollutants in stormwater runoff and will not adversely impact the water quality of the area



MARK CLARK EXPRESSWAY

CANDIDATE MITIGATION SITES

FIGURE IV-1

Surface water quality impacts would be primarily short-term resulting from construction of new highway lanes through wetlands and from bridge construction activities at the Stono River, James Island Creek, and Penny's Creek crossings. There will be no lasting effect on area water quality from this project.

Water quality impacts would be greatest with Alternates A, C, and D due to the greater amount of wetlands crossed by those alternatives. Water quality impacts to the Stono River open water are expected to be nearly equal due to the proximity of the alternatives and the nearly equal bridge lengths.

5. Water Body Modification

Open water crossings include the Stono River (two crossings), two tidal creeks (Penny's Creek, James Island Creek tributary), two ponds, two man-made drainage ditches, and one canal. Alternate D has the longest crossing of the Stono River, while Alternate B has the shortest. Alternate B impacts the least amount of tidal open waters, followed in order by Alternates C, D, and A.

6. Coastal Zone

The project is located within the Coastal Zone Critical Area of Charleston County. Direct permit authority for marsh wetland impacts and bridge projects over navigable waterways, as well as coastal zone consistency determinations, will be the responsibility of the U.S. Coast Guard, with coordination with OCRM.

Three geographic areas of particular concern (GAPC) will be impacted by the project including: wetlands, shellfish harvesting areas, and navigational channels. The project will impact up to 47 acres of salt marsh wetlands by roadway construction on fill. Approximately up to 62 acres of freshwater wetlands will be impacted by roadway construction on fill and 3.3 to 3.8 acres cleared for roadway construction on bridge structure. Unavoidable impacts will be mitigated by techniques developed in consultation with regulatory agencies during the planning and permitting process.

Although the Stono River is classified as shellfish harvesting waters, the area is declared "restricted" and no commercial or public easements are designated in the project area. Therefore, the shellfish harvesting waters are not a GAPC.

The Stono River, Penny's Creek, and James Island Creek are navigable waterways of the project area. The proposed bridges over these waterways are subject to U.S. Coast Guard approval and will provide adequate vertical and horizontal clearances so as not to interfere with commercial or recreational vessels.

In view of the above, the project appears to be consistent with the South Carolina Coastal Management Program. Coastal zone certification of applicable permit applications will be requested from the OCRM.

I. Farmland

Because the entire study area is planned for urban development, the Farmland Protection Policy Act does not apply.

J. Potential Hazardous Material Sites

State regulatory agencies have been consulted, and lists of potential hazardous material sites have been reviewed. The study corridor was also inspected in the field to ascertain the likelihood of hazardous waste sites. As stated in Section III.G, no reported or suspected areas of contamination are located in or near the proposed alignments.

K. Historic and Archaeological Sites

As discussed in Chapter III, the cultural resource surveys discovered several sites potentially eligible for the National Register of Historic Places.

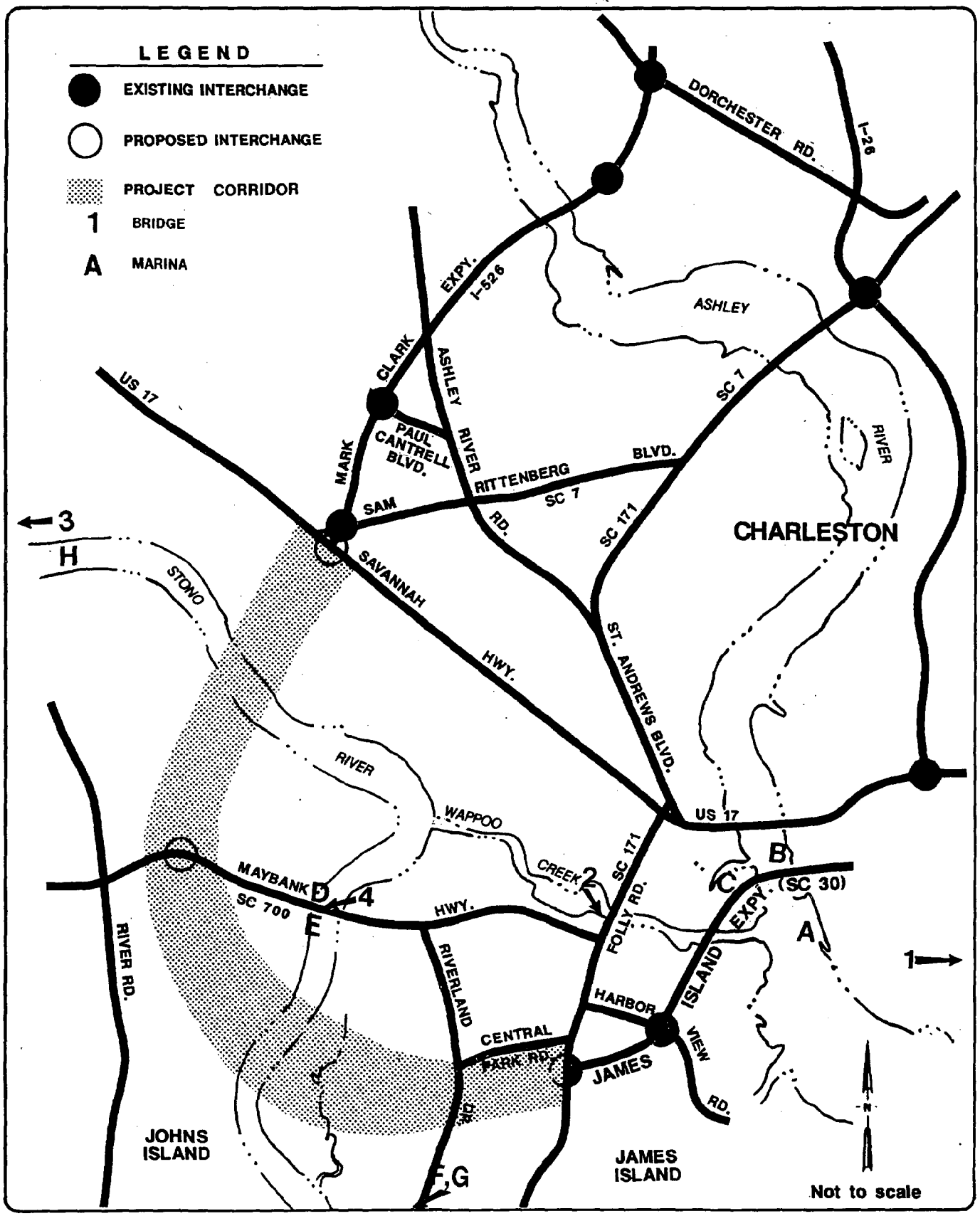
Of the sites within the area of potential effect evaluated in the architectural survey, none were judged to be potentially eligible for the National Register. Fenwick Hall, a National Register property approximately one-half mile from the proposed alignment, would not be affected by any alternative.

The 60-foot vessel (3BCH1497) detected by the underwater archaeological investigation at the south crossing of the Stono River could be affected by Alternate C. If that alternative is selected, further work may be necessary to determine the nature and possible historic significance of that object.

Three terrestrial archaeological sites (described in Chapter III) were encountered which will require further work. One of these sites, 38CH1146, would be impacted by all four alternates. The second (38CH1148) would be impacted by Alternate B. The third site, 38CH1550, would be impacted by Alternates C and D. These sites are potentially significant resources which require archaeological testing to clearly determine their eligibility for nomination to the National Register. Testing should be directed toward determining the age of the sites, their internal integrity, the potential or presence of subsurface features, and the sites' horizontal and vertical limits.

The Fenwick Hall causeway (38CH1146) is recommended as a National Register eligible archaeological site. Avoidance is not feasible since the causeway stretches all the way from Fenwick Hall to the Stono River. Therefore, data recovery should be conducted to obtain the data that would otherwise be lost during construction. The data recovery program should be designed to determine and record the method of construction of the causeway, and should include historic research into its construction and use in order to place it in a historic context of the development of plantations along the Stono River.

The above determinations were documented in the technical memorandum An Archaeological Survey of the Mark Clark Expressway Project from US Highway 17 to Folly Beach Road (New South Asociates, September 1994). The conclusions in this report were concurred with by SHPO.



MARK CLARK EXPRESSWAY

MARINAS AND MOVEABLE BRIDGES

FIGURE IV-2

L. Rivers and Harbors

1. Proposed River and Stream Crossings

The Mark Clark Expressway is proposed to cross the Stono River in two locations. In addition, the road will cross a tributary to James Island Creek, a tributary to the Stono river, Penny's Creek, and a channel between Eastshore Lane and the Stono River. Bridge permits may be required for some or all of these crossings, under Sections 9 and 10 of the Rivers and Harbors Act.

The proposed northern crossing of the Stono River upstream from Maybank Highway crosses a portion of the river which is designated as part of the Intracoastal Waterway (IWW). The crossing is anticipated to consist of a fixed-span bridge with 65-foot vertical clearance and 200-foot horizontal clearance, per current U.S. Coast Guard policy regarding bridges over the IWW. Design of this bridge will be coordinated with the U.S. Coast Guard.

A second fixed-span bridge over the Stono River is proposed south of Maybank Highway between Johns Island and James Island, where the Stono River is no longer part of the Intracoastal Waterway. Because there is no "standard" bridge height in this area, considerable study was given to the characteristics of the river and boat traffic using this section of the river, as documented in the following sections. Based on that study, the Southern Stono River Crossing is proposed to have a 65-foot vertical clearance and 200-foot horizontal clearance.

None of the four other proposed crossings would affect navigation. The tributary to James Island Creek is very shallow and is not navigable by anything other than very small craft (John-boats, canoes, or rowboats). A six-foot vertical clearance and 10-foot horizontal clearance are proposed. The Stono tributary crossing (east shore) would have a 12-foot vertical clearance and 30-foot horizontal clearance. Penny's Creek, which flows into the Stono River at Stono Marina, is not navigable by anything larger than outboard motorboats. Upstream from a private ramp a short way in from the river, Penny's Creek is crossed by the Maybank Highway at approximately six feet above mean high water. The proposed clearances at the Penny's Creek crossing are 12-feet vertical and 30 feet horizontal. The man-made channel near Eastshore Lane is shown on the navigation charts as reported two-foot depth. The portion of the channel upstream of the proposed highway is surrounded by a subdivision, with 12 houses backing up to the channel. One house has a small dock, while another house was observed to have a small motorboat in the back yard. Based on the size and depth of the channel and the type of development, the planned bridge over the channel would not have an effect on navigation and access, and would have no effect on commercial boat operations. A 12-foot vertical clearance and 30-foot horizontal clearance are planned.

2. Stono River Vessel Inventory

The Stono River flows south from Maybank Highway to join the Kiawah River and Folly River and then out to sea through the Stono Inlet. The river has depths from 15 feet near the Stono bridge to 48 feet at the confluence of the Kiawah and Stono. The Folly River is quite changeable with minimum depths of six feet at the confluence with the Stono River. Mean tidal ranges in the areas discussed are 5.2 feet and 6.1 feet. The Stono Inlet is not ordinarily navigable by sailboats due to a constantly shifting and changing channel. It is not reliably marked, and only shrimp boats which go in and out daily make the journey without trouble. These boats normally draw six feet of water or less. This circumstance makes access to the

Folly River and Kiawah River by vessels other than shrimp boats possible only by way of the Stono River from the north and under the proposed new fixed span bridge. Thus, the height of boats which would be likely to use the Stono River between Maybank Highway and the Stono Inlet were considered in determining the proposed height of the new span.

Marina occupancies, vessel heights, and lengths were surveyed during the period of June 28 to June 30, 1993. Local marinas in the Charleston area with potential for generating boat traffic along the lower Stono River are listed in Table IV-7. Letters on the table refer to locations on Figure IV-2.

TABLE IV-7
LOCAL MARINAS IN THE STONO RIVER/CHARLESTON AREA

Marina	Chart Designation	Approximate Number of Boat Slips
Charleston City Marina	A	150 (300*)
Ashley Marina	B	200
Ripley Light Marina	C	77
Buzzards Roost Marina	D	200
Stono Marina	E	150
Folly Marina	F	100*
Mariners Cay Marina	G	80
Ross Marine Shipyard	H	--

* Capacity when rebuilt

The Charleston City Marina (A) was destroyed by Hurricane Hugo and has not yet been completely restored. If the marina is leased to a private group for operation and/or restoration, the present 150 slip capacity may be increased to 300. However, no concrete plans have been made for full restoration and expansion of the marina. The city marina presently has 152 boats of which 102 are sail. Of these, 12 have masts 55 feet or higher, including one vessel exceeding 60 feet in height.

The Ashley Marina (B) is just north of the new fixed-span James Island bridge, and mast heights are necessarily limited to 55 feet. The marina has a capacity of 200 boats, more or less depending on transient traffic. A total of 171 boats are docked at the Ashley Marina, 103 of which are sail. The marina is considered fully occupied by its manager. Three of these boats have masts above 55 feet high, and thus must go in and out of the marina at dead low tide.

Across the Ashley River from Ashley Marina is Ripley Light Marina (C) with 62 motorboats and 6 sail presently docked. None exceed 55 feet in height. This marina is silted in and, consequently, most sailboats prefer not to use it.

Buzzards Roost Marina (D) is located adjacent to and north of the Maybank Highway which spans the Stono River. The Stono River swing bridge crosses the river here at a height of eight feet above mean high water. At the time of this survey, the marina was occupied by 122 boats of which 70 were sail, including 12 over 55 feet in height. None were over 64 feet. The marina has a nominal capacity of 200 boats. A popular seafood restaurant located at this marina attracts

some marine traffic for meals. Approaching Buzzards Roost from Wappoo Cut, there are a number of private docks with perhaps 24 sailboats. The tallest of these include a ketch with a 62-foot mast height and a 46-foot sloop with a 60-foot mast.

Just south of the Stono River bridge is the Stono Marina (E) with a capacity of 150 boats. At the time of survey, 128 boats were docked here of which 75 were sail, including 14 over 55 feet high.

The Folly Marina (F) was totally destroyed by the "White Hurricane" of March 1993 when wind gusting over 75 mph hit Charleston. At present, only a few boats are docked here, 16 sail and 11 power boats. Two of the boats have mast heights exceeding 55 feet high. When rebuilt, the marina will have capacity for 100 boats.

Further up the Folly River, adjacent to the Folly Road fixed span bridge, is Mariner's Cay Marina (G) where 37 boats are docked, of which 21 are sail. Three of these boats have mast heights exceeding 55 feet.

Ross Marine (H), a division of Swygart Shipyards, is a full service shipyard capable of hauling any boat that can reach it. This has in the past included boats with masts over 64 feet high, meaning that such boats could only pass under IWW fixed spans at low tide. The yard can accommodate vessels of 75 tons on their travel lift and 750 tons on their marine railway. The yard is presently working at capacity and has been since Hurricane Hugo. On July 7, 1993, this yard had 7 sailboats, 2 of which had 64-foot masts, and 18 motorboats up to 75 feet long.

Kiawah Island has a dozen unoccupied docks on the Kiawah River. These appear to be built for riverfront houses. Approximately two dozen boats are docked at private piers on the Stono River. One of these is a traditional ketch with a mast height of over 55 feet, but under 64 feet. In Wappoo Cut are another two dozen boats of which half are sail with under 55-foot mast heights. The Stono River channel is delineated by day markers for the entire length of the river. The U.S. Coast Guard maintains these aids to navigation, and their ships are expected to travel periodically down the Stono to Folly River and the Stono Inlet.

Several local groups of sailboats travel down the Stono River each year. The James Island Yacht Club (JIYC) cruises to Sandy Point annually from Charleston. The past Commodore of JIYC possesses a traditional 45-foot ketch with a mast height of 62 feet. Also the Charleston Cruising Club, a group of 60 sailboats, has been down the Stono River four times in 1993 with two more trips planned. There are at least three boats in this group with mast heights exceeding 55 feet. Because the tidal range in Charleston is in the neighborhood of six feet plus or minus one, a boat of marginal height could wait for low tide to negotiate a low bridge; however, most skippers are reluctant to risk bringing a mast down. Therefore, a bridge lower than 64 feet would effectively preclude these particular boats from participating in these activities.

In summary, over 700 boats were surveyed, a majority of them sailboats. Of the boats surveyed, 48 had mast heights above 55 feet, including 11 that were between 60 feet and 64 feet and three that exceeded 65 feet. The Challenge America with its 80-foot mast is home ported in Charleston, but was in Fort Lauderdale at the time of survey.

3. Existing Moveable Bridges

Additional data were obtained regarding moveable bridges in the Charleston area. These bridges are described in Table IV-8 and shown on Figure IV-2.

May, when southern boats head north for the summer, is the peak month for traffic. Similarly, October is also a busy month as the boats go south for the winter. Therefore, May 1993 was analyzed to determine the number of openings required for sailboats. The average sailboats through the bridge per opening is believed to be typical for the year as a whole. Because of the restrictive opening schedules of these bridges, it is not uncommon for several boats to go through on a single opening. In the case of powerboats, many can go under a closed bridge by laying down antennas, canopies, etc., whereas all but the smallest sailboats require openings to pass.

TABLE IV-8
MOVEABLE BRIDGES IN THE CHARLESTON AREA

Bridge	Chart Designation	Type	Height Above MHW
Ben Sawyer	1	Swing	31 feet
Wappoo Cut	2	Bascule	33 feet
Limehouse	3	Swing	12 feet
Stono	4	Swing	8 feet

4. Contacts with Waterway Users

Representatives of Stevens Towing Company, Younges Island, SC, and Willis Barge Line, Paulsboro, New Jersey, were quite adamant about the need for a 65-foot bridge, mentioning the height of the cranes and dredges that they move. Dredges typically measure 200 feet long by 37 feet wide, and the spud gantry cranes on the dredge are 55 feet high. They will not go under a 55-foot bridge. Use of these dredges to renourish Folly Island beach will probably be required periodically. A 55-foot bridge across the Stono River would seriously impede dredge movement to the Folly River. Traffic through the Stono River Inlet is not possible for dredges. They are seldom moved in open ocean as a one-time Coast Guard permit must be obtained and much involved preparation must be done.

Owners of boats with masts over 55 feet support a 65-foot bridge over the Stono, promising to be at the hearing. Managers of the Ashley & Ripley Light Marinas were resigned to a low bridge, having been limited already by the 55-foot James Island bridge. The owner of Stono Marina nearest the proposed new bridge noted that the 55-foot height would place a long-term restriction on the use of the Stono by large sailing vessels. The three-masted charter sailing vessel "Charleston Pride" is presently docked at the Ripley Light Marina. Because of the 55-foot fixed span James Island bridge, the owner, Captain Robert Marthai, was forced to remove the top portion of the main mast to reduce the vessel's 64-foot height to 46 feet. Captain Marthai frequently takes the Pride down the Stono River to Kiawah Island. He anticipates much more charter and tourist activity on this stretch of the Stono River. He anticipates building a new 135-foot long sailing vessel with a mast height of 60 feet as soon as he can obtain a deep water dock south of the 55-foot James Island Expressway bridge. Both Captain Marthai and Mr. Robert Freeman, Chairman of the Maritime Commission of Charleston, believe that with the closing of Naval facilities, much more emphasis must be placed on Charleston sailing facilities.

The local sailing community believes that Charleston possesses one of the finest sailing areas in the world, equal to or surpassing Annapolis, Newport, or San Diego. The damaged state of the City Marina, the James Island bridge, and ecological opposition to marina development and docks all serve to inhibit Charleston's sailing activities. Local sailors believe a low fixed bridge over the Stono River would be one more roadblock to successful development of Charleston's maritime enterprises.

5. Coast Guard Coordination

A scoping letter was sent to the U.S. Coast Guard on May 11, 1993. No written response was received.

Preliminary coordination continued in July 1993, when project engineers met with US Coast Guard representatives in Miami. The dimensions of the bridge over the IWW portion of the Stono River were agreed to be well defined by existing Coast Guard policy. The Coast Guard representative noted that the height of the Stono River Bridge south of the IWW should be carefully considered, and advised obtaining data regarding existing demand on the river, including recreational and commercial uses.

Further coordination in May 1993 resulted in the vessel and user survey on the Stono River. The types of surveys to be performed were discussed with a Coast Guard representative before determining the scope of the project.

Additional coordination will be accomplished during the planning and preliminary design phases of this project, prior to and following completion of bridge permit applications. Agreement on the navigational clearances will be documented in the FSEIS.

M. Construction Impacts

Construction of the Mark Clark Expressway will temporarily increase erosion and air and noise pollution. Traffic disruption will occur wherever existing traffic interfaces with the project. The development of thorough plans and specifications along with a traffic control plan will minimize these impacts and ensure safe operations during construction.

Water and other utility lines will be relocated prior to extensive construction to ensure that water supplies are not contaminated.

Air pollution will be minimized by sprinkling surface areas with water as required to control dust. If materials are disposed of by burning, this will be carried out in accordance with the necessary rules and regulations.

Erosion and sedimentation during construction will be controlled by limiting the area of erodible earth material which may be exposed at any one time; by restricting waste and disposal areas and construction roads such that sediment does not enter the streams; by restricting flooding of any streams; by temporary measures such as berms, dikes, sediment basins, grasses or slope drains; and by coordination of temporary measures with those permanent soil erosion control measures included in the project, in accordance with the standards of the State Department of Transportation. Construction would be in conformance with policies stated in 23 CFR 650(B).

Bridge construction across the marsh areas on Johns Island and James Island will involve temporary loss of marshland vegetation with the extent of impact dependent on the construction method selected and condition of the subject marsh area. During the final design phase, a detailed survey of the marsh will be made and water depths determined. A construction method will then be selected which will be economically and environmentally suitable for the project. The construction contractor will return surface elevations to surrounding pre-construction elevations, allowing for natural re-vegetation of marsh plants.

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

Although temporary adverse impacts are likely to occur during the construction of the Mark Clark Expressway, the effects generated by this project over the long term are expected to be beneficial. The creation of additional road capacity in South Charleston is essential to relieving the worsening congestion on Savannah Highway, Folly Road, and other arterial streets, and to accommodating planned development.

1. Short-term Environmental Uses

During construction, earth-moving equipment and clearing and grading activities will create temporary adverse effects. Air quality would be diminished due to vehicular emissions, soil disturbance, and vegetation burning. Noise levels would increase because of heavy equipment use. Traffic delays due to construction also could contribute to air quality deterioration, noise level increases, and increased accidents. These activities also are expected to disrupt wildlife and normal human activity during the short-term. Finally, construction will cause disruption of marsh areas on Johns Island and James Island.

Another short-term effect of construction would be the consumption of man-hours of labor required to carry out the project. This additional employment could stimulate the local economy, but it also could cause competition for scarce workers, depending on the wage rate paid to construction workers. However, steady employment in a seasonal resort area over the duration of construction would have a positive benefit to local businesses which service the laborers.

Lastly, utility relocations will be expected to occur, but only short duration interruptions in service are anticipated.

2. Long-term Environmental Effects

Previous chapters of this document explained the need for the Mark Clark Expressway in terms of overall improvement of traffic service on arterial routes, both in the next few years and to build-out. Although the natural environment will be permanently altered along the route, the long-term benefits of providing a safe and efficient transportation system and maintaining a healthy economy by increasing job and development opportunities outweigh the disruption. By designing a limited access facility, new development will be confined primarily to interchange areas, thereby minimizing further encroachment on wildlife habitat or established human communities.

The proposed alignments were chosen to minimize disruption of developed areas, and to minimize disruption of wetland and marine habitat. No known occurrences of threatened or endangered species will be adversely impacted.

By identifying cultural resource areas within the corridor which may be suitable for nomination to the National Register, the process of testing sites and recovering irreplaceable historical and archaeological information will be accelerated, thus enhancing it over what otherwise might occur.

O. Irreversible and Irretrievable Commitments of Resources

Relatively few commitments of resources required by this project could be considered completely irreversible or irretrievable.

Costs for acquisition of right-of-way could be considered irreversible, once expended, but the right-of-way could be used for other purposes in the distant future if the project were abandoned, thus providing some return on the investment.

A substantial financial commitment would be required for the capital cost of the Expressway, in addition to right-of-way acquisition. Major quantities of fuel, materials, and labor would be consumed during construction. These costs would be irreversible, but their expenditure would be considerably mitigated by the financial return of safety, better operational efficiency, improved access throughout the corridor, and increased economic activity of local business.

In summary, existing conditions would be improved significantly by the commitment of irreversible or irretrievable resources, resulting in a generally favorable impact overall.

P. Summary Comparison of Alternatives

Table IV-9 summarizes the quantifiable impacts of the alternatives.

TABLE IV-9
ENVIRONMENTAL COMPARISON OF ALTERNATIVES

	TOTAL ROUTE USING ALTERNATE			
	A	**B**	**C**	**D**
Length (Miles)	7.0	6.9	7.1	7.1
Displacements				
Residences	12	11	10	9
Businesses	5	5	5	5
Other (Park Offices)	1	0	1	0
Distance From Murray-Lassaine School	1,000'	500'	1,200'	1,300'
Noise Impacts				
Substantial Increase	62	93	56	59
Exceed Noise Abatement Criteria	21	30	19	19
Park and Greenway Impacts	1	1	1	1
Acres of Parkland to be Acquired	40.3	0	40.9	41.1
Acres of Parkland Severed	0	0	45.0	64.3
Historic Impacts				
Properties Requiring Additional Work	1	2	2	2
Wetland Impacts (fill only, acres)				
OCRM Jurisdiction	47.1	43.9	46.8	463.8
USACOE Jurisdiction	57.1	47.7	61.6	62.0
Total	104.2	91.6	108.4	108.9
Upland Impacts (acres)				
Live Oak/Mixed Hardwood	19.5	20.8	19.0	18.0
Pine/Mixed Hardwood	17.9	14.1	18.4	19.0
Pine Forest	10.4	12.1	10.4	10.4
Man-Dominated	19.4	30.2	18.6	19.2
Total	67.2	77.2	66.4	66.6
Potential Hazardous Material Sites	0	0	0	0
Construction Costs ($ millions)	151.1	150.0	152.0	152.3
Construction Costs for Bridge Alternate ($ millions)	204.5	196.3	206.9	208.1

CHAPTER V
DRAFT SECTION 4(f)/6(f) EVALUATION

A. James Island County Park - Section 4(f)/6(f) Evaluation

1. Description of 4(f)/6(f) Property

The James Island County Park is located on 640 acres on the west side of James Island, between Riverland Drive and the Stono River. The Charleston County Parks and Recreation Commission owns and operates this facility, which was opened in 1990. Figure V-1 shows the park, as well as the proposed alignments for Mark Clark Expressway in the vicinity of the park.

The *James Island Land Use Policy Recommendations*, published in the summer of 1987 by the James Island Study Committee, indicated that the park was to be built on a portion of the Dill property on Riverland Drive at a cost of $1.5 million. It also stated that the facility was to get underway shortly after the Committee's July and August 1987 meetings. Planning for the park first started in 1986. Its original opening date of 1989 was postponed one year by Hurricane Hugo, which caused extensive damage to the park area.

Numerous recreational activities are available at the James Island County Park, including the following:

- Fishing and crabbing dock
- Children's playground and spray fountain
- Paved bike trails and numerous walking trails
- Pedal boat and bicycle rentals
- 16 acres of lagoons and more than 12 acres of open meadows
- Picnic center with vending machines and four picnic shelters
- Ten fully furnished vacation cottages
- 125-space RV campground and tent/group camping area
- Game room, snack bar, and recreation hall
- Challenge course for use by groups in leadership and team-building workshops
- Holiday Festival of Lights

The headquarters building houses the Charleston County Park and Recreation Commission offices and is located off Riverland Drive in the northeastern corner of the park property. James Island Parkway is a loop road within the park that intersects Riverland Drive just north of Camp Road, approximately 1,500 feet south of the headquarters building. A gatehouse is located within the park entrance. A future water feature is planned in the southeast part of the park near the gatehouse.

Proceeding clockwise around the parkway from the gatehouse, the first road to the left (Fisherman's Way) provides access to the Wando and Stono Shelters and to the fishing/crabbing dock, all located in the southwest corner of the park. The picnic center, the Fun Yard (children's playground), the spray fountain, and the floating dock are all located in the west-central part of the park. The picnic center serves as focal point for park programming. It has restrooms, vending machines, phones and bike rental facility. This area also includes bike rentals, restrooms, vending machines, and telephones.

The second road to the west, Osprey Point, provides access to the Wappoo Shelter, the conference center, and the arboretum, each located near the Stono River in the west-central part of the park. The conference center is equipped for small business meetings and staff retreats.

Marshview Circle provides access to the vacation cottages, the conference center and the maintenance buildings, all located in the northwest part of the park. The ten fully furnished, modern three-bedroom vacation cottages overlook the Stono River marsh.

The park center provides a snack bar, park offices, 1,000-square-foot board room, gameroom, restrooms, pedal boat rental facility, and phones. The park center offices and the boathouse are located in the center of the parkway loop. Also located in the center of the loop are the sites for the future miniature golf course and playground, and the future amphitheater.

North of the James Island Parkway but south of the power lines are located the RV campground and campground activity center. This area also includes two bathhouses/laundromat facilities for the campground, as well as a campground registration facility.

The Edisto shelter is located in the northeast part of the park inside the parkway loop. It provides large climate-controlled structure for receptions, banquets and other group functions. It has a stage, built-in sound system, cafeteria-style kitchen, and restrooms.

At the extreme northern edge of the park north of the electric transmission lines are the primitive tent/group camping areas (northwest border) and the challenge course area (north-central border).

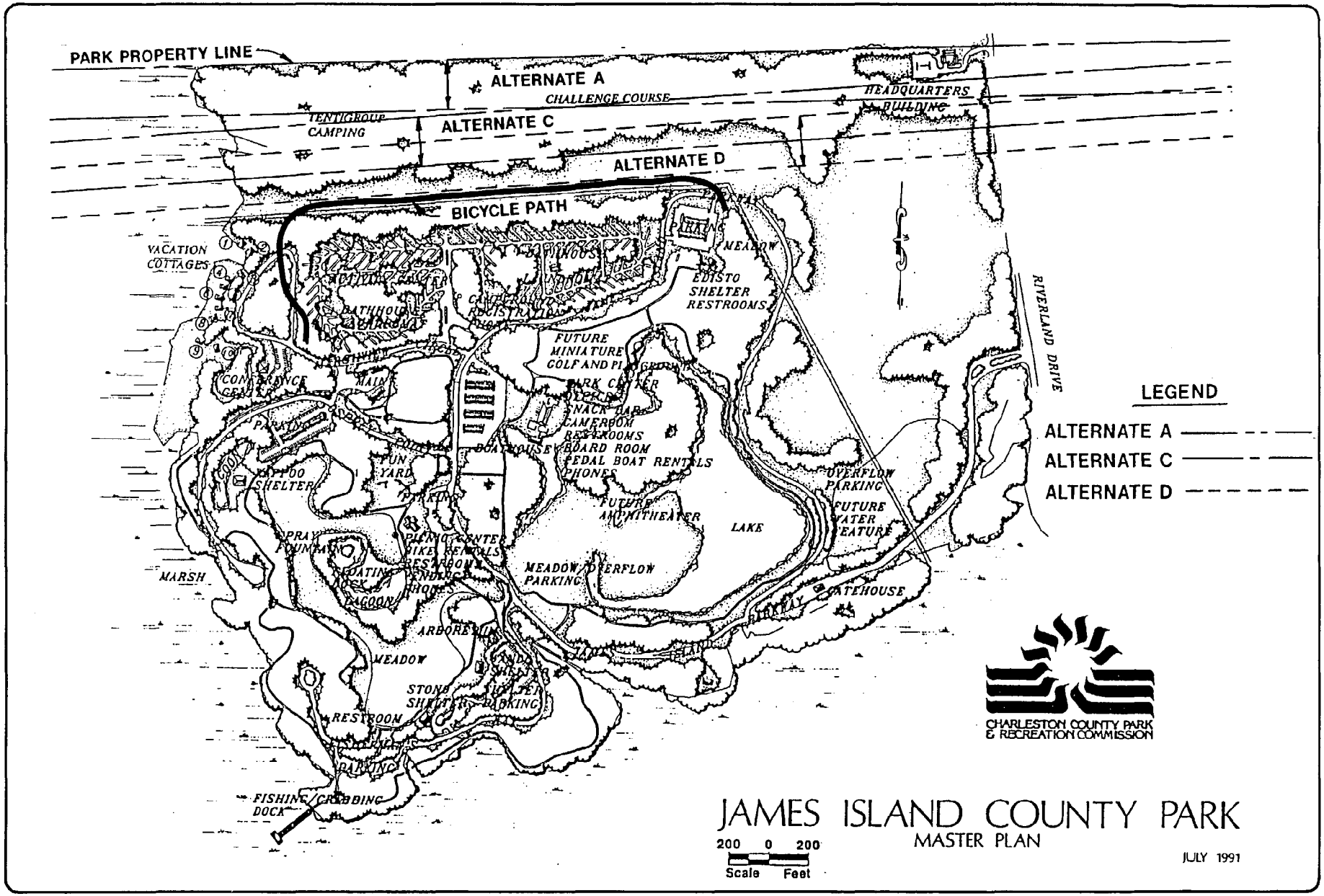
Other planned facilities will include additional picnic shelters, another playground, volleyball courts, a dance barn, a water feature near the gatehouse, an amphitheater, a miniature golf course, and more than five miles of additional bike trails.

Access to the James Island County Park is primarily vehicular, with the only vehicle entrance at the intersection of Riverland Drive and James Island Parkway. Bicyclists and pedestrians may also access the park via Riverland Drive. Two bicycle routes are currently planned to serve the park: one from Maybank Highway and further south on Riverland Drive, and one to connect the eastern part of the island on a route not yet specified.

Approximately 202,000 people visited the park in 1993, up from 160,000 in 1991. These figures included 38,300 using the camping facilities and 9,600 staying at cottages. In addition, over 155,000 visitors drove through the park during the Holiday Festival of Lights in December 1993.

The Charleston County Park and Recreation Commission currently operates four parks: Beachwalker Park, Folly Beach County Park, Palmetto Islands County Park, and James Island County Park. There are no other planned or existing County park facilities on James Island.

The City of Charleston owns and operates three existing recreation facilities on James Island, with five additional facilities planned. The Town of James Island has plans for two parks. The *Charleston 2000* publication, adopted by the City in 1991, calls for developing "parks that are in continuous network, such as walking and biking trails to connect neighborhoods." However, these inter-connections, such as the bikeways previously discussed, are currently only in the planning stages for James Island County Park.



MARK CLARK EXPRESSWAY

IMPACT TO JAMES ISLAND COUNTY PARK

FIGURE V-1

The construction of certain facilities within the park has involved funding from the State of South Carolina that would restrict those facilities to park use; however, no state funds were used for any park facilities within the right-of-ways of any of the alternates for the proposed project. There are no other clauses affecting clear ownership of the park by the Charleston County Parks and Recreation Commission, other than the electric transmission lines easement.

2. Impact

The proposed alignment for Alternates A, C, and D would cross through the northern section of the park. They would cross the areas for the primitive tent/group camping and the challenge course (which includes facilities for group outdoor "challenge" activities). Alternates A and C would also take the park Headquarters Building. Alternate A would take approximately 40.3 acres of park land, including 17.7 acres of marshland. Alternate C would take 40.9 acres of park land, while severing another 45.0 acres. Alternate D would take 41.1 acres, while severing 64.3 acres.

Portions of the park within 208 feet of the proposed alignment's centerline can be expected to experience traffic noise levels above the FHWA noise abatement criteria. This would include portions of the tent/group camping area and the challenge course area across the northern boundary of the park. With Alternate A, the northernmost vacation cottage and the RV campground would be about 750 feet south of the proposed centerline and would experience a 12 dBA noise increase (from 46 to 58 dBA). This increase is not considered substantial, and projected noise levels are well below FHWA noise abatement criteria. (See *Technical Memorandum on Noise Analysis*, Kimley-Horn and Associates, Inc., February 1993 and January 1995).

The northernmost vacation cottage and the RV campground would be about 430 feet south of the proposed centerline for Alternate C and would experience a 16 dBA noise increase (from 46 to 62 dBA). This increase is considered substantial, although projected noise levels are below FHWA noise abatement criteria.

For Alternate D, the northernmost vacation cottages and RV campground would be approximately 305 feet from the proposed centerline. These receptors would experience a substantial 17 dBA noise increase (from 46 to 63 dBA).

Noise impacts on park activities for all four alternative are shown in Table V-1.

TABLE V-1
NOISE IMPACTS IN JAMES ISLAND COUNTY PARK

	Cottages			Campsites		
Alt	Substantial Increase	Approach or Exceed Criteria	Total*	Substantial Increase	Approach or Exceed Criteria	Total*
A	0	0	0	0	0	0
B	0	0	0	0	0	0
C	2	0	2	21	0	21
D	4	0	4	45	0	45

* Excluding Double Counting

No adverse air quality impacts are anticipated in the vicinity of the Expressway.

A preliminary noise barrier analysis was performed for James Island County Park. A 3,000-foot-long noise barrier, placed on the edge of the roadway shoulder (60 feet from centerline) was evaluated. Results of the analysis indicated that a 10-foot-high noise barrier would reduce the noise impact at the northernmost cottages and campgrounds from 62 to 58 dBA (4 dBA reduction) and the Alternate D noise impact from 63 to 59 dBA (4 dBA reduction). With a 12-foot high noise barrier, the noise level at the northernmost cottage and campgrounds would be 57 dBA for Alternate C and 58 dBA for Alternate D.

Because of the difference in elevation between the roadway and the park, a noise barrier located at the edge of right-of-way (125 feet from centerline) would not be effective and was not evaluated.

The proposed alignment for Alternates A, C, and D would result in visual impacts. Alternates C and D would have the greatest visual impact due to their proximity to park activities. If noise barriers are included the visual impact would be worsened by raising the visual profile of the expressway. The raised highway and bridge across the marshlands near the park and across the Stono River will be visible to patrons of the park looking to the north from points on or near the western border of the park and from the remaining tent/group camping and challenge course areas. Planting additional vegetation within the park to replace the trees lost to Hugo would limit the visual impact to the park, particularly the RV campground.

3. Avoidance Alternatives

Use of Alternate B in this portion of the study area would constitute an avoidance alternative. Alternate B would result in reduced noise and visual impacts within the park in comparison with Alternate A. The noise level at the northern boundary of the park, in the tent camping and challenge course area, would be 62 dBA, a reduction of 5 dBA from Alternate A. The noise level at the northernmost vacation cottage and the RV campground would be 53 dBA, an increase of 7 dBA from existing noise levels and reduction of 5 dBA from Alternate A. No other impacts on the park would result from use of Alternate B.

4. Measures to Minimize Harm

The proposed alignment for Alternate A is designed with the northern edge of the right-of-way coincident with the northern property line of the park. This design allows for a minimum amount of park land to be taken and keeps the park from being severed by the highway.

Alternate C is the original alignment that was established before the park was developed. As such the alignment itself does not minimize harm to the park, although the narrow strip between the road and the power line can be used for landscaping and visual screening. The Alternate D alignment modifies the original Alternate C alignment by shifting the road right-of-way so that it is adjacent to the power line right-of-way. This shift avoids leaving a narrow strip of land between the road and the power line while maximizing the size of the remaining park parcel north of the highway.

Further measures to minimize harm to the park could include noise barriers where appropriate (as discussed above) and vegetative screening to limit adverse visual impact. The design would attempt to leave as much natural vegetation, especially trees, as possible intact during construction of the proposed project, with the potential for planting additional trees and screening vegetation within the park. Depressing the grade within the park is not feasible because of the low ground elevation.

Because of the use of Land and Water Conservation Fund grants for the park, selection of Alternatives A, C, or D would require that replacement property of reasonably equal usefulness and location and of at least equal fair market value be provided.

5. Coordination

Picnic shelters, bike trails, and a dock expansion at James Island County Park have been financed in part by Land and Water Conservation Fund grants.

Coordination with Charleston County Parks and Recreation Commission (PRC) has been maintained since the beginning of this study. A meeting with PRC staff took place in May 1992, during which PRC expressed preference for an alignment avoiding the park, particularly the park headquarters building. The PRC was also included in a public meeting regarding this project and the James Island Expressway in July 1992. Further meetings including SCDOT, PRC, FHWA, elected officials, and citizens took place in 1993 and 1994 following the public meeting. These meetings included discussions regarding the early planning of the park and its consideration of the adopted 1972 corridor. The alternatives were discussed with PRC staff and the alignment for Alternate A was developed in consultation with them. PRC indicated that if an alternative takes parkland, the impact should be minimized by placing the alignment at the property line to avoid severing any park property. Copies of alternative alignments have been provided to the PRC.

Copies of this 4(f)/6(f) document will be circulated to the Department of Interior - National Park Service, the South Carolina Department of Parks, Recreation & Tourism, and the Charleston County Parks and Recreation Commission.

B. West Ashley Greenway - Section 4(f) Evaluation

1. Description of 4(f) Property

The West Ashley Greenway, formerly known as the West Ashley Bikeway South, is located approximately 900 feet south of US 17. The greenway is located on the abandoned Croghan Branch of the Seaboard System Railroad, Inc. right-of-way. The greenway is located within the same right-of-way as a utility corridor. Figure V-2 shows the location of the greenway and its relationship to the proposed expressway.

The property was purchased in 1985 by the Commissioners of Public Works of the City of Charleston. In 1991, the Commissioners of Public Works leased the property to the City of Charleston for twenty-five years. The lease agreement provides that the City may use the property for recreational purposes as a passive public greenway, including landscaping, pedestrian and bicycle paths, and seating. Other uses require prior approval of the Commissioners of Public Works.

The greenway is approximately 7.75 miles long, and is unpaved. Crushed rock has been placed at intersections with local streets. City staff from the Department of Parks indicate that the greenway is regularly used by pedestrians and for non-motorized vehicular uses as a recreational facility and as an off-road connector between neighborhoods in the area. No usage estimates are available from the City's Department of Parks.

2. Impact

The corridor selection was re-examined during preparation of this document. All of the corridors would bisect the greenway in approximately the same location, and no revisions to the corridors were made as a result of the greenway. Only one alternative has been identified for this section of the Expressway.

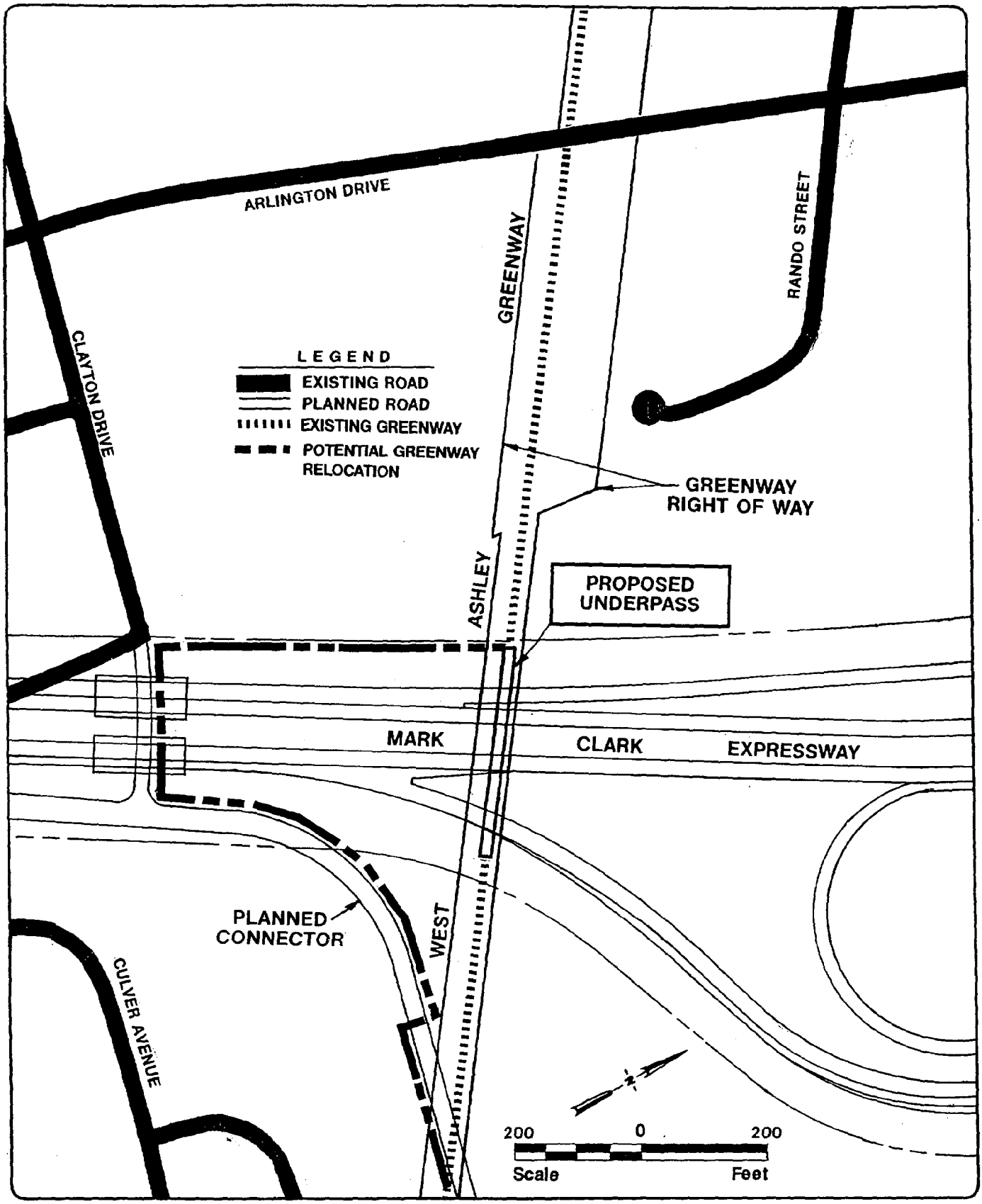
Approximately 0.8 acres of the greenway would be crossed by the Expressway, as shown in Figure V-2. No adverse air quality or noise impacts are anticipated in the vicinity of the Expressway. The proposed alignment would result in visual impacts as currently unrestricted views of the greenway would be impeded by the proposed underpass. Planting additional vegetation at both ends of the underpass would reduce the visual impacts. The greenway would have to be closed for a period of time during construction of the Expressway. Construction will be phased to minimize the period of closure.

3. Avoidance Alternatives

In this section of the project, only one alignment has been identified. Because of the north-west orientation of the proposed action, and the east-west orientation of the greenway, any alignment would have a similar effect on the greenway.

4. Measures to Minimize Harm

The proposed Expressway includes providing an underpass to maintain the West Ashley Greenway continuously, either in its existing location or utilizing the proposed Clayton Drive underpass which would avoid severing the greenway. In one alternative, the greenway would utilize the underpass to run under the proposed Expressway; the approximate length of the underpass is 300 feet. Lighting will be provided in the structure unless the Clayton Drive location is used. The second alternative would relocate the greenway along the planned connector and Clayton Drive, and then along the west side of the Expressway right-of-way to



MARK CLARK EXPRESSWAY

IMPACT TO WEST ASHLEY GREENWAY

FIGURE V-2

the existing greenway. This alternative would involve the construction of approximately 1,700 feet of relocated greenway to replace 850 feet of existing greenway.

Further measures to minimize harm could include noise barriers where appropriate and vegetative screening to limit adverse visual impact. This would include attempts to leave as much natural vegetation, especially trees, intact as possible during construction, with the potential for planting additional trees and screening vegetation on the periphery of the greenway.

5. Coordination

Coordination with the City's Parks Department indicates that the greenway is included in the City's Park Plan.

CHAPTER VI
LIST OF PREPARERS

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Thomas R. Wheaton
Study Director

Mary Beth Reed
Architectural Historian

CHAPTER VII

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

U.S. Department of Agriculture, Soil Conservation Service
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Fish and Wildlife Service (Charleston)
U.S. Environmental Protection Agency-Region IV
U.S. Army Corps of Engineers
National Marine Fisheries Service
U.S. Coast Guard
S.C. Department of Archives & History
S.C. Department of Parks, Recreation & Tourism
S.C. Wildlife & Marine Resources Department
S.C. Water Resources Commission
S.C. State Development Board
S.C. Department of Health & Environmental Control
S.C. Land Resources Conservation Commission
S.C. Coastal Conservation League
Institute of Archaeology and Anthropology
Grice Marine Biological Laboratory
Governor's Office
South Carolina Coastal Council
Lowcountry Regional Planning Council
Charleston Chamber of Commerce
Columbia Audubon Society
S.C. Wildlife Federation
South Carolina Nature Conservancy
Coastal Environmental Coalition
Sierra Club
Wildlife Action, Inc.
Chicora Foundation
Garden Club of America
NAACP Branch President
Local League of Women Voters
State Senator McConnell
State Representative Gonzales
Mayor of Charleston
Highway Commissioner
Charleston County Administrator
Charleston County Development Director

CHAPTER VIII

COMMENTS AND COORDINATION

The Draft Supplemental Environmental Impact Statement was coordinated with Federal, State, and local agencies and organizations, as well as with the public through an extensive public involvement plan. A Notice of Intent to prepare an environmental document was published on May 22, 1992 in The Federal Register.

A. Agencies and Organizations

Specific agencies and organizations contacted during the study process are listed below. Scoping letters were distributed to these agencies and individuals on May 11, 1992. Written responses from these agencies are included in Appendix A.

Federal Agencies

- U.S. Fish and Wildlife Service (Charleston)
- U.S. Environmental Protection Agency-Region IV
- U.S. Army Corps of Engineers
- National Marine Fisheries Service
- U.S. Coast Guard
- U.S. Geologic Survey
- National Park Service
- Federal Emergency Management Agency

State Agencies and Elected Officials

- S.C. Department of Archives & History
- S.C. Department of Parks, Recreation & Tourism
- S.C. Wildlife & Marine Resources Department
- S.C. Water Resources Commission
- S.C. Department of Health & Environmental Control
- S.C. Forestry Commission
- S.C. Human Affairs Commission
- Nature Conservancy
- Governor's Office
- South Carolina Coastal Council
- State Senator McConnell
- State Representative Gonzales
- Highway Commissioner Harrell

Local Agencies

- City of Charleston
- Charleston County
- Carolina Coastal College
- Charleston County Park and Recreation Department

Meetings Held

Site review meetings were held with the U.S. Army Corps of Engineers and the S.C. Coastal Council (now OCRM) field representatives to establish and confirm jurisdictional wetland boundaries. SCDOT representatives also attended an interagency coordination meeting in Charleston on January 6, 1993 to discuss wetland issues, including bridge length.

Key Issues Identified

The responses of various resource agencies to requests for input into project planning and environmental studies indicate the following key issues:

(1) Consideration should be given to avoiding and minimizing impacts to estuarine (salt marshes associated with the Stono River) and freshwater wetlands.

(2) Construction-related techniques to minimize impacts to wetlands should be identified.

(3) Mitigation for unavoidable impacts should focus on restoration of previously impacted wetlands.

Coordination Meeting 6/8/95

Copies of the Natural Resources Technical Memorandum and a summary of the bridge length analysis results were provided to permit and resource agencies prior to this meeting.

Following is a summary of agency comments from the meeting and responses:

1. One commentor suggested that ratios should be based on creation of new wetlands rather than enhancement of existing wetlands.

   Over the recent years the majority of permit and resource agencies have tended to move away from creation in favor of enhancement. The ratios used in the bridge vs. fill analysis are included for order of magnitude comparison only and adjustments will not affect the results for this purpose.

2. One commentor indicated that the mitigation option for saltwater wetlands (as opposed to avoidance) should not be considered at this stage of the document. Another indicated that all saltwater areas should be bridged.

   The intention of showing alternatives in the draft document is to disclose to the public, interested agencies, and decisionmakers the range of potential environmental effects and the relative costs associated with various mitigation options. Therefore, we have retained the option in this Draft document.

3. One commentor indicated that the acquisition cost of mitigation area for wetlands should be $75,000 and $15,000 for creation.

We feel that the suggested price for acquisition is to high. Prices included in the document were based on a preliminary search for available lands and best available information was used. Again, for purposes of this preliminary analysis, only an order of magnitude comparison is needed. Estimates will be refined as the project develops and more detailed project and mitigation plans are prepared.

4. A suggestion was made to reduce the median width; a statement was made that the 48' median width was unacceptable.

   A 48' median width was assumed in the preliminary design for consistency with the existing portion of the route. From the standpoint of safety to travelling public, we find that the proposed median is both desirable and acceptable. This would also provide the opportunity for expanding the facility if needed in the future with lower public cost and minimal environmental impacts. Therefore, for purposes of this draft document, the 48' median is utilized for the analysis.

5. One request was made to include in the analysis the difference in bridge lengths as well as the difference in acres for the bridge vs. fill alternatives.

   The embankment alternative as currently proposed has 12,405 feet of bridge, including the two Stono River bridges but not including the relatively short bridges at Savannah Highway, Folly Road, and James Island Creek tributary. The bridge alternative as currently proposed has an additional 13,195 feet of bridge in the three study areas (Johns Island, Headquarters Island, and County Park), for a total of 25,600 feet of bridge.

6. The Final Supplement EIS should discuss construction techniques for the bridges.

   We will provide additional information regarding bridge construction techniques in the FEIS following review of written comments on the DEIS and further refinement of bridge design.

7. A question was raised about how stormwater will be treated on the bridges.

   We will provide additional information regarding stormwater treatment in the FEIS following review of written comments on the DEIS and further refinement of bridge design.

B. Public Meetings

A public meeting was held in James Island in July 1992 to discuss this project and the adjacent James Island Expressway. Approximately 200 citizens attended the meeting, which included SCDOT staff and elected officials. Several citizens expressed concern regarding the route's impact on the Bradham Road area and urged that it be moved onto James Island County Park. Representatives of SCDOT met with Town of James Island officials on July 8, 1993. The two studied alternatives were presented and the general impacts discussed. A representative of the local community was included in the meetings.

An informal public meeting on this project was held at James Island High School on Wednesday, August 25, 1993, between 4:00 and 7:00 PM. The format of the meeting was a walk-through workshop, with engineers and planners available to answer questions and accept comments. Right-of-way staff were also available to answer questions regarding relocation and property acquisition procedures. Two sets of public hearing maps were displayed, which showed the alternative alignments, affected properties, and other topographic features. Approximately 250 members of the public attended the meeting. The following comments or concerns were expressed:

- Several people expressed the need for the project and hoped that it could be built quickly.

- Some residents and property owners in the Headquarters Plantation development objected to the road's proximity to portions of that development.

- Many of the people attending the meeting were interested in the schedule for acquiring right-of-way and constructing the highway.

- Some owners of large tracts of property were concerned by the project's severing portions of their property.

- In general, residents of affected parcels were concerned by the proximity of the road to their property.

- Several residents asked about the location of noise barriers.

- Approximately 75 residents of Bradham Road and the adjoining community who attended the meeting strongly objected to Alternate B, favoring Alternate A or the original corridor through what is now James Island County Park property. Some of these residents were particularly interested in the Section 4(f) regulations.

C. Public Hearing

A combined corridor/design public hearing will be conducted by SCDOT after distribution of the Draft Supplemental Environmental Impact Statement. The purpose of the public hearing is to receive comments from the public so that the comments can be considered in recommending a corridor and design for the Mark Clark Expressway. Comments received at the public hearing will be in the Final Supplemental Environmental Impact Statement.

CHAPTER IX
INDEX

APPENDIX A

AGENCY RESPONSES

United States Department of the Interior
FISH AND WILDLIFE SERVICE
P.O. BOX 12559
217 FORT JOHNSON ROAD
CHARLESTON, SOUTH CAROLINA 29412

TAKE PRIDE IN AMERICA

May 21, 1992

Mr. Robert L. White
State Highway Engineer
S.C. Department of Highways and Public Transportation
P.O. Box 191
Columbia, SC 29202

Re: Supplemental Environmental Impact Statement - I-526, Proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County.

Dear Mr. White:

This responds to your May 11, 1992 solicitation for input with particular reference to the project's effects on the natural and human environment. The U.S. Fish and Wildlife Service (Service) offers the following "scoping" input for issues which should be addressed in the supplemental EIS for the project.

The general alignment of the project includes two crossings of the Stono River. It will also traverse marsh and creek system tributaries of the Stono. These are sensitive environmental areas contributing much to the recreational, aesthetic, and fish and wildlife resource amenities of the local area. Therefore, the document should explore alternatives to avoid, minimize and compensate for unavoidable impacts to these areas.

Crossing the Stono River creeks, marshes, and mainstem should be planned on structure. The intersection with Maybank Highway should be planned on highground. Alternative construction techniques which minimize short and long term impacts to the marsh and creek systems should be explored and the least damaging, practicable alternative, selected and specified. Compensation mitigation options for unavoidable impacts to marsh and wetland systems should also be explored and identified in the document. Exploration of alignment shifts to avoid wetlands, large live oaks, and other sensitive and valuable resources in the alignment should be included in the document.

In preparation of the document, reference should be made to the standard endangered species list for Charleston County. Please contact us if you need an update of the County lists (the latest update is dated May 1, 1992). Habitats in the project area should be compared to those suitable for the species on the list. Suitable habitats should be surveyed for the presence of the species if appropriate and/or an assessment of project impacts on the species should be prepared and incorporated into the document.

We appreciate this opportunity for early planning input and look forward towards continued coordination through the planning and permitting process.

Sincerely yours,

Edwin M. EuDaly

Edwin M. EuDaly
Acting Field Supervisor

EME/SG/km

CP1229

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

JUN 11 1992

RECEIVED

JUN 15 1992

CZR, INCORPORATED
JUPITER, FLORIDA

Mr. Samuel E. Wiley
CZR Incorporated
1150 South U.S. Highway 1, Suite 201
Jupiter, Florida 33477-7236

RE: Mark Clark Expressway - Charleston, South Carolina

Dear Mr. Wiley:

The U.S. Environmental Protection Agency (EPA) has received your request for information regarding the presence of designated Sole Source Aquifers and Wellhead Protection Areas within the area encompassed by the above referenced project. We appreciate your inquiry.

Under the authority of Section 1424(e) of the Safe Drinking Water Act (SDWA), EPA reviews federally-funded projects with respect to their potential impacts on ground water if the projects are located in areas that have "an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health". The subject property is not located in an area that has been designated as a Sole Source Aquifer, and EPA is not in receipt of a petition to designate any portion of the property as such. Hence, this project is not affected by the Sole Source Aquifer Program.

In regard to your request for information concerning the presence of Wellhead Protection Areas within the project area, please keep in mind that states maintain the primary responsibility for Wellhead Protection activities, while EPA's role is primarily one of oversight. Presently, EPA does not maintain an inventory of designated Wellhead Protection Areas within South Carolina. The information you requested is available through the South Carolina Department of Health and Environmental Control (SCDHEC). The primary SCDHEC contact for inquiries related to Wellhead Protection is Mr. David Baize. Mr. Baize can be reached by telephone at (803) 734-5329. His mailing address is as follows:

Assessment and Development Section
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201

I hope this information is of help to you. If you have any questions, please do not hesitate to contact me at (404) 347-3866.

Sincerely yours,

Dale Froneberger

Dale Froneberger
Ground-Water Management Unit

LJM

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 919
CHARLESTON, S.C. 29402-0919

REPLY TO
ATTENTION OF

June 29, 1992

Regulatory Branch

Mr. Robert B. Ferrell
Environmental Program Administrator
South Carolina Department of
Highways & Public Transportation
Post Office Box 191
Columbia, South Carolina 29202

Dear Mr. Ferrell:

This is in response to your letter dated May 11, 1992, requesting our comments on a proposed Supplemental Environmental Impact Statement for the remaining portion of I-526 (Mark Clark Expressway) to be constructed from S. C. Route 7 to S. C. Route 171 in Charleston County, South Carolina.

After reviewing the information provided, it is apparent that large expanses of tidal estuarine wetlands are located within a majority of the proposed highway corridor. Also, there is a high probability that isolated pockets of freshwater wetlands will be located within the highland portions of the corridor. If roadway embankment construction involves the discharge of dredged or fill material in these wetland areas, a Department of the Army permit will be required under Section 404 of the Clean Water Act.

If wetland impacts are identified, I have inclosed two documents entitled "Applying NEPA TO The 404 Permit Process" and "Mitigation Information Needs." Your use of the information and guidance contained in these documents will allow for a more complete and thorough review of the proposed project, practicable alternatives and mitigation. A beneficial result of this type of approach will be an overall reduction in the time required to obtain a decision on a permit.

As you are probably aware, Congress recently passed the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA strongly emphasizes that the document "Applying The Section 404 Permit Process to Federal-Aid Highway Projects" will be fully implemented as an official policy of the Federal Highway Administration, U. S. Army Corps of Engineers and the Environmental Protection Agency. Since this document is no stranger to our agencies, I feel that we can and will fully adhere to its intent and purpose on this project as well as future projects.

Also, I have coordinated your project with our Engineering and Planning Division. They recommend that if rip-rap is to be placed around bridge piers then a containment sheet pile wall should be constructed.

I would like to thank you for the opportunity to comment on this project and if we can be of any further assistance, please do not hesitate to contact Mr. Fred Veal of my staff at A/C 803-727-4684.

Sincerely,

Clarence A. Ham
Chief, Regulatory Branch

Enclosure

Mitigation Information Needs

Site specific mitigation requirements may affect use of the elements outlined below. However, in most cases the mitigation plan should include the following information:

1. A description of the location, acreage, and type of wetlands eliminated and brief explanation of known or anticipated functional values. Also, a map of the project area and site specific design drawings or overlays.

2. A description of the location, acreage, and type of replacement wetlands. Also, a map of the mitigation site along with site-specific design drawings or overlays. Also, a description of existing habitat values and functions at the mitigation site.

3. A description of the elevation, slope, and/or contours to be constructed at the mitigation site. Note: The site should be excavated to an elevation 6 inches lower than the adjacent wetlands and backfilled with organic material from the impacted site to establish an elevation and substrate equivalent to the desired habitat.

4. The location and dimensions of the hydrological connection with adjacent wetlands or open water. The design of the mitigation site should maximize the "edge effect" to promote biological interaction with adjacent waters. If interior, isolated wetlands are created/restored, information relative to hydrological success (i.e. groundwater or runoff source) should be identified.

5. A description of the replacement habitat construction techniques and limitations on construction alternatives needed to avoid impacting adjacent wetlands.

6. A description of transplanting techniques, including species, spacing, and schedule (time of year). Also, the source of transplants (i.e., from adjacent natural wetlands or greenhouse stock). If obtaining from natural sources, techniques, sites, and other information needed to assure impact minimization should be provided.

7. Plans for stabilization of the wetland/uplands interface to prevent erosion of sediments into the mitigation site. Also, plans for needed stabilization of the mitigation site.

8. A plan to monitor the mitigation site at the time of completion and periodically after completion. Transects with fixed stations should be established, and at each time interval, documentation, using color photography, should be provided.

9. Develop criteria for evaluation of success. Note: Criteria should include measure of vegetation aerial coverage and growth. Mitigation will generally be regarded to be successful with attainment of 75 percent aerial coverage and growth of the transplants.

10. Identification of remedial measures (e.g., regarding the site to adjust the elevation and/or replanting) that will be taken to meet the established

performance criteria, if necessary.

11. Measures to ensure that the mitigation site will remain in perpetuity as wetlands.

12. Plans showing that the mitigation site and associated planting will be completed prior to or concurrently with project construction.

Review agencies will be provided with the results of each monitoring effort and will make recommendations, as needed, to assure attainment of the desired mitigation. At the end of the two year monitoring period, the applicant's responsibility for creation of replacement wetlands will be completed, pending approval by the review agencies and the Corps of Engineers.

Finally, the mitigation plan should be attached to and incorporated by reference in the issued permit so that the permit is revocable if the requirements of the plan are not met.

APPLYING NEPA TO THE 404 PERMIT PROCESS

This document is to assist the South Carolina Department of Highways and Public Transportation in the preparation of environmental assessments as they pertain to Department of the Army permitting and compliance with the 404(b)(1) Guidelines. Some of the recommendations contained herein can be applied to NEPA documentation in order to facilitate the permit review.

In an effort to improve communication between the Highway Department and the various regulatory environmental agencies, we have identified a pattern of problems in the documentation. Those subjects are alternative analysis, minimization of wetland impacts and mitigation for unavoidable impacts.

The Highway Department has indicated that the alternative analysis issue has usually been addressed during the NEPA process and the agencies are requiring them to go through the process twice. The resource agencies contend that the alternative analysis provided during the NEPA documentation is not specific enough to comply with the 404(b)(1) Guidelines that are part of the Corps permit review. Also, mitigation is rarely addressed during the NEPA process since the specific environmental impacts are seldom known at that point in time.

ALTERNATIVES

An adequate alternative analysis is a requirement of the NEPA process and the 404(b)(1) Guidelines. Alternatives are seldom disputed for road widening projects for obvious reasons. It is new roadway alignments that generate controversy on alternatives. The resource agencies usually prefer improvements to existing roadways over new alignments.

An alternative analysis that only addresses the preferred, the most economical, the no build, the mass transit and the road widening through a developed area is not, in most cases, considered adequate. The preferred alternative should be the least environmentally damaging practicable one that will fulfill the basic purpose of the proposed project after taking into consideration cost, existing technology, and logistics. The alternative analysis should be presented in the following format:

1. The project purpose must be clearly stated.

2. The applicant should start with the premise that the least environmentally damaging alternative is the preferred alternative until and unless adequate detailed analysis demonstrates that it is not practicable. Should practicality rule out this alternative, proceed to the next least environmentally damaging alternative and so on.

The documentation of the various alternatives considered should proceed in the following manner:

1. A map that depicts all wetlands in the study area. A National Wetland Inventory (NWI) map, if available, would be ideal for this purpose. If a county soil survey or another type of map is used, the wetlands should be identified in accordance with the NWI classification system (Cowardin et al, 1979).

2. A mylar overlay (the same scale as the above mentioned map) that depicts each alternative considered.

3. A mylar overlay that shows all properties that contain areas of historical interest or substantial improvements located in any of the alternative alignment corridors.

4. A mylar overlay that shows areas that are likely to contain any Endangered or Threatened species.

5. A matrix that describes the wetland impacts for each alternative considered. The matrix should contain the acreage, classification, and Resource Category (as defined in the FWS's Mitigation Policy (46 FR 7644-7663) of wetland impacts in the various alternatives.

6. A description of the wetlands functions and values for the types identified in the various alternative alignments. In some cases this may require a HEP or wet analysis.

7. A discussion of the rationale in the proposed designation of bridge vs. causeway wetland crossing. The resource agencies generally recommend maximizing the amount of wetlands crossed by bridging.

8. Any other information that was considered which led to the selection of the preferred alternative over a less environmentally damaging alternative.

MITIGATION

The Council of Environmental Quality (CEO) has defined mitigation in its regulations at 40 CFR 1508.20 as including: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. To simplify this document these will be combined to form three general types: avoidance, minimization and compensatory mitigation.

As mentioned above it may be difficult to combine NEPA and the 404 permit process as they apply to mitigation since all the wetland impacts may not be known during a projects planning stage. However, when a road must cross a large linear wetland the highway planners should have a reasonably good idea as to the location, type and amount of wetlands that will be impacted. In a case where approximate wetland impacts are known, the Highway Department should propose specific mitigation during the NEPA process. The Highway Department has indicated they often have difficulty providing mitigation in the vicinity of a project. If the mitigation is not proposed during the NEPA phase, then it must be provided during the permitting process and risk losing mitigation opportunities that were available during the early stages of the project.

The preferred mitigation is on-site and in-kind. This means when a portion of a bottom land hardwood wetland is destroyed by a project, a new area of bottom land hardwood should be created or a degraded wetland restored/ enhanced in the immediate vicinity. The Highway Department has often stated that they are unable to condemn property for mitigation purposes. The resource agencies contend that mitigation is an integral part of roadway construction when wetlands are impacted. If permit applications are denied due to lack of suitable mitigation, then the mitigation or lack there of, may well be considered an integral part of the project. This controversy may have to be settled in the courts or by the Highway Department purchasing land in lieu of condemning it.

A mitigation proposal should be specific. The location, acreage, and a description of the proposed mitigation should be provided. Plan and cross-sectional drawings that accurately depict the existing and proposed changes in the mitigation area should be included. Tidal range/elevation should be included if applicable. A detailed monitoring plan of the mitigation area and a contingency plan, should the proposed mitigation be unsuccessful, should also be provided.

AVOIDANCE: As mentioned above, avoidance should be addressed in detail in the alternative analysis during the NEPA phase.

MINIMIZATION: The Highway Department should take credit when they minimize impacts to wetlands. When documenting the impacts "filled wetlands" should be separated from "bridged wetlands" in the evaluation of wetland impacts. A reduction in the width of road shoulders or construction techniques that reduce impacts to wetlands should also be documented. Temporary construction impacts, if known, should also be addressed. In sensitive wetlands where bridges are to be constructed, the construction methods should be discussed. If it is not practicable to build the bridge without a temporary access road, or dredge and access canal, then it should be discussed in the Environmental Assessment or it will be assumed that a temporary access road or access canal will not be necessary.

COMPENSATION: Compensation for unavoidable impacts to wetlands is a reoccurring problem area during the permit process. The Highway Department has requested assistance from the resource agencies in this area on several occasions. Budget and manpower restraints prevent the resource agencies from designing compensatory mitigation for every highway project. It is the Highway Departments responsibility. Therefore, the Highway Department will have to meet this requirement by increasing its inhouse personnel or contractual services. However, the resource agencies should both continue to provide general guidance regarding what should be included in the mitigation and its thoughts on the adequacy of plans submitted by the Highway Department.

Compensatory actions should be undertaken, when practicable, in areas adjacent or contiguous to the discharge site (on-site compensatory mitigation). If on-site compensatory mitigation is not practicable, off-site compensatory mitigation should be undertaken in the same geographic area (i.e., in close physical proximity and, to the extent possible, in the same watershed). In determining compensatory mitigation (e.g., restoration of existing degraded wetlands or creation of man made wetlands), the functional values lost by the resource to be impacted must be considered. In most cases,

values lost by the resource to be impacted must be considered. In most cases, in-kind compensatory mitigation is preferable to out-of-kind. There is continued uncertainty regarding the success of wetland creation or other habitat development of this type. Therefore, in determining the nature and extent of habitat development of this type, careful consideration should be given to its likelihood of success.

The Federal Highway Administration has suggested the following mitigation measures: The use of uneconomic remnants for the purpose of mitigation. Requiring contractors to borrow road fill material from specific areas when the borrow material is satisfactory, cost efficient, and the area is suitable for mitigation. Use independent roadway alignments when locating new dual highways if such an arrangement would present opportunities for wetland creation or preservation. Design mitigation between ramps and roadways in interchange areas when possible.

The National Marine Fisheries Service has made the following mitigation recommendations: Remove abandoned causeways and plant suitable wetland vegetation. Open old dikes and embankments to reestablish natural inundation. Mitigation banking that provide benefits to NMFS trust resources that are impacted by a specific project.

Mitigation Banking can not be applied to every highway project, but it will expedite certain ones and it may be worth pursuing. It will require the full participation of the regulatory agencies, the resource agencies, and the highway department. The Vandross Bay Bank would be a likely candidate to start with. If that one is successful others could be considered.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

June 16, 1992 F/SE021/RSS
919/728-5090

Mr. Robert L. White
S. C. Department of Highways and
Public Transportation
P. O. Box 191
Columbia, South Carolina 29202

Attention: Kevin Sheppard

Dear Mr. White:

Please reference your May 11, 1992, letter requesting our comments on the Supplemental Environmental Impact Statement (SEIS) for the proposed I-526 Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County, South Carolina. We have reviewed the information provided in your letter and offer the following comments.

The Stono River and its adjacent wetlands provide habitat for a variety of estuarine dependent and anadromous fishery resources. The proposed highway alignment under study crosses the Stono River and tributaries in two places and potentially adversely impacts wetlands and waters that support both commercially and recreationally important fishery resources. Therefore, we recommend that the SEIS include the following:

1. The SEIS should address bridge alignment alternatives that will avoid and minimize wetland losses.

2. The SEIS should describe the location, species, and acreage of wetlands potentially impacted by the alternatives considered.

3. The SEIS should provide a description of the aquatic organisms found in the project area and an assessment of the impacts of the project's alternatives on these resources.

4. The SEIS should describe highway and bridge construction alternatives that will minimize wetland losses. We recommend bridging all wetlands to avoid loss of these important resources.

5. The alternative analysis in the SEIS should demonstrate that the recommended alternative also represent the least environmentally damaging alternative.

6. Bridge construction often requires temporary filling for access roads and/or excavation of channels for barge construction access. The SEIS should address the impact on wetlands and fishery resources of any construction related temporary wetland losses or fishery habitat alterations.

7. If, after avoidance and minimization of wetland involvement, the selected alternative requires unavoidable wetland losses, the SEIS should provide a mitigation plan to compensate for wetlands lost.

The S. C. Wildlife and Marine Resources Department is an excellent and reliable source of data concerning specific fishery resources in the project area. A representative of our Beaufort field office is available to discuss National Marine Fisheries Service's concerns at any time during the SEIS or permit review process.

Sincerely yours,

Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

SCDOT
South Carolina
Department of Transportation
P.O. Box 191
Columbia, S.C. 29202-0191

Daniel P. Fanning, P.E.
Director

February 28, 1995

Dr. George Vogt
State Historic Preservation Officer
South Carolina Dept. of Archives & History
P.O. Box 11669
Columbia, SC 29211

Subject: An Architectural Underwater Reconnaissance and Terrestrial Archaeological Survey of the Mark Clark Expressway Project from U. S. Highway 17 to Folly Beach Road by New South Associates

Dear Dr. Vogt:

The Department's consultant has completed its archaeological and architectural investigations on the above referenced project and we have enclosed one copy of the report for your review and comment. The research techniques included an intensive archaeological survey, underwater reconnaissance, and a historical architectural survey along alternate corridors of the project.

The survey resulted in the identification of four archaeological sites and seven architectural sites. Of the four archaeological sites, (38CH1293) was evaluated not eligible for the National Register of Historic Places and no additional investigations are recommended. One site (38CH1146), the Fenwick Hall causeway, is eligible for the National Register of Historic Places and will require mitigation through data recovery. Site 38CH1148 is potentially eligible for the National Register and will require archaeological test excavations for a definitive assessment of eligiblity if Alternate B is selected. Site 38CH1550 is potentially eligible for the National Register and will require archaeological test excavations if Alternates C or D are selected.

Of the seven historic structures, none are eligible for the National Register. No additional investigations are recommended.

In accordance with the memorandum of agreement approved by the Federal Highway Administration, March 16, 1995, the Department is providing this information as agency offical designee, as defined under 36 CFR 800.2, to ensure compliance with Section 106 of the National Historic Preservation Act.

It is requested that you review the enclosed material and, if appropriate, indicate your concurrence in the Department's findings, thus implementing the Section 106 consultation process. Please respond within 30 days if you have any objections or if you have need of additional information.

Sincerely,

Paul F. Embler
Environmental Program Administrator

Enclosure

I (do ~~not~~) concur in the above determination.

Signed: R Wilt Taylor Date: 3/17/95

a few questions

Wayne, where is Appendix C?
need site definition methodology (ie 2 sq. 5's in cruciform, or grid, etc.)
Were alt. C&D reconnaissance or intensively surveyed?

Wayne Roberts answered these comments and a clean final, final report is available. (8-10-95)

South Carolina Department of Archives and History

1430 Senate Street, P.O. Box 11,669, Columbia, South Carolina 29211 (803) 734-8577
State Records (803) 734-7914; Local Records (803) 734-7917

July 23, 1993

Mr. Robert B. Ferrell
Environmental Program Administrator
SC Dept. of Transportation
P.O. Box 191
Columbia, SC 29202

Re: Archaeological Investigations of the
Mark Clark Expressway Project,
U.S. 17 to Folly Beach Road
Charleston County

Dear Mr. Ferell:

Thank you for providing a copy of the report AN ARCHITECTURAL, UNDERWATER ARCHAEOLOGICAL, AND TERRESTRIAL ARCHAEOLOGICAL SURVEY OF THE MARK CLARK EXPRESSWAY PROJECT FROM U.S. HIGHWAY 17 TO FOLLY BEACH ROAD. We offer the following comments on properties identified during investigations.

ELIGIBLE

38CH1146 (Fenwick Hall Causeway)*

*If this site will be affected by construction, means of mitigation need to be determined in consultation with the SHPO.

NOT ELIGIBLE

Bldg. #249.1501	Bldg. #249.1505	38CH1293
Bldg. #249.1502	Bldg. #249.1506	
Bldg. #249.1503	Bldg. #249.1507	
Bldg. #249.1504		

ADDITIONAL INFORMATION NEEDED

38CH1148: Test excavations needed for eligibility assessment.

Underwater Anomaly in Stono River, Alternate A. Further assessments are needed if Alternate A is selected. We remind you and the authors of the report that properties treated as archaeological sites require a completed State Archaeological Site Form and a permanent state site number assigned by the SC Institute of Archaeology and Anthropology.

These comments are provided to assist you and the Federal Highway Administration with its responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended, and the regulations codified at 36 CFR Part 800. If you have questions, please call Ms. Nancy Brock, Review and Compliance Branch Supervisor, at 803/734-8615.

Sincerely,

Mary Watson Edmonds

Mary Watson Edmonds, Deputy
State Historic Preservation Officer

cc: Mr. Ken Myers
FHwA

South Carolina Department of Archives and History

1430 Senate Street, P.O. Box 11,669, Columbia, South Carolina 29211 (803) 734-8577
State Records (803) 734-7914; Local Records (803) 734-7917

20 May, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
S.C. Department of Highways and
Public Transportation
P.O. Box 191
Columbia, SC 29202

Reference: I-526 Proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County.
Initial Consultation.

Dear Mr. Bob Ferrell:

Thank you for soliciting our comments regarding the proposed seven-mile section of the Mark Clark Expressway from S.C. Route 7 to S.C. Route 171. The following comments are offered to assist you as you plan to address the cultural resources responsibilities that will be a part of the environmental documentation necessary to comply with the regulations of the Federal Highway Administration, and in accordance with the National Environmental Policy Act.

Although the provided map of the project area was imprecise, allowing only an approximation of the area of potential project effect, a review of our files indicates that one National Register listed historical site may be in or near the project area. Fenwick Hall is located on Johns Island south of Pennys Creek and north of Maybank Highway. It was built for John Fenwick, a wealthy South Carolina planter, in 1730 and is one of the finest examples of an early Georgian two-story brick plantation house built on the Huguenot floor plan that was widely used in South Carolina plantation houses during the 18th century. It was listed in the National Register on 23 February, 1972.

A review of the archaeological site files housed at the South Carolina Institute of Archaeology and Anthropology indicates that only a few known sites in the immediate vicinity of the project area (38CH1148, 38CH1291, 38CH1292, 38CH1293). This paucity of known sites is no guarantee that significant cultural resources do not exist in the project area. Our knowledge of the location of cultural resources in any given part of our State, whether historic structures or archaeological sites, is a direct reflection of the amount and quality of field survey that has been conducted in that area. A survey of proposed Maybank Highway widening from SC 171 to River Road located three of the above sites. 38CH1291 and 38CH1292 were considered to be potentially eligible for the National Register of Historic Places, while 38CH1293 was considered not eligible. Site 38CH1148 was identified during a borrow pit survey and was considered probably not eligible by the investigation archaeologist. Neither of these professional

archaeological surveys was designed to identify cultural resources along the proposed project corridor.

The proposed Mark Clark Expressway from SC Route 7 to SC Route 171 has a very great potential to adversely affect cultural resources. Without complete and contemporary architectural and archaeological survey of the proposed corridors, however, we cannot with certainty assess what these effects might be. The level of documentation provided to us regarding various improvement and new construction projects planned by the South Carolina Department of Highways and Public Transportation has been very helpful in identifying potential effects, and we would welcome a similar effort for the current project.

We look forward to assisting you as you work to comply with the federal regulations designed to take into account the affect this project might have to significant cultural resources. Please feel free to contact Staff Archaeologist Charlie Hall (734-8612) or the for the region (734-8005) should you have any questions regarding these comments, or should you require additional information.

Sincerely Yours,

Mary

Mary Watson Edmonds, Deputy State
Historic Preservation Officer

PRT John William Lawrence, *Executive Director*

Division of Engineering & Planning
Barbara Beth McClure, *Director*
(803) 734-0175
(803) 734-1042 FAX

May 19, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
S.C. Department of Highways and
Public Transportation
P.O. Box 191
Columbia, South Carolina 29202

Dear Mr. Ferrell:

Thank you for your May 11, 1992 letter addressed to Mr. William R. Jennings regarding the I-526 Proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County. Our staff is in the process of reviewing your request for comments and we will provide you with a response within the 30 day time frame.

I would like to request that in the future you send this type of request to me as Mr. Jennings is now the Deputy Executive Director of PRT. Thank you.

Sincerely,

Beth McClure

Beth McClure, Director
Division of Engineering and Planning

cc: Mr. William R. Jennings

BBM/lm

C:RFEXPRSW

PRT John William Lawrence, *Executive Director*

Division of Engineering & Planning
Barbara Beth McClure, *Director*
(803) 734-0175
(803) 734-1042 FAX

June 17, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
SC Department of Highways and
Public Transportation
955 Park Street
Columbia, SC 29202

RE: I-526 Proposed Mark Clark Expressway from SC Route 7 to SC Route 171 in Charleston County

Dear Mr. Ferrell:

This is to confirm receipt of your letter of intent to perform a supplemental environmental impact statement for the proposed seven mile segment of the above expressway. The South Carolina Department of Parks, Recreation and Tourism anticipates that the project will be planned so as not to hinder recreational boating or fishing and that all natural and cultural resources will be considered. We also support any efforts to encourage walking and bicycling.

If there are any questions, please call me at 734-0189.

Sincerely,

Tony L. Bebber
Planner

South Carolina
Wildlife & Marine
Resources Department

Equal Opportunity Agency

James A. Timmerman, Jr., Ph.D.
Executive Director

Larry D. Cartee
Asst. Executive Director

June 17, 1992

Ms. Kathy Reis
Grant Services
1205 Pendleton Street
Columbia, SC 29201

RE: SC920409-017 & SC920511-080 - (I-526 Proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 - Charleston County)

Dear Ms. Reis:

Personnel from the South Carolina Wildlife and Marine Resources Department have reviewed the proposal to prepare a supplemental Impact Statement for the section of the Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County and offer the following comments.

Based on the limited information provided about the proposed project, we are unable to offer any specific comments on potential impacts to fish and wildlife resources at this time. We would, however, like to make some general comments concerning the issues which should be addressed in the EIS process.

As you are well aware, coastal South Carolina contains extensive acreage of both estuarine and freshwater wetlands. Wetland areas provide valuable habitat for fish and wildlife and are essential in maintaining water quality in adjoining water bodies. Careful consideration should be given to avoiding fill and other impacts to wetlands whenever possible and minimizing unavoidable impacts to the maximum extent possible. This will be of special importance in the crossings of the Stono River and its tributaries. Means for avoiding and minimizing wetland impacts should be fully addressed early on in the EIS process and should consider alternatives such as bridging wetland crossings, reduction of median and shoulder widths through wetland areas, and use of top down construction methods. Stormwater management, including possible means for stormwater treatment prior to discharge into adjacent water bodies, should be addressed in the EIS review process. Mitigation for unavoidable impacts should be addressed in the EIS process and should focus on the restoration of previously impacted wetland systems. Wetland creation is

difficult and often results in limited success. For this reason, we would not recommend it be used as the major method of mitigation.

Our agency would appreciate the opportunity to provide more specific comments and would suggest an interagency meeting be set up to discuss additional information as it becomes available.

Sincerely,

James A. Timmerman, Jr.
Executive Director

JATjr/sa
cc: Marine (EES)
WL/FWF
SCDHPT - Robert B. Ferrell

CP1229

South Carolina
Wildlife & Marine
Resources Department

EQUAL OPPORTUNITY AGENCY

James A. Timmerman, Jr., Ph.D.
Executive Director
Paul A. Sandifer, Ph.D.
Director of
Marine Resources Division

June 4, 1992

Mr. Samuel E. Wiley
Assistant Vice President
CZR Incorporated - Environmental Consultants
1150 South U.S. Highway 1
Suite 201
Jupiter, FL 33477-7236

REF: Mark Clark Expressway,
Charleston, SC

Dear Mr. Wiley:

Personnel from the South Carolina Wildlife and Marine Resources Department have reviewed the proposal to prepare a supplemental Environmental Impact Statement for the section of the Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County and offer the following comments.

Based on the limited information provided about the proposed project, we are unable to offer any specific comments on potential impacts to fish and wildlife resources at this time. We would, however, like to make some general comments concerning the issues which should be addressed in the EIS process.

As you are well aware, coastal South Carolina contains extensive acreage of both estuarine and freshwater wetlands. Wetland areas provide valuable habitat for fish and wildlife and are essential in maintaining water quality in adjoining water bodies. Careful consideration should be given to avoiding fill and other impacts to wetlands whenever possible and minimizing unavoidable impacts to the maximum extent possible. This will be of special importance in the crossings of the Stono River and its tributaries. Means for avoiding and minimizing wetland impacts should be fully addressed early on in the EIS process and should consider alternatives such as bridging wetland crossings, reduction of median and shoulder widths through wetland areas, and use of top down construction methods. Stormwater management, including possible means for stormwater treatment prior to discharge into adjacent water bodies, should also be addressed in the EIS review process.

Mitigation for unavoidable impacts should be addressed in the EI$ process and should focus on the restoration of previously impacted wetland systems. Wetland creation is difficult and often results in limited success. For this reason, we would not recommend it be used as the major method of mitigation.

In response to your request for information on fish species composition for the Stono River and updated state lists for threatened and endangered species, we have been in contact with Mr. J. Brad Melko with your firm and have provided him with appropriate contacts within the department.

Our agency would appreciate the opportunity to provide more specific comments and would suggest an interagency meeting be set up to discuss additional information as it becomes available.

Sincerely,

Robert E. Duncan
Environmental Coordinator

CP1229

South Carolina Water Resources Commission

1201 Main Street, Suite 1100 ☐ Columbia, S.C. 29201 ☐ Telephone (803) 737-0800

Alfred H. Vang
Executive Director

June 15, 1992

Mr. Samuel E. Wiley
CZR Incorporated
1150 South U.S. Highway 1
Suite 201
Jupiter, Florida 33477

Dear Mr. Wiley:

In reference to your letter concerning the Stono River, there is currently no protection status for the Stono River based on programs administered by the South Carolina Water Resources Commission.

Sincerely,

Barry R. Beasley
Coordinator of River
Conservation Programs

BRB:cw

MR DuBOSE
SANDRA FERRELL

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201

General: 734-5000

May 21, 1992

Mr. Robert L. White
State Highway Engineer
Department of Highways and Public Transportation
P.O. Box 191
Columbia, SC 29202

Re: I-526 Proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County

Dear Mr. White:

All National Ambient Air Quality Standards are presently being met in Charleston County. Therefore, the subject project is compatible with the goals of the present South Carolin Air Quality Implementation Plan.

Respectfully,

J. T. Thornberry, Manager
Air Programs Section
Bureau of Air Quality Control

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201

June 16, 1992

Mr. Robert L. White
State Highway Engineer
S. C. Department of Highways and Public Transportation
P. O. Box 191
Columbia, SC 29202

Re: Supplemental Environmental Impact Statement
I-526, Proposed Mark Clark Expressway from S. C. Route 7 to S. C. Route 171
Charleston County

Dear Mr. White:

The proposed expressway will cross the Stono River which is classified as shellfish harvesting (SFH). SFH waters are tidal saltwaters protected for shellfish harvesting. Bacterial standards are stringent enough to protect the health of the consumers of shellfish. SFH waters are also protected for the uses of Class SA waters which includes primary contact recreation as well the uses of Class SB waters which are secondary contact recreation, crabbing, and fishing. These waters are also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

In order to ensure protection and maintenance of water quality standards, including wetlands functions, the Department recommends the following issues be addressed in the Supplemental Environmental Impact Statement.

1. Existing alignments or corridors should be used as much as feasible. This should minimize any new impacts to wetland areas. After a clear demonstration of avoidance and minimization of wetland impacts, SCDHPT should provide compensatory mitigation for any unavoidable wetland losses.

2. Best Management Practices to prevent or minimize erosion and sedimentation to adjacent waters and wetlands should be described in detail. This should include storm water management during construction.

3. SCDHPT should evaluate the impacts of storm water after construction and during use of this expressway on the shellfish harvesting use of the Stono River. Presently shellfish harvesting is prohibited or restricted in the Stono River, but the goal of all SFH waters is to have water quality so that shellfish harvesting is allowed.

3. SCDHPT should describe a Spill Prevention and Clean Up Plan to be used during construction of this project.

4. SCDHPT should coordinate with the Department's Bureau of Solid and Hazardous Waste Management or the Trident District Environmental Quality Control Office to identify potential contamination in the project area.

5. SCDHPT should coordinate with the Trident District Environmental Quality Control Office if construction requires relocation of any existing water and sewer lines.

Thank you for the opportunity to comment on this project. Please call me at 734-5311 if you have any questions.

Sincerely yours,

Sally C. Knowles

Sally C. Knowles, Manager
Water Quality Certification
and Wetlands Programs Section
Bureau of Water Pollution Control

SCK

cc: Robert B. Ferrell, SCDHPT, Environmental Section
Samuel E. Wiley, CZR Incorporated
Trident District EQC

STATE OF SOUTH CAROLINA

HUMAN AFFAIRS COMMISSION

2611 Forest Drive, Suite 200, Post Office Box 4490
Columbia, South Carolina 29240
(803) 253-6336 (803) 253-6322 FAX (803) 253-4191

James E. Clyburn
Commissioner

To file complaints dial (803) 253-6339
or 1-800-521-0725 (In-State only)

May 18, 1992

Mr. Robert L. White
State Highway Engineer
Department of Highways and
Public Transportation
Post Office Box 191
Columbia, South Carolina 29202

RE: I-526 Proposed Mark Clark Expressway from South Carolina Route 7 to S.C. Route 171, in Charleston

Dear Mr. White:

In response to your letter, dated May 11, 1992, and a copy of the map which indicates the proposed interchange supplemental to your final environmental impact statement, has been reviewed by the State Human Affairs Commission.

This Commission is concerned about your relocation of residents and businesses. Please submit as quickly as possible your cultural resource surveys for our review and response.

We appreciate your agency requesting comments from this agency with respect to this important project.

Please submit necessary changes to this project within 30 days, or contact me at (803)253-6322.

Sincerely,

Earl F. Brown, Jr.

Earl F. Brown, Jr.
Director
Community Relations

TMM/pck

cc: Mr. James E. Clyburn
Commissioner

Mr. Paul W. Beazley
Deputy Commissioner
Consultive Services

LM

The Nature Conservancy

South Carolina Office
2231 Devine Street, Suite 100
P.O. Box 5475
Columbia, South Carolina 29250
(803) 254-9049 FAX: (803) 252-7134

July 9, 1992

Mr. Kevin Sheppard
Project Engineer
S.C. Department of Highways
and Public Transportation
P.O. Box 191
Columbia, SC 29202

Dear Mr. Sheppard:

This letter is in regards to the I-526 proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County.

The Nature Conservancy has no nature preserves in the proposed route.

Thank you for giving us the opportunity to comment on this proposal.

Sincerely,

Dale Soblo
Director of Stewardship

DS/mf

State of South Carolina

Office of the Governor

ACKNOWLEDGEMENT

CARROLL A. CAMPBELL, JR.
GOVERNOR

OFFICE OF EXECUTIVE
POLICY AND PROGRAMS

May 27, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
S.C. Department of Highways and
Public Transportation
Post Office Box 191
Columbia, South Carolina 29202

Project Name: S. C. Department of Highways and Public Transportation: I-526 Proposed Mark Clark Expressway From S.C. Rt. 7 to S.C. Rt 171 in Charleston Cty

Project Number: SC920511-080

Suspense Date: 7/4/92

Dear Mr. Ferrell,

Receipt of the above referenced project is acknowledged. The Governor's Office, Grant Services Unit, has initiated an intergovernmental review of this project. You will be notified of the results of this review by the suspense date indicated above. South Carolina state agencies are reminded that if additional budget authorization is needed for this project, three copies of the completed GCR-1 form and two copies of the project proposal must be submitted to this office. This action should be initiated immediately, if required. You should use the State Application Identifier number in your correspondence with our office regarding this project. Contact me at (803) 734-0435 if you have any questions.

Sincerely,

Kathy Reis

Kathy Reis

SOUTH CAROLINA COASTAL COUNCIL

Ashley Corporate Center
4130 Faber Place
Suite 300
Charleston, S.C. 29405
(803) 744-5838
FAX 744-5847

William W. Jones, Jr.
Chairman

H. Wayne Beam, Ph.D.
Executive Director

May 19, 1992

Mr. Robert L. White
State Highway Engineer
S. C. Department of Highways and Public Transportation
P. O. Box 191
Columbia, S. C. 29202

Re: I-526; Route 7 to Route 171

Dear Mr. White:

This is in response to your recent letter concerning the Supplemental Environmental Impact Statement for the Mark Clark Expressway section between Route 7 and Route 171. This proposed road will involve two bridges across the Stono River and possibly several other crossings of both salt and freshwater wetlands.

The Coastal Council would prefer that to the maximum extent practical wetlands be avoided and where they cannot be avoided they be bridged, using appropriate construction methods to ensure the minimal amount of disturbance. Also storm water management plans will be required for the two Stono bridge crossings and possibly for other crossings if they have the potential to seriously impact the water quality of the River or adjacent wetlands.

As always early and frequent coordination between our agencies is important to insure the least number of delays and I encourage you to meet with us when you have a preliminary route established.

Sincerely,

Steve Moore
Permit Administrator

SM:0155P

cc: Dr. H. Wayne Beam
Mr. Christopher L. Brooks
Mr. Robert B. Ferrell
Mr. Stephen Snyder
Ms. Debra Hernandez

House of Representatives

State of South Carolina

Stephen E. Gonzales
District No. 113 - Charleston-Dorchester Counties
5029 Ashby Avenue
North Charleston, S.C. 29406

Committee:
Agriculture, Natural Resources and Environmental Affairs

320-D Blatt Building
Columbia, S.C. 29211

Tel. (803) 734-2970

May 20, 1992

Mr. Robert B. Ferrell
Post Office Box 191
Columbia, SC 29202

Dear Mr. Ferrell:

Thank you for your kind letter of recent date concerning the environmental impact for the I-526 proposed Mark Clark Expressway from S.C. Route 7 to S.C. Route 171 in Charleston County. I certainly appreciate your prompt assistance and attention to this project. And, I want you to know that if I can in any way be of assistance in speeding the progress of this project, I would be more than willing to lend my services. As you may well know, we are anxious to see this project completed; and I want you to know that I have no objections to anything that I have seen out of your department. I believe the EIS will serve as valuable information and I look forward to viewing this document.

Again, thank you for taking the time to write. If I can be of assistance to you in the future, please feel free to contact me.

With every good wish and kind regards, I am

Sincerely,

Stephen E. Gonzales

GLENN F. McCONNELL
SOUTH CAROLINA STATE SENATE
DISTRICT 41, CHARLESTON COUNTY
613 GRESSETTE SENATE OFFICE BUILDING
COLUMBIA, SOUTH CAROLINA 29202
803-734-2896

CHARLESTON ADDRESS
27 Bainbridge Drive
Charleston, South Carolina 29407
(803) 571-3921

COMMITTEES
Judiciary
Banking and Insurance
Labor, Commerce & Industry
Transportation
Rules
Joint Insurance Study
Judicial Screening
State Bidding Practices
Procurement Policy Committee, Chairman

May 27, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
S. C. Dept. of Highways and Public Transportation
P.O. Box 191
Columbia, SC 29202

Dear Mr. Ferrell:

I am in receipt of your letter regarding the I-526 proposed Mark Clark Expressway from SC Route 7 to SC Route 171 in Charleston County. I believe this highway is in need of being built, and I also am of the opinion that any environmental disturbances or impact are minuscule when compared against the public impact and the public good that will be served by the building of this road.

Thanks for giving me the opportunity to have some input on this.

With warmest personal regards, I am

Sincerely,

Glenn F. McConnell

GFM:rs

L:\G-613\CORRESP\MCCON\I-526

JOSEPH P. RILEY, JR.
Mayor

City of Charleston

Department of Planning
and
Urban Development

YVONNE FORTENBERRY
Director

June 5, 1992

Mr. Robert B. Ferrell
Environmental Program Administrator
South Carolina Department of Highways and
Public Transportation
Post Office Box 191
Columbia, South Carolina 29202

Re: I-526 Proposed Mark Clark Expressway from South Carolina Route 7 to South Carolina Route 171 in Charleston County

Dear Mr. Ferrell:

It is my understanding that you are requesting comments concerning the above-referenced project. Since a substantial part of this project is in the City of Charleston, we are concerned about the loss of trees, especially where the expressway crosses Riverland Drive and Maybank Highway.

We would appreciate the opportunity to review road construction drawings which show all existing trees 24 inches DBH (Diameter Breast Height) or greater. This will enable us to determine mitigation necessary for trees which must be removed.

Please feel free to contact me should you have any questions concerning the city's tree mitigation policy. We appreciate the opportunity to provide pre-construction input with regards to the environmental impact of this project.

Sincerely,

Beth H. Lewis

Beth H. Lewis
Land Resource Planner

BHL:geh
RBF/4Z1

cc: Robert L. White, State Highway Engineer
Bill Turner, Charleston County Planning
Lee Batchelder, Zoning Administrator
Yvonne Fortenberry, Director

Planning Department
County Office Building
2 Court House Square
Charleston, S.C. 29401-2206

Phone (803) 723-6739
In Reply Refer to:

County of Charleston

Charleston, South Carolina

June 10, 1992

Mr. Robert L. White
State Highway Engineer
South Carolina Department of Highways
and Public Transportation
Post Office Box 191
Columbia, South Carolina 29202

Dear Mr. White:

On behalf of the Charleston County Planning Department and the citizens of Charleston County, I would like to take this opportunity to thank you for allowing us to provide comments on the proposed Mark Clark Expressway (I-526). In order that we may facilitate our review of the proposed project, we would like the Highway Department to provide the following information:

A. Tree survey of trees 24 inches in diameter or greater with sizes noted.

B. Grading and staking plans.

C. Proposal for tree mitigation or letter of intent (after we have reviewed tree survey and plans).

D. Allow staff input prior to right-of-way being purchased and design locked.

Once again I would like to thank you for allowing us to comment on the proposed completion of the Mark Clark Expressway and look forward to working with you and other Highway Department representatives in the future.

Sincerely,

William W. Miller

William W. Miller
Director of Planning

WWM/ted

APPENDIX B

PROTECTED SPECIES LISTING

South Carolina
Wildlife & Marine
Resources Department

Equal Opportunity Agency

James A. Timmerman, Jr., Ph.D.
Executive Director
W. Brock Conrad, Jr.
Director of
Wildlife and Freshwater Fisheries

May 20, 1992

Mr. Robert Ferrell
Department of Highways and Public Transportation
P.O. Box 191
Columbia, SC 29202

Dear Mr. Ferrell:

I have reviewed our data on the site of the Mark Clark Expressway, as outlined in your letter of May 11. No rare, threatened, or endangered species or communities are recorded in the area.

I have enclosed a list of species and communities tracked by our agency in Charleston County, as an indication of potential occurrences on the site.

The enclosed list includes the following fields of data:

ELEMENT - scientific and common names.

ELCODE - element code, indicating taxonomic class in bytes 1-2:

- AA - Animals, Amphibians
- AB - Animals, Birds
- AF - Animals, Fish
- AM - Animals, Mammals
- AR - Animals, Reptiles
- PD - Plants, Dicots
- PG - Plants, Gymnosperms
- PM - Plants, Monocots
- PP - Plants, Pteridophytes

GRANK/SRANK - the Nature Conservancy rating of degree of endangerment:

- G1 - Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction
- G2 - Imperiled globally because of rarity or factor(s) making it vulnerable
- G3 - Either very rare throughout its range or found locally in a restricted range, or having factors making it vulnerable
- G4 - Apparently secure globally, though it may be rare in parts of its range

G5 - Demonstrably secure globally, though it may be rare in parts of its range
GH - Of historical occurrence throughout its range, with possibility of rediscovery
GX - Extinct throughout its range
GU - Status unknown

S1 - Critically imperiled state-wide because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation
S2 - Imperiled state-wide because of rarity or factor(s) making it vulnerable
S3 - Rare or uncommon in state
S4 - Apparently secure in state
S5 - Demonstrably secure in state
SA - Accidental in state (usually birds or butterflies that are far outside normal range)
SE - Exotic established in state
SH - Of historical occurrence in state, with possibility of rediscovery
SN - Regularly occurring in state, but in a migratory, non-breeding form
SR - Reported in state, but without good documentation
SX - Extirpated from state
SU - Status unknown

STATUS - legal status:

FE - Federal Endangered
FT - Federal Threatened
NC - Of Concern, National (unofficial - plants only)
RC - Of Concern, Regional (unofficial - plants only)
SE - State Endangerd (official state list - animals only)
ST - State Threatened (official state list - animals only)
SC - Of Concern, State (unofficial - animals)
SL - Of Concern, State (unofficial - plants)
SX - State Extirpated
CU - Candidate Undetermined (Federal status review)
UN - Undetermined

All information is based on the existing S.C. Heritage Trust database, and we do not assume that it is complete. Areas not yet inventoried by our biologists may contain important species. Also, our data are always in need of updating because as natural populations change over time, species must be added, dropped, or reclassified. Thank you for your inquiry. If I can be of further assistance, please call me at 803-734-4032.

Sincerely,

Katherine Boyle
Data Manager
S.C. Heritage Trust

CHARLESTON COUNTY

ELEMENT: BOTRYCHIUM LUNARIOIDES / WINTER GRAPE-FERN
ELCODE: PPOPH01090 — STATUS: UN
GRANK: G4? — SRANK: S?

ELEMENT: PSILOTUM NUDUM / WHISK FERN
ELCODE: PPPSI01020 — STATUS: SL
GRANK: G5 — SRANK: S1S2

ELEMENT: LYGODIUM PALMATUM / CLIMBING FERN
ELCODE: PPSCH02030 — STATUS: SL
GRANK: G4 — SRANK: S1S2

ELEMENT: PELTANDRA SAGITTIFOLIA / SPOON-FLOWER
ELCODE: PMARA0E020 — STATUS: UN
GRANK: G3G4 — SRANK: S?

ELEMENT: CANNA FLACCIDA / BANDANA-OF-THE-EVERGLADES
ELCODE: PMCAN01030 — STATUS: UN
GRANK: G5? — SRANK: S4

ELEMENT: CAREX DECOMPOSITA / EPIPHYTIC SEDGE
ELCODE: PMCYP033K0 — STATUS: UN
GRANK: G3G4 — SRANK: S?

ELEMENT: CYPERUS TETRAGONUS / PIEDMONT FLATSEDGE
ELCODE: PMCYP063H0 — STATUS: SL
GRANK: G4? — SRANK: S1

ELEMENT: ELEOCHARIS VIVIPARA / VIVIPAROUS SPIKE-RUSH
ELCODE: PMCYP091Y0 — STATUS: UN
GRANK: G5 — SRANK: S?

ELEMENT: SCLERIA BALDWINII / BALDWIN NUTRUSH
ELCODE: PMCYP0R010 — STATUS: SL
GRANK: G3G4 — SRANK: S1S2

ELEMENT: SYNGONANTHUS FLAVIDULUS / YELLOW PIPEWORT
ELCODE: PMERI03010 — STATUS: UN
GRANK: G5 — SRANK: SH

ELEMENT: THALIA DEALBATA / POWDERY THALIA
ELCODE: PMMAR03010 — STATUS: UN
GRANK: G3G5 — SRANK: S?

ELEMENT: CALOPOGON BARBATUS / BEARDED GRASS-PINK
ELCODE: PMORC0C010 — STATUS: UN
GRANK: G5? — SRANK: S?

ELEMENT: HABENARIA QUINQUESETA / LONG-HORN ORCHID
ELCODE: PMORC1A070 — STATUS: UN
GRANK: G4G5 — SRANK: S?

ELEMENT: LISTERA AUSTRALIS / SOUTHERN TWAYBLADE
ELCODE: PMORC1N020 — STATUS: UN
GRANK: G4 — SRANK: S?

ELEMENT: PLATANTHERA INTEGRA / YELLOW FRINGELESS ORCHID
ELCODE: PMORC1Y0C0 — STATUS: UN
GRANK: G3G4 — SRANK: S2

ELEMENT: PTEROGLOSSASPIS ECRISTATA / CRESTED FRINGED ORCHID
ELCODE: PMORC27010 — STATUS: C2
GRANK: G3G4 — SRANK: S2

ELEMENT: SPIRANTHES LACINIATA / LACE-LIP LADIES'-TRESSES
ELCODE: PMORC2B0E0 — STATUS: UN
GRANK: G4G5 — SRANK: S1

ELEMENT: TRIPHORA TRIANTHOPHORA / NODDING POGONIA
ELCODE: PMORC2F050 — STATUS: SL
GRANK: G4 — SRANK: S2

ELEMENT: ANTHAENANTIA RUFA / PURPLE SILKYSCALE
ELCODE: PMPOA0D010 — STATUS: UN
GRANK: G5 — SRANK: S?

ELEMENT: CHASMANTHIUM NITIDUM / SHINY SPIKEGRASS
ELCODE: PMPOA1D030 — STATUS: UN
GRANK: G3? — SRANK: S?

ELEMENT: DYSCHORISTE HUMISTRATA / SWAMP DYSCHORISTE
ELCODE: PDACA09040 — STATUS: UN
GRANK: G4G5 — SRANK: S?

ELEMENT: AMARANTHUS PUMILUS / SEABEACH PIGWEED
ELCODE: PDAMA040Z0 — STATUS: NC/C2
GRANK: G2 — SRANK: S1

ELEMENT: ASCLEPIAS PEDICELLATA / SAVANNAH MILKWEED
ELCODE: PDASC021E0 — STATUS: RC
GRANK: G3G4 — SRANK: S1

ELEMENT: LOBELIA BOYKINII / BOYKIN'S LOBELIA
ELCODE: PDCAM0E050 — STATUS: C2
GRANK: G2 — SRANK: S?

ELEMENT: IPOMOEA STOLONIFERA / BEACH MORNING-GLORY
ELCODE: PDCON0A1G0 — STATUS: UN
GRANK: G5? — SRANK: S?

ELEMENT: DIONAEA MUSCIPULA / VENUS' FLY-TRAP
ELCODE: PDDR001010 — STATUS: RC
GRANK: G3 — SRANK: S1

ELEMENT: MONOTROPSIS ODORATA / SWEET PINESAP
ELCODE: PDERI0V010 — STATUS: RC
GRANK: G3 — SRANK: S1

ELEMENT: PIERIS PHYLLYREIFOLIA / CLIMBING FETTER-BUSH
ELCODE: PDERI10020 — STATUS: SL
GRANK: G3? — SRANK: S?

ELEMENT: LITSEA AESTIVALIS / PONDSPICE
ELCODE: PDLAU08010 — STATUS: C2
GRANK: G3G4 — SRANK: S3

ELEMENT: OROBANCHE UNIFLORA / NAKED BROOMRAPE
ELCODE: PDORO040F0 — STATUS: UN
GRANK: G5 — SRANK: S?

ELEMENT: SAGERETIA MINUTIFLORA / TINY-LEAVED BUCKTHORN
ELCODE: PDRHA0D010 — STATUS: UN
GRANK: G4 — SRANK: S2

ELEMENT: AGRIMONIA INCISA / INCISED GROOVEBUR
ELCODE: PDROS03040 — STATUS: NC/C2
GRANK: G3 — SRANK: S1

ELEMENT: SARRACENIA RUBRA / SWEET PITCHER-PLANT
ELCODE: PDSAR02080 — STATUS: UN
GRANK: G3 — SRANK: S1

ELEMENT: LEPUROPETALON SPATHULATUM / SOUTHERN LEPUROPETALON
ELCODE: PDSAX0L010 — STATUS: UN
GRANK: G5? — SRANK: S?

ELEMENT: SCHISANDRA GLABRA / BAY STARVINE
ELCODE: PDSCH01020 — STATUS: SX
GRANK: G4 — SRANK: SX

ELEMENT: SCHWALBEA AMERICANA / CHAFFSEED
ELCODE: PDSCR1Q010 — STATUS: NC/PE
GRANK: G2 — SRANK: S2

ELEMENT: ACIPENSER BREVIROSTRUM / SHORTNOSE STURGEON
ELCODE: AFCAA01010 — STATUS: FE
GRANK: G3 — SRANK: S3S4

ELEMENT: AMBYSTOMA CINGULATUM / FLATWOODS SALAMANDER
ELCODE: AAAAA01030 — STATUS: SC/C2
GRANK: G4 — SRANK: S3

ELEMENT: AMBYSTOMA TIGRINUM TIGRINUM / EASTERN TIGER SALAMANDER
ELCODE: AAAAA01146 — STATUS: SC
GRANK: G5T5 — SRANK: S2S3

ELEMENT: PSEUDOBRANCHUS STRIATUS STRIATUS / BROAD-STRIPED DWARF SIREN
ELCODE: AAAAG01015 — STATUS: SC
GRANK: G5T? — SRANK: S2

ELEMENT: ACRIS CREPITANS CREPITANS / NORTHERN CRICKET FROG
ELCODE: AAABC01012 — STATUS: UN
GRANK: G5T5 — SRANK: S5

ELEMENT: RANA AREOLATA
ELCODE: AAABH01010 — STATUS: SC
GRANK: G4 — SRANK: S?

ELEMENT: CARETTA CARETTA / LOGGERHEAD TURTLE
ELCODE: ARAAA01010 — STATUS: FT
GRANK: G3 — SRANK: S3

ELEMENT: CLEMMYS GUTTATA / SPOTTED TURTLE
ELCODE: ARAAD02010 — STATUS: UN
GRANK: G5 — SRANK: S5

ELEMENT: ALLIGATOR MISSISSIPPIENSIS / AMERICAN ALLIGATOR
ELCODE: ARABA01010 — STATUS: FT(S/A)
GRANK: G5 — SRANK: S5

ELEMENT: OPHISAURUS COMPRESSUS / ISLAND GLASS LIZARD
ELCODE: ARACB02020 — STATUS: C2
GRANK: G4 — SRANK: S1S2

ELEMENT: MICRURUS FULVIUS / EASTERN CORAL SNAKE
ELCODE: ARADC02010 — STATUS: UN
GRANK: G5 — SRANK: S2

ELEMENT: PELECANUS OCCIDENTALIS / BROWN PELICAN
ELCODE: ABNFC01020 — STATUS: SC
GRANK: G5 — SRANK: S1S2

ELEMENT: MYCTERIA AMERICANA / WOOD STORK
ELCODE: ABNGF02010 — STATUS: FE
GRANK: G5 — SRANK: S1S2

ELEMENT: PANDION HALIAETUS / OSPREY
ELCODE: ABNKC01010 — STATUS: SC
GRANK: G5 — SRANK: S4

ELEMENT: ELANOIDES FORFICATUS / AMERICAN SWALLOW-TAILED KITE
ELCODE: ABNKC04010 — STATUS: SE
GRANK: G5 — SRANK: S2

ELEMENT: ICTINIA MISSISSIPPIENSIS / MISSISSIPPI KITE
ELCODE: ABNKC09010 — STATUS: UN
GRANK: G5 — SRANK: S4

ELEMENT: TYTO ALBA / BARN-OWL
ELCODE: ABNSA01010 — STATUS: UN
GRANK: G5 — SRANK: S4

ELEMENT: PICOIDES BOREALIS / RED-COCKADED WOODPECKER
ELCODE: ABNYF07060 — STATUS: FE
GRANK: G2 — SRANK: S2

ELEMENT: VERMIVORA BACHMANII / BACHMAN'S WARBLER
ELCODE: ABPBX01010 — STATUS: FE
GRANK: G1 — SRANK: SX

ELEMENT: DENDROICA VIRENS / BLACK-THROATED GREEN WARBLER
ELCODE: ABPBX03100 — STATUS: UN
GRANK: G5 — SRANK: S4

ELEMENT: LIMNOTHLYPIS SWAINSONII / SWAINSON'S WARBLER
ELCODE: ABPBX09010 — STATUS: UN
GRANK: G4 — SRANK: S4

ELEMENT: AIMOPHILA AESTIVALIS / BACHMAN'S SPARROW
ELCODE: ABPBX91050 — STATUS: C2
GRANK: G3 — SRANK: S3S4

ELEMENT: MYOTIS AUSTRORIPARIUS / SOUTHEASTERN MYOTIS
ELCODE: AMACC01030 — STATUS: C2
GRANK: G4 — SRANK: S2S3

ELEMENT: LASIURUS CINEREUS / HOARY BAT
ELCODE: AMACC05030 — STATUS: UN
GRANK: G5 — SRANK: S?

ELEMENT: PLECOTUS RAFINESQUII / RAFINESQUE'S BIG-EARED BAT
ELCODE: AMACC08020 — STATUS: SE/C2
GRANK: G4 — SRANK: S2?

ELEMENT: SCIURUS NIGER / FOX SQUIRREL
ELCODE: AMAFB07040 — STATUS: UN
GRANK: G5 — SRANK: S4

ELEMENT: NEOTOMA FLORIDANA / EASTERN WOODRAT
ELCODE: AMAFF08010 — STATUS: UN
GRANK: G5 — SRANK: S3S4

ELEMENT: NEOTOMA FLORIDANA FLORIDANA
ELCODE: AMAFF08011 — STATUS: UN
GRANK: G? — SRANK: S?

ELEMENT: MICROTUS PENNSYLVANICUS / MEADOW VOLE
ELCODE: AMAFF11010 — STATUS: SC
GRANK: G5 — SRANK: S4

ELEMENT: URSUS AMERICANUS / BLACK BEAR
ELCODE: AMAJB01010 — STATUS: SC
GRANK: G5 — SRANK: S3?

ELEMENT: MUSTELA FRENATA / LONG-TAILED WEASEL
ELCODE: AMAJF02030 — STATUS: UN
GRANK: G5 — SRANK: S3S4

ELEMENT: INTERTIDAL BEACH
ELCODE: CMCXX00020 — STATUS: UN
GRANK: G5 — SRANK: S3

ELEMENT: BALD CYPRESS-TUPELO GUM SWAMP
ELCODE: CPPCX00010 STATUS: UN
GRANK: G5 SRANK: S4

ELEMENT: POCOSIN
ELCODE: CPSCX00040 STATUS: UN
GRANK: G3G4 SRANK: S3S4

ELEMENT: MARITIME FOREST
ELCODE: CTCXX00050 STATUS: UN
GRANK: G2 SRANK: S2S3

ELEMENT: MARITIME SHRUB THICKET
ELCODE: CTCXX00070 STATUS: UN
GRANK: G4 SRANK: S2S3

ELEMENT: MIDDENS
ELCODE: CTCXX00090 STATUS: UN
GRANK: G? SRANK: S3

ELEMENT: SPRUCE PINE-MIXED HARDWOOD FOREST
ELCODE: CTCXX00130 STATUS: UN
GRANK: G3 SRANK: S2

ELEMENT: MESIC MIXED HARDWOOD FOREST
ELCODE: CTPCX00010 STATUS: UN
GRANK: G5 SRANK: S4

ELEMENT: COMMUNITY UNDEFINED
ELCODE: CXXXX00000 STATUS: UN
GRANK: G? SRANK: S?

ELEMENT: CAROLINA BAY
ELCODE: OBPROPOSED STATUS: UN
GRANK: SRANK:

ELEMENT: ROOKERY;OCEAN BIRDS,HERONS AND ALLIES
ELCODE: ORXXX00004 STATUS: UN
GRANK: SRANK:

ELEMENT: ROOKERY;HERONS AND ALLIES,NON-FORESTED
ELCODE: ORXXX00005 STATUS: UN
GRANK: SRANK:

ELEMENT: ROOKERY;HERONS AND ALLIES,FORESTED
ELCODE: ORXXX00006 STATUS: UN
GRANK: SRANK:

ELEMENT: ROOKERY;LEAST TERN
ELCODE: ORXXX00010 STATUS: ST
GRANK: SRANK:

ELEMENT: ROOKERY;SHOREBIRDS
ELCODE: ORXXX00R01 STATUS: UN
GRANK: SRANK:

ELEMENT: ROOKERY;MIXED OCEAN AND SHORE BIRDS
ELCODE: ORXXX00R02 STATUS: UN
GRANK: SRANK:
