

**SPECIAL MANAGEMENT AREA PLAN**  
**For**  
**THE PORT OF PASCAGOULA**  
**JACKSON COUNTY, MISSISSIPPI**

**MISSISSIPPI COASTAL PROGRAM**  
**SMA TASK FORCE**

**Task Force Consultant**

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**NOVEMBER, 1985**



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PUBLIC NOTICE

Revision to Mississippi Coastal Program

On November 18, 1985 the Mississippi Commission on Wildlife Conservation approved a revision to the Mississippi Coastal Program to incorporate the Port of Pascagoula Special Management Area Plan into the Coastal Program. The Port of Pascagoula SMA is a conceptual plan that balances the public interest of industrial development, the seafood industry and the protection of coastal resources.

On May 15, 1986 the Office of Ocean and Coastal Resource Management concurred that this revision constitutes a routine Mississippi Coastal Program Implementation action.

This revision will become effective and federal consistency shall apply as of June 1, 1986.

For additional information contact the Bureau of Marine Resources, P. O. Drawer 959, Long Beach, Mississippi 39560 or call (601) 864-4602.

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FOR  
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Participating Agencies

**Jackson County Port Authority  
Jackson County Board of Supervisors  
Mississippi Bureau of Marine Resources  
Mississippi Bureau of Pollution Control  
Mississippi Department of Archives and History  
U.S. Army Corps of Engineers, Mobile District  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service  
U.S. National Marine Fisheries Service**

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**November 1985**

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Zone Management Act of 1972, as amended.

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## PREFACE

The Special Management Area (SMA) Plan for the Port of Pascagoula is the result of a three-year-long planning process which has included numerous discussion and negotiation sessions as well as field reconnaissance and technical studies on the part of the SMA Task Force. The SMA Plan consists of provisions affecting development in specific geographic areas within the Pascagoula SMA boundaries, provisions for operating under the Plan, and general provisions to be applied throughout the SMA.

While this Plan reflects the consensus of the Task Force with regard to future industrial development and environmental protection in the Port of Pascagoula, it is not necessarily a model for other SMA plans in Mississippi or elsewhere. Although the basic components of other SMA plans may be similar (i.e., area development plan, mitigation plan, dredged material disposal plan, etc.), the approach and content of other plans must depend on the nature of the understandings reached during the SMA process for each specific special management area. The SMA process must be flexible in order to respond to particular issues and planning and development needs which may vary considerably in scope from area to area.

The SMA Plan Document for the Port of Pascagoula is organized as follows:

- **INTRODUCTION.** Includes an explanation of the SMA planning process and the role of the SMA Task Force.
- **CHAPTER 1.** Describes the Port of Pascagoula and existing industries in the Port.
- **CHAPTER 2.** Describes the regulatory context affecting the planning and implementation of new development in the Pascagoula SMA.
- **CHAPTER 3.** Includes a description of the environmental resources within the SMA (wetlands, water quality, cultural resources, etc.).
- **CHAPTER 4.** Includes a description of the process of SMA Plan formulation.
- **CHAPTER 5.** Contains the SMA Plan, including development and mitigation components. (Chapter 5 is reproduced on colored paper for ease of identification.)
- **APPENDICES.** Contain the preliminary letters of commitment to the Draft SMA Plan from the participating agencies, a conditional agreement for transfer of real property from Jackson County to the State of Mississippi, an Environmental Assessment and 404(b)(1) Evaluation of the Plan by the US Army Corps of Engineers, a memorandum of agreement for implementing the Plan, and a dredged material disposal plan.

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## INTRODUCTION

### **Special Management Area Planning and the Mississippi Coastal Program**

#### Background

Along the Gulf of Mexico from Texas to Florida, the conflicts between efforts to promote certain types of development and efforts to protect natural resources have often resulted in confrontations between contending groups who define the public interest in the coastal area from quite different perspectives. In particular, some of the most heated conflicts in the coastal area have arisen over plans and proposals for the use of coastal wetlands. Resolution of these conflicts has historically been resolved through litigation -- a costly and time-consuming method of dealing with issues related to environmental resource management and economic growth.

Following passage of the Fish and Wildlife Coordination Act (1958) and the National Environmental Policy Act (1969), and the subsequent passage of the Clean Air Act, the Clean Water Act, the Coastal Zone Management Act and other environmental legislation, every state and many cities passed parallel laws for protecting and managing environmental resources. Simultaneously, state agencies were established to administer new regulations, often in tandem with the responsible federal agencies.

The key state agency in the State of Mississippi charged with the responsibility for coastal wetlands management is the Bureau of Marine Resources (BMR) of the Department of Wildlife Conservation. Policy decisions regarding coastal wetlands, however, are made by the Mississippi Commission on Wildlife Conservation. In carrying out the provisions of both state and federal legislation, the Bureau of Marine Resources works closely with other state agencies such as the Bureau of Pollution Control (BPC) and the Department of Archives and History (DAH). BMR, BPC, and DAH also work in cooperation with the federal agencies charged by Congress with managing the nation's environmental resources according to the provisions of national legislation. These federal agencies include the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S. Environmental Protection Agency.

Also concerned with the use of coastal wetlands in Mississippi are private firms, entrepreneurs, and public development agencies whose primary objectives are directed toward economic growth and development. Along the Mississippi Gulf Coast, new development currently being pursued by these groups includes port expansion and water-related industrial activities.

As a result of port and industrial development initiatives in Mississippi, new industries have located in the coastal area, some established industries have expanded, and future long-term industrial growth is contemplated for the years ahead. In anticipation of these trends, requests are being made for permits to dredge and deepen navigation channels, fill tidal wetlands to provide sites for new industrial activities, and dispose of dredged material on wetland sites.

The principal conflict which public officials face in responding to current growth and development pressures in coastal Mississippi, however, is not simply a conflict between economic development on the one hand and environmental conservation on the other. Conservation of the natural, renewable resources of the Gulf Coast should not be viewed as "conflicting" with economic development. These resources contribute significantly to the economic diversity and well-being of both the state and the nation by providing the finfish and shellfish upon which Mississippi's commercial and recreational fishing industries are dependent. In 1984, for example, the total dockside value of all fisheries landed in Mississippi was \$43,441,200. Using a standard multiplier of 5 for converting landing value to total economic value, it could be estimated that these fisheries landings augmented the economy of the state by roughly \$217 million. Fishing is also one of the coast's most enjoyed recreational activities and in 1980 it was estimated that the recreational fishing industry provided \$43.7 million to the state's economy.

#### Mississippi's Approach to Conflict Resolution

While Mississippi's coastal wetlands provide significant economic benefits to the state and nation and perform a variety of ecologically important functions, they have also been historically susceptible to destruction. Many areas of wetlands have been lost

through dredging for channels, marinas and ports, or have been filled to create new land. The disposal of dredged material has also resulted in the loss of considerable wetlands acreage over the years. The impacts of these losses are far-reaching. For example, the quality and quantity of the marine organisms that support the commercial and recreational fishing industries in Mississippi are dependent on the quality and quantity of the habitat provided by coastal waters and wetlands. Loss of this habitat therefore poses a threat to the long term stability of the fisheries industries and thus to the overall economic well-being of the state.

The Mississippi Coastal Wetlands Protection Law was passed in 1973 to prevent future development from adversely affecting the public interest in the wetlands, and to protect and enhance the state's biological resources and environmental quality. Even with the implementation of this legislation, however, state officials recognized that unless accompanied by affirmative efforts to encourage sound development practices in the coastal area, regulations alone would have limited value in balancing competing public interests for wetlands use. Regulations alone cannot maintain industrial requirements, promote economic diversity in the coastal area, and also ensure the long term stability of the state's fisheries industries and the maintenance of vital ecological functions.

In 1980, the Mississippi Coastal Program (MCP) was implemented to supplement regulations with affirmative management efforts. Administered by the Bureau of Marine Resources, the MCP designated special management areas (SMA's) and established a process for adopting management plans for these areas through a cooperative and voluntary process involving local, state and federal agencies. A basic objective of these management plans is to establish a balance among the competing interests in the coastal area, taking into consideration the diverse ecological values of wetlands, the need for maintaining industrial requirements, the importance of wetlands to the fisheries industries, and other factors.

### **Goals of the SMA Planning Process**

Special Management Area Planning addresses developmental, biological, institutional, and other conflicts in the coastal area. Its purposes, as specified by the Mississippi Coastal Program, are:

- "1. To apply the general provisions of the coastal program to specific geographical areas.
2. To streamline regulatory decisions in these areas through planning for and resolving permit conflicts in advance of individual development projects being implemented.
3. To coordinate federal and state regulatory decisions with the affirmative development efforts of the coastal program and of local governments.
4. To provide assistance to local governments and state agencies to plan for public facilities and services in areas whose use is historically, economically, and culturally tied to coastal waters."<sup>1</sup>

Essentially, SMA planning tries to draw potential future conflicts between competing uses of the coastal area into the present, and to reconcile those conflicts by working toward the negotiation of long-range land and water use plans for specific management areas. By initiating the SMA process in Mississippi, the Bureau of Marine Resources seeks to supplement its regulatory efforts with an affirmative program to manage development in Mississippi's coastal area. Through the SMA process BMR can, where appropriate, encourage new water-dependent development and at the same time carry out its responsibilities for wetlands and fisheries management.

### **The SMA Task Force**

A variety of federal and state laws, programs and agencies play important roles in the management of natural resources and development activities in coastal Mississippi. The federal and state agencies responsible for administering and implementing the principal

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1. Mississippi Coastal Program, Chapter 8, Section 5.

regulatory programs pertinent to planning and implementation of coastal development were invited by the Bureau of Marine Resources to participate in the SMA planning process.

These "regulatory" agencies, along with the responsible county development authorities, are represented on the Mississippi SMA Task Force which was established in late 1981 for the purpose of preparing SMA Plans for the the Port of Pascagoula, the Port Bienville Industrial Park, and the Pass Christian Industrial Park. This document contains the resulting SMA Plan for the Port of Pascagoula, prepared by representatives of the following local, state, and federal agencies:

- Jackson County Port Authority (JCPA)
- Jackson County Board of Supervisors (JCBS)
- Mississippi Bureau of Marine Resources (BMR)
- Mississippi Bureau of Pollution Control (BPC)
- Mississippi Department of Archives and History (DAH)
- U.S. Army Corps of Engineers, Mobile District (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service (FWS)
- U.S. National Marine Fisheries Service (NMFS)

The components of the SMA Plan were formulated by the Task Force during a series of meetings that began in April, 1982 and extended through April, 1985. All decisions of the Task Force leading to the formulation of the Plan were based on consensus; throughout the SMA planning process no one agency assumed decision-making authority above that of any other agency.

The Task Force was aided by the consulting firm of Ralph M. Field Associates, Inc., whose role was to provide a general framework for decision-making, guide the preparation of needed technical studies, act as mediator at Task Force meetings, and document all decisions reached by the Task Force.

Funding for the SMA planning effort was provided by the Federal Office of Ocean and Coastal Resources Management which also provided technical assistance.

### **Major Steps in the the Port of Pascagoula SMA Planning Process**

The planning process leading to the formulation of the SMA Plan for the Port of Pascagoula can be described in terms of the following major steps:

1. Port development goals and long range plans were presented to the Task Force by the Jackson County Port Authority.<sup>1</sup>
2. Analysis of these goals and plans led to the identification of some basic planning issues or potential points of contention between the development and regulatory members of the Task Force. Some of the major issues to be resolved were:
  - What is the appropriate time frame for planning efforts?
  - How should the anticipated development needs of major private industries within the SMA (i.e., Tenneco, Chevron, Mississippi Chemical, Ingalls Shipbuilding) be addressed in the planning process?
  - Does the need for waterfront industrial sites in the foreseeable future in the Port of Pascagoula and Jackson County justify additional dredging and filling of wetlands to accommodate new development?
  - If so, how much wetland acreage can be affected before an unacceptable adverse impact on environmental quality and fisheries resources occurs?
  - Are there viable alternatives to current port development plans (e.g., alternatives that would meet development needs and also result in reduced environmental impacts)?
  - What opportunities exist to mitigate or compensate for the dredging and filling of wetlands associated with the creation of new industrial development sites?
  - Will new waterfront development activities impact cultural resources and how should this impact be mitigated?
  - How will future waterfront development activities affect existing dredged material disposal requirements?

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1. See Update of Master Plan for the Greater Port of Pascagoula Area Port, Harbor and Industrial Development; West Harbor, Greenwood Island and Dredge Disposal, prepared for Jackson County Board of Supervisors and Jackson County Port Authority by Michael Baker, Jr., Inc., June 1981, and Research and Data Compilation in Connection with Bureau of Marine Resources Special Management Area, Pascagoula, prepared for Jackson County Port Authority by Michael Baker Jr., Inc., March 1983.

3. A preliminary outline of a Pascagoula SMA Plan Document was prepared by the Task Force consultant in September 1982. The purpose of this document was to propose a format for the Plan, identify information gaps, and give Task Force members an early opportunity to respond to written material.
4. The Task Force agreed upon a basic plan formulation procedure to include the following major steps:
  - a. Identification of areas suitable for development.
  - b. Identification of natural areas to be protected or preserved.
  - c. Assessment of potential impacts to natural and cultural resources in areas suitable for development.
  - d. Development of mitigation requirements associated with identified potential impacts.
5. Various background and technical study needs were identified by the Task Force and an agreement to provide financial assistance for the accomplishment of these studies was negotiated between BMR and the Jackson County Port Authority.
6. A proposed "Scenario for SMA Plan Formulation" was presented to the Task Force by the Bureau of Marine Resources. This scenario responded to and modified development concepts presented in the JCPA's Master Plan proposals, offered tentative working definitions for mitigation, and delineated separate Planning Areas and Management Units within the SMA.
7. In response to the proposed "Scenario for SMA Plan Formulation", the JCPA and the Board of Supervisors formed a joint committee to provide the Task Force with more specific proposals for anticipated development and planning priorities in the SMA.<sup>1</sup>
8. Planning and negotiating sessions then took place in which a series of proposals addressing development, mitigation, and dredged material disposal throughout the

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1. Jackson County, Mississippi, Special Management Area Plan, prepared for the SMA Task Force by the Jackson County Port Authority and Jackson County Board of Supervisors, December 15, 1983.



SMA were alternately formulated by the federal and state Task Force agencies and by the Jackson County Board of Supervisors/Port Authority. Assessment of each proposal was guided by the Task Force's on-going identification of development and natural resource protection needs within the SMA (i.e., as determined through the course of carrying out the plan formulation procedure noted in Step 4 above, and with the benefit of information generated by the various background studies). A more detailed review of this process is included in Chapter 4.

9. Consensus was reached on a Draft Plan based on the determination of an acceptable balance between new development and environmental resource protection in the Pascagoula SMA. The Draft Plan specified operating provisions (including the use of the Plan in the permit application review process and procedures for revising or modifying the Plan); provisions affecting development in specific geographic areas within the SMA boundaries; and general provisions to apply throughout the SMA.
10. Each of the federal, state, and local agencies that participated in the preparation of the Draft SMA Plan indicated their commitment to implementing the provisions of the Plan in preliminary letters of commitment. The notice of intent expressed in the preliminary letters of commitment was conditional, pending completion of all necessary plan approval actions. The preliminary letters of commitment are contained in Appendix A.
11. The Corps of Engineers, Mobile District, prepared an Environmental Assessment (EA) of the Plan in accordance with the requirements of the National Environmental Policy Act and also a Section 404(b)(1) Evaluation as required by the Clean Water Act. Both the EA (along with a draft Finding of No Significant Impact) and the 404(b)(1) Evaluation were circulated to the participating agencies and subsequently appended onto the Public Hearing Draft of the SMA Plan Document. The Public Hearing Draft was made available by BMR to the general public 30 days prior to a public hearing on the draft and its incorporation into the Mississippi Coastal Program.

12. Following the required public notice period, a public hearing was held on the proposed revision of the Mississippi Coastal Program to incorporate the SMA Plan. This hearing was held on September 24, 1985 in Jackson County, Mississippi. Following the public hearing, the Corps determined that it was not necessary to prepare an Environmental Impact Statement (EIS) on the SMA Plan and prepared a "Finding of No Significant Impact" (FONSI). The EA, FONSI, and 404(b)(1) Evaluation are contained in Appendix B.
13. The Bureau of Marine Resources transmitted a Final Draft of the SMA Plan document (incorporating public and governmental agency comments) to: the Jackson County Board of Supervisors/Jackson County Port Authority; the Bureaus of Pollution Control, Archives and History, and Wildlife Conservation of the Mississippi Department of Natural Resources; the U.S. Environmental Protection Agency; the U.S. Fish and Wildlife Service; the National Marine Fisheries Service; and the U.S. Army Corps of Engineers for their final approval.
14. A conditional agreement for conveying a 3,500 acre tract of county property within the SMA to the State of Mississippi (deemed necessary in order to ensure the future preservation of an acceptable balance between new development and environmental resource protection in the Pascagoula SMA) was executed between the JCBS/JCPA and BMR. The Conditional Agreement for Transfer of Real Proprety is contained in Appendix C.
15. The Mississippi Commission on Wildlife Conservation adopted the Final Draft of the SMA Plan and a Memorandum of Agreement was signed by all participating agencies setting forth the agencies' committments for implementing the Plan. The Federal Office of Ocean and Coastal Resources Management reviewed the SMA Plan as a program change of the Mississippi Coastal Program. The Memorandum of Agreement is contained in Appendix D.
16. Upon signing of the Memorandum of Agreement by all participating agencies, Jackson County transferred title to the 3,500 acre tract of county-owned property to the Mississippi Department of Wildlife Conservation.

### **The SMA Plan and Its Future Implementation**

The SMA Plan contained in this document has been formulated through consensus approval by the Task Force and is the vehicle for recording the understandings reached during the SMA planning process for the Port of Pascagoula. Following approval by the Mississippi Commission on Wildlife Conservation, the Plan was incorporated into the Mississippi Coastal Program through the established Program revision process.

Incorporation into the Mississippi Coastal Program (MCP) gives the SMA Plan formal legal status. The Plan is an authoritative, specific interpretation of the Coastal Program for the area within the SMA boundaries and will serve as the basis for state coastal wetlands permit decisions within those boundaries. Unless specifically amended by the SMA Plan, the existing provisions of the Mississippi Coastal Program (including rules, regulations, guidelines, and procedures contained in Chapter 8 of the MCP) remain in effect.

The Federal Office of Ocean and Coastal Resources Management (OCRM) has reviewed the SMA Plan under 15 CFR Subsection 923.84 of the implementing regulations of the Coastal Zone Management Act (CZMA). OCRM has approved the SMA Plan as a part of the MCP, thus activating the federal consistency provisions under Section 307 of the CZMA.

The SMA Plan for the Port of Pascagoula contains three major elements as specified in the Mississippi Coastal Program:<sup>1</sup>

1. An area development plan showing the limits of development and establishing guidelines for planned development within the area.
2. A dredged material disposal plan for maintenance dredged material providing the location of disposal areas as well as a program to ensure adequate disposal capacity to support the area development plan.

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1. Mississippi Coastal Program, Chapter 6, Section 2.

3. A mitigation program to compensate for environmental and cultural resource losses resulting from development of the area.

The area development plan and the mitigation program are incorporated in Chapter 5 of this document. The dredged material disposal plan is contained in Appendix E.

The SMA Plan also contains an explanation of how the Plan will be used, particularly in local, state, and federal permit decisions. One or more federal and state permits are normally required for coastal development activities in Mississippi. The SMA process cannot eliminate these case-by-case permit decisions nor can it guarantee future permit issuance. Each of the permitting agencies represented on the Task Force maintains its legal power and responsibility to review future permit applications in the Port of Pascagoula SMA in accordance with its particular agency mission and statutory responsibilities.

The SMA planning process, however, is expected to expedite future permit decisions simply because it has established and improved communications among the agencies participating in the process. By meeting to discuss and evaluate alternative development concepts before a permit application for a specific development project is submitted, the agencies represented on the Task Force have been able to reach a consensus on acceptable development activities as well as what must be done to minimize environmental impacts on an area-wide basis. As a result of this consensus on a general development plan, the decision-making process for specific permit applications should be streamlined.

The SMA Plan for the Port of Pascagoula necessarily contains provisions for amendment. To obtain continuing agency commitments, the SMA Plan must not be allowed to remain static in the face of changing circumstances over the years. At the same time, since the Plan reflects a balance between new development and environmental protection, future amendments must not be allowed to undo that balance, which is essential to continuing agency commitment.

## CHAPTER 1: DEVELOPMENT CONTEXT

This chapter includes an overview of: (1) existing development in Jackson County and the Port of Pascagoula; (2) navigational access and dredged material disposal in the Port; and (3) long range development plans of the Jackson County Port Authority as contained in the 1975 Master Plan for the Port of Pascagoula.

### **Regional Context**

The Port of Pascagoula is located in Jackson County in the southeastern corner of Mississippi, about 32 miles west of the entrance to Mobile Bay, Alabama and about 100 miles east of New Orleans, Louisiana. Jackson County is bounded on the north by George County, Mississippi, on the east by Mobile County, Alabama and on the west by Harrison County, Mississippi. The county's coastal edge adjoins the Mississippi Sound (see Figure 1).<sup>1</sup>

Historically, Jackson County was a relatively undeveloped area between the two major urban centers of Mobile, Alabama, and Gulfport-Biloxi, Mississippi. In the 1960's, however, the massive expansion of Ingalls Shipbuilding and the location of major chemical plants in Pascagoula caused rapid growth in the southern portion of the county. Although Jackson County as a whole is sparsely developed, highly concentrated development occurs along the coastline. In fact, development in the county has taken place almost exclusively along a 10-mile wide strip extending along the coast. This area is crossed by U.S. Highway 90 (E-W), a coastal route; I-10 (E-W) to the north of the incorporated cities of Pascagoula, Moss Point and Ocean Springs; and State Highway 63 (N-S) which

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1. For a more detailed discussion of environmental conditions and socio-economic characteristics in Jackson County and the Mississippi Sound region, the reader should refer to the following reports: Mississippi Sound and Adjacent Areas, Plan Formulation Report, U.S. Army Corps of Engineers, Mobile District, 1983; Final Environmental Impact Statement, Pascagoula Harbor, Mississippi, (Maintenance Dredging), U.S. Army Corps of Engineers, Mobile District, December 1975; Pascagoula Harbor, Mississippi, Feasibility Report, Improvement of the Federal Deep-Draft Navigation Channel, Volumes I and II, U.S. Army Corps of Engineers, Mobile District, March 1985.

connects the highly industrialized area in East Pascagoula at Bayou Casotte with other highways. In addition to the three incorporated cities, unincorporated areas lie between Pascagoula and Ocean Springs. Residential development, including many new subdivisions, extends to the north and east from each of these cities. Agriculture, forestry, and open space are the predominant land uses in the northern four-fifths of the county.

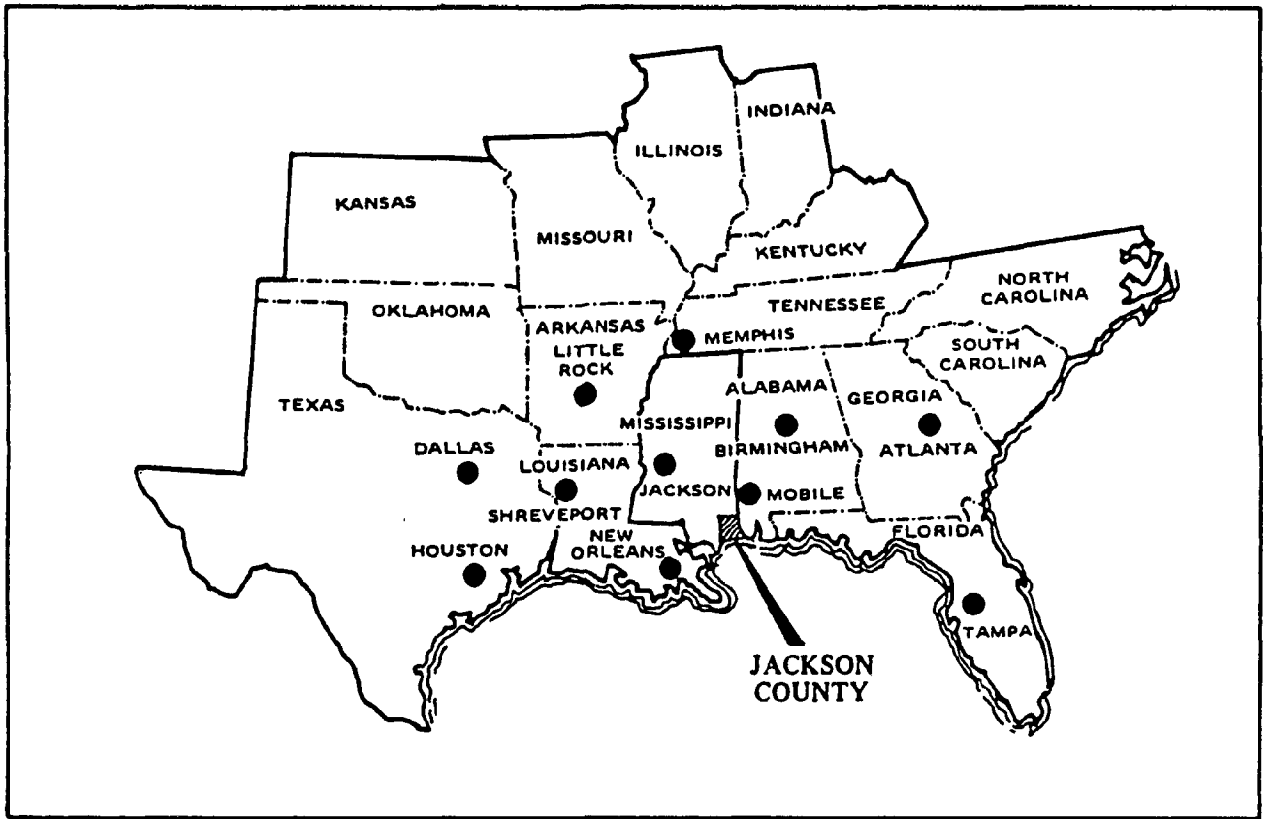
The Pascagoula River, surrounded by extensive wetlands and fed by numerous tributaries including the Escatawpa River, flows through the central portion of the county and into the Mississippi Sound just to the west of the City of Pascagoula. East and west of the city, and south of U.S. Highway 90, the county's coastal edge is largely comprised of vast expanses of tidal marsh.

In 1980, Jackson County's population of 118,015 placed it third in total population among the 82 Mississippi counties, while its 731-square-mile area made it the 14th largest county in land area. At the time of the 1980 Census, Jackson County contained five cities with populations of 1,000 persons or more. Pascagoula, with 29,318 inhabitants, is Jackson County's largest city and serves as the county seat. Moss Point was the county's second largest city in 1980 with 18,998 persons, and Ocean Springs ranked third in the county with 14,504 persons.

Jackson County is Mississippi's most industrialized county, and its economy is largely dependent on marine-related industry and commerce. The Port of Pascagoula is the center of the county's water-related industrial activities and accounts for a large part of the total employment in the county.

The county's economy is dominated by manufacturing income due primarily to the influence of Ingalls Shipbuilding in Pascagoula. Ingalls Shipbuilding estimated its 1984 employment at slightly over 10,000 workers, making it the largest single employer in the state as well as in the county. Jackson County is home to two other companies with employment of 1,000 persons or more. International Paper Company in Moss Point lists its employment at 1,150 and Chevron U.S.A. Inc. in Pascagoula employs 1,000 area workers. Including the three largest manufacturing employers in Jackson County, there are 18 establishments employing 100 or more workers.

LOCATION OF JACKSON COUNTY



LOCATION OF PASCAGOULA ON THE MISSISSIPPI GULF COAST

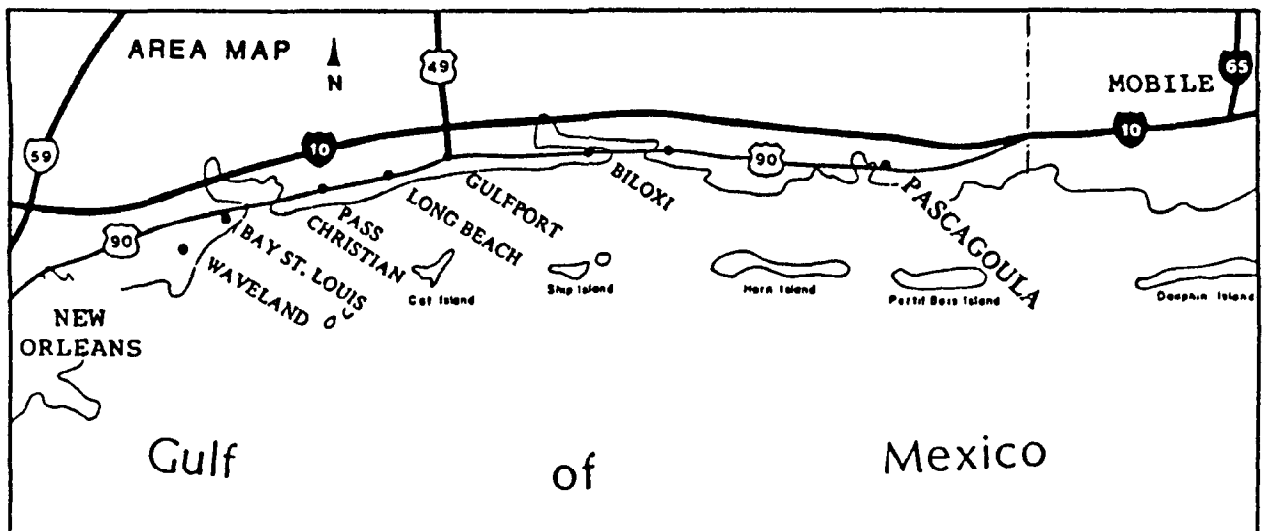


FIGURE 1: REGIONAL CONTEXT

Source: Proposal for Homeporting of a Battleship Surface Action Group (SAG) in Pascagoula, 1985.

Through the ports of Pascagoula and Moss Point, Jackson County receives greater than 85% of all Mississippi fisheries landings, including all industrial fish, 95% of the mullet, trout, and red snapper, and 74% of the croakers landed. In 1983, the landings through the ports of Pascagoula and Moss Point had a value of \$23.2 million. Using a standard multiplying factor of 5 for converting landing value to total economic value, it could be estimated that Jackson County fisheries landings augment the economy of the area by roughly \$115 million per year.

Jackson County's labor force has remained relatively steady in recent years, with a slight average annual decrease of 0.4 percent from 1975 through 1983. The size of the labor force stood at 51,460 in 1975, but it had slipped to just under 49,000 by 1983. The county's unemployment rate is considerably higher than the state level, largely due to the scaling down of operations at Ingalls Shipbuilding over the last several years. In 1983, Jackson County had an unemployment rate of 19.9 percent, compared to a state unemployment rate of 12.6 percent.

### **Existing Development in the Port of Pascagoula**

#### History of Development<sup>1</sup>

The Port of Pascagoula has a long history, achieving regional importance as early as 1819, when it was a center for cotton exports. Other early activities include shipbuilding, beginning at Moss Point in 1838; lumber shipping, from the post civil war period until the depression; and pulp production/shipping by the International Paper Company from its mill on the Escatawpa River beginning in 1912.

The shipyard at the mouth of the Pascagoula River, one of the first Mississippi "Balance Agriculture with Industry" projects, was a primary employer in the Jackson County area prior to the end of World War II. After the war, however, the trend toward deeper-

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1. For a more detailed account of port expansion and growth including the development of public dock and terminal facilities, early industries, etc. the reader should refer to Statement Regarding Greater Port of Pascagoula, prepared for JCPA and Jackson County Board of Supervisors by Michael Baker, Jr., Inc., May 1972, revised December 1975.



draft ocean-going vessels and the relatively shallow depth of the 22 foot federal channel serving the Port placed the shipyard in a noncompetitive position. In 1949, with appropriations from state and local sources, this channel was deepened by the United States Army Corps of Engineers to a depth of 30 feet below mean low water.

A development plan for the Bayou Casotte Harbor and Industrial Area was prepared in 1955, and dredging of the Bayou Casotte access channel and harbor to a depth of 30 feet was completed in 1957.

The 1958 session of the Mississippi Legislature authorized the issuance of state bonds for the purpose of building port and harbor facilities, and the Jackson County Port Authority (JCPA) assumed responsibility for building and operating the facilities of the Port of Pascagoula.

In 1962, following the construction of public dock and terminal facilities by the JCPA, the navigation channels serving the Pascagoula Harbor and Bayou Casotte industrial areas were federally authorized to their current 38 foot depths. (See section on Navigation Access.)

#### Existing Facilities and Industrial Activities<sup>1</sup>

The Port of Pascagoula is Mississippi's largest port in terms of annual water-borne tonnage and is also the center of the state's fishing industry. Port facilities are located in two harbors — the Pascagoula River Harbor and the Bayou Casotte Harbor — separated by the City of Pascagoula. The existing public facilities and the various private industrial operations in the Port of Pascagoula are identified in Figure 2.

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1. The descriptions of existing port facilities and industrial activities in this section are taken primarily from the Pascagoula Harbor, Mississippi, Feasibility Report for Improvement of the Federal Deep-Draft Navigation Channel, by the Mobile District, U.S. Army Corps of Engineers, March 1985. For additional information the reader should refer to that study and to Greater Port of Pascagoula, Public Terminal Facilities and Service Industries, Jackson County Port Authority, January 1981, and Economic Impact of the Port of Pascagoula on Jackson County and the Surrounding Area, Mississippi Research and Development Center, September 1977.

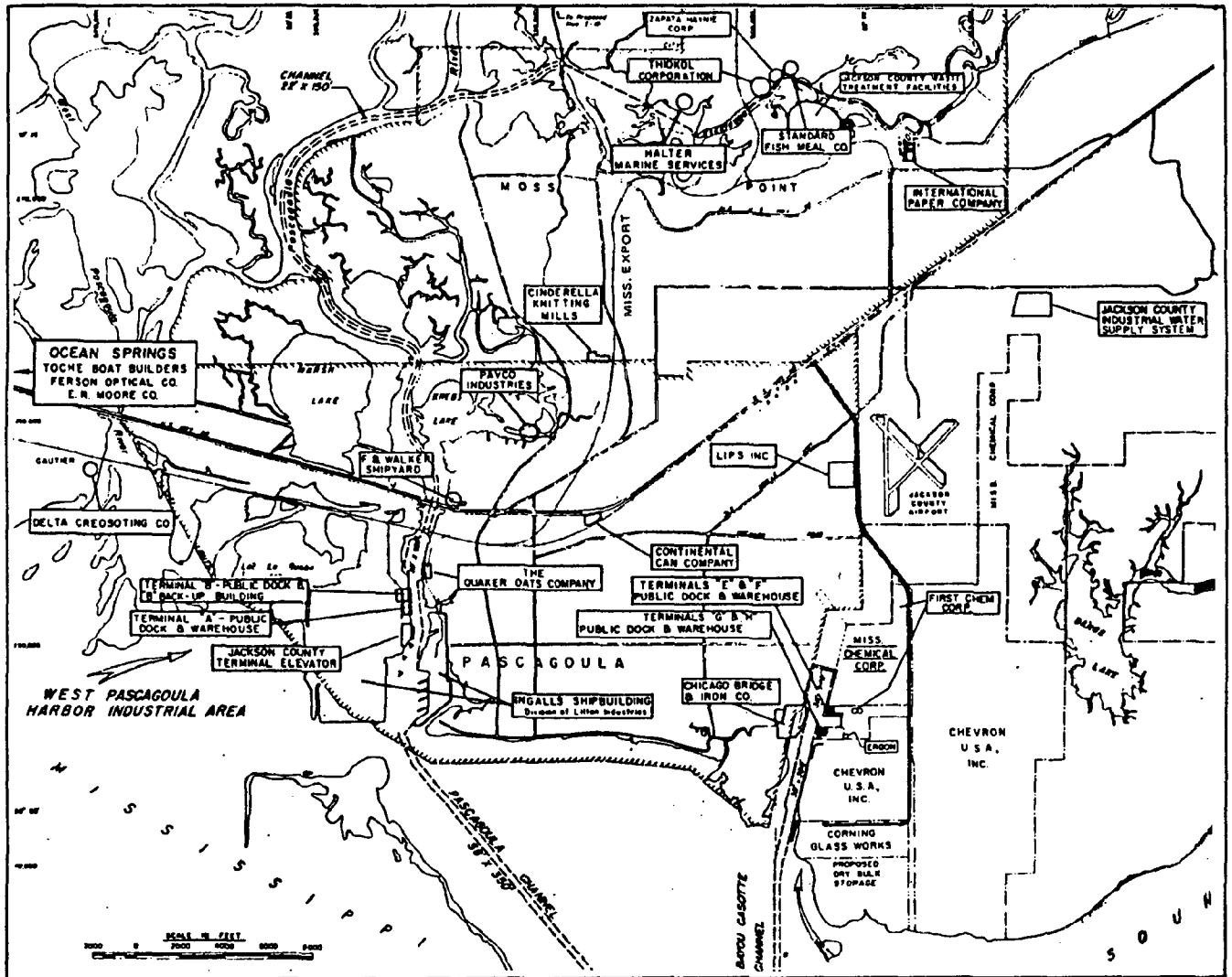


FIGURE 2: EXISTING PUBLIC FACILITIES AND INDUSTRIAL ACTIVITIES

Source: Pascagoula Harbor Mississippi, Feasibility Report, Improvement of Federal Deep Draft Navigation Channel, Volume 1, Main Report and Environmental Impact Statement, U.S. Army Corps of Engineers, Mobile District, March 1985.

The Pascagoula River Harbor (West Harbor) is located in the lowermost portion of the Pascagoula River. Most of the West Harbor facilities are located along the river between Mississippi Sound and a turning basin located about 1½ miles inland from the mouth of the river. The entrance to the West Harbor is flanked by the two shipbuilding facilities of the Ingalls Shipbuilding Company, a Division of Litton Industries. Ingalls operates a conventional shipyard facility on the east bank of the harbor and a modular construction shipyard — the only new shipyard that has been built in the country since World War II — on the west bank.<sup>1</sup>

Ingalls Shipbuilding has been building ships in Pascagoula for the U.S. Navy and Merchant Marine since 1938. Vessels constructed by the company include troop transports, escort aircraft carriers, net layers, LST's, LSD's, LPH's, LPD's, destroyers, icebreakers, ammunition ships, submarine tenders, nuclear powered attack submarines, general cargo vessels, containerships, oil and chemical tankers, passenger liners, oil drilling rigs, and specialty vessels for commercial use.

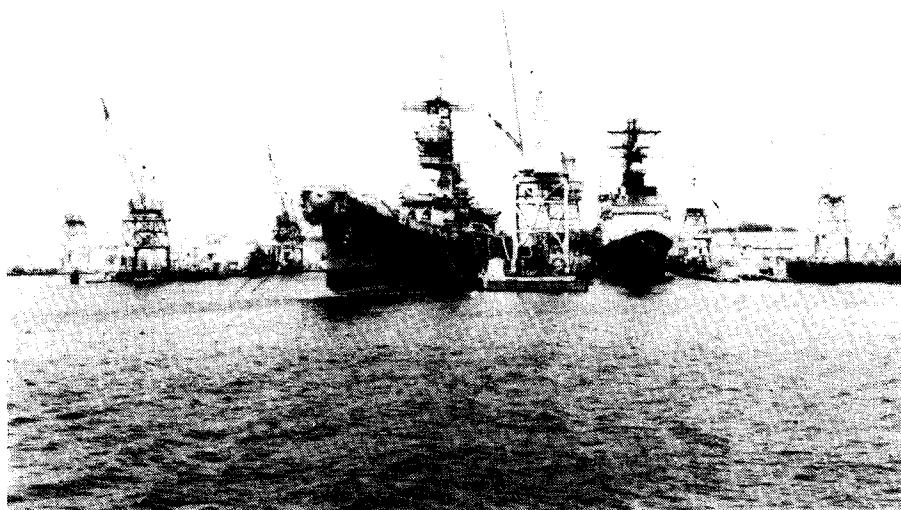


Figure 3: East Bank Shipyard; Battleship USS Iowa

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1. For a detailed description of the Ingalls Shipbuilding facilities, the reader should refer to the Proposal for Homeporting of a Battleship Surface Action Group (SAG) in Pascagoula, prepared in 1985 by the City of Pascagoula, Jackson County Board of Supervisors, and JCPA.

Ingalls' combined shipbuilding resources cover nearly 800 acres on both banks of the Pascagoula River and employ a work force of about 10,000, making Ingalls the city's and the state's largest employer. The 611 acre West Bank Shipyard was completed in 1970 to accommodate modular construction techniques.

In the West Bank Shipyard, fabricated steel and minor subassemblies are brought from the fabrication, panel, and shell shops to a subassembly area where they are erected into major assemblies, which in turn move to the module assembly area. After the modules are completed, they are moved to the integration area where they are erected into a complete ship. The completed ship is then moved over land onto a drydock which is subsequently floated and moved to a deep water area where it is sunk and the ship is launched.

The drydock can launch or recover ships up to 38,000 tons and 800 feet by 177 feet. Approximately 4,400 feet of berthing space is available for outfitting. The assembly, integration and outfitting areas are serviced by mobile cranes of up to 200-ton capacity.

The east bank facility has a graving dock which has been used for construction of nuclear-powered submarines but is currently being used primarily for overhaul and repair work. Ships up to the size of a frigate can be accommodated. A wharf and four piers serviced by cranes with a 110-ton maximum capacity provide a total of 3,700 feet of berthing space for outfitting and topside repair.

Since 1975, Ingalls has delivered 42 sophisticated new warships to the Navy, including the lead ships of four different classes. Ingalls was selected by the Navy in mid-1982 to modernize and reactivate the battleship USS Iowa. This 887-foot, 58,000-ton ship arrived at Ingalls in January 1983. The ship, with new weapons, communications, and support systems, was redelivered in April 1984.

Public port and dock facilities in the West Harbor area consist of two terminals and warehouses owned and operated by the Jackson County Port Authority. These facilities are designated as Terminals "A" and "B". Louis Dreyfus Grain Corporation operates a grain elevator and dock facilities on the west bank of the harbor just north of Ingalls. This is a privately operated public facility open to all shippers on equal terms with services and charges set by the JCPA. The Dreyfus docks are used for loading bulk grain onto ocean-going vessels for export, and for unloading grain barges that originate in the Midwest.

Other private docks, terminals, repair yards, and fish houses/docks in the West Harbor area are owned and/or operated by Quaker Oats, F. B. Walker Shipyard, Hudship, Halter Marine, Mississippi Menhaden Fish Meal Company, Standard Fish Meal Company, International Paper Company, and numerous other fishing and small boat repair facilities.

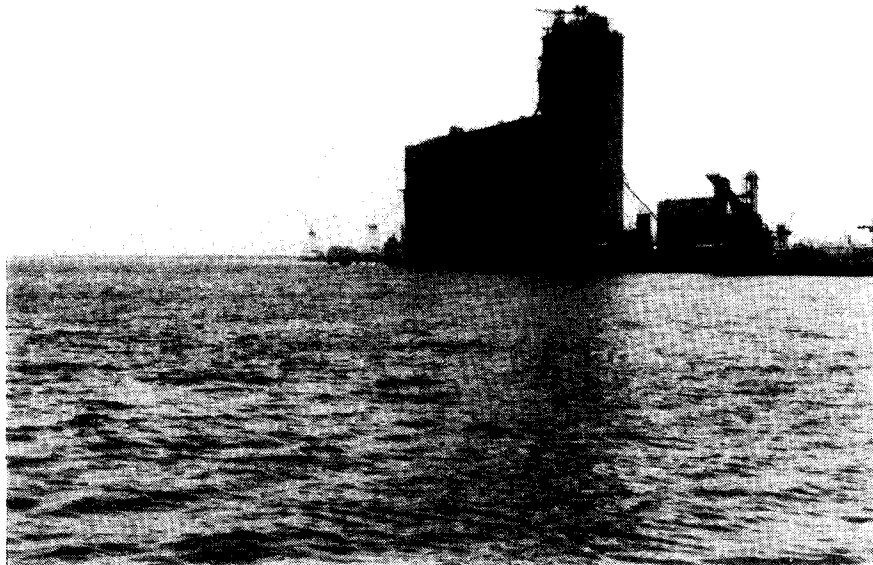


Figure 4: Grain Elevator; Pascagoula River Harbor

The Bayou Casotte Harbor (East Harbor) is located about three miles to the east of the Pascagoula Harbor and contains the most intense concentration of heavy industrial development on the Mississippi coast. The East Harbor extends about 1 mile inland from Mississippi Sound and contains privately owned docks as well as docks and terminal facilities owned by the county. The major industrial facilities located on Bayou Casotte are the Chevron U.S.A. refinery and the Mississippi Chemical Corporation fertilizer plant.

The Chevron Oil Refinery maintains the largest petroleum and wharf operation in Mississippi. The refinery produces a full line of finished stocks and products consisting of liquefied petroleum gases, various grades of gasolines, fuel oils, asphalts, petrochemicals, and anhydrous ammonia. These products are shipped to many distribution terminals along the Gulf Coast and up the Mississippi River.

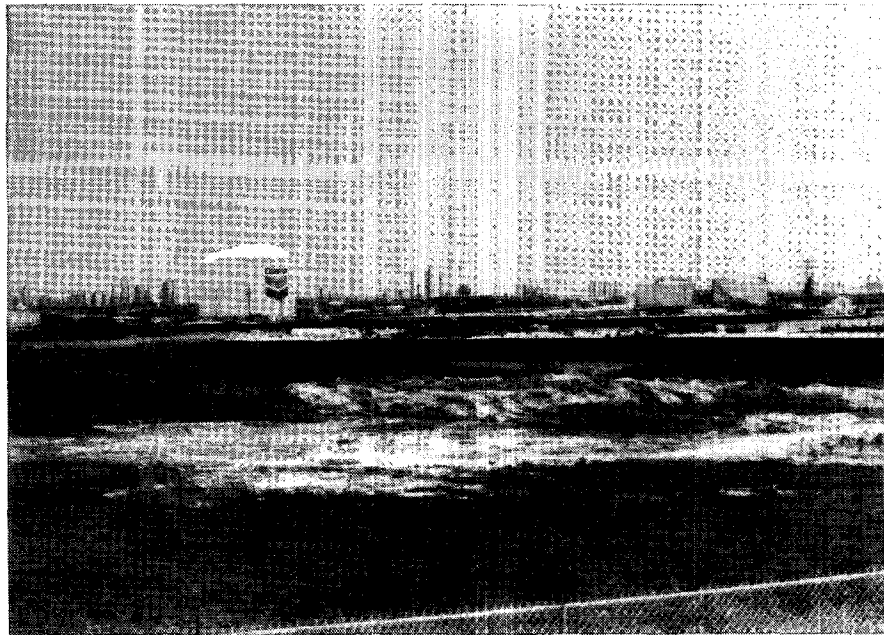


Figure 5: Chevron Oil Refinery

Chevron owns two wharfs, which are used for importing crude oil and shipping petroleum and chemical products by barge and ship, and is currently building new facilities and expanding the present refinery to be capable of receiving and processing 45,803 tons of Arabian heavy crude per day. The crude oil is to arrive at a position offshore in Very Large Crude Carriers (VLCC) and Ultra Large Crude Carriers (ULCC), then lightened to the refinery docks in smaller tankers. When completed, the expanded refinery will process 16.7 million short tons of heavy crude per year.

Mississippi Chemical's complex in the East Harbor area is one of three owned by Mississippi Chemical Corporation of Yazoo City, Mississippi, the South's largest fertilizer manufacturer and distributor. Mississippi Chemical uses its docks for bringing in phosphate rock to its fertilizer manufacturing plant in ocean-going barges. Mixed fertilizer is then shipped by barge across the Gulf and up the navigable rivers of the Southeast. Mississippi Chemical was the first industrial operation to select a site in the Bayou Casotte Industrial Area and was the first to ship through the terminals of the Bayou Casotte Harbor.

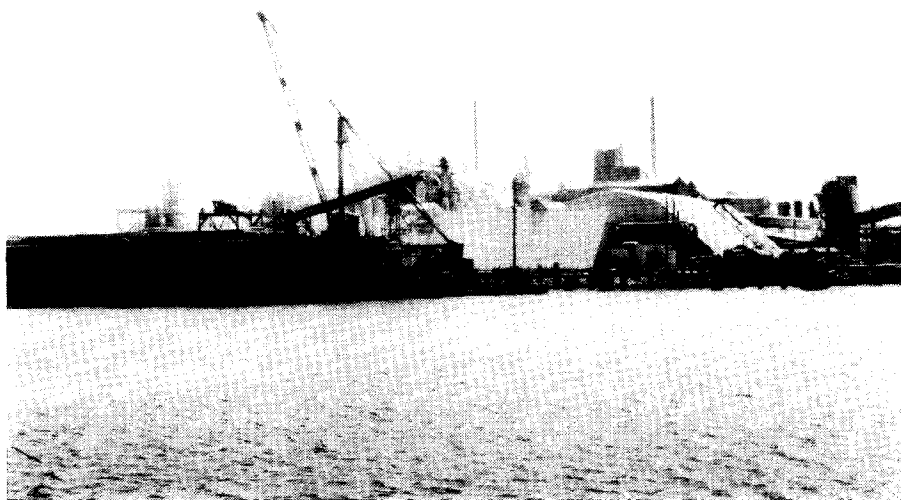


Figure 6: Mississippi Chemical Fertilizer Plant

On the Bayou Casotte channel, the JCPA owns and operates Terminals "E", "F", "G", and "H". In addition to Chevron and Mississippi Chemical, Corning Glass Works and Chicago Bridge and Iron have plants and dock facilities on the channel. First Chemical Corporation has a plant adjacent to the turning basin, but uses Terminal "F" for the docking, loading and unloading of vessels. There are also small docks and fish houses located in the East Harbor area. Tennessee Gas Transmission Company (Tenneco) plans to import LNG by deep draft vessels through a proposed dock and terminal facility to be located near the entrance to the Bayou Casotte Harbor. The LNG product will be further shipped by pipeline to inland customers. The terminal is expected to be operational by the end of 1988.

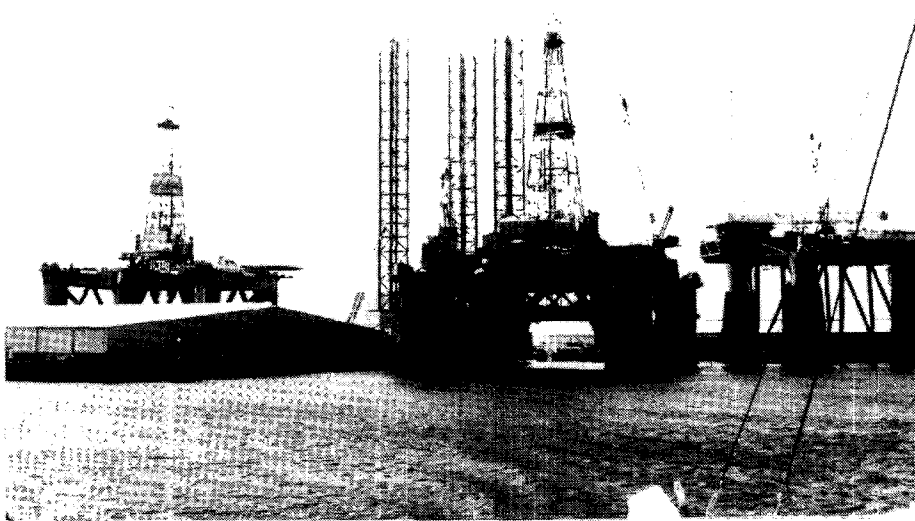


Figure 7: Offshore Oil Rigs Under Construction and Repair; Bayou Cassotte Channel



Waterborne Commerce<sup>1</sup>

In 1979, 9.4 million tons of imports, .6 million tons of exports, .5 million tons of coastwise receipts and 5.2 million tons of coastwise shipments passed through the Bayou Casotte Harbor. The remainder of the Bayou Casotte tonnage consisted of 4.6 million tons of barge and shallow draft vessel cargo. The Pascagoula River Harbor handled 3.8 million tons of exports and about .3 million tons of imports and coastwise commerce. The tonnage of commerce moving in shallow draft vessels through the Pascagoula River Harbor was 1.0 million tons. Total commerce handled through both harbors in 1979 was 25.3 million tons.

The major waterborne commodities handled at the Port of Pascagoula, including the East and West Harbors, during CY 1979 by deep-draft vessels were: grain, crude petroleum, fertilizer and fertilizer material, petroleum products, chemicals, and general break-bulk cargo. A general breakdown of this commerce is as follows:

<u>PRODUCT</u>	<u>VOLUME</u> (thousand short ton)	<u>PERCENT</u>
Crude Petroleum	8.7	44.0
Petroleum Products	6.2	31.0
Grain	3.8	19.0
Chemicals	.6	3.0
Fertilizer	.3	2.0
Other	<u>.1</u>	<u>1.0</u>
TOTAL 1979 TONNAGE	19.7	100.0

The annual volume of waterborne deep-draft commerce shipped through the East and West Harbors increased from 3.7 million tons in 1970 to 19.7 million tons in 1979. Although shallow-draft vessel commerce had no appreciable increase during this 10-year period, a sharp increase in total port commerce occurred in 1975 and has steadily increased since that time. These increases were brought about primarily because of

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1. This section is taken from the Corps of Engineers' Pascagoula Harbor Feasibility Report, Volume II, Technical Appendices. For a more comprehensive discussion of waterborne commerce in the Port of Pascagoula, including historical trends of tonnage by commodity, projections of commerce, as well as a detailed description of vessel traffic, the reader should refer to that document.

the completion of the Chevron Refinery in 1973 and the increased demand for foreign grain exports.

Port facilities at Pascagoula are used to move a variety of cargo to and/or from most regions of the U.S. Analysis of the 19 states served indicates that states utilizing the port extend from New Mexico to New Jersey. In addition, the foreign markets for grain exports are Northern Europe, Southern Europe, the Black Sea, Spain, Eastern Mediterranean, Western Mediterranean, Far East, South America and Caribbean areas.

### **Navigation Access and Dredged Material Disposal**

#### **Pascagoula Harbor Project<sup>1</sup>**

The Pascagoula Harbor Project is a federal navigation project authorized by the federal River and Harbor Acts of March 4, 1913; March 4, 1915; May 17, 1950; Sept. 3, 1954; July 3, 1958; July 14, 1960; and October 23, 1962 (see Table 1). The existing project was completed in August 1965 and the U.S. Army Corps of Engineers, Mobile District is responsible for its maintenance. By law, the Jackson County Port Authority is the local sponsor for the project with responsibility for dredging in berthing areas and interior access channels, maintaining public terminal facilities, and providing upland dredged material disposal areas with necessary retaining dikes.

The principal purpose of the existing Pascagoula Harbor Project is to maintain the navigational quality from the Gulf of Mexico to Pascagoula, Mississippi, by maintaining channels of sufficient depth to handle commercial vessels of draft not over 38 feet. The type of traffic using the Pascagoula channels consists principally of cargo ships, tankers, shrimp and menhaden boats, coastal tow boats, and barges. Pleasure craft also use the channels.

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1. A description of the Pascagoula Harbor Project is also included in Appendix E: Pascagoula Harbor Management Plan for Long-Term Disposal of Dredged Material.

The federally-authorized project consists of the following channels (See Figure 8):

1. An entrance channel 40 feet deep and 350 feet wide from the Gulf of Mexico through Horn Island Pass (Bar Channel), including an impounding area for littoral drift (40 feet deep, 200 feet wide) and about 1500 feet long, adjacent to the channel at the west end of Petit Bois Island.
2. A channel 38 feet deep and 350 feet wide in Mississippi Sound and the Pascagoula River to the railroad bridge at Pascagoula, including a turning basin 2000 feet long and 950 feet wide (including the channel area), on the west side of the river below the railroad bridge.
3. A channel 38 feet deep and 225 feet wide from the ship channel in Mississippi Sound to the mouth of Bayou Casotte, then 38 feet deep and 300 feet wide for about 1 mile to a turning basin 38 feet deep, 1000 feet wide, and 1750 feet long.
4. A channel 22 feet deep and 150 feet wide up the Pascagoula River from the railroad bridge to the mouth of the Dog River, then up the Dog River to the Highway 63 bridge.
5. A channel 12 feet deep and 125 feet wide from the highway bridge, via Robertson and Bounds Lakes, to mile 6 on the Dog River.

The Pascagoula Harbor Project is classified as an unquestionably justified Corps of Engineers' navigation project due to the current ratio of maintenance costs relative to shipping tonnages.

#### Regulatory Context for Dredging and Dredged Material Disposal

Federal. A number of federal laws constrain and guide the planning, construction, and maintenance of federal projects. Proposed dredging programs on federally-authorized projects must be reviewed under the following federal laws: Clean Water Act; Marine Protection, Research, and Sanctuaries Act; Coastal Zone Management Act; National Environmental Policy Act; Fish and Wildlife Act; Migratory Marine Game and Fish Act; Fish and Wildlife Coordination Act; Endangered Species Act; National Historic

Preservation Act; Archaeological and Historic Preservation Act; Estuary Protection Act; Clean Air Act; and Coastal Barrier Resources Act.<sup>1</sup>

The recipient of the public notice of a proposed Corps of Engineers' dredging program is requested specifically to review the proposed action as it may impact on water quality relative to section 404(b)(1) of the Clean Water Act<sup>2</sup>. Review of any other potential impact is also required.

State Certification and Review. Pursuant to Section 404(a)(1) of the Clean Water Act, water quality certification from the State of Mississippi is required for routine maintenance of the Pascagoula Harbor Project. Pursuant to Section 404(t) of the Act, project approval is also required from the Mississippi Bureau of Marine Resources which must evaluate the proposed maintenance action for consistency with the management programs and objectives of the Mississippi Coastal Program.

In addition, The Coastal Program establishes a set of guidelines for dredged material disposal<sup>3</sup>. These guidelines, however, do not require water quality standards more stringent than those required by the Clean Water Act.

#### Major Studies

The Corps of Engineers, Mobile District, has recently completed two major studies of dredging and dredged material disposal needs in the area: the Mississippi Sound and Adjacent Areas Study and the Pascagoula Harbor Study as described in the following sections.

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1. For a summary of pertinent sections of each of these laws, see Volume I of the Corps' Pascagoula Harbor Feasibility Report for Improvement of the Federal Deep-Draft Navigation Channel.
  2. For a discussion of regulatory requirements under Section 404 of the Clean Water Act, see Chapter 2: Regulatory Context.
  3. Mississippi Coastal Program, Chapter 8, Section 2.

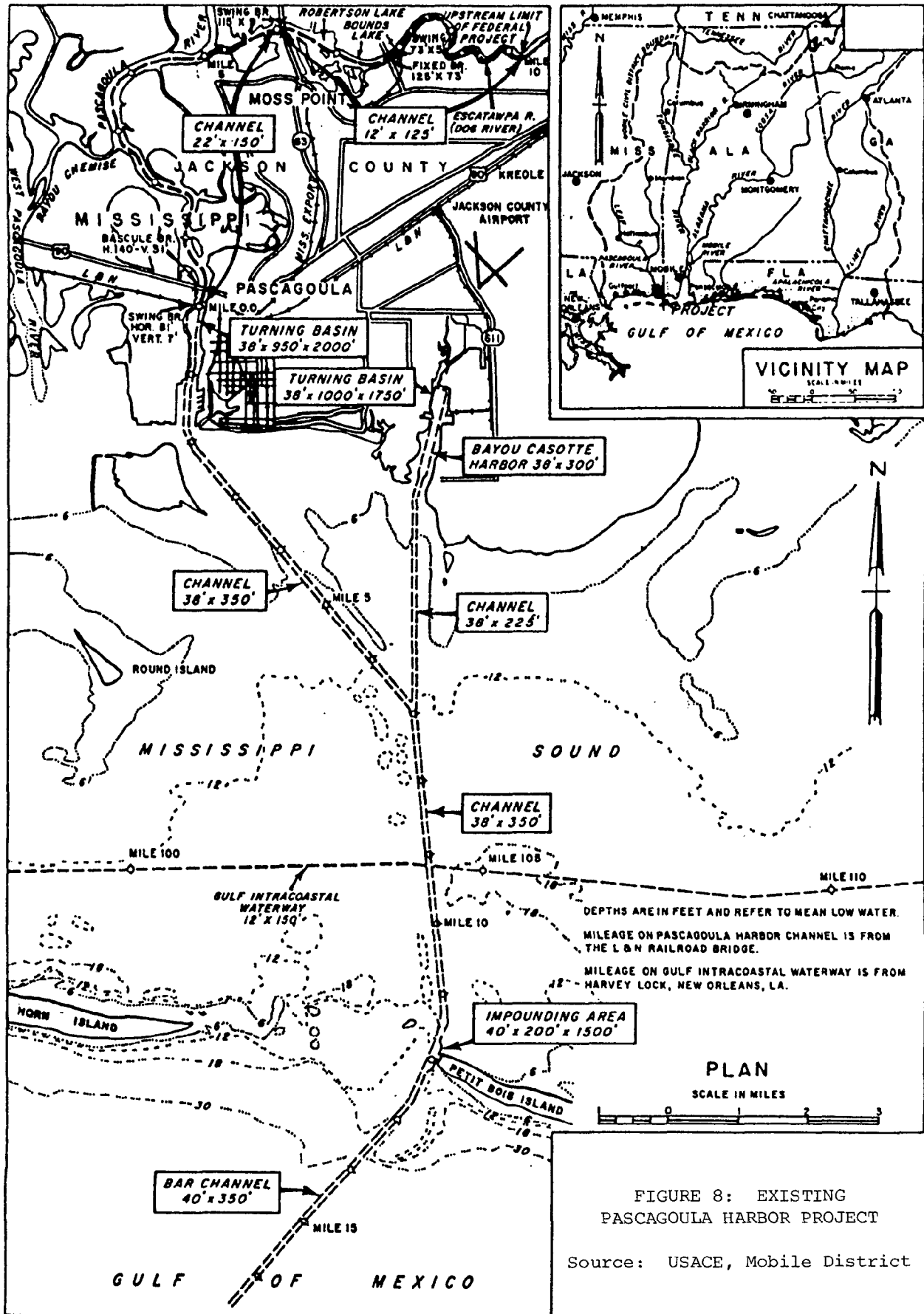


FIGURE 8: EXISTING PASCAGOULA HARBOR PROJECT

Source: USACE, Mobile District

TABLE 1: AUTHORIZING LEGISLATION FOR PASCAGOULA HARBOR PROJECT

<u>Acts</u>	<u>Work Authorized</u>	<u>Documents</u>
Mar. 4, 1913	Provides for through channel from the Gulf to mile 4 on Dog River, 25 feet through Horn Island Pass thence 22 by 25 feet across Mississippi Sound and up Pascagoula River to the railroad bridge, thence 22 by 150 feet in Pascagoula River above bridge, and up Dog River to mile 4, all subject to financial participation by local interests.	H.Doc.682, 62d Cong., 2d Sess.
Mar. 4, 1915	Waived requirement for financial participation by local interests.	River and Harbor Committee Doc. 12, 63d Cong. 2nd Sess.
May 17, 1950	Cutoff channel 12 by 125 feet, from State Highway 63 bridge to mile 4 on Dog River, via Robertson and Bounds Lakes.	H.Doc.188, 81st Cong., 1st Sess.
Sept. 3, 1954	Modification to provide for channel dimensions of 35 by 325 feet through Horn Island Pass, thence 30 by 275 feet across Mississippi Sound and up Pascagoula River to the railroad bridge, and a turning basin just below the bridge.	H.Doc. 98, 86th Cong., 1st Sess.
July 3, 1958	Reimbursement of local interests for work done on Dog River cutoff (\$44,000).	
July 14, 1960	Modification to provide for maintenance of 12 by 125-foot channel to mile 6 on Dog River, and maintenance of 30- by 225-foot side channel from main ship channel in Mississippi Sound to the mouth of Bayou Casotte, thence 30 by 300 feet in Bayou Cassotte to a turning basin of the same depth 1 mile above the mouth.	H.Doc. 98, 86th Cong., 1st Sess.
July 14, 1960	Deepening the Horn Island Pass channel to 38 feet and deepening the main ship channel in Mississippi Sound, the river channel to the railroad bridge, and the turning basin all to 33 feet.	Chief of Engineers Report dated 11/3/60
Oct. 23, 1962	Enlarging Horn Island Pass Channel to 40 by 350 feet, provision of an impounding area adjacent to and east of channel 40 feet deep, 200 feet wide, and about 1,500 feet long, enlarging main channel in Mississippi Sound and river channel to railroad bridge to 38 by 350 feet, and deepening turning basin in river and Bayou Casotte channels and basin to 38 feet.	H.Doc. 560, 87th Cong., 2nd Sess.

Mississippi Sound and Adjacent Areas Study. The purpose of this study, authorized by Congressional resolution in 1977, is to "investigate the existing dredging and dredged material disposal practices in Mississippi Sound and adjacent areas and to determine how these practices should be modified, considering possible development of a regional dredging and disposal program, new dredging equipment and the environmental quality of the area."

The Reconnaissance Report (Stage 1) completed in March 1979, summarized existing and projected conditions, identified problems and established planning objectives. The Plan Formulation Report (Stage 2) was completed in June 1983 and provides a more detailed description of the existing physical and environmental characteristics and socio-economic conditions of the study area and focuses on various scenarios of dredging and disposal and the application of hydrodynamic models (most notably the Waterways Implicit Flooding Model with Salinity) to Pascagoula Harbor. The purpose of the modeling effort is to analyze water circulation patterns and the degree of resuspension or movement of deposited dredged material that will occur in Mississippi Sound under various wind and tide conditions. Through the use of hydrodynamic models, the Corps addressed the relationship between maintenance dredging needs and the movement of formerly deposited dredged material from open water disposal areas. The study has recently been completed (Mississippi Sound and Adjacent Areas Dredged Material Disposal Study, Feasibility Report, Resource Inventory, Volume II, Mobile District, U.S. Army Corps of Engineers, March 1985).

Pascagoula Harbor Study. In response to a Congressional resolution adopted on Sept. 23, 1965 by the Public Works Committee of the U.S. Senate, the Mobile District has investigated the need and feasibility of deepening and widening the ship channels of the Pascagoula Harbor Project. The Corps has conducted economic analyses to determine the maximum channel depth at which there will be a unity of benefit (economic benefit based on savings in transportation costs resulting from the use of larger, deeper draft vessels) to cost (cost of constructing and maintaining new channel depths).

The Corps' study considered the need for modification of the existing federal project at Pascagoula Harbor to accommodate present and prospective commerce. The primary study area included the federal project and all lands and waters directly impacted by the project. Alternative plans were formulated to meet the identified needs, and associated costs and benefits, including the economic, environmental, and social impacts

of the proposed improvements, were assessed. The study was performed in sufficient detail to determine what resource management measures or systems would be in the overall public interest at Pascagoula Harbor and should be recommended for Congressional authorization.

Plans with channel dimensions up to 55 feet deep by 500 feet wide were initially considered. Early economic surveys showed, however, that while deepening and/or widening the existing project was probably feasible, dimensions that were very much greater than the existing channel could not be justified. As a result, the channel modifications considered in detail were widening and/or deepening the channels on essentially the existing alignment.

Of the plans initially formulated, the Corps selected five for detailed study along with a "No Action" alternative. All plans considered for detailed study included deepening all of the channels in Mississippi Sound to 42 feet and the entrance channel to 44 feet; widening of the Bayou Casotte channel to 350 feet; and providing a 1400 foot diameter turning basin just inside the mouth of Bayou Casotte. The upper Pascagoula River Harbor channel would be deepened to a point just south of the grain elevator and the Bayou Casotte Channel would be deepened to the turning basin. In addition, all plans would use a shallow depth disposal site south of the eastern end of Horn Island for new work and for maintenance materials dredged from the entrance channel. The existing upland disposal sites (see section on Existing Disposal Areas) would be used for containment of new work and maintenance materials from the inner Pascagoula and Bayou Casotte harbors.

The selected plan, as shown in Figure 9, would dispose of new work material from the Bayou Casotte and Upper and Lower Pascagoula channels in a currently undesignated site in the Gulf of Mexico. Maintenance materials from the three channels would be disposed of in existing open water sites in the Mississippi Sound and in confined disposal sites. Dredging quantities and disposal areas for construction of the selected plan are shown in Table 2. This plan was selected based on its performance in addressing the identified public concerns and its net positive contributions to the goals of National



Economic Development and Environmental Quality.<sup>1</sup>

Dredged Material Disposal Needs for Existing Channels

Although not all of the channels in the Pascagoula Harbor Project require annual dredging, rapid shoaling necessitates dredging in some portions of the project each year. Since December 1963 when the Pascagoula/Bayou Casotte channel system was widened and deepened to its present dimensions, 16 separate federal maintenance dredging contracts have been issued. The dredging histories for each reach and annual volumes of maintenance dredged material are summarized in Appendix E: Pascagoula Harbor Management Plan for Long-Term Disposal of Dredged Material.

In addition to federal maintenance requirements, the Jackson County Port Authority and private industries within the Port also conduct dredging activities in the Pascagoula River Harbor and Bayou Casotte areas. Although all parties undertaking non-federal maintenance dredging are required to apply to the Corps of Engineers for appropriate permits, information regarding the volume of material and required frequency of JCPA/private interest dredging is currently less precise than similar information regarding federal dredging needs. It has been estimated, however that existing Jackson County Port Authority and city facilities will require about 23,000 cubic yards of maintenance dredging per year and that approximately 200,000 cubic yards of material per year will be dredged from private facilities.

The existing upland disposal sites (see following section on Existing Disposal Areas and Appendix E) are used to accommodate both the federal and non-federal dredging activities in the Pascagoula River and Bayou Casotte sections of the project.

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1. See Pascagoula Harbor, Mississippi, Feasibility Report, Improvement of the Federal Deep-Draft Navigation Channel, Volume 1: Main Report and Environmental Impact Statement, Volume 2: Technical Appendices, prepared by U.S. Army Corps of Engineers, Mobile District, March 1985.

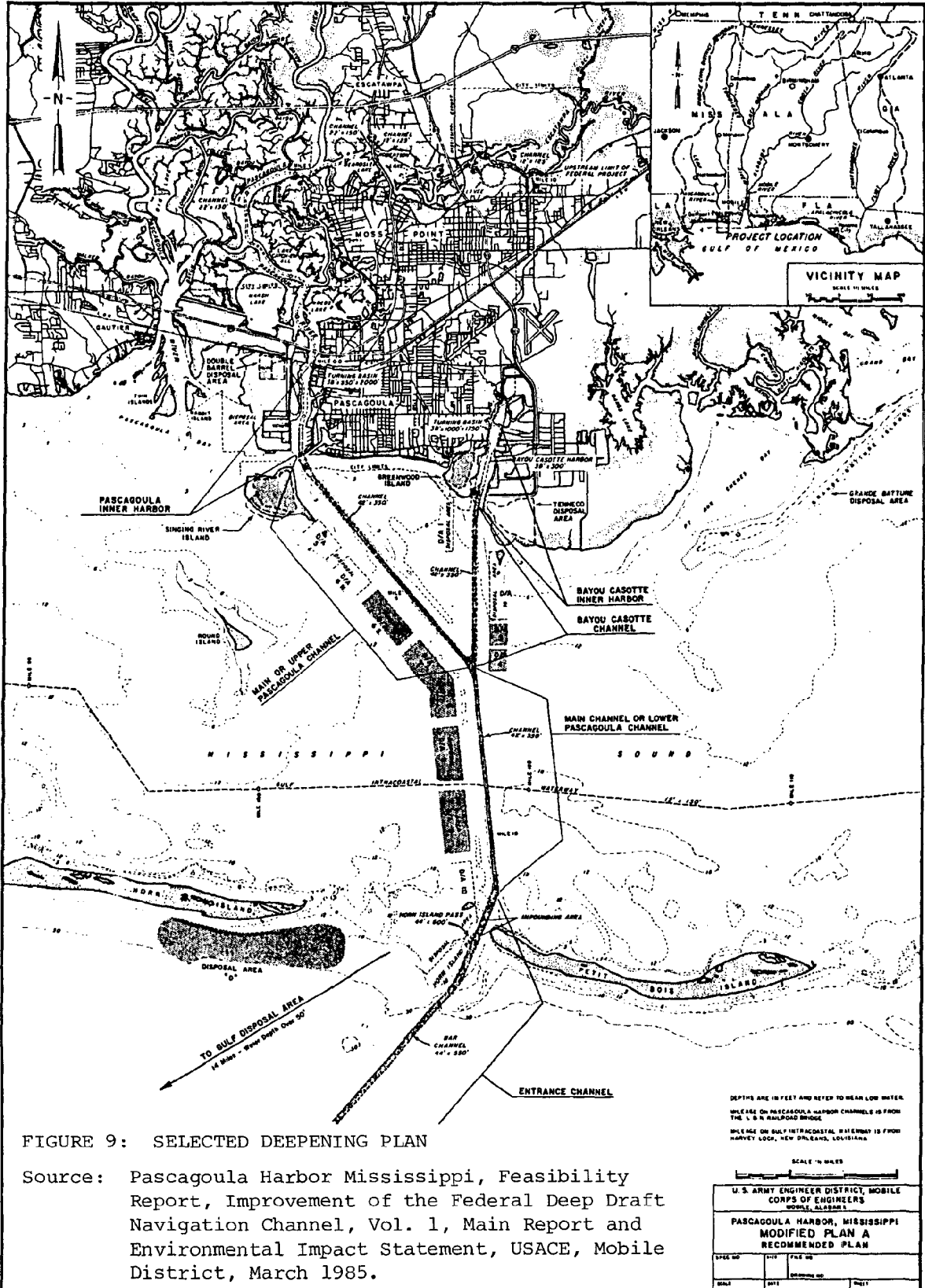


FIGURE 9: SELECTED DEEPENING PLAN

Source: Pascagoula Harbor Mississippi, Feasibility Report, Improvement of the Federal Deep Draft Navigation Channel, Vol. 1, Main Report and Environmental Impact Statement, USACE, Mobile District, March 1985.

DEPTHS ARE IN FEET AND REFER TO MEAN LOW WATER  
 MEASURE ON PASCAGOULA HARBOR CHANNELS IS FROM  
 THE U. S. N. RAILROAD BRIDGE  
 MEASURE ON GULF INTRACASTAL WATERWAY IS FROM  
 HARVEY LOCK, NEW ORLEANS, LOUISIANA

SCALE 1" = 1 MILE

U. S. ARMY ENGINEER DISTRICT, MOBILE  
 CORPS OF ENGINEERS  
 MOBILE, ALABAMA

PASCAGOULA HARBOR, MISSISSIPPI  
 MODIFIED PLAN A  
 RECOMMENDED PLAN

DATE	BY	FILE NO.
SCALE	DATE	DRAWING NO.

TABLE 2:  
DREDGING QUANTITIES AND DISPOSAL AREAS FOR  
CONSTRUCTION OF THE SELECTED CHANNEL IMPROVEMENT PLAN

<u>CHANNEL REACH</u>	<u>DREDGING QUANTITIES</u>	<u>DISPOSAL SITES</u>
Bayou Casotte Inner Harbor	NW: NONE O&M: 99,000	NONE Greenwood Island
Bayou Casotte Turning Basin	NW: 2,322,000 O&M: incl. in Inner Harbor O&M	Gulf site
Pascagoula Inner Harbor	NW: 623,000	Double Barrel I. & Singing River I.
mile 0.0 - 1.2	O&M: 225,435	Double Barrel I.
mile 1.2 - 1.8	O&M: 113,565	Singing River I.
Bayou Casotte Channel	NW: 3,938,000 O&M: 800,000	Gulf site Open Water 3, 4
Upper Pascagoula Channel	NW: 3,302,000	Gulf site
mile 1.8 - 3.0	O&M: 225,250	Singing River I.
mile 3.0 - "Y"	O&M: 675,750	Open Water 6B, 7
Lower Pascagoula Channel	NW: 1,564,000 O&M: 379,000	Gulf site Open Water 7, 8, 9
Entrance Channel	NW: 3,348,000 O&M: 691,000	Horn Island site Horn Island site
Notes: NW = New Work in cubic yards O&M = Maintenance in cubic yards per year		

Source: Pascagoula Harbor Mississippi, Feasibility Report, Improvement of the Federal Deep Draft Navigation Channel, Vol. II, Technical Appendices, USACE, Mobile District, March 1985.

### Existing Disposal Areas

Depending on the particular dredging reach, maintenance dredged material from the Pascagoula Harbor Project is currently deposited in three different types of disposal areas: diked, upland disposal sites; open water disposal areas adjacent to the channels in Mississippi Sound; and an "ocean dumping" site in the Gulf of Mexico.

Upland Disposal Sites. At present there are three upland disposal sites in the Pascagoula area. These sites are located on Greenwood Island, Singing River Island, and Lowery Island (commonly known as the Double-Barrel Site). (See Figure 14 and Appendix E.)

Greenwood Island is approximately 190 acres in size and is located on the west side of the mouth of Bayou Casotte. The diked disposal area is 101 acres with a current effective dike elevation of 18 to 19 feet. The Greenwood Island disposal area generally accommodates maintenance dredged material from the mouth of the Bayou Casotte Harbor to the inland terminus of the channel. Under existing conditions, the Mobile District, Corps of Engineers estimates that this disposal area would have a service life of approximately 15 more years before dike raising would be required.



Figure 10: Greenwood Island Disposal Area and Dike

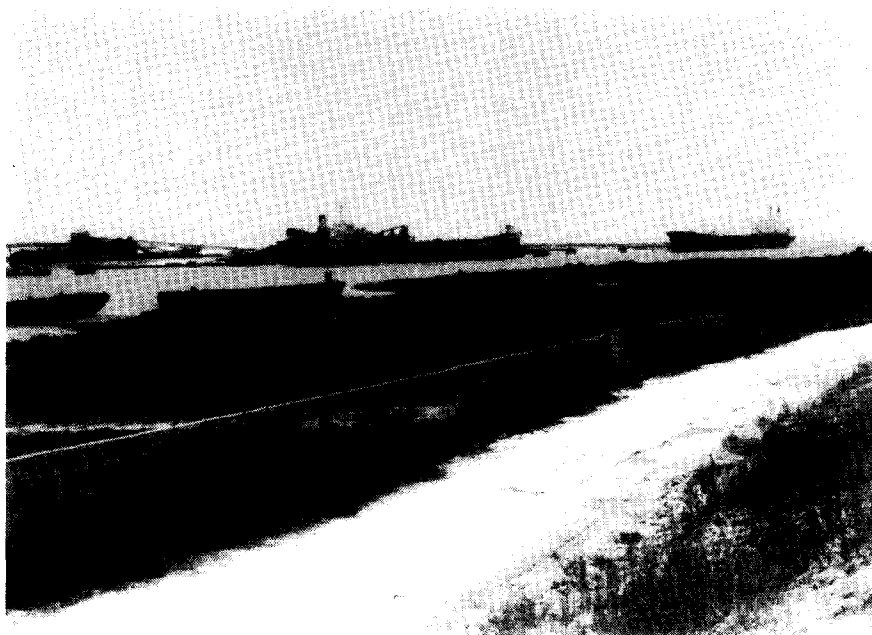


Figure 11: Eastern Edge of Greenwood Island;  
Chevron Docks

Singing River Island, about 480 acres, is located just south and west of the mouth of the Pascagoula River. The island was formed over a number of years by the deposition of dredged material by private interests and the Corps of Engineers. The existing diked disposal area is 203 acres, consisting of a 90 acre cell at about elevation 17 feet and a 110 acre cell ranging from elevation 17 feet to about 28 feet. The current effective dike elevation is 14 feet although a portion of the dike has been raised to 24 feet. Dredged material from about mile 3 to mile 1.75 of the Pascagoula Harbor channel is placed in this disposal area. The Corps estimates that the Singing River Island disposal site could be operated and managed under existing conditions for about nine more years before dike raising would be required. (On September 24, 1984, the Mobile District, Corps of Engineers, circulated an Environmental Assessment addressing the potential impacts of expanding the existing diked disposal area to 333 acres. A Finding of No Significant Impact was made and an expanded disposal area of 333 acres is included in the Pascagoula Harbor Management Plan for Long Term Disposal of Dredged Material (see Appendix E).)

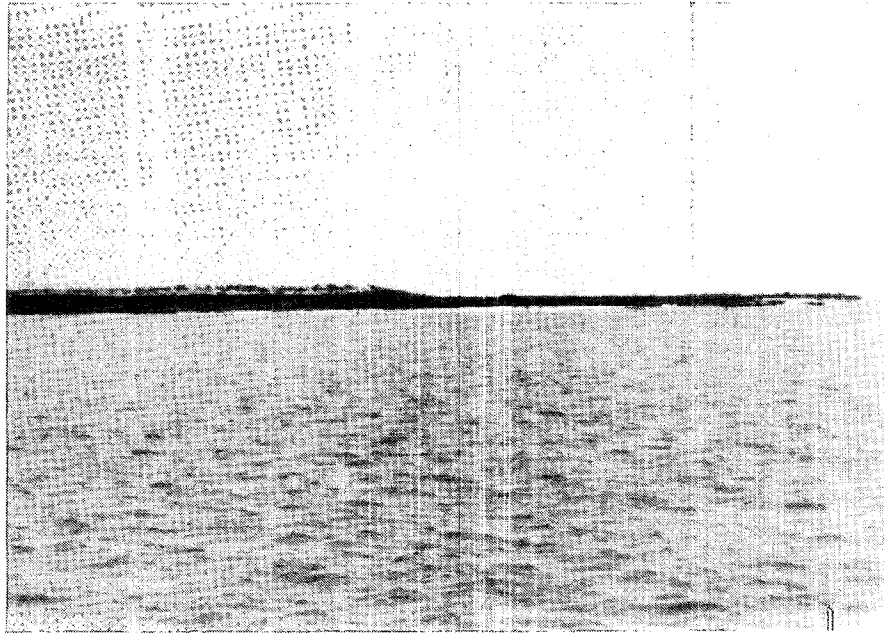


Figure 12: Singing River Island from the  
Pascagoula Channel



Figure 13: Double Barrel Disposal Area;  
Ingall's West Bank Shipyard

The Double Barrel disposal area is located on the west bank of the Pascagoula River, south of the L&N Railroad. Following a 1983 expansion of the site to the east, the site is now approximately 115 acres in size with an effective dike elevation of 15 to 16 feet. The site generally accommodates dredged material from the inland portion of the Pascagoula River Harbor channel between mile 1.75 and the railroad bridge. Under existing conditions the Corps estimates that this disposal site could be operated for about 9 more years before dike raising would be required.

Open Water Disposal. Maintenance dredging in the Mississippi Sound portions of the Pascagoula Harbor Project is carried out with a hydraulic pipeline dredge and the material is pumped to open water disposal sites adjacent to the navigation channels (See Figure 14, and note that the use of sites 1, 2, 5, and 6N has been recently discontinued as discussed below.) Dredged material is pumped into these open water areas at a minimum distance of 2500 feet from the center lines of the channels.

The total area of Mississippi Sound waterbottoms currently designated as open water disposal sites for the Pascagoula Harbor Project is approximately 4200 acres (less the acreage of discontinued sites 1, 2, 5, and 6N). It is only within the past decade that the Corps of Engineers has begun to define the limits of the open water disposal sites. Prior to the enactment of environmental legislation in the early 1970s, the location of these open water sites was often not specified, and dredged material was simply pumped to the sides of the channels.

Historically, the location and shape of Singing River Island and the deposition of dredged material alongside the upper portions of the Pascagoula ship channels has produced chains of banks which have interfered with the natural water circulation patterns of Mississippi Sound, as well as with the operation of small boats. Use of the upper disposal banks along the west side of the ship channel into the Pascagoula River Harbor, the upper disposal area along the eastern edge of the Bayou Casotte channel, and the open water disposal site between the two channels (sites 5, 6N, 2 and 1, respectively, on Figure 14) has recently been discontinued by the Corps of Engineers in order to eliminate potential future impacts on water circulation identified in the previously-noted Environmental Assessment of September 24, 1984.

To guard against potential interference with water circulation, the State of Mississippi has placed limits on the use of open water disposal areas. Deposited material cannot build up above four feet below mean low water and dredged material cannot be placed in areas shallower than four feet below mean low water. Condition surveys to monitor the water depth and the accretion of materials in designated open water disposal areas are carried out by the Mobile District about once a year.

Ocean Dumping Site. There is currently one disposal site in the Gulf of Mexico serving the Pascagoula Harbor Project. The site, about two miles southeast of the eastern end of Horn Island, receives dredged material removed by Hopper dredge from the Horn Island Pass (Bar Channel) portion of the project.

Unlike the open water disposal areas along the sides of the channels which are designated by the Corps of Engineers under the requirements of Section 404 of the Clean Water Act (see Chapter 2: Regulatory Context), an ocean dumping site must be designated by the Environmental Protection Agency under the requirements of the Marine Protection, Research, and Sanctuaries Act of 1972. The ocean disposal site currently serving the Pascagoula Harbor Project has been given interim status by EPA pending the completion of an Environmental Impact Statement by the Mobile District, Corps of Engineers.



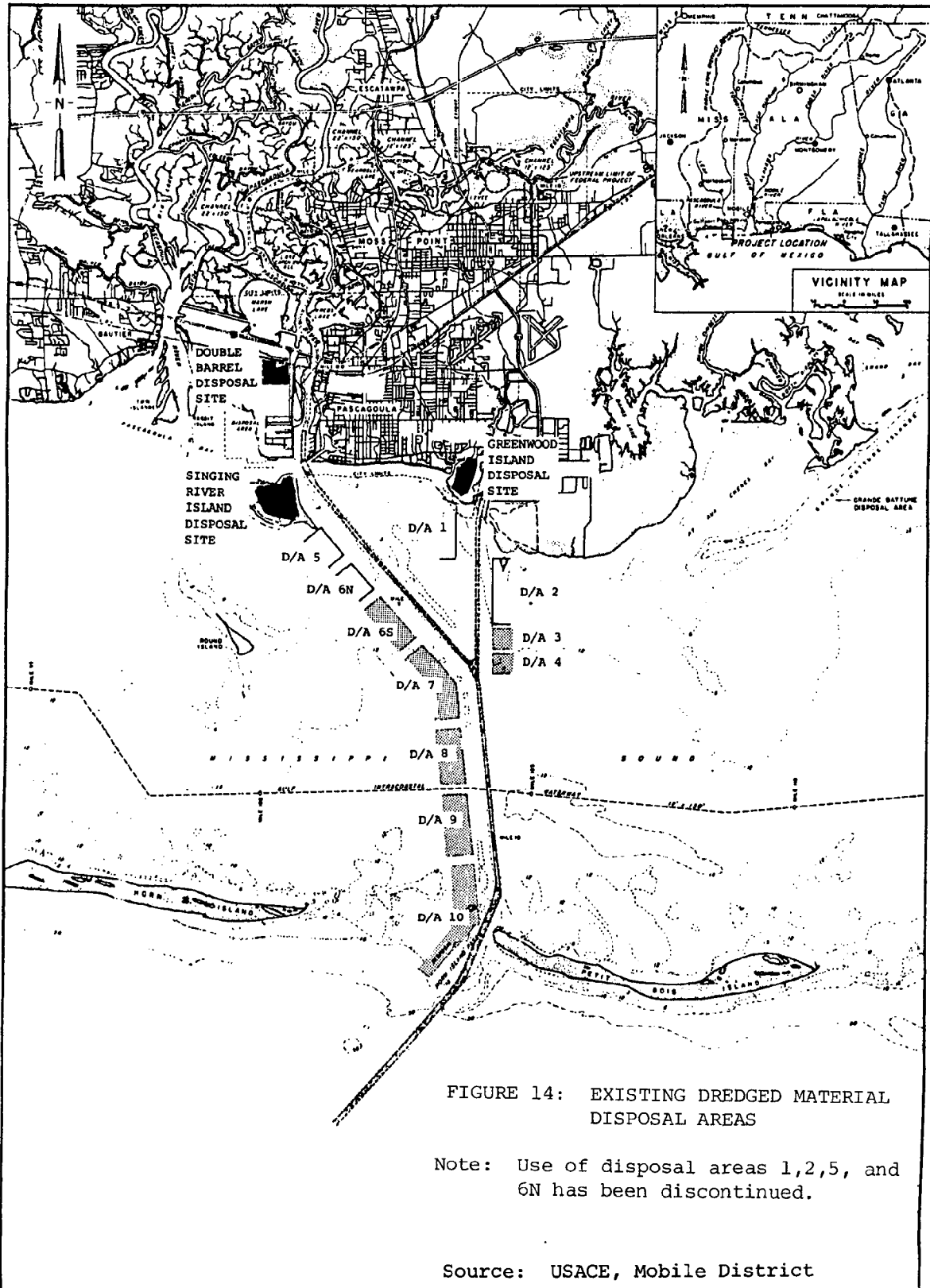


FIGURE 14: EXISTING DREDGED MATERIAL DISPOSAL AREAS

Note: Use of disposal areas 1, 2, 5, and 6N has been discontinued.

Source: USACE, Mobile District

## **JCPA Master Plan for Port Development**

The original master plan for development in the Port of Pascagoula ("Master Plan for Industrial Development at Bayou Casotte") was prepared in 1955. Over the years this plan has been updated and revised several times to accommodate changed conditions and requirements. Prior to the preparation of the Port of Pascagoula SMA Plan, the Jackson County Port Authority had been using the most recent update — "Master Plan, Greater Port of Pascagoula, Area Port, Harbor and Industrial Development", prepared by Michael Baker, Jr., Inc. in September 1975 — as a general guide for development in the port. The development goals and objectives contained in the Master Plan were presented to the Task Force by the JCPA at the outset of the SMA planning process and served as the starting point for SMA Plan formulation (see Chapter 4).

### Local Development Authority

Under Mississippi Code Section 59-11-1, et. seq., the Jackson County Port Authority (JCPA) was established by the county in 1956 to undertake various county-wide port development duties. The Port Authority is administered by a board of 9 members.

Development activities are planned, initiated, and carried out by the JCPA under the authority of the county, as represented by the Board of Supervisors. While the Port Authority has "jurisdiction" over the port, the Board of Supervisors, acting through the Port Authority, retains the basic power to acquire land, finance construction of port facilities, carry out industrial development (by purchase or condemnation of land, dredging and reclaiming), and sale or lease of property to private industry.

### Summary of Master Plan Proposals

The major proposals for industrial expansion in the Port of Pascagoula as contained in the 1975 Master Plan address channel improvements and the filling of vast wetland areas to create new land for port and industrial expansion. (See Figure 15.)

Channels. The Plan proposes a nominally 50-foot by 500-foot channel from deep water in the Gulf of Mexico through Mississippi Sound to a turning basin just inside the mouth of Bayou Casotte. The Channel from the "Y" into the Pascagoula River Harbor would

remain at its present dimensions of 38 x 350 feet. A 14-foot deep by 150-foot wide interharbor barge channel would connect the northern ends of the Pascagoula and Bayou Casotte Channels. Another barge channel 12 feet deep by 150 feet wide would begin in the vicinity of Singing River Island and extend to the southwest to the Gulf Intracoastal Waterway. A barge fleeting area would be developed just north of Singing River Island.

Filling for New Industrial Sites. The plan proposes extensive long-term filling of wetlands and water bottoms using dredged material to reclaim land for port and industrial development. The major elements of these filling proposals are:

1. Point Aux Chenes would be extended to a southern limit about halfway between the mouth of Bayou Casotte and the Gulf Intracoastal Waterway and from the Bayou Casotte channel eastward to a boundary running south of Bangs Lake.
2. Greenwood Island would be filled and extended to the southwest and an industrial area called Greenwood Island East, to include a barge fleeting area and terminal development, would be developed between the west shore of Bayou Casotte and the disposal area.
3. Singing River Island would be extended to the southeast and enlarged to over twice its present size and a causeway or bridge would be constructed from the mainland to permit industrial development on the island.
4. The delta area directly west of Ingalls Shipbuilding, from U.S. Highway 90 south to an extension of Ingalls' south property line and west from Ingall's west boundary to West Pascagoula River, would be filled to a suitable height and used for industrial development.

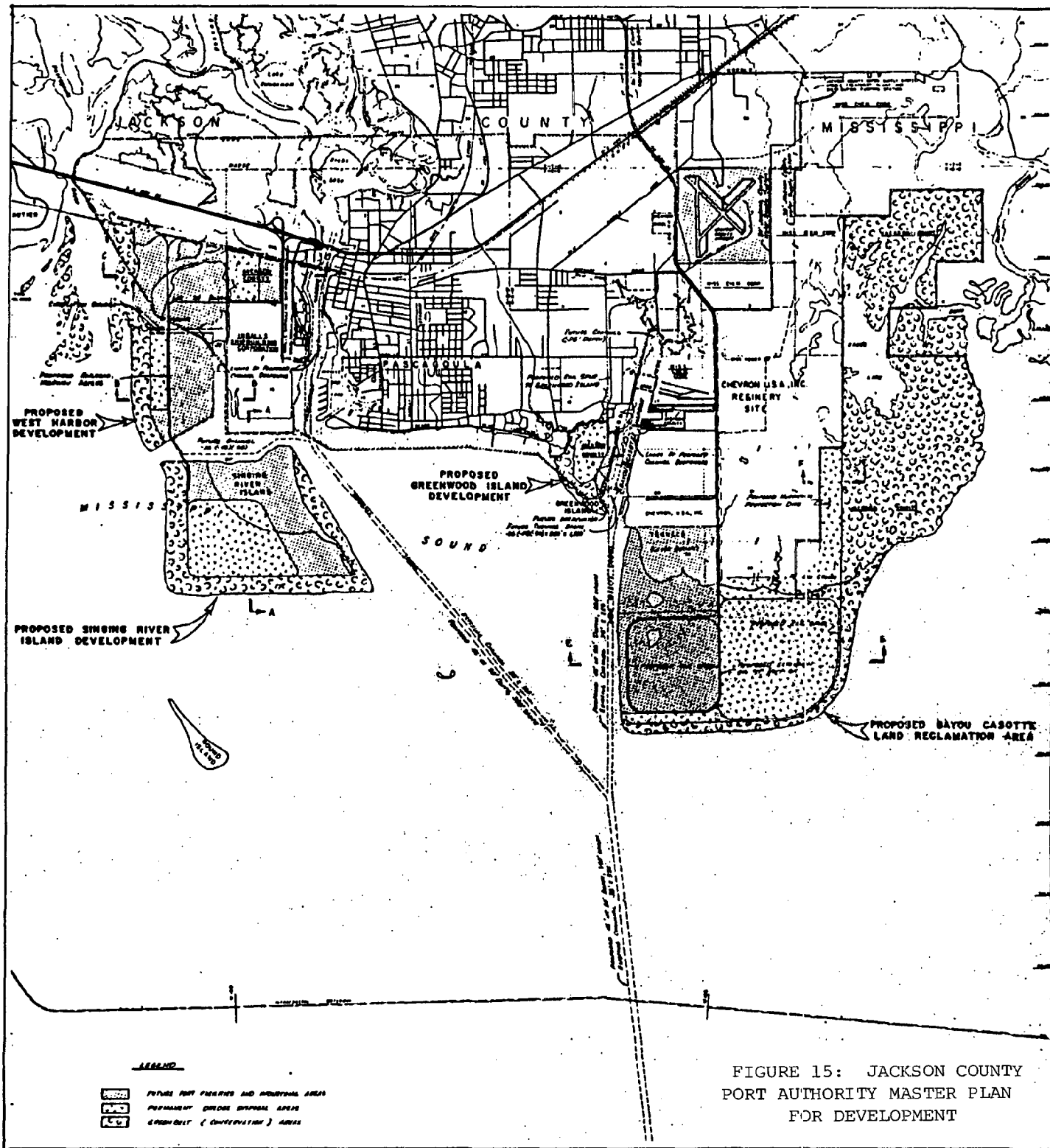


FIGURE 15: JACKSON COUNTY PORT AUTHORITY MASTER PLAN FOR DEVELOPMENT

## CHAPTER 2: REGULATORY CONTEXT

A variety of federal and state laws, programs and agencies play important roles in the management of natural resources and development activities in coastal Mississippi. This chapter highlights the principal regulatory programs pertinent to the planning and implementation of new development in the Port of Pascagoula. These programs are administered and/or implemented by federal and state agencies represented on the SMA Task Force and deal principally with wetlands management and permitting, pollution control, coastal zone management coordination, fish and wildlife management, and cultural resource protection.

### **State Regulatory Authorities and Programs**

#### Wetlands Management and Permitting

The Mississippi Coastal Wetlands Protection Law (Section 49-27-1 through Section 49-27-69, Mississippi code of 1972), as amended in 1979 and 1980, establishes the state's public policy of wetlands protection and provides for the regulation of specific activities in the state's tidal wetlands. The law authorizes a permitting and compliance review procedure to regulate specified activities, the most significant of which involve the dredging and filling of coastal wetlands. The Bureau of Marine Resources, acting through the Mississippi Commission on Wildlife Conservation (MCWC), has the responsibility for the general management of the state's coastal wetlands.

BMR is also responsible for implementing and administering the major portions of the Mississippi Coastal Program (MCP). The MCP contains a number of rules, regulations, guidelines and procedures for coastal area management that are promulgated under the authority of the Coastal Wetlands Protection Law. The MCP also incorporates a Coastal Wetlands Use Plan which applies to all Mississippi coastal wetlands and designates uses permitted in specific wetland areas. Designated use districts are: water dependent industrial development areas; areas for commercial fishing and recreational marina-related development; general use areas; preservation areas; and special use areas.

The Wetlands Use Plan is the authoritative interpretation of the wetlands protection policy established in the Coastal Wetlands Protection Law and serves as a basis for the permitting program administered by BMR. A permit may not be issued unless the proposed activity is consistent with the use district designated in the Wetlands Use Plan.

Under the Wetlands Protection Law, certain entities are excluded from having to secure a state permit to conduct regulated activities in coastal wetlands. These entities, however, must adhere to the policies of the Wetlands Law and must notify the Bureau of Marine Resources prior to beginning any regulated activity. Among the excluded entities are local port and development agencies including the Jackson County Port Authority. Development proposals from these local agencies are not considered to be in compliance with the public policy of wetlands protection unless the activity proposed is consistent with the Mississippi Coastal Program.

Although the state's coastal wetlands and fisheries regulations are administered directly by BMR, other state agencies also exercise powers to implement the Coastal Program. The Coastal Program incorporates all applicable constitutional provisions, laws, and regulations of the State of Mississippi, and requires that all state agencies carry out their responsibilities in compliance with the program. The authorities of three agencies — the Mississippi Bureau of Pollution Control and Bureau of Land and Water Resources in the Department of Natural Resources, and the Department of Archives and History supplement the authorities exercised directly by BMR. Together with BMR, these agencies are collectively called the "coastal program agencies". The Bureau of Pollution Control and the Department of Archives and History are represented on the SMA Task Force and the functions of these agencies as they relate to state regulatory responsibilities are described below. Both agencies also have a role in the federal regulatory process, as discussed in the concluding sections of this chapter.

#### Pollution Control

The authorities under the Mississippi Air and Water Pollution Control Law (Section 49-17-1 through 49-17-43 of the Mississippi Code) are exercised through the Bureau of Pollution Control. BPC develops and administers air and water quality standards and manages various permitting programs in the state related to air and water pollution. The requirements of the Federal Clean Water Act and Clean Air Act are enforced by BPC under the authorities of the Mississippi Air and Water Pollution Control Law, and

are incorporated into the Mississippi Coastal Program. In addition to its other functions under state laws, BPC administers the National Pollution Discharge Elimination System (NPDES) in Mississippi to regulate industrial and municipal point source discharges.

### Cultural Resource Protection

The Antiquities Law of Mississippi (Sections 39-7-3 through 39-7-41 of the Mississippi Code of 1972, as amended) establishes the state's public policy to preserve the cultural resources of the state. This policy is carried out by the Mississippi Department of Archives and History under the authorities established by the Antiquities Law. Under the law, the Board of Trustees of Archives and History may designate a site or structure meeting specified criteria and located on state, county, or municipally owned property as a state landmark. A site or structure so designated "may not be taken, altered, damaged, destroyed, salvaged or excavated without a contract or permit" from the Board of Trustees.

In order to determine the eligibility of a site or structure for designation as a Mississippi Landmark, the Department of Archives and History may require that a cultural resource survey be undertaken. The Department will determine the need for such a survey in the early stages of planning activities carried out by state, county, or local governments. Although the authorities of the Antiquities Act specifically apply to landmarks on government-owned property, significant cultural resource sites located on private lands may also be designated as state landmarks at the request of the private landowner. The criteria for designating a site as a state landmark are the same as criteria for designating a site for inclusion on the National Register of Historic Places.

### **Federal Regulatory Authorities and Programs**

#### Wetlands Management and Permitting

In addition to the State of Mississippi's wetlands permitting program, the principal regulatory programs affecting new water dependent development activities are administered by the Department of the Army, Corps of Engineers, under Section 404 of the Clean Water Act, Section 10 of the River and Harbor Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. Section 404 requires

authorization for any activities that involve the placement of dredged or fill material into waters of the United States. Section 10 requires authorization for any structures and/or work within the ordinary high water of a navigable water of the United States. Section 103 requires authorization for the transportation of dredged material for the purpose of dumping it into ocean waters.

Both the Section 10 and 404 permit programs are important to the SMA planning efforts for the Port of Pascagoula. The U.S. Army Corps of Engineers under Section 10 of the River and Harbor Act of 1899 regulates structures or work in, or affecting, navigable waters of the United States. The Corps, under Section 404 of the Clean Water Act, is responsible for evaluating applications for Department of the Army permits to deposit dredged and/or fill material into waters of the United States. During the evaluation of these applications, the Corps applies guidelines developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army.<sup>1</sup>

In evaluating a permit application involving structures or work in navigable waters of the U.S. and/or placement of dredged or fill materials into waters of the U.S., the Corps is subject to statutory, executive, and regulatory requirements which involve various state and federal government agencies. The principal federal and state agencies involved in the 404 permitting process are represented on the SMA Task Force and have participated in the SMA planning process for the Port of Pascagoula. The current role of these agencies in the 404 regulatory program is discussed below in the context of their statutory responsibilities for environmental resource management. To a large extent these responsibilities have defined the roles that each of these agencies has played in the Port of Pascagoula SMA planning process. Before describing these responsibilities however, it is important to define some key terms basic to any discussion of the 404 permit procedure and to briefly outline the basic steps in that procedure.

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1. Under Section 404(b)(1) of the Act, the Administrator of the EPA, after consultation with the Corps of Engineers, develops the substantive criteria used by the Corps in evaluating discharges of dredged or fill material under the Section 404 permit program. Furthermore, under Section 404(c) of the Act, EPA may prohibit or withdraw the specification of a dredged material disposal site upon a determination that use of the site would have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas, and wildlife or recreational areas.



The term "waters of the United States" is currently defined by regulation to include all navigable and interstate waters, their tributaries, and adjacent wetlands, as well as isolated wetlands and lakes, and intermittent streams. The extent of the jurisdiction of the Clean Water Act and therefore the extent of the Corps' jurisdiction to regulate and authorize the discharge of dredged and/or fill material is defined as the "waters of the United States".

The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

"Dredged material" is material that is excavated or dredged from waters of the United States and "fill material" is any material used for the primary purpose of replacing an aquatic area with dry land or changing the bottom elevation of a water body. The term "discharge of fill material" refers to the addition of fill material into waters of the U.S. and includes site-development fills for industrial uses as well as property protection devices such as riprap, seawalls, and revetments. "Discharge of dredged material" means any addition of dredged material into waters of the U.S. and includes the addition of dredged material to any specified disposal site located in waters of the U.S.

An "individual permit" is a Department of the Army authorization that is issued following a case-by-case evaluation of a specific project involving a proposed discharge of dredged or fill material. A "general permit" is an authorization issued for categories of discharges of dredged or fill material that are judged to be substantially similar in nature and to cause only minimal individual and cumulative adverse environmental impacts. The Corps has the authority to issue general permits for certain minor activities. General permits may be issued for activities that are similar in nature; that will cause minimal environmental impacts, both individually and cumulatively; and that conform to the 404(b)(1) Guidelines. The general permits, which may be issued on either a state, regional, or nationwide basis, may be modified or revoked if the permitted activities are found to have an unacceptable adverse impact or if it becomes otherwise evident that the activities are more appropriately regulated by individual permits.

The Section 404 evaluation process begins with the Corps' receipt of a completed application which includes, but is not limited to, a detailed description of the proposed

activity. This description should include the purpose and use of the activity, the type of structures to be used, the types of vessels that will use the facility, the facilities to be used for handling wastes, and the type, composition, and quantity of dredged or fill material. The names and addresses of adjacent property owners, and the location of the proposed activity, including section, township, range, county, and waterway must also be noted.

Within 15 days of receipt of the completed application, the Corps issues a public notice which contains information needed to assist interested parties in evaluating the probable impact of the proposed activity. Copies of the public notice are sent to the applicant, adjacent property owners, appropriate federal, state, and local agencies, individuals, newspapers, businesses, post offices, and many private organizations. After the specified comment period, normally 21 calendar days, the Corps evaluates the proposed activity using the 404(b)(1) Guidelines. Although extensions to the comment period may be requested, these requests are granted only if a definite need for the extension is shown.

A public interest review is also conducted by the Corps which weighs the public benefits against the probable impacts of the proposed activity. The Corps also considers whether the proposed activity is primarily dependent on being located in close proximity to, or in, the aquatic environment and whether or not practicable alternative sites exist. The Corps strives to reach a final permit decision within 60 days of receipt of a completed application. If the proposed activity is controversial and/or if it is determined that an Environmental Impact Statement is required, the Corps will require more time to reach a final decision.

During the public notice comment period, anyone may offer comments on the proposed project and may request a public hearing. The request for a public hearing must be in writing and must clearly state the need for a public hearing. A public hearing will be held only if it is determined that information useful to the evaluation of the proposed activity can be obtained.

#### Pollution Control

All permit applications submitted to the USACE for activities which may affect the quality of waters of the U.S. must be evaluated for compliance with applicable effluent limitations, water quality standards, and management practices during the construction,

operation, and maintenance phases of the proposed activity. Under Section 401 of the Clean Water Act, a state water quality certification is required before the Corps of Engineers can take final action on a 404 permit application. Prior to the Corps of Engineers taking final action on a 404 permit application, the responsible state agency must take final action on the proposed work with regard to applicable effluent limitations and water quality standards. A water quality certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility.

In Mississippi the state agency responsible for providing Section 401 water quality certification is the Bureau of Pollution Control. A certification of compliance issued by BPC is considered by the Corps to be conclusive with respect to the water quality considerations of the 404 permit process unless the Environmental Protection Agency advises the Corps of other water quality aspects of the permit application that must be taken into consideration. As described above, EPA is responsible for issuing guidelines for the specification of disposal sites for dredged or fill material, and these guidelines are the substantive criteria used by the Corps in evaluating proposed discharge at particular sites.

The U.S. Environmental Protection Agency's responsibility under the Clean Water Act and the National Environmental Policy Act (NEPA) is to provide protection, maintenance and enhancement of the waters of the U.S. In this role EPA reviews and evaluates Section 404 permit applications with regard to water quality, air quality and solid waste considerations. The process and procedures established by NEPA to ensure that environmental information is available to public officials and citizens prior to decision-making applies to the Corps of Engineers' permit program; the preparation of an Environmental Impact Statement as authorized by NEPA may be necessary to resolve questions and issues that arise during the public interest review period of the 404 permit process.

#### Coastal Zone Management Coordination

A Corps of Engineers permitting decision must be consistent with the Mississippi Coastal Wetlands Use Plan. Pursuant to Section 307(c) of the Coastal Zone Management Act, applications for Department of the Army permits for activities affecting the coastal zones of states having a coastal zone management program approved by the Secretary of Commerce must be evaluated with respect to compliance with that program. The

Corps may not issue a permit until certification has been provided that the proposed activity complies with the coastal zone management program and the appropriate state agency has concurred with the certification.

The Bureau of Marine Resources is responsible for reviewing all Corps of Engineers permit applications for consistency with the Mississippi Coastal Program. If BMR finds that the proposed activity is not consistent with the program (e.g., is inconsistent with the Wetlands Use Plan), the Bureau will recommend actions that must be taken to achieve consistency.

#### Fish and Wildlife Management

The Fish and Wildlife Coordination Act authorizes the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), and state agencies responsible for fish and wildlife resources to investigate the impact of proposed federal activities and also non-federal actions requiring a federal permit on fish and wildlife populations and on the intricate fabric of natural resources -- the habitat -- on which these populations depend.

Under its legal authorities to protect and conserve fish and wildlife and their habitat for the benefit of the people of the United States, the USFWS within the Department of the Interior conducts fish and wildlife impact evaluations relative to development projects of all kinds. These evaluations are conducted through a full partnership with state agencies responsible for fish and wildlife resources and, since 1970, with the NMFS within the Department of Commerce. The NMFS has primary federal responsibility for the conservation, management, and development of living marine resources and for the protection of certain marine mammals. The Agency also has responsibilities to the U.S. commercial and marine recreational fishing industry, including fishermen, and to the states and the general public.

With regard to the Section 404 regulatory program, the USFWS and NMFS provide advice and comments to the Corps of Engineers regarding the fish and wildlife impacts of proposed work for which the Corps has published a public notice of a permit application. When USFWS biologists determine that the development action that is the subject of the permit application will cause a habitat change considered to be adverse, the Service recommends measures to avoid, or minimize and compensate for, such adverse change

or loss of the public's environmental resources. These measures are commonly referred to as mitigation measures. Mitigation recommendations forwarded by the USFWS to the Corps of Engineers during the Section 404 permit process are based on established USFWS policy developed in accordance with the Fish and Wildlife Act of 1956 and the Fish and Wildlife Coordination Act.

The NMFS evaluates proposed activities affecting the habitat of the living resources for which it is responsible based on its responsibilities under the Fish and Wildlife Coordination Act (i.e., to protect and, where possible, enhance and restore the habitat of living marine resources including anadromous fishery resources and commercial freshwater fishes). The recommendations and comments of the NMFS to the Corps address the impact of the proposal on marine resource populations and habitat.

The USFWS and NMFS perform a review and commenting role rather than a regulatory role in the Section 404 permit process. Their recommendations, however, must be considered by the Corps and given equal weight to other environmental and socioeconomic factors in evaluating the permit application. Such consideration is with a view to the conservation of wildlife resources by prevention of their direct and indirect loss and damage due to the activity proposed in the permit application. The Corps may request that the applicant modify the proposal to lessen adverse environmental impacts identified by USFWS and NMFS. In appropriate cases, a permit may be conditioned to accomplish this purpose. The Corps of Engineers also has the option of denying a permit.

#### Cultural Resource Protection

The National Historic Preservation Act of 1966 created the Advisory Council on Historic Preservation to advise the President and Congress on matters involving historic preservation. In performing its function, the Council is authorized to review and comment upon construction activities funded, licensed or assisted by the federal government which will have an effect upon properties that are listed on the National Register of Historic Places or are eligible for such a listing.

An application for a Section 404 permit may involve an area which possesses recognized historic, cultural, scenic, conservation, recreational or similar values. Full evaluation of the general public interest requires the Corps to consider the effect which the

proposed structure or activity may have on the enhancement, preservation, or development of such values.

Pursuant to the National Historic Preservation Act of 1966 and subsequent amendments, the Mississippi Department of Archives and History evaluates Section 404 permit applications to assess the impact of proposed activities on properties that are listed or are eligible for listing on the National Register of Historic Places. In this regard, the Department of Archives and History performs a review and commenting role in the 404 regulatory process as do the USFWS and NMFS. In some cases, cultural resource surveys may be required by the Department of Archives and History prior to initiation of the projects to identify potential National Register or National Register-eligible properties.

If the Department of Archives and History finds that a proposed activity involves either a listed property or a property eligible for listing, it forwards its findings and recommendations to the Advisory Council on Historic Preservation. If the proposed activity is found to have an adverse effect on the property, the Department of Archives and History will recommend specific mitigation measures to avoid or minimize this effect.

### **CHAPTER 3: ENVIRONMENTAL RESOURCES**

This chapter presents an overview of the natural resources found in the Pascagoula SMA study area. The study area includes two separate planning areas and nine different management units delineated by the SMA Task Force.

#### **Study Area**

The Mississippi Coastal Program designates a total of 17 Special Management Areas (five industrial and port areas, four beach areas, and eight urban waterfronts) and identifies the general location of each area. The Coastal Program leaves to the discretion of the Task Force, however, the delineation of more precise SMA boundaries for the purpose of guiding planning and management efforts within each SMA.

#### **Description of Boundaries**

At the outset of the SMA planning process, the Task Force considered the following in selecting the study area boundaries for the Pascagoula SMA:

- Development plans. Which land and water areas were considered by the Jackson County Port Authority for port expansion as indicated in the 1975 Master Plan?
- Cumulative impacts. How much area should be included within the SMA in order to adequately analyze the potential cumulative impacts of planned development? (e.g., What are the natural boundaries of the ecological systems that could be impacted by anticipated development?)
- Mitigation opportunities. How large an area should be included within the SMA to enable the Task Force to identify adequate mitigation opportunities to compensate for or balance the anticipated environmental impacts of planned development?
- Planning horizon. For what time period should the SMA Plan be in effect? (A longer planning horizon, for example, might point toward a larger study area.)

Figure 16 shows the boundaries selected by the Task Force for the Pascagoula Special Management Area. This study area includes both the Port of Pascagoula SMA and the Pascagoula Urban Waterfront SMA as designated by the Mississippi Coastal Program. The area is bounded on the north generally by U.S. Highway 90, on the east by the Mississippi/Alabama state line, on the west by the west bank of the West Pascagoula River, and on the south by an imaginary east-west line in the Gulf of Mexico just south of the existing ocean disposal site. The study area covers approximately 105 square miles.

In addition to study area boundaries, the Task Force delineated two separate planning areas within the Pascagoula SMA. These planning areas (described in following sections) distinguish the two major development areas within the Port of Pascagoula (the Pascagoula River or West Harbor area and the Bayou Casotte or East Harbor area) as well as the two separate and largely undisturbed ecological systems (the Middle River and Bangs Lake areas) within the delineated boundaries of the SMA study area.

Within each planning area the Task Force delineated a series of management units intended to identify: (1) areas of specific existing or possible future natural resource-development conflicts requiring special management attention; and/or (2) areas where - based on land characteristics, development proposals, and anticipated management objectives - specific sets of consistent management criteria might be developed and applied.

The planning areas and management units identified by the Task Force to guide the development of the SMA Plan are shown in Figure 17 and listed below:

1. Bayou Casotte - Bangs Lake Planning Area

- Greenwood Island Management Unit
- Tenneco/Chevron Management Unit
- Bayou Casotte/Mississippi Sound Management Unit
- Upper Bayou Casotte Management Unit
- Bangs Lake/Point aux Chenes Bay Management Unit



2. Pascagoula River Harbor - Middle River Planning Area

- Pascagoula River Harbor Management Unit
- Singing River Island Management Unit
- Highway 90 Management Unit
- Middle River Management Unit

Data Base

The information base used by the Task Force in the negotiation and decision-making phase of the SMA planning process (see Chapter 4) was assembled from several basic sources, including: 1) past and ongoing studies of the Pascagoula area and Mississippi Sound region; 2) specific SMA studies undertaken in the Pascagoula area at the direction of the Task Force; and 3) the professional judgment and experience of individual Task Force members with regard to existing development and natural resources in the identified planning areas. On several occasions the Task Force visited the Pascagoula SMA as a group in order to assess existing conditions relative to proposed development plans, natural resource quality, and potential mitigation opportunities.

A focal point for the Task Force's assessment of natural resources in the SMA was the mapping and analysis of wetlands which was carried out in three phases. In the first phase, a wetlands mapping project was undertaken by the Jackson County Port Authority. This project, based primarily on aerial photo interpretation, involved the mapping and analysis (including acreage calculations) of specific wetlands vegetation types in the two planning areas.<sup>1</sup> (Property area boundaries within the SMA were also delineated.) This work was designed to provide the Task Force with species-specific wetlands information and to provide input to the Corps of Engineers for use in identifying the wetland areas in the SMA subject to the regulatory jurisdiction of the Corps under Section 404 of the Clean Water Act.

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1. The results of this wetlands analysis are displayed on four maps available for review in the offices of the Mississippi Bureau of Marine Resources.



FIGURE 16: STUDY AREA BOUNDARIES; PASCAGOULA SPECIAL MANAGEMENT AREA

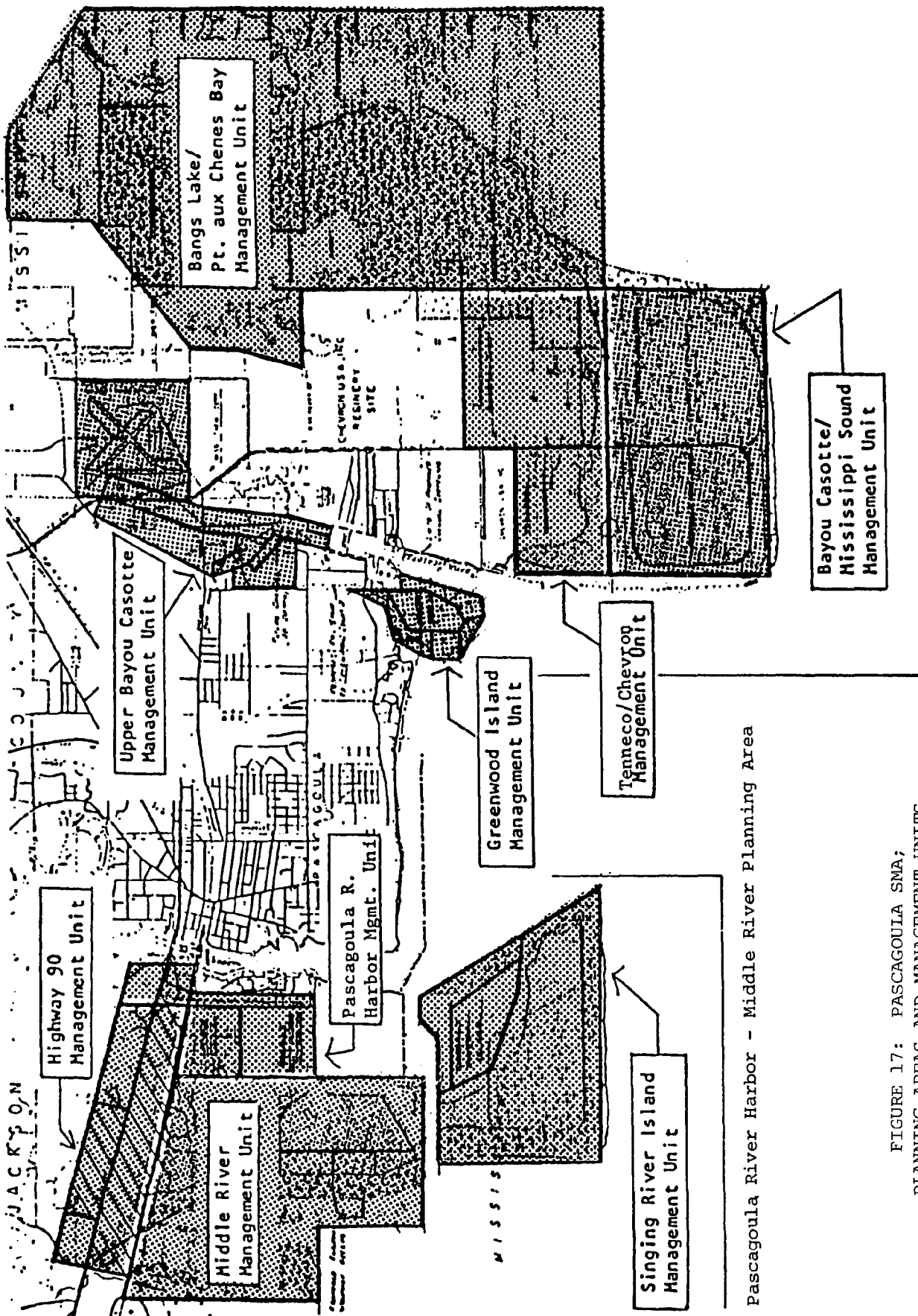


FIGURE 17: PASCAGOULA SMA; PLANNING AREAS AND MANAGEMENT UNITS

Bayou Casotte - Bangs Lake Planning Area

The second phase of the wetlands mapping and analysis involved modification, by the Mobile District, Corps of Engineers, of the phase one mapping in order to delineate the boundaries of the "404 wetlands". This jurisdictional determination identifies intertidal wetlands within the study area subject to the regulatory requirements of Section 404 (see Figures 18 through 21). Due to the vast extent of the area studied by the Corps, however, the jurisdictional maps prepared do not necessarily represent the exact boundaries of the Corps' legal authority. These maps were prepared for SMA planning purposes only.

During the third phase of the wetlands analysis, representatives of the Corps of Engineers, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Bureau of Pollution Control, and Bureau of Marine Resources evaluated the wetland areas within the Corps' jurisdiction relative to habitat value and water quality functions. The evaluation procedure used was based on the Fish and Wildlife Service's Habitat Evaluation Procedure (HEP) as applied to each management unit. Each wetland area evaluated was assigned a composite habitat value on a scale from 0 to 1. The Bureau of Pollution Control rated these same wetland areas in terms of water quality functions (taking into consideration hydrological connections, ambient water quality, marsh size and species composition) and noted that the water quality values correlated well with the habitat value ratings.

#### Resource Overview

The rich diversity of fish and wildlife resources supported within the Pascagoula SMA has been extensively documented in several recently prepared studies.<sup>1</sup> The vegetated wetlands and open waters provide optimum habitat for many species that support varied consumptive and non-consumptive human uses. The multi-million dollar seafood industry

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1. For a more detailed description of environmental resources in the Pascagoula SMA, the reader should refer to the Mobile District, Corps of Engineers' Mississippi Sound and Adjacent Areas Study, Plan Formulation Document, 1983 and Feasibility Report and Resource Inventory, 1984, as well as the Pascagoula Harbor, Mississippi Feasibility Report, Improvement of the Federal Deep-Draft Navigation Channel, Volume I, Main Report and Environmental Impact Statement and Volume II, Technical Appendices, March 1985. The overview of natural resources in the Pascagoula SMA study area as contained in this chapter is taken largely from the latter report.

of this area, as well as its overall environmental quality, are largely dependent on the health of the Pascagoula River and Bangs Lake/Point aux Chenes Bay estuarine complex.

Within the study area several habitat types are found which support many species of fish and wildlife. The waterbottoms, grassbeds, intertidal flats and tidal marshes provide vital spawning, nursery, and feeding habitat for a major portion of the marine and freshwater fin fishes and shellfish. The detrital material produced in the estuary is a major component of the estuarine and marine food chain.

The estuarine system can be broken down into two subsystems (subtidal and intertidal) with each of these subsystems being further divided into a number of separate classes such as emergent wetlands and scrub/shrub wetlands which are found in the Pascagoula SMA.

The most productive and ecologically important wetlands in the study area are the wetland areas adjacent to Mississippi Sound, especially the vast saline marshes between the Bayou Casotte industrial area and the Mississippi/Alabama state line, and in the Pascagoula River delta. The estuarine emergent wetlands in these areas are generally composed of such species as threesquare (Scirpus spp), black needlerush (Juncus roemerianus), saltmeadow cordgrass (Spartina patens), and giant cordgrass (Spartina cynosuroides). In the more saline marshes, species such as black needlerush (Juncus roemerianus) and saltgrass (Distichlis spicata) are dominant. Smooth cordgrass (Spartina alterniflora) is also common along the intertidal zones of the saline marshes. The saline marshes are prevalent in the Bangs Lake, Chevron, and Bayou Casotte areas. Saline marshes consisting primarily of Juncus roemerianus and Distichlis spicata are located on Singing River Island. Estuarine scrub/shrub wetlands in the study area are primarily located along the Pascagoula River in the area of Highway 90 and in the Chevron/Bayou Casotte area. Baccharis halimifolia dominates the scrub/shrub system.

In addition to playing an extremely important role as food and shelter for most of the aquatic organisms within the project area, this vegetation serves a valuable function by assimilating various pollutants from the water column. The ability of these wetlands to absorb pollutants is especially important given the high degree of industrialization in the Port of Pascagoula.

A diverse wildlife population is also supported by the intertidal and subtidal estuarine environments. The value of the estuarine system to wildlife is related in large part to the diversity of the plant communities. Continued productivity requires that this diversity be maintained and that natural and unnatural processes which tend to reduce this diversity be modified.

Several major environmental problems with particular relevance to the SMA planning efforts have been identified within the Pascagoula SMA. These problems include previous wetlands losses, industrial discharges, water circulation problems associated within the configuration of Singing River Island, and existing dredging problems.

The creation of the port and additional developments along the Pascagoula River and Bayou Casotte have resulted in substantial losses (several hundred acres) of wetlands habitat. In view of the important ecological functions performed by the wetlands in the Pascagoula area, it becomes imperative that the remaining systems be protected and, in cases where losses are unavoidable, that these losses be mitigated.

In addition, the Port of Pascagoula area (including the East and West Pascagoula Rivers to mile 2 below the confluence of the Escatawpa, and Bayou Casotte) has one of the most severe water quality problems within the State of Mississippi. Activities in this heavily-developed industrial area contribute over 60 million gallons a day of municipal and industrial discharges to surface waters. Bayou Casotte has been recognized as having both dissolved oxygen (DO) and bacteria problems as a result of discharges from the Pascagoula/Bayou Casotte Sewage treatment plant and other sources. Sampling by the U.S. Geological Survey confirmed the problem in July 1979 when fecal coliform bacteria concentrations as high as 28,000 mpn/100 ml were found. (The allowable limit for fish and wildlife uses is 2000 mpn/100 ml). Bacterial problems still exist within the study area as evidenced by the closure of the major oyster reefs near the mouth of the West Pascagoula River.

Sediment analyses within the harbor and Mississippi Sound show that various metals, PCBs, and pesticides are tied up in the sediments. The relatively high levels of nitrogen compounds, total phosphorus, certain metals, and molecular weight hydrocarbons, however, do not appear to pose any particular hazard with respect to dredged disruption of sediments. (See the Section 404 (b)(1) Evaluation in Appendix B.)

As demonstrated by the recent USACE testing (using the numerical Waterways Implicit Flooding Model), the configuration of Singing River Island has a definite effect on water circulation and salinity patterns of the Middle River area. During low flow the open water disposal banks running southeast of the island tend to restrict the westward diffusion of freshwater from the East Pascagoula River and, therefore, increase salinities in the Middle River area. This restriction on circulation and deflection of freshwater toward the east is likely aggravating existing degraded water quality in the Harbor area and could also be having a profound impact on oyster production in the Middle River area.

Another water quality-related problem may be associated with the open water disposal of dredged material which (as described in Chapter 1) occurs within Mississippi Sound from the barrier islands to the Pascagoula and Bayou Casotte Harbors. This method of disposal causes increased turbidity levels but resulting impacts on water quality have not been quantified. The suspended particle load in the Mississippi Sound system fluctuates naturally and the turbidity increase caused by open water dredged material disposal may be within the natural range of the system.

### **Bayou Casotte - Bangs Lake Planning Area**

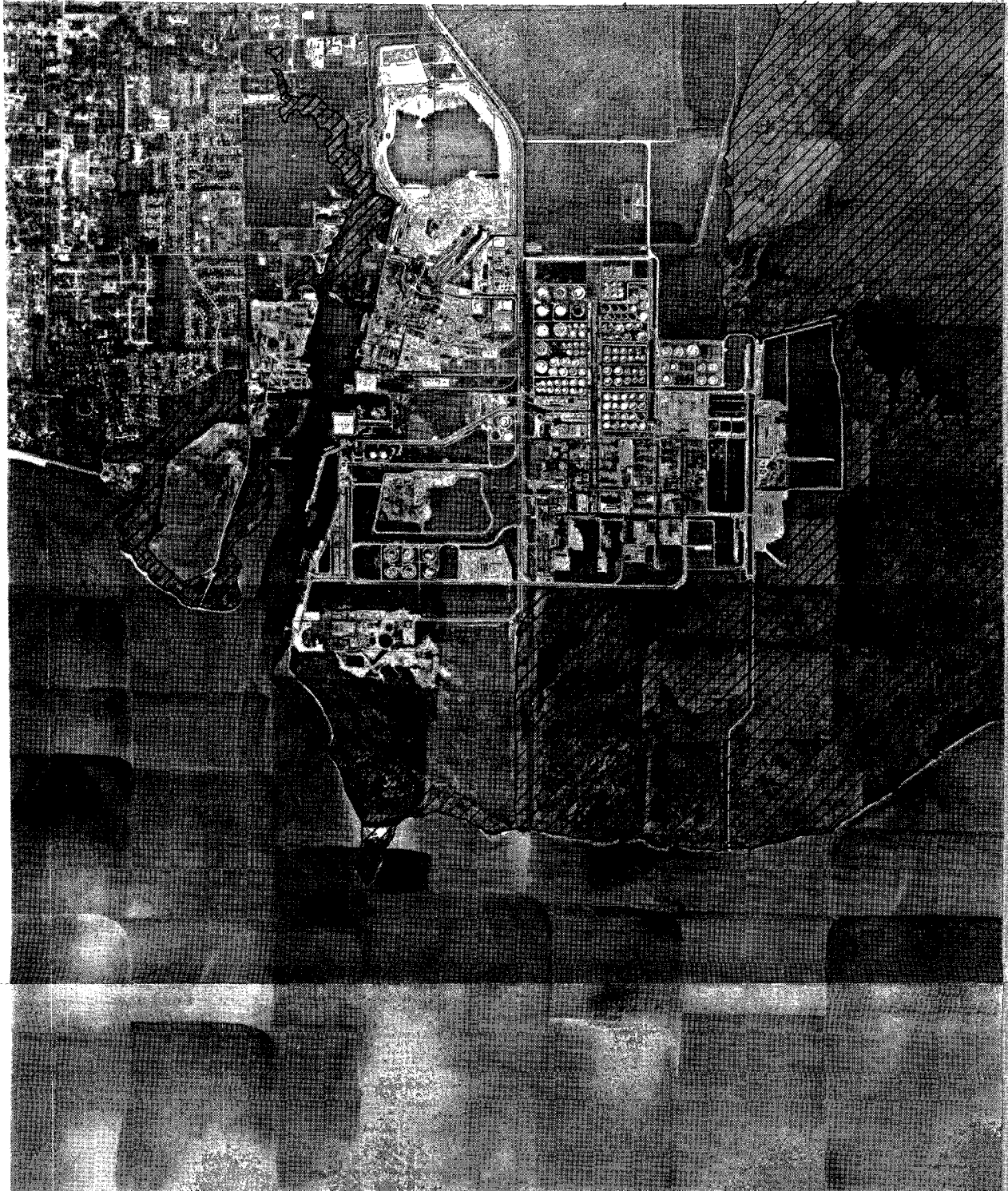
The Bayou Casotte - Bangs Lake Planning Area contains the Bayou Casotte Harbor with the most intense concentration of heavy industrial development on the Mississippi Coast. The planning area also contains the extensive, undeveloped tidal marsh and open water areas between Bayou Casotte and the Mississippi-Alabama state line. The boundaries of the planning area have been designated to include: new waterfront development areas as proposed by both private interests and the JCPA; the Greenwood Island dredged material disposal site and the adjacent Bayou Chico marsh area; the undeveloped marsh and Mississippi Sound waterbottoms south of the Chevron development (proposed for future development in the 1975 JCPA Master Plan); the Bayou Casotte channel and existing industrially developed areas along the channel; the upper portion of Bayou Casotte north of the existing channel including the West Prong wetlands; the Jackson County airport site and adjacent lands; the approximately 3500 acres of county-owned land adjacent to Bangs Lake; as well as private holdings in the North Bayou and Bayou Cumbest areas.

Despite the extent of existing industrial development, the planning area consists mostly of intertidal wetlands subject to the Corps of Engineers' Section 404 regulatory program. (See Figures 18 through 20).

The drainage areas of Bayou Casotte (7.4 square miles) and Bayou Chico (2.87 square miles) are small, and freshwater inflow is generally low. The principal drainage into both estuaries is from urban runoff. The 1982 State of Mississippi Water Quality Report to Congress identified the Bayou Casotte-Bayou Chico estuary area as a major problem area with industrial and municipal discharges causing violation of the state's dissolved oxygen and bacteria criteria.



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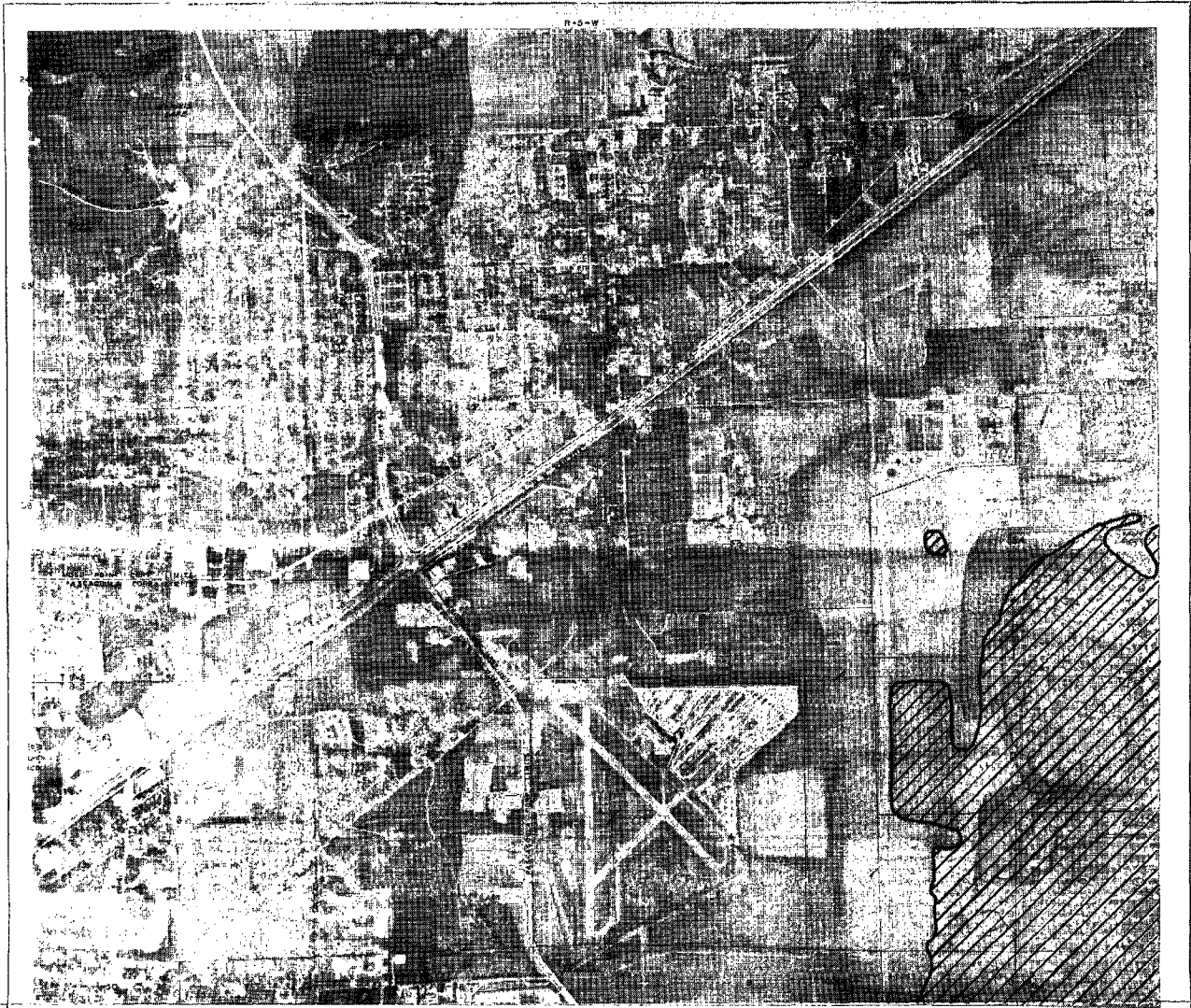


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**FIGURE 18:**  
**"404" WETLANDS - BAYOU CASOTTE AREA**

JACKSON COUNTY SOIL AUTHORITY  
 JACKSON COUNTY BOARD OF SUPERVISORS  
 BUREAU OF MARINE RESOURCES  
 SPECIAL MANAGEMENT AREA  
 PORT OF PASCAGOULA  
 BAYOU CASOTTE AREA  
 MICHAEL SHELL, JR., INC.  
 CONSULTING ENGINEERS - PASCOULA, MISSISSIPPI  
 SCALE: AS SHOWN - 1987 (REVISED 1988)





**FIGURE 19:**  
**"404" WETLANDS - BAYOU CASOTTE AREA**

BUREAU OF MARINE RESOURCES  
 SPECIAL MANAGEMENT AREA  
 PORT OF PASCAGOULE  
 KREOLE INDUSTRIAL AREA

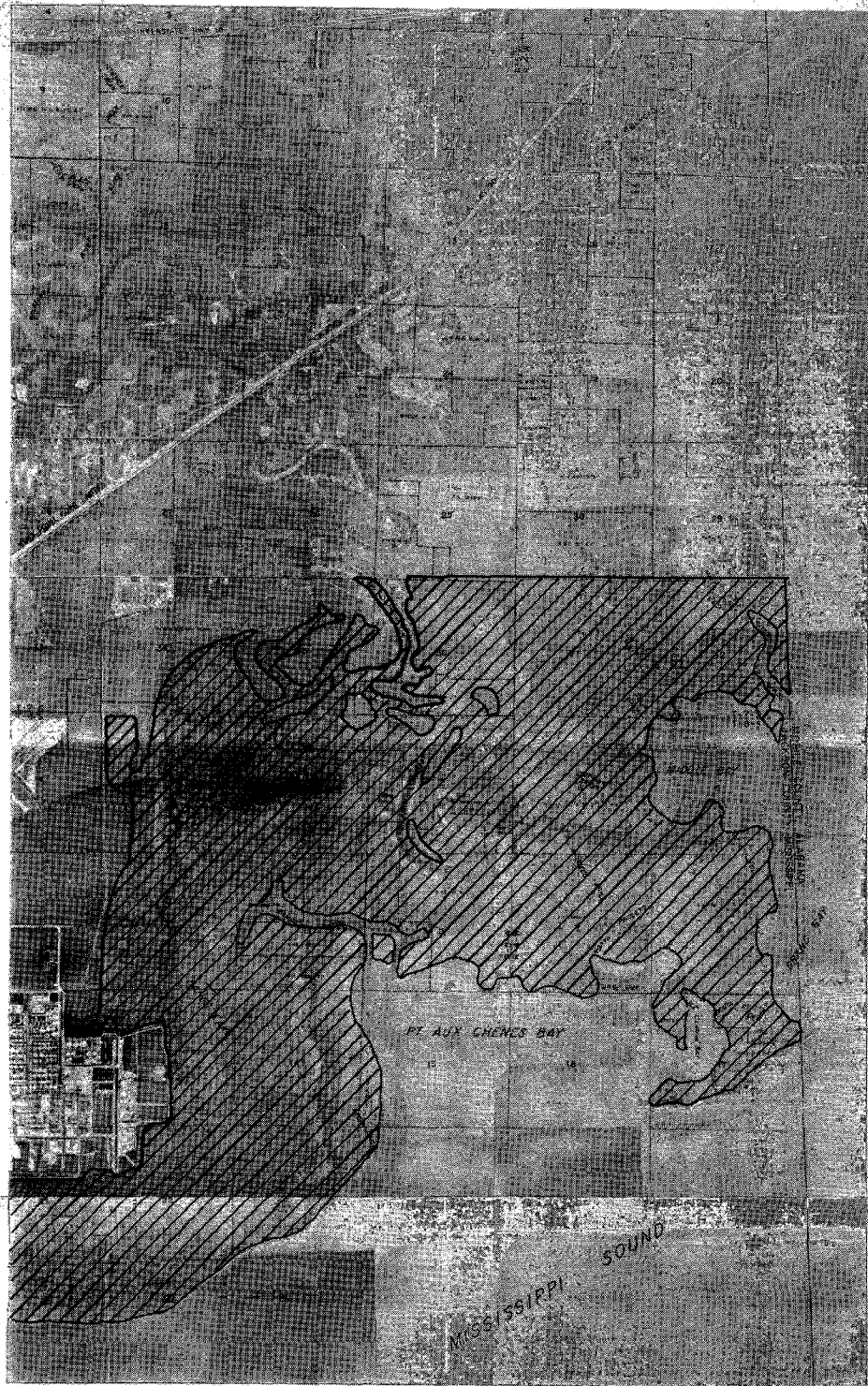


FIGURE 20:

"404" WETLANDS - BANGS LAKE AREA

JACKSON COUNTY BOAT AUTHORITY  
JACKSON COUNTY BOARD OF SUPERVISORS  
BUREAU OF MARINE RESOURCES  
SPECIAL MANAGEMENT AREA  
PORT OF PASCAGOULA  
SOUTHEASTERN JACKSON COUNTY

© CHARLES BAKER, JR., INC.  
PROFESSIONAL ENGINEER - MARINE AND  
CIVIL ENGINEER - CIVIL ENGINEER - 1988



SCALE  
1" = 1 MILE

### Greenwood Island Management Unit

This management unit was delineated to contain the undeveloped Greenwood Island peninsula and existing dredged material disposal site on the west bank of Bayou Casotte as well as the Bayou Chico marsh area west of and adjacent to the disposal site. Approximately 300 acres are contained in this management unit, including the 101 acre disposal site.

As its name implies, Greenwood Island was originally an island and the deposition of dredged material is responsible for its current attachment to the mainland. The entire island, including the existing disposal site, is owned by the Jackson County Port Authority.

The management unit contains 123 acres of emergent wetlands and 11 acres of shrub-scrub wetlands with the following vegetation types dominant: Spartina alterniflora, S. patens, Distichlis spicata, Juncus roemerianus, Scirpus sp., Borrchia frutscens and Baccharis halimifolia.

The Mississippi Coastal Program includes Greenwood Island in a list of waterfront erosion and accretion areas, and notes that "the Greenwood Island area of Bayou Casotte bears the brunt of waves generated over a long fetch from the southeast through Petit Bois Pass". The Coastal Wetlands Use Plan designates the area as S-4 (Special Use - dredged material disposal and disposal island).

Two archaeological sites are located on the island and were the subject of a recent archaeological survey conducted for the JCPA by the Department of Archaeological Research at the University of Alabama.<sup>1</sup> These sites, sites 22JA516 ("Big Greenwood Island" site) and 22JA618 ("Little Greenwood Island" site) as cataloged by the Mississippi Department of Archives and History, are eligible for inclusion in the National Register of Historic Places. Site 22JA516 is a buried cultural deposit containing well preserved

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1. More detailed description of the two Greenwood Island cultural resource sites is included in the report entitled "Archeological Survey and Testing of Greenwood Island and Bayou Casotte Proposed Port Facilities", Jackson County, Mississippi, 1982.

floral, faunal, and human remains and intact cultural features. These cultural deposits occur intact despite looting of the site by pothunters. Site 22JA618 is a shell midden which remains relatively undisturbed despite some evidence of looting.

#### Tenneco/Chevron Management Unit

The boundaries of this unit define the marsh and waterbottom area east of the Bayou Casotte entrance channel and immediately south of the existing Chevron development. Approximately 830 acres of emergent wetlands and 190 acres of shrub scrub wetlands subject to Corps of Engineers' jurisdiction are included. The State Wetlands Use Designations are I (Industrial Development) and G (General Use). Included in this management unit is the 320 acre Tennessee Gas Transmission Company (Tenneco) site adjacent to the Bayou Casotte channel, and also the undisturbed Chevron marshes between the Tenneco area and the Bangs Lake/Point aux Chenes Bay Management Unit.

The Tenneco site basically consists of a shrub wetland intermixed with various emergent vegetation such as Scirpus robustus and Spartina patens. Pockets of water are found in this area during various times of the year and the southern portion of this wetland receives tidal influence through a break in an old low dike. This wetland area is excellent habitat for wildlife species such as muskrat, raccoon, songbirds, rabbit, wading birds, various other waterfowl, small mammals, reptiles, and amphibians. The thick vegetation within this site provides ample food and cover for these and many other wildlife species.

#### Bayou Casotte/Mississippi Sound Management Unit

This management unit defines a 1700 acre open water area in Mississippi Sound adjacent to and south of the Tenneco/Chevron unit. Included in this unit is an open water disposal area (currently used for federal maintenance dredging activities) adjacent to the east side of the Bayou Casotte entrance channel.

The southern boundary of the management unit corresponds to the seaward limit of the Bayou Casotte Land Reclamation Area (containing future port facilities and a permanent dredged material disposal site) proposed by the JCPA in the 1975 Master Plan for Port Development.

The State Coastal Wetlands Use Designations are G (General Use), S-4 (Special Use - dredged material disposal area), and P (Preservation).

#### Upper Bayou Casotte Management Unit

The boundaries of this management unit delineate an area between the inland terminus of the existing Bayou Casotte channel and the Jackson County Airport and include the meandering West Prong of Bayou Casotte and a portion of the Mississippi Chemical gypsum disposal area.

Approximately 42 acres of emergent wetlands subject to Corps of Engineers' jurisdiction are included in this unit. Two relatively distinct wetland areas can be identified; one such area, the West Prong, is relatively undisturbed while the other area, adjacent to the Bayou Casotte channel, has been degraded by adjacent industrial development. The Coastal Wetlands Use Designations are G (General Use) and I (Industrial Use).

#### Bangs Lake/Point aux Chenes Bay Management Unit

The Bangs Lake-Point aux Chenes Bay Management Unit defines an extensive undeveloped area east of Bayou Casotte consisting primarily of tidal marsh and open water bounded on the west by the Chevron and Mississippi Chemical properties and on the east by the Mississippi-Alabama state line. Roughly 28,000 acres have been included in this unit including the approximately 3,500 acres of county-owned land surrounding Bangs Lake east of Chevron, and also private land holdings in the North Bayou and Bayou Cumbest areas. (The Bangs Lake area is one of the largest pieces of undeveloped county-owned acreage in the study area and is designated for conservation use in the 1975 JCPA Master Plan.) This management unit encompasses a variety of intertidal, upland and open water habitats, and because of its size and undisturbed character has been described as a unique natural area within the Mississippi coastal zone.

The management unit predominantly consists of intertidal "404" wetlands intersected by numerous watercourses and about 20 acres of oyster reefs. The Bayou Cumbest - Bangs Lake area is one of eight water areas in Mississippi classified as approved for the direct harvesting of shellfish.

The Coastal Wetlands Use Designations for the area are P-1 (preservation - marsh and waterbottoms), S-1 (Special Use - oyster reefs), and G (General Use).

A comparison of aerial photographs has revealed that about 200 acres of marsh were lost in the Bangs Lake area between 1956 and 1979. It is assumed that much of this loss is due to natural ongoing erosion processes. The high wave climate which has completely eroded the Grande Batture Islands now appears to be eroding the Bangs Lake marshes, with a loss rate of about 10 acres per year.

#### **Pascagoula River Harbor - Middle River Planning Area**

The boundaries of this planning area generally define an area between the west bank of the West Pascagoula River and the downtown center of Pascagoula, south of the "East River - West River Cut". Included are the heavily industrialized areas adjacent to the Pascagoula River Harbor, the Double Barrel and Singing River Island dredged material disposal sites, and extensive wetlands in the Middle River Area and adjacent to U.S. Highway 90.

The planning area contains approximately 1500 acres of intertidal wetlands subject to the Corps of Engineers Section 404 regulatory program (See Figure 21).

#### **Pascagoula River Harbor Management Unit**

This management unit contains the Pascagoula River harbor and adjacent industrial lands, including the Ingalls Shipyard and the "Double Barrel" disposal site, and the area north of Highway 90 between the Ingalls access loop and the Pascagoula River.

The management unit contains 92 acres of emergent wetlands and 104 acres of shrub-scrub wetlands subject to the Corps of Engineers Section 404 regulatory program. These

wetland areas are located in several small sites between the Ingalls access road and the Pascagoula Harbor and in the undeveloped area between the West Bank Shipyard and the Double Barrel site. The wetlands within this management unit are designated as I (Industrial Development), C (Commercial Fisheries), and G (General Use) in the Coastal Wetlands Use Plan.

#### Singing River Island Management Unit

Singing River Island, created by the deposition of dredged material from the Pascagoula Harbor project, is located south of the Ingalls Shipyard and west of the Pascagoula Harbor entrance channel. The island, approximately 480 acres, is owned by the Jackson County Port Authority and contains a diked, upland disposal site. The management unit boundaries include the island as well as adjacent open water areas delineated for reclamation and future industrial use in the JCPA 1975 Master Plan.

The management unit contains 129 acres of emergent wetlands outside of the dredged material containment dikes and subject to the Section 404 regulatory program. The tidal wetlands surrounding the disposal area are vegetated primarily with Spartina alterniflora and S. patens; non-tidal wetlands are vegetated with S. patens, sp; Ruppia maritima vegetates isolated open water pockets, and transitional wetlands are vegetated with S. patens, Andropogon sp. and pines (pinus).

The Coastal Wetlands Use Designations are S-4 (Special Use - dredged material disposal area), and G (General Use).

As noted earlier, the configuration of Singing River Island has been demonstrated to have a definite effect on circulation and salinity patterns of the Middle River area. During low flow the open water disposal banks running southeast of the island tend to restrict the westward diffusion of freshwater from the East Pascagoula River and, therefore, increase salinities in the Middle River area. This restriction of circulation and deflection of freshwater toward the east is likely aggravating existing degraded water quality in the Harbor and could also be having an impact on oyster production in the Middle River area.



### Highway 90 Management Unit

This management unit defines a predominantly wetland area bisected by U.S. Highway 90 and bounded on the north by the "West River - East River Cut" and on the South by the L&N Railroad.

Approximately 460 acres of emergent wetlands and 115 acres of shrub-scrub wetlands under Corps of Engineers' jurisdiction are included in the management unit. The wetland area is designated in the Coastal Wetlands Use Plan as P (Preservation), G (General Use), C (Commercial Fishing and Recreational Marinas), and S-3 (Special Use - leased wetlands for other uses).

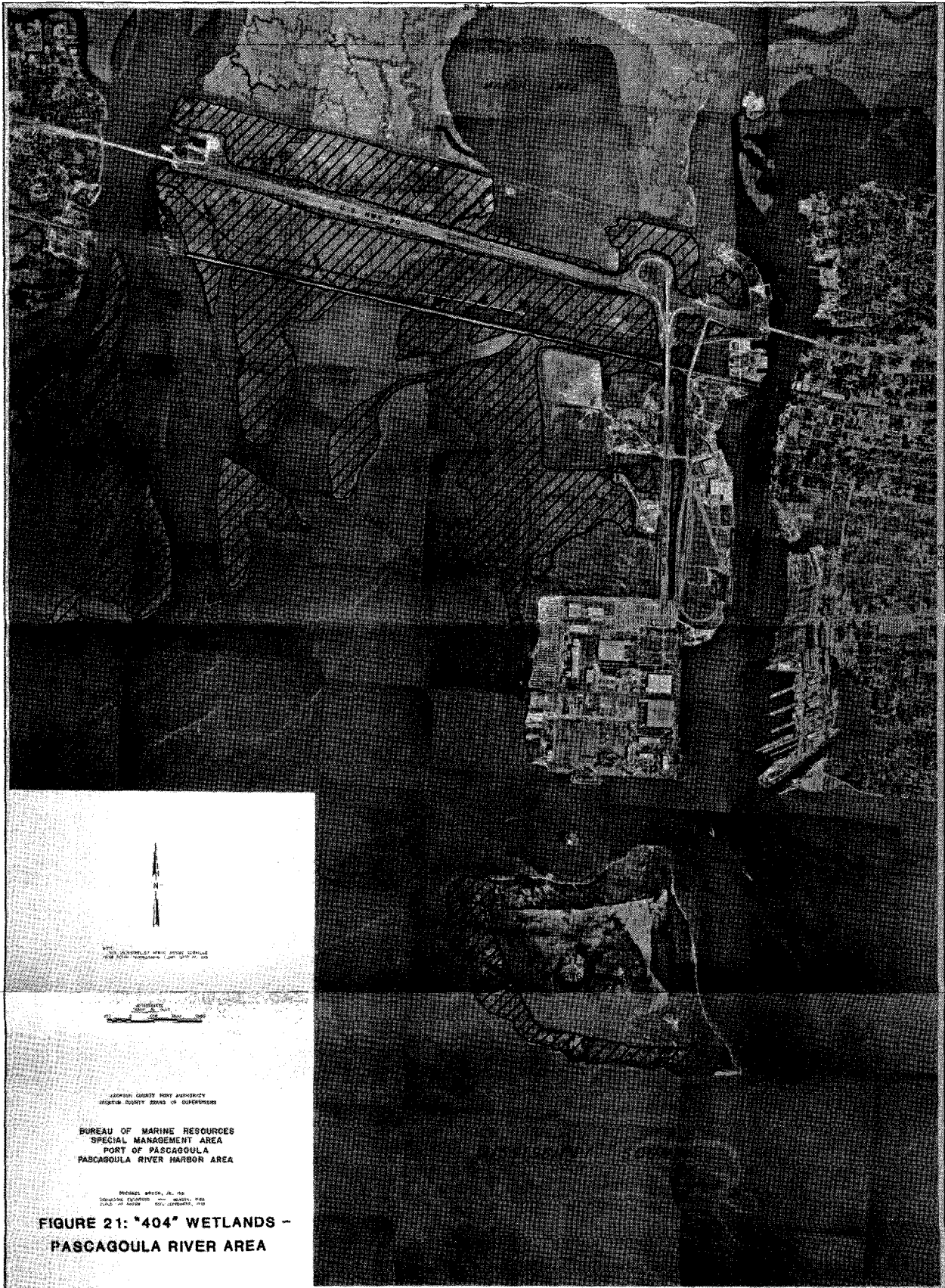
### Middle River Management Unit

The boundaries of this management unit were delineated to include the extensive open water and marsh area south of the L&N Railroad between the west bank of the Ingalls Shipyard and the west bank of the West Pascagoula River. The boundaries also include the site of the Jackson County Port Authority's proposed West Harbor Development as described in the 1975 Master Plan.

The management unit encompasses a rich and dynamic estuarine system including approximately 600 acres of emergent wetlands, and a diverse fish population with relatively high numbers of game fish. The Coastal Wetlands Use Designation includes P-1 (Preservation - marsh and waterbottoms), G (General Use), and S-1 (Special Use - oyster reefs). Much of the intertidal wetland area, along with some areas of waterbottoms was designated for industrial development by the 1982 Mississippi Legislature.

The State of Mississippi's 1982 Water Quality Report to Congress states that the overall water quality of the West Pascagoula River is "good with an improving trend" as indicated by data from the water quality monitoring station located on the West Pascagoula River at Highway 90.

A portion of the Gautier Oyster Beds is located within this management unit. The productivity of the Gautier Beds is exceptionally high because of organic nutrients supplied by the Pascagoula River. The lack of sewage treatment facilities in the area, however, causes excessive levels of bacteria in the Gautier Beds, resulting in their closure to commercial oyster fishing.



## **CHAPTER 4: THE PROCESS OF PLAN FORMULATION**

This chapter describes the consensus-building process that led to the formulation of the Pascagoula SMA Plan. The draft plan has three major elements: an area development plan; a mitigation program to compensate for unavoidable environmental and cultural resource losses; and a dredged material disposal plan. As noted in the Introduction, early on in the consensus-building process the SMA Task Force agreed upon a general procedure for formulating the development and mitigation components. This procedure includes the following major steps:

- (1) Identification of areas suitable for development;
- (2) Identification of natural areas to be protected or preserved;
- (3) Assessment of potential impacts to natural and cultural resources in areas deemed suitable for development; and
- (4) Development of mitigation requirements associated with identified potential impacts.

The consensus-building process was carried out primarily in a series of Task Force planning sessions where various development concepts were proposed and evaluated with respect to potential environmental impacts and development needs. The process, however, did not always follow a step by step approach. Rather, the development and mitigation elements of the consensus SMA Plan evolved almost simultaneously in the effort to achieve one of the principle goals of the overall planning process — the striking of an acceptable balance between development and environmental resource protection in the SMA. (See the section on Formulating the Consensus Plan.)

### **Formulating the Development Plan**

#### **Initiating the Planning Process**

The process of identifying areas for port and industrial expansion within the Pascagoula SMA was initiated by the presentation of the development goals and long range plans of the Jackson County Port Authority (as contained in the 1975 Master Plan for the Greater Port of Pascagoula and summarized at the end of Chapter 1).

Analysis of these goals and plans led to the identification of some basic planning issues and potential points of contention between the regulatory and development members of the Task Force. In addition to the issues listed in the Introduction (see page 6), a key issue centered on the appropriate level of development plan detail for the Task Force to be concerned with. For example, should the goal of the Task Force be to identify general areas for development, or to evaluate site-specific development plans? The Task Force chose the former goal, so as not to duplicate the existing 404 regulatory process and associated interagency forums for preliminary evaluation of permit applications.

The Task Force also identified the need to distinguish between Phase 1 or immediate priority development areas and Phase 2 or longer term development areas; Phase 2 areas being areas for which it would not be possible for the Jackson County Port Authority to prepare specific development plans or statements of need at this time. The Task Force agreed that the process of identifying development areas should involve the formulation of development alternatives and the evaluation of those alternatives relative to: (1) an assessment of environmental resources and; (2) various development criteria such as: opportunities for concentrating future major development rather than dispersing it; availability of land; size and usability of land; transportation access for rail and highway; proximity to navigation channels; availability of utilities; and relationship to existing industrial areas.

As described in Chapter 3, the Task Force delineated the SMA study area, two separate planning areas, and nine individual management units to focus planning efforts and guide the development of the SMA Plan.

#### Assessment of Environmental Resources

Following the delineation of planning areas and management units, an assessment of environmental resources within the planning areas and management units was carried out. Various background and technical studies needed to accomplish this assessment were identified by the Task Force and financial assistance for the accomplishment of some of these studies was provided by BMR to the Jackson County Port Authority. (Chapter 3 included a summary of these studies and an overview of natural resources in the Pascagoula SMA.)

In qualitatively evaluating the wetlands resources found in the Pascagoula SMA, the Task Force took into consideration a variety of wetlands functions in addition to fish and wildlife habitat. Some of the many diverse values of coastal wetlands noted by the Task Force include<sup>1</sup>:

- significance of wetland areas for natural biological functions, including food chain production, general habitat, and nesting, spawning, and rearing sites for aquatic or land species;
- significance for study of the aquatic environment, or potential for designation as sanctuaries or refuges;
- importance to natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics;
- significance in shielding other areas from wave action, erosion, or storm drainage;
- value as storage areas for storm and flood waters;
- value as natural recharge areas;
- value in providing natural water purification functions; and
- other criteria (e.g., size, surrounding uses, uniqueness, etc.).

#### Scenario for SMA Plan Formulation

In October, 1983, a proposed "Scenario for SMA Plan Formulation" was presented to the Task Force by the Bureau of Marine Resources. This scenario responded to and modified development concepts presented in the JCPA's 1975 Master Plan and also offered tentative working definitions for mitigation.

The Plan Scenario was intended to present a broad, conceptual approach to the development of the SMA Plan based on specific management units and on the designation of specific management categories for priority land uses within the management units. The Scenario was intended to serve as a starting point for the formulation and discussion of alternative plans and was designed to stimulate and elicit response, comments, and

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1. These criteria are used by the Corps of Engineers in the Section 404 regulatory process to decide whether affected wetlands are important to the public interest.

alternatives from all Task Force members. As such, the Scenario served as an important catalyst in the overall plan formulation process.

The Plan Scenario proposed five broad management (priority use) categories to guide development and to protect and preserve natural resources in the SMA. These categories were as follows:

Water Dependent Development: This category would be applied to areas designated by the Task Force for development and requiring the dredging and/or filling of wetlands. Future development activities in areas so designated would only take place following the formal designation (through the final SMA Plan) of conservation and preservation areas (see below), the formulation of a disposal site management program, and, where appropriate, wetlands enhancement, restoration or replacement.

Conservation: The intent of this category would be to preserve and protect the existing value (in terms of habitat, water quality enhancement, etc.) of specific wetland areas for as long as possible. Areas designated by the Task Force for conservation use would be withheld from development consideration until such time as it is determined that development pressures cannot be met anywhere else within the SMA.

Preservation: This category would be applied by the Task Force to those wetland areas that, because of their uniqueness and existing importance to natural processes, are deemed unsuitable for industrial development or port expansion. Such areas would be withheld from development in perpetuity.

Upland Dredged Material Disposal: Diked upland disposal of dredged material would take place in accordance with specified best management practices established through the SMA process and formalized in the SMA Plan. The specific disposal site management responsibilities of the USACE and JCPA would be identified. Site management practices could include raising the elevation of existing dikes and the removal and reuse, if practical, of previously deposited dredged material in order to increase and maximize the life expectancy of designated disposal areas.

Wetlands Enhancement, Restoration, or Replacement: Areas designated under this category would be existing wetlands in which opportunities for significantly improving habitat value, water quality, etc., have been identified by the Task Force. The appropriate means of improving wetlands quality would be decided by the Task Force on a site specific basis.

Response to Proposed Scenario for Plan Formulation

In responding to the Plan Scenario, Task Force discussion of the proposed conservation category produced the most divergent points of view. One view was expressed that, based on the intent of the conservation category as defined in the proposed scenario, it would be more appropriate to use the term "secondary or phase-two, water dependent development" to describe this management category. Also, based on the proposed intent of this category, several Task Force members noted the importance of carefully defining the criteria by which a future management decision to consider a conservation area for water dependent development would be based. It was suggested that the Task Force develop a "decision-tree" approach to determining when all alternative development options have been exhausted and development pressures are great enough to consider a designated "conservation" or "secondary water dependent development" area for development.

With regard to the proposed preservation category, it was suggested by several members of the Task Force that it would be appropriate to distinguish between two or more sub-categories of preservation areas, for example, areas that would be preserved for the life of the SMA plan, and areas to be preserved in perpetuity (possibly through deed restrictions or dedications to a public trust organization).

Regarding the proposed wetlands enhancement, restoration or replacement category, there was agreement on the need to identify and assess the extent of opportunities for wetlands enhancement, restoration or replacement throughout the SMA and, if possible, to target specific areas for such action.

In response to the proposed "Scenario for SMA Plan Formulation", the JCPA and the Jackson County Board of Supervisors formed a joint committee to provide the Task Force with more specific proposals for anticipated development and planning priorities in the SMA. The resulting Port-wide plan of development incorporated specific short-

term development needs along with the Port Authority's criteria for longer term development flexibility.

The individual elements of the county's proposed development plan were presented to the Task Force and are described in the document entitled: "Jackson County, Mississippi, Special Management Area Plan", December 15, 1983. Some of the key elements presented were as follows:

- The SMA Plan would be in effect from the time of its adoption for a period of 10 years and would include provisions for amendment.
- The Plan would identify three major categories of lands for future development. The earliest priorities for industrial and commercial development on public lands would be contained in areas designated for Phase 1 Development. Public lands to be held in conservation status until development pressures necessitate their use would be defined as Phase II areas. Areas designated for future private development, the timing dependent on the needs and requirements of private interests, would also be identified.
- The Plan would identify public and private lands to be preserved (for the 10-year life of the Plan) in an effort to balance or mitigate for planned development elsewhere in the SMA. Two publicly-owned areas so identified would be the Bangs Lake region and the western two-thirds of the Middle River wetland area designated by the Mississippi Legislature in 1982 for industrial use. The county would also attempt to preserve privately-owned land adjacent to the Bangs Lake region through the application of a restrictive flood plain zoning district.
- Certain publicly-owned wetland areas would be excluded from development and designated for enhancement activities to be determined by the SMA Task Force and designed to improve wetlands quality.
- The dredged material disposal component of the proposed plan would be based on the results of ongoing studies by the Corps of Engineers, Mobile District.



### Formulating the Consensus Plan

Following presentation of Jackson County's proposed SMA Plan, planning and negotiation sessions took place in which a series of proposals addressing development, mitigation, and dredged material disposal throughout the SMA were alternately formulated by the regulatory agencies and the Board of Supervisors/Port Authority. Evaluation of each proposal was followed by negotiation sessions in which the objectives of each Task Force agency regarding development and conservation within the SMA was brought forth. With each succeeding proposal, the Task Force came closer to producing a compromise plan which satisfied the basic objectives of each participating agency.

After numerous drafts of alternative proposals and eighteen months of negotiation, consensus was reached on a SMA Plan. This Plan (contained in Chapter 5, with the exception of the Dredged Material Disposal Component which is contained in Appendix E) represents a balance between development and environmental resource protection in the Pascagoula SMA, a balance acceptable to each agency participating on the Task Force. Although the development component of the Plan evolved from the original goals and long term plan presented in the 1975 JCPA Master Plan, the Plan represents a major transformation in the development proposals contained in the Master Plan. Most notably:

- The SMA Plan distinguishes between the most immediate development needs (which can be implemented within the 15 year life of the Plan) and longer term, currently unforeseen development activities. If development activities currently unforeseen are proposed within 15 years, implementation of these proposals would require amendment of the SMA Plan. The 1975 JCPA Master Plan makes no distinction between immediate and future development needs.
  
- The 1975 Master Plan emphasized large areas of Mississippi Sound waterbottoms — the Bayou Casotte and Singing River Island land reclamation areas as shown in Figure 15 — which would be filled for industrial and port development; the SMA Plan eliminates these areas from development consideration because of the potential impacts on water quality identified in the Corps of Engineers' Mississippi Sound Study. The extensive West Harbor Development proposed as shown in Figure 15 is also eliminated from development consideration in the SMA Plan.

The SMA Plan achieves a balance between new development areas and environmental resource protection. The proposed new development acreage and the area of wetlands affected in the SMA Plan is significantly less than that proposed in the development plan contained in the JCPA Master Plan. (Approximately 23 acres of shallow subtidal lands and 143 acres of emergent wetlands would be filled to accommodate new development in accordance with the area specific provisions of the SMA Plan. The JCPA Master Plan envisioned the creation of several thousand acres of new land for development purposes, much of that land to be created from emergent wetlands and Mississippi Sound waterbottoms.) The SMA Plan also establishes a legally binding mechanism for preservation of the Bangs Lake wetlands area.

### **Formulating the Mitigation Approach**

From the outset of the Pascagoula SMA planning process, one of the principal goals of the Task Force was to strike an acceptable balance between new development and environmental protection. Concurrent with this goal, the Task Force identified the need for establishing measures to ensure that this balance, once established, is preserved. The mitigation approach was formulated as the Task Force worked to strike the balance and establish those measures.

The procedure developed by the Task Force for determining and ensuring the maintenance of an acceptable balance between new development and environmental protection in the Pascagoula SMA involved a qualitative assessment of wetlands values and development needs in order to determine the balance, and the preservation of significant amounts of unique wetland areas in order to ensure the future maintenance of the balance.

### **Definitions**

In its most common usage, the term "mitigate" means "to make less severe". As applied to the Corps of Engineers permit program under Sections 10 and 404, mitigation refers to actions designed to lessen the adverse impacts of proposed development activities on waters of the U.S. Mitigation may also refer to actions designed to lessen the adverse impacts of proposed work on resources of cultural significance. There are various ways in which adverse impacts of proposed work upon both aquatic ecosystems and cultural resource sites can be reduced.

Regulations developed pursuant to the National Environmental Policy Act (NEPA) establish the principal definition of mitigation. Guidelines and policies regarding mitigation as adopted by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service were also judged to be particularly relevant for SMA planning purposes in the Port of Pascagoula.

1. NEPA Definitions. Regulations prepared pursuant to the National Environmental Policy Act include a five-part definition of "mitigation" (43 FR 56005, §150.20):
  - (a) Avoiding the impact altogether by not taking a certain action or parts of an action;
  - (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
  - (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
  - (d) Reducing or eliminating the impact over time by preservation and maintenance operations furthering the life of the action; and
  - (e) Compensation for the impact by replacing or providing substitute resources or environments.
  
2. FWS Mitigation Policy. The U.S. Fish and Wildlife Service's policy statement on mitigation (46 FR 7644 - 7663, January 23, 1981) contains the following key points:
  - (a) FWS policy adopts the NEPA definition of mitigation;
  - (b) FWS policy is concerned with mitigation needs for fish and wildlife and their habitat;
  - (c) FWS policy is focused on the mitigation of losses of habitat value;
  - (d) Acre for acre loss replacement is not necessarily recommended;
  - (e) The fundamental principles guiding mitigation are: (1) that avoidance or compensation be recommended for the most valued resources; and (2) that the degree of mitigation requested correspond to the value and scarcity of the habitat at risk.

- (f) Four resource categories with mitigation goals of decreasing stringency are identified:

<u>Resource Category and Designation Criteria</u>	<u>Mitigation Planning Goal</u>
1. High value for evaluation species and unique and irreplaceable	No loss of existing habitat value
2. High value for evaluation species and scarce or becoming scarce	No net loss of in-kind habitat value
3. High to medium value for evaluation species and abundant	No net loss of habitat value while minimizing loss of in-kind habitat value
4. Medium to low value for evaluation species	Minimize loss of habitat value

3. NMFS Policy. The approach of the National Marine Fisheries Service to mitigation is based upon the NEPA definition of mitigation and is concerned with reducing the loss of habitat necessary for the maintenance of living marine resources for the benefit of the nation. NMFS has recently adopted a habitat conservation policy (48 FR 53142-53147, Nov. 25, 1983), which the agency will utilize in making decisions on actions which affect habitat for which NMFS has responsibility.

#### SMA Task Force Mitigation Policy

As established by the SMA Task Force for general SMA planning purposes in Mississippi, mitigation is considered to include compensation for the loss of, or adverse impacts to, three types of resources: wetlands; water quality; and cultural resources.

1. Wetlands. Mitigating actions for impacts on wetland resources are considered to include avoidance, creation, restoration, enhancement, and preservation of wetland resources. Task Force definitions for each are outlined below:
  - a. Avoidance of impacts. Some aquatic resources are considered essential to the maintenance of fishery resources and therefore should not suffer any adverse impacts from coastal area development. Development alternatives should be sought that will lessen or avoid the impacts while achieving the purpose of the proposal. This type of mitigation (involving the selection of alternative sites, construction methods, etc.) is of primary importance as it avoids loss or

degradation of habitat in situ and maintains the integrity of the aquatic system in the most natural state under the circumstances. When loss of habitat cannot be avoided and this loss is deemed to be in the overall public interest, other mitigating actions are necessary to offset the wetlands lost to dredge or fill activities.

- b. Habitat creation. When adverse impacts to fishery habitat are unavoidable, the creation of habitat is an appropriate mitigating action. The de novo creation of habitat should be adjacent to the site of impact or, if this is not possible, within the same aquatic ecosystem. The habitat created should duplicate, to the extent possible, the habitat type lost and not substitute one type of wetland habitat for another (substitution resulting in a net loss of one type for gain in another). The ratio of the area created to the area lost in order to compensate functionally for the loss must be decided on a case-by-case review of ecological conditions and opportunities for creation.
  
- c. Restoration. Restoration of previously functioning wetland habitat is also a mitigating action. Areas that were filled in the past can be reduced to appropriate elevations to create fishery habitat of the same kind as previously impacted, either adjacent to the site of lost habitat or within the same aquatic ecosystem. The ratio of the area restored to the area lost in order to compensate functionally for the loss must be decided on a case-by-case review of ecological conditions and opportunities for restoration.
  
- d. Enhancement. Enhancement of existing aquatic habitat that has been adversely impacted in the past is also considered to be a mitigating action. This mitigation category would apply to habitat that is currently functioning to some degree within the aquatic ecosystem. Enhancement can take the form of increasing tidal exchange of impounded or partially impounded areas, increasing flushing of stagnant areas, or reducing the impacts of other adverse impacts upon the existing habitat. The ratio of the area enhanced to the area lost in order to compensate functionally for the loss must be decided on a case-by-case review of ecological conditions and opportunities for enhancement.

- e. Preservation. The long-term preservation of existing, functioning wetlands (for example, by placing them in a public trust or by transfer of the lands to a private organization for preservation) is also a mitigating act but to a lesser degree than those above. Simple guarantee of preservation of an area of existing habitat as compensation for the loss of habitat elsewhere should be viewed as a net loss to the system.

Assuming that "avoidance of impacts" is addressed first in the planning process and that some form of compensation (i.e., mitigation) is appropriate; in general, the preferred order of mitigating actions should be: (1) restoration; (2) creation; (3) enhancement; (4) preservation.

2. Water Quality. Mitigating actions to address the impacts of new development on water resources and water quality should be undertaken to compensate for: (1) the loss of water quality functions resulting from unavoidable dredging and filling of wetland areas; and (2) degradation of water quality resulting from future industrial activities.

Mitigating actions designed to replace habitat value losses through the avoidance, creation, enhancement, and preservation of wetland areas as described above are also considered to provide adequate mitigation for the loss of water quality functions resulting from wetlands destruction.

The potential for future water quality degradation is to be addressed through the provision of appropriate wastewater and surface runoff treatment, prevention of effluents and runoff from entering water bodies which have poor flushing capabilities, and avoidance of new channel designs associated with poor water circulation. Specified Best Management Practices (BMPs) should be implemented to guide new industrial development in a manner that minimizes the water quality impacts of future industrial activities. These BMPs should be implemented in the design of: (1) overall, area-wide drainage plans for development areas; and (2) surface runoff plans for the individual industrial sites as they are developed.

Best Management Practices to ensure adequate pretreatment of surface runoff prior to discharge to port-wide drainage collection systems should include small catchment

ponds, grassed swales, oil skimmers, or other appropriate treatment measures. These measures should be developed at new tenant locations depending on the activity at that location and the waste residues generated.

To ensure adequate surface water treatment prior to discharge, new industrial development sites should also provide a system of grassed swales, retention and detention ponds and drainage ways as necessary to provide 24-hour retention and treatment of the first one-half inch of runoff in any rain storm event. In addition, new industrial sites should be prepared in a manner to ensure that no runoff from the facilities occurs as direct sheet flow or untreated point source emptying into any canal, wetland or aquatic area. Buffer strips should be established between industrial sites and aquatic areas.

3. Cultural Resources. With regard to mitigating the impacts of proposed development on cultural resources, if a proposed development activity is judged to have an effect upon a significant cultural resource site, preference should be given to avoidance of the site as the first mitigation priority. If avoidance is impossible, the site should be sealed or capped to preserve the resource, thereby allowing development to occur in the immediate vicinity while retaining the resource site for future study. If only portions of the resource site must be destroyed, random sampling and excavation should be carried out for the destroyed area. As a final mitigation alternative, complete excavation of the cultural resource site is recommended whenever total destruction of the site is unavoidable.

#### Mitigation Approach for the Pascagoula SMA

In the process of identifying areas for development, all development projects proposed by the JCPA were reviewed by the Task Force for compliance with the primary mitigation mechanism — impact avoidance. This review led to several transformations in the series of development proposals alternately formulated by Jackson County and by the regulatory agencies represented on the Task Force. As a result, the scale of development projects identified as acceptable and the area of wetlands affected in the SMA Plan is significantly less than that proposed in the development plan contained in the JCPA 1975 Master Plan.

The Task Force also reviewed each planning area in the Pascagoula SMA for potential wetlands creation, enhancement, restoration and/or preservation opportunities; opportunities that might be applied as mitigation for unavoidable development impacts. Some areas outside the study area boundaries, such as the old disposal islands on the Pascagoula River north of Highway 90, were also evaluated for such mitigation opportunities.

Following the assessment of natural resources in the two planning areas, however, it became apparent that opportunities for wetlands enhancement, restoration, and creation are limited in the Port of Pascagoula area. Most of the study area consists of already developed upland areas or valuable, naturally functioning wetlands. As a result, the Task Force realized it would not be able to follow its preferred order of mitigating actions in developing the mitigation component of the Pascagoula SMA Plan. Accordingly, the Task Force developed a mitigation approach based on the recognition by all participating agencies that there will be some unavoidable adverse impact on wetland resources associated with dredging and filling activities identified by the Task Force as necessary and acceptable. In the judgment of the Task Force, however, the significance of this impact will be reduced by preservation of significant wetland areas elsewhere in the SMA. The preservation of these wetland areas in perpetuity will ensure an acceptable balance between development and environmental protection in the future. Any dredge and fill activities in addition to those designated as acceptable in the SMA Plan, however, will upset this balance and necessitate additional mitigation actions through wetlands enhancement, restoration, creation, and/or preservation to reestablish the balance. (This mitigation approach is similar to that used in the formulation of the Grays Harbor, Washington SMA Plan.)

The efforts of the Task Force to preserve significant wetlands acreage in the Pascagoula SMA focused on the 3500 acre tract of county property in the Bangs Lake Management Unit. In identifying this area as a potential preservation area, the Task Force took into consideration the high natural resource value of these wetlands, the potential opportunity for future expansion of this preservation area through possible acquisition of adjacent, privately-owned lands, and the opportunity for establishing a state plan for continued resource management of the area.

With regard to the preservation of the Bangs Lake area, a key concern of the Task Force was the selection of the appropriate mechanism to ensure its continued protection in the future. Different preservation mechanisms were proposed including: establishing



written policies to preserve the area for the life of the SMA Plan; applying restrictive county flood plain zoning; transferring title in fee simple to a state agency or agencies; placing the property in escrow to be held by a non-profit environmental organization pending the granting of specified development permits; and others.

The Task Force decided on procedures and agreements for fee-simple conveyance of the county-owned Bangs Lake property to the State of Mississippi Department of Wildlife Conservation. Following the Preliminary Agency Commitment to the SMA Plan (see Appendix A), the Corps of Engineers, Mobile District, prepared an Environmental Assessment (EA) of the Plan in accordance with the requirements of the National Environmental Policy Act and also a Section 404(b)(1) Evaluation as required by the Clean Water Act. The EA and 404(b)(1) Evaluation are contained in Appendix B. After a public hearing on the SMA Plan and its incorporation into the Mississippi Coastal Program was held, a conditional Agreement for Transfer of Real Property (see Appendix C) was executed between the JCBS/JCPA and the Bureau of Marine Resources. As specified in this agreement, final conveyance of title to the State of Mississippi took place upon signing of the Memorandum of Agreement (to implement the SMA Plan) by all participating agencies.

### **Planning for Dredged Material Disposal**

As already noted, the SMA Plan for the Port of Pascagoula contains three major elements as specified in the Mississippi Coastal Program. While the Task Force as a whole worked to formulate the area development and mitigation elements of the Plan, the Corps of Engineers, Mobile District assumed the principal responsibility for preparing the third major element of the Plan: a dredged material disposal plan for maintenance dredged material. This disposal plan provides the location of disposal areas as well as a program to ensure adequate disposal capacity to support the area development plan and is contained in Appendix E: Pascagoula Harbor Management Plan for Long-Term Disposal of Dredged Material.

### Objectives

Prior to the initiation of the SMA planning effort, planning for both federal and local dredging and dredged material disposal in the Pascagoula Harbor area had been short-

range in nature. Recognizing that continuation of this type of planning would result in an inefficient use of both economic and environmental resources, the USACE, with the support of the SMA Task Force, undertook the development of a long-range management strategy to facilitate a more efficient use of the limited disposal areas in the Pascagoula SMA.

The resulting long-term disposal plan contained in Appendix E states explicitly the objectives and policies of the USACE and the SMA Task Force with respect to the federal maintenance dredging responsibilities in the Port of Pascagoula. The plan recommends implementation of a specific dredged material disposal strategy as well as an evaluation and control system to monitor its effectiveness. The plan addresses the Pascagoula River channel and the Bayou Casotte channel to their junction in Mississippi Sound, and the disposal areas considered are the Double Barrel, Singing River Island, and Greenwood Island areas as described in Chapter 1 and shown in Figures 22 and 23.

#### Planning Considerations

The USACE's efforts to plan for dredged material disposal began with an evaluation of the remaining capacities of the disposal areas (assuming a continuation of current operating methods). This evaluation was also based on the premise that the existing containment dikes would not be raised with the exception of the dikes around the Singing River Island disposal area where dike raising is required in some areas to bring all dikes to approximately the same level.

The Corps' analysis determined, as noted in Chapter 1, that the Singing River Island and Double Barrel disposal areas could be operated and managed under current operating methods for about 9 more years before dike raising would be required. The Greenwood Island disposal area would have a service life of approximately 15 more years before dike raising would be required. Following those determinations, planning efforts focused on measures that would increase the useful life of the existing disposal areas.

The opportunity for gaining additional containment storage capacity through active site management including the dewatering of dredged material was identified. If an active dewatering program is implemented, a saving in storage capacity and service life between 30 and 40 percent could be realized. Therefore the assumption of a well-managed

dewatering program was made in evaluating various disposal alternatives.

Reclamation of fine-grained material onsite for dike upgrading was also identified as an opportunity for increasing storage capacity. If dikes must be raised for the next deposition of material, the use of material from within the area is thought to be beneficial pending tests to determine if such use is practical.

Another factor of importance identified in the planning process is the erratic use of the disposal areas by non-federal interests (the Jackson County Port Authority, for example). The disposal of JCPA/private interest dredging at erratic intervals may pose potential long-term reductions in site capacity caused by interference with an ongoing dredged material dewatering program. Thus, a long-term strategy for increasing the active life of the disposal areas should include the separation of federal and non-federal disposal requirements. As an alternative to separation, however, the non-federal dredging interests could accommodate their dredging needs to the approximate 18 month frequency of federal activities.

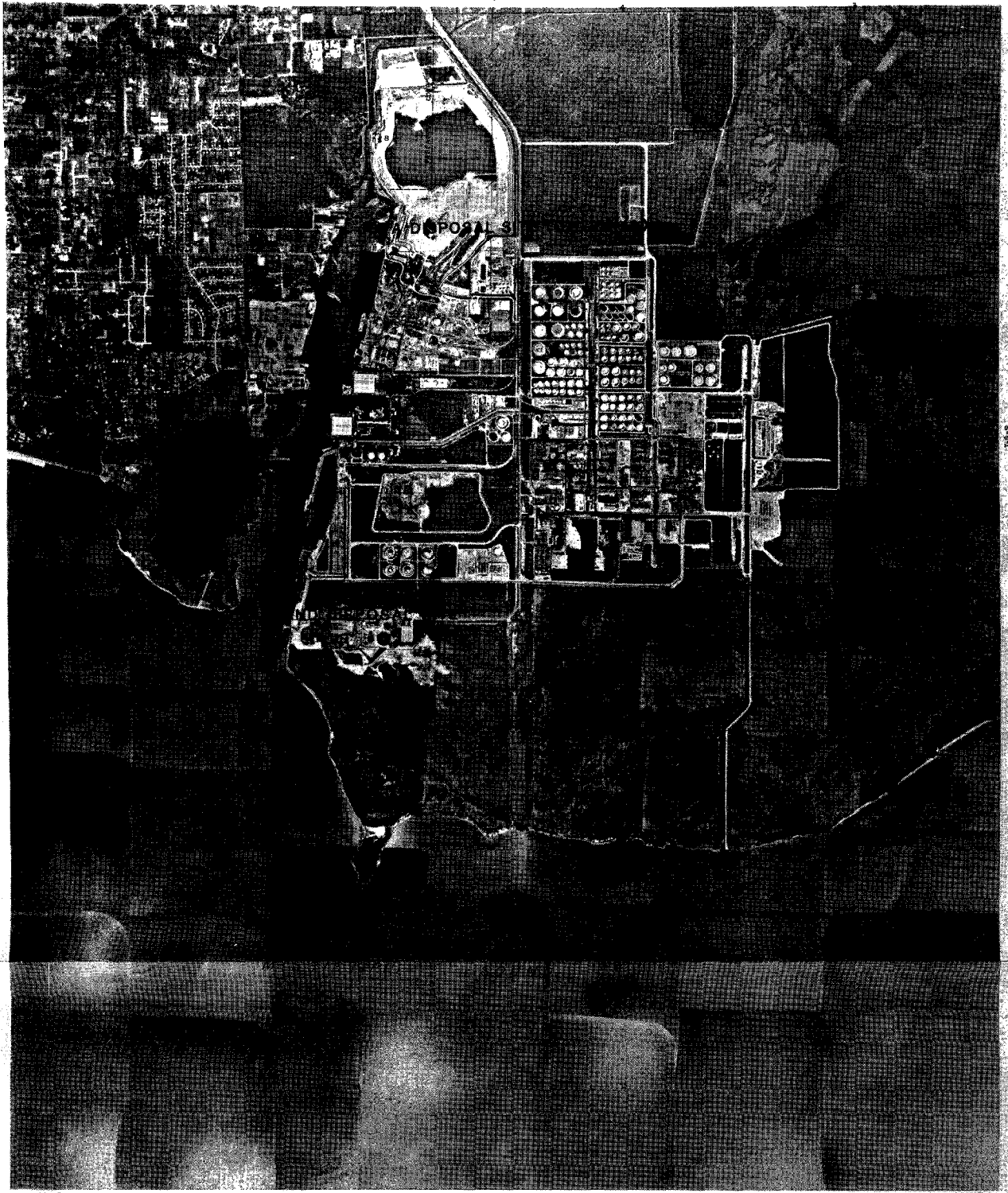
Federal dredging currently occurs, on the average, on 18 month intervals. Non-federal dredging occurs on a 24 to 36 month interval. To achieve the consolidation/ desiccation results required, non-federal disposal into the sites must occur at about the same time as federal disposal. Accordingly, close continuing coordination will be required to assure optimal use of the disposal areas in accordance to the developed management strategy.

Implementation of the long-term disposal plan contained in Appendix E will require additional engineering to confirm and refine the assumptions utilized. A complete foundation investigation is recommended for each disposal site. In addition, consolidation testing for both foundation and sediment samples is recommended to assess the storage capacities more accurately. This would enable refining the recommended dike heights and consolidation characteristics.

Refinement of the longevity of the disposal areas will be a continuing evaluation process as actual quantities of materials are deposited and the dewatering process undertaken. All efforts will be made to accommodate non-federal disposal needs during these evaluations. The Mobile District, Corps of Engineers will be responsible for implementing the long-term management plan to assure the long-term utilization of the disposal areas.



R-5-W



**FIGURE 23:  
SMA DREDGED MATERIAL DISPOSAL SITES**

JACKSON COUNTY PORT AUTHORITY  
 JACKSON COUNTY BOARD OF SUPERVISORS  
 BUREAU OF MARINE RESOURCES  
 SPECIAL MANAGEMENT AREA  
 PORT OF PASCAGOULA  
 BAYOU CASOTTE AREA

WYOMING, DELAWARE, VA. INC.  
 1950  
 JACKSON COUNTY, MISSISSIPPI  
 1950



## **CHAPTER 5: THE PORT OF PASCAGOULA SMA PLAN**

The Special Management Area (SMA) Plan for the Port of Pascagoula contains three types of provisions: provisions for operating under the Plan; provisions affecting development in specific geographic areas within the SMA boundaries; and general provisions which apply throughout the SMA. The specific geographic areas addressed in the SMA Plan are shown in Figures 24 and 25.

### **A. OPERATING PROVISIONS**

#### **1. Purpose and Use of the SMA Plan**

The SMA Plan is intended to balance the needs for water dependent development and environmental conservation in the Port of Pascagoula Special Management Area. The Plan identifies certain areas that are appropriate for water dependent development and certain other areas that are to be protected in a natural state. The Plan is also intended to provide guidance to the Jackson County Board of Supervisors (JCBS) and the Jackson County Port Authority (JCPA) and to federal and state agencies in carrying out their respective responsibilities with regard to the Section 10/404 regulatory process, the Section 401 water quality certification process, and certifications of consistency with the Mississippi Coastal Program (MCP) for development proposals within the Plan boundaries.

The JCBS/JCPA (local signatory agencies) will use the SMA Plan as the principal basis for designing specific development proposals for submission to the Mississippi Bureau of Marine Resources, Mississippi Bureau of Pollution Control, Mississippi Department of Archives and History, and U.S. Army Corps of Engineers. The Bureau of Marine Resources, Bureau of Pollution Control, Department of Archives and History, Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and National Marine Fisheries Service (signatory regulatory agencies) will use the SMA Plan as a guideline for interpreting their respective agency policies and responsibilities with regard to the acceptability of submitted development proposals within the Pascagoula SMA.

**2. BMR as Plan Trustee**

BMR will act as trustee of the SMA Plan and will be responsible for assuring the implementation of the agreed operational procedures, including procedures for future Plan amendments.

**3. Conveyance of County Property at Bangs Lake**

As mitigation for water dependent development in the Greenwood Island East, Upper Bayou Casotte, Singing River Island, and Pascagoula River Harbor Areas, as described in paragraphs B-2 through B-5 of the Area-specific Provisions, the 3500-acre parcel of county-owned property in the Bangs Lake Management Unit will be preserved in perpetuity. All development of this property will be barred except that essential for maintaining or improving public access and enjoyment, technical study or information gathering, cultural resource preservation or survey activities, and wetlands enhancement, creation, or restoration.

To provide for preservation, JCBS will convey title to this property to the Mississippi Commission on Wildlife Conservation for subsequent incorporation into the State's Wildlife Heritage Program. Conveyance of title will take place within 30 days of signing of the final Memorandum of Agreement by all participating agencies and their designates.

**4. Permitting**

The Plan intent is to increase the predictability of the permitting process by advance consideration and evaluation of water dependent development on an area-wide basis. The SMA process cannot, however, eliminate case-by-case permit decisions nor can it guarantee future permit issuance. Each of the signatory regulatory agencies retains its legal power and responsibility to review and comment on permit applications in the Port of Pascagoula SMA in accordance with its particular agency mission and statutory responsibilities.

Following receipt of a permit application from JCBS/JCPA, Litton, or the City of Pascagoula for a water dependent development activity within the Pascagoula SMA, BMR will determine whether or not the proposed activity is in conformance with the SMA Plan (and therefore in compliance with the provisions of the MCP). This compliance

determination will be made within 30 days of receipt of an application from the JCBS/JCPA or within 90 days of receipt of an application from Litton or the City of Pascagoula. BMR will consult with the signatory agencies before making a compliance determination.

Conforming applications. Determinations by BMR that proposed activities (conforming application) are in conformance with the SMA Plan will be transmitted to all signatory agencies.

Non-conforming applications. If BMR judges the proposed activity to be not in compliance with the MCP (non-conforming), BMR will either: (1) require the permit applicant to modify the proposal to achieve compliance and transmit such modification to all signatory agencies; or (2) consult with the applicant and the signatory agencies to resolve the non-compliance issue(s) within an additional 30 day period.

If the signatory agencies resolve the non-compliance issue(s), BMR will: (1) grant conditional compliance dependent on the specified project modifications; or (2) initiate procedures specified in Chapter 8 of the Mississippi Coastal Program to revise the MCP as necessary.

If the signatory agencies cannot resolve the non-compliance issue(s), BMR will maintain its finding of non-compliance.

##### **5. Annual Review of Plan Status**

To assure continued adherence to the SMA Plan as well as to identify needed amendments or clarifications, an annual review will be conducted. As part of this annual review, BMR will evaluate the status of SMA Plan implementation. JCPA will be responsible for providing information to BMR on the status of public water dependent development and mitigation activities in the Port of Pascagoula. BMR will in turn provide an annual status report to the signatory agencies.



## **6. Evaluation of Need for Amendments and Clarifications**

BMR will evaluate the need for amendment of the SMA Plan. BMR's evaluation will be conducted annually or more frequently as needed. JCBS/JCPA may request an amendment of the SMA Plan, in which case BMR will present the request to the Mississippi Commission on Wildlife Conservation for consideration no later than 30 days from receipt.

BMR will reconvene the signatory agencies to consider amendments to the Plan. BMR will coordinate with all signatory agencies any needed action by the JCBS/JCPA, the Mississippi Commission on Wildlife Conservation, and OCRM to amend the Plan. Amendments to the SMA Plan will be processed in accordance with the revision procedures contained in Chapter 8 of the MCP.

## **7. Acceptable Activities**

The term "acceptable activity" for the purposes of the SMA Plan refers to a water dependent development proposal which may be conceptual in nature and which is subject to all applicable laws and regulations, as well as the specific conditions contained in the SMA Plan.

### **B. AREA-SPECIFIC PROVISIONS**

#### **1. Greenwood Island West**

The development by the City of Pascagoula of a recreational marina on the west side of Greenwood Island is an acceptable activity provided that the proposed access road does not adversely affect the US Army, Corps of Engineers' Pascagoula Harbor Management Plan for Long Term Disposal of Dredged Material (USACE PHMP). Mitigation for the development at this site would consist of restoration of approximately 14 acres of former wetlands impacted by the old Highway 90 roadway. Dredged material will be deposited in an upland site or an existing, approved, diked disposal site. Jackson County will not be the permit applicant.

**2. Greenwood Island East**

Full development on the east side of Greenwood Island for water dependent industry is an acceptable activity provided the following major conditions are met:

- a. New dredging and disposal requirements do not adversely affect the USACE PHMP for the Greenwood Island disposal area;
- b. Future water quality impacts and cultural resource assessments are addressed through state review of the individual industrial activities and best available technology;
- c. The identified cultural resource site is preserved according to federal and Mississippi Department of Archives and History criteria.

Mitigation for development at this site will be accomplished by preservation of the 3,500-acre tract of county-owned land in the Bangs Lake area.

**3. Upper Bayou Casotte**

Northward extension of the Bayou Casotte Channel toward the Jackson County airport is an acceptable activity. New channel construction and filling for new water dependent development, however, will avoid the West Prong wetland area. The channel dimensions will be determined by:

- a. Present and future industrial needs;
- b. Engineering requirements associated with channel proximity to the gypsum disposal pile;
- c. Availability of adequate dredged material disposal capacity;
- d. Design criteria to minimize water quality impacts associated with dead-end canals;
- e. Economic feasibility.

The area immediately north of the existing terminus of the Bayou Casotte Channel can be dredged for use as a turning basin or retained for use as a dredged material disposal area for port and private use.

Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology. Mitigation for development at this site will be accomplished by preservation of the 3,500-acre tract of county-owned land in the Bangs Lake area.

#### **4. Singing River Island**

Water dependent development on the north and east sides of Singing River Island is an acceptable activity provided the following conditions are met:

- a. New development does not adversely affect the USACE PHMP for the Singing River Island disposal site;
- b. New development will not extend the existing shoreline of Singing River Island;
- c. Future water quality impacts and cultural resource assessments are addressed through state review of individual industrial activities and best available technology;
- d. Singing River Island wetlands on the west and south will be preserved for the life of the Plan and the existing disposal area on the island will not be increased in size beyond that required by the USACE PHMP.

A transportation corridor to serve new development on the north and east sides of Singing River Island is an acceptable activity provided the following conditions are met:

- a. That portion of the corridor over waterbottoms or marsh is supported by pilings;
- b. Any work channel necessary for construction of the corridor will be dredged west and north of the corridor, and the work channel will be limited to a bottom width of 90 feet and a depth no greater than ten feet;
- c. The centerline of the north-south portion of the corridor, including the work channel, will be located 2,000 feet west of the present western property line of Litton;
- d. Any marsh disturbed by construction will be restored to pre-project conditions.

Mitigation for development at this site will be accomplished by preservation of the 3,500-acre tract of county-owned land in the Bangs Lake area.

**5. Pascagoula River Harbor**

Dredging and development of the "D-dock" area and associated filling and use of wetlands east of the Ingalls' access road and south of Highway 90 for water dependent development is an acceptable activity.

Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology.

Mitigation for development at this site will be accomplished by preservation of the 3,500-acre tract of county-owned land in the Bangs Lake area.

**6. Highway 90 Mitigation Area**

Although partially outside SMA boundaries, the Highway 90 Mitigation Area is identified as acceptable for enhancement, creation, or restoration of wetlands to compensate for any unavoidable losses incurred as a result of any future development activities not described in paragraphs B-2 through B-5 above.

**7. Middle River Area**

The Middle River management unit includes the area bounded by the Mississippi Sound from the west bank of the West Pascagoula River to a north-south extension of Litton's western boundary, all south of the L & N Railroad. It is the intent of the Plan that no development in the Middle River Area will occur during the 15-year life of the Plan. With the exception of the transportation corridor to Singing River Island described in paragraph B-4 above, JCBS/JCPA will not develop or propose to develop in the Middle River Area during the life of the Plan. (Should a transportation corridor be constructed to Singing River Island, such as proposed for the U.S. Navy Homeporting and described in paragraph B-4, then that area west and north of the corridor will not be developed for a period of at least 50 years, and the area east of the corridor to Litton's western property line will not be developed for a period of at least 15 years.) Litton, however, may file a written proposal with BMR as Plan Trustee for expansion onto public lands in the Middle River Area immediately adjacent to the existing shipyard on the west bank of the Pascagoula River. If such a proposal is submitted, and approved by JCBS/JCPA, the signatory agencies will review such proposal and evaluate the need

for any amendment to the SMA Plan prior to the submission of any permit application. Any amendment to the SMA Plan will be accomplished in accordance with paragraph A-6 herein.

#### **8. Bangs Lake Area**

Privately owned lands in the Bangs Lake management unit will be considered as potential mitigation opportunity areas for wetlands enhancement, creation, restoration, and/or preservation to compensate for any unavoidable wetland losses incurred at future development sites not described above. Any development activities within the Bangs Lake area will be subject to all applicable federal and state laws and regulatory processes. Dredging and disposal activities to provide a navigable channel into Bayou Cumbest is recognized as being an acceptable activity subject to approval of dredging depths and a dredged material disposal plan. Nothing in this paragraph shall be construed to prohibit the Jackson County Port Authority making application to dredge Bayou Cumbest.

### **C. GENERAL PROVISIONS**

#### **1. Life of the Plan**

The SMA Plan will be in effect for 15 years from the date of signing of the Memorandum of Agreement by all participating agencies. By signing the Memorandum of Agreement, the signatory agencies bind themselves to the Plan for its duration, including the provision that if the Singing River Island transportation corridor as described in paragraph B-7 is constructed, then the area west and north of the corridor will not be developed for a period of at least 50 years.

#### **2. Cultural Resources**

Identification in the planning stage and/or appropriate preservation or mitigation of significant cultural resources shall be carried out for projects undertaken in the Greenwood Island West, Greenwood Island East, Upper Bayou Casotte, Singing River Island, Pascagoula River Harbor, and Middle River areas in accordance with the Area-specific Provisions of the SMA Plan. Significant cultural resources on public property

shall be designated as Mississippi Landmarks at the discretion of the Mississippi Department of Archives and History.

### **3. Private Development**

In the event that private parties submit applications for development involving dredging and filling of wetlands within the Pascagoula SMA, neither the Jackson County Port Authority nor the Jackson County Board of Supervisors will be responsible for performing mitigation for those private parties.

Application for development on privately owned or leased land within the SMA boundaries (other than in the Middle River Area as described in paragraph B-7 above) will be reviewed under the normal permitting process and be subject to mitigation as identified by the permit review agencies of the State of Mississippi and the federal government. Also, if the Tennessee Gas Transmission Company allows its property to revert to Jackson County's ownership, any water dependent development proposed by Jackson County will be handled under the normal permitting process.

NOTE: Normal permitting process is the review process of a joint application filed with the USACE and BMR for authorization to conduct Section 10 or 404 activities within the coastal zone of the State of Mississippi. This review includes opportunity for public comment and consultation with appropriate state and federal agencies to accomplish a complete public interest review.

### **4. Public Port Facilities**

The improvement, development, and expansion of public port facilities and federally authorized projects in the Pascagoula SMA are acceptable activities subject to conformance with applicable state and federal laws and regulations.

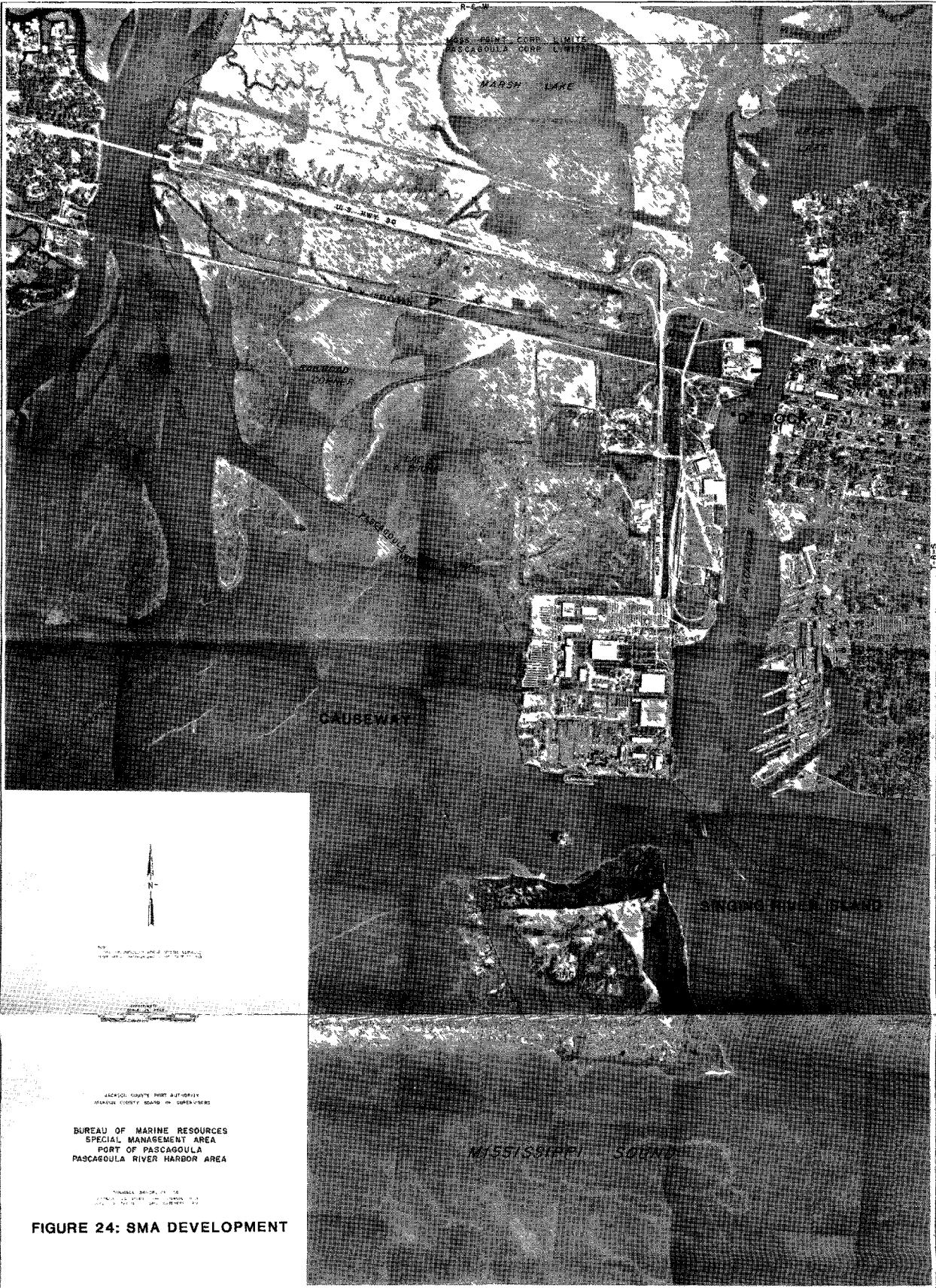
Note: The term "public port facilities" for the purposes of the SMA Plan means facilities owned or operated by the JCPA including but not necessarily limited to public terminals, wharfs, docks, piers, ramps, etc.

**5. Other Provisions of the MCP**

Except as specifically amended by this SMA Plan, the existing provisions of the MCP (including rules, regulations, guidelines, and procedures contained in Chapter 8) will remain in effect.

**6. Future Laws Which May Affect the SMA Plan**

Future laws which may render any provisions of the SMA Plan void shall not necessarily render the Plan or other provisions void.



**FIGURE 24: SMA DEVELOPMENT**



UPPER BAYOU CASOTTE EXTENSION

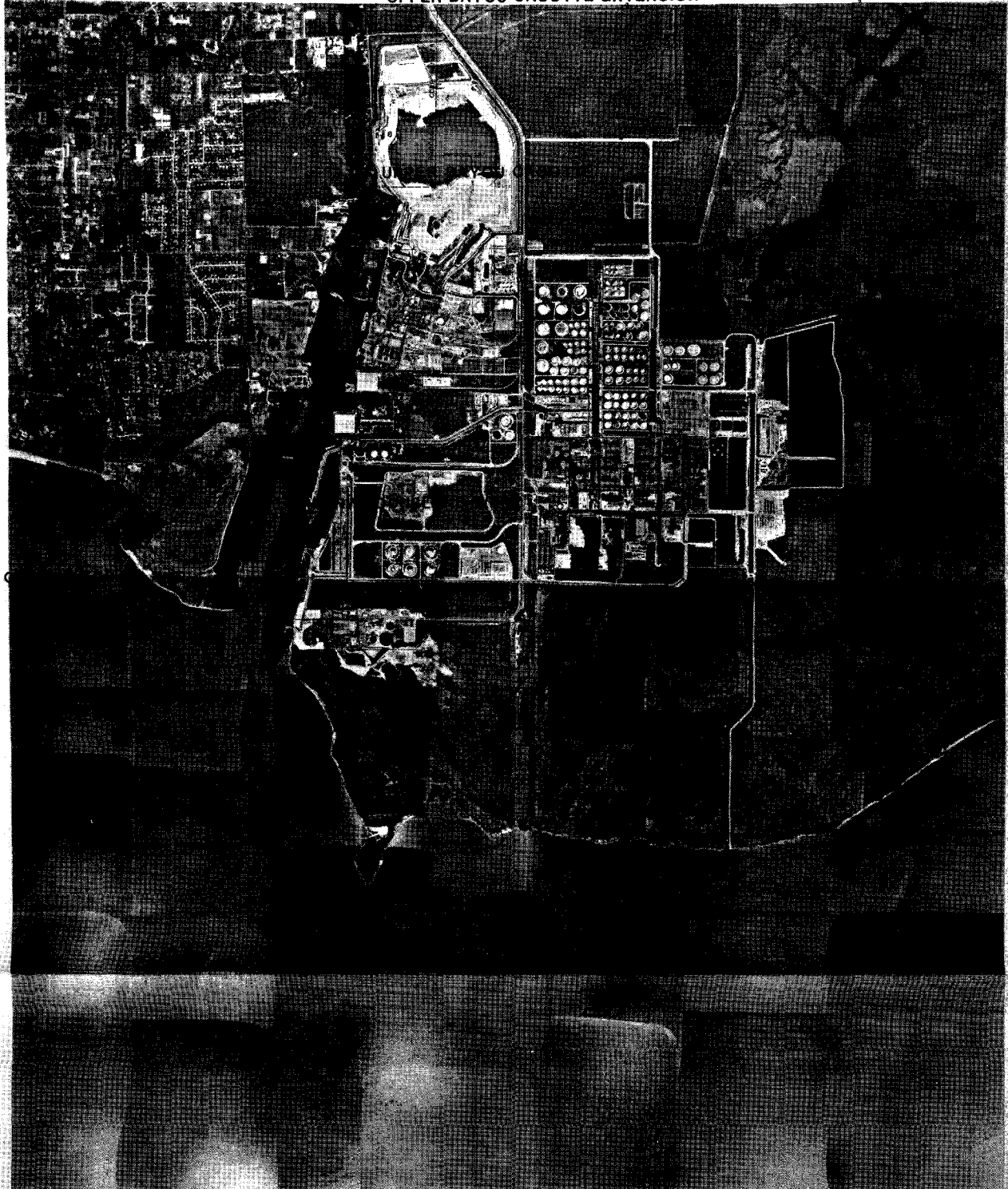


FIGURE 25: SMA DEVELOPMENT

JACKSON COUNTY WMT AUTHORITY  
JACKSON COUNTY BOARD OF SUPERVISORS  
BUREAU OF MARINE RESOURCES  
SPECIAL MANAGEMENT AREA  
PORT OF PASCAGOULA  
BAYOU CASOTTE AREA  
MICHAEL BAKER, JR. INC.  
CORPORATE HEADQUARTERS  
SCALE 1:25,000



**APPENDIX A:**

**PRELIMINARY LETTERS OF COMMITMENT**



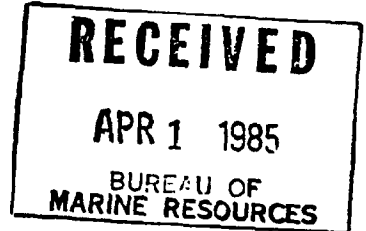
*Jerry,*

## United States Department of the Interior

FISH AND WILDLIFE SERVICE

75 SPRING STREET, S.W.  
ATLANTA, GEORGIA 30303

March 28, 1985



Dr. Richard Leard  
Mississippi Department of  
Wildlife Conservation  
Bureau of Marine Resources  
Post Office Box 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

This is in response to your memorandum of March 5, 1985, to all Task Force Members of the Pascagoula Harbor Special Management Area Plan. Mr. Larry Goldman, the Fish and Wildlife Service representative on the Task Force, has recommended that the plan be accepted, and the Memorandum of Agreement be signed.

It is the policy of FWS to have the Department of the Interior's Regional Solicitor review such agreements prior to signing. Therefore, I have sent the Plan and Agreement to the Regional Solicitor for review.

Planning efforts that have taken place to date have been useful and productive considering the complicated circumstances. Overall plans, such as have been developed for Pascagoula Harbor, are very worthwhile from our point of view. Therefore, this letter represents the intent of the FWS to sign the Memorandum of Agreement when it has been cleared by the Departmental Solicitor.

Sincerely yours,

James W. Pulliam, Jr.  
Regional Director

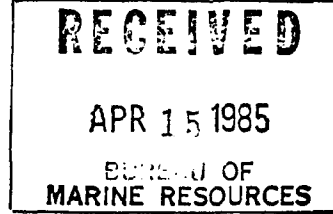
A. E. PIERCE  
District 1  
FRED ROBINSON, JR.  
District 2  
J. C. MAY  
District 3  
T. W. BRODNAX  
District 4  
DOUGLAS R. HOLDEN  
District 5  
LYNN PRESLEY  
Clerk

*Jerry*

**BOARD OF SUPERVISORS**  
**JACKSON COUNTY, MISSISSIPPI**

POST OFFICE BOX 998  
PASCAGOULA, MISSISSIPPI 39567  
601-769-3089

April 12, 1985



JIM E. WILLIAMS  
Administrator  
LOUIS GUIROLA, JR.  
Attorney

Dr. Richard L. Leard, Director  
Bureau of Marine Resources  
P.O. Drawer 959  
Long Beach, Mississippi 39560

Re: Memorandum of Agreement  
Letter of Intent - SMA

Dear Dr. Leard,

This is in response to your memorandum of March 5, 1985, to all Task Force Members of the Pascagoula Special Management Area Plan. Mr. Roger Clark, Jackson County's representative to the Task Force, and Mr. Karl Wiesenburg, Jackson County's legal advisor on the SMA Plan have reviewed all pertinent documents concerning this planning effort and have recommended that the plan be accepted and that the Memorandum of Agreement be signed by the Jackson County Board of Supervisors, as well as the Jackson County Port Authority.

Therefore, this letter represents the intent of the Jackson County Board of Supervisors and the Jackson County Port Authority to sign the Memorandum of Agreement after the actual document has been reviewed by Jackson County's legal counsel.

Sincerely,

JACKSON COUNTY BOARD OF SUPERVISORS

by: *Fred Robinson, Jr.*  
Fred Robinson, Jr., President

/lj

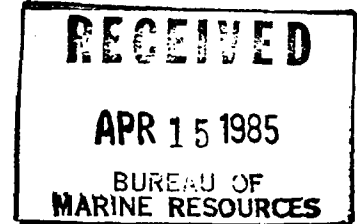


*Jerry*

STATE OF MISSISSIPPI  
DEPARTMENT OF ARCHIVES AND HISTORY

P. O. BOX 571  
JACKSON, MISSISSIPPI 39205-0571

April 10, 1985



BOARD OF TRUSTEES

- WILLIAM F. WINTER, PRESIDENT
- JOHN K. BETTERS WORTH
- ARCH DALRYMPLE III
- HERMAN B. DECELL
- FRANK E. EVERETT JR.
- MRS. MITCHELL ROBINSON
- ESTUS SMITH
- EVERETTE TRULY
- SHERWOOD W. WISE
- ELBERT R. HILLIARD  
DIRECTOR

Dr. Richard Leard  
 Director  
 Bureau of Marine Resources  
 Post Office Box 959  
 Long Beach, Mississippi 39560

RE: Draft SMA Plan for the Port of Pascagoula.

Dear Dr. Leard:

In response to your April 3, 1985, memorandum regarding the above plan, the Mississippi Department of Archives and History issues this letter of commitment. Provided the specific area of concern from our agency (namely the in-situ preservation of site 22JA516, located on Greenwood Island; the designation of significant sites on publicly owned property as "Mississippi Landmarks" by the Board of Trustees of the Department of Archives and History at the Board's discretion under the provisions of the State Antiquities Act; and the necessary surveys and or preservation/mitigation of public property in the Bangs Lake area.).

Our agency, of course, will continue to review and comment on individual public notices as issued by the Corps or BMR.

We appreciate the efforts of BMR in coordinating the planning for this SMA. It is most helpful in the protection of cultural resources to have a broad overview of areas potentially affected by industrial and recreational development.

We also look forward to assisting in the implementation of the plan as it pertains to those areas of our concern.

Sincerely,

ELBERT R. HILLIARD  
 State Historic Preservation Officer

*Roger G. Walker*

By: Roger G. Walker  
 Interagency Coordinator

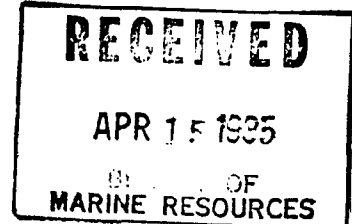
RGW/jc



MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES  
P.O. Box 20305  
Jackson, Mississippi 39209  
(601) 961-5000

*Jerry*

April 12, 1985



Dr. Richard Leard  
Bureau of Marine Resources  
Post Office Box 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

This is in response to your memorandum of April 3, 1985, requesting preliminary letters of commitment from the Task Force Members on the draft Pascagoula Harbor Special Management Area Plan.

We believe such efforts that plan for future development and environmental conservation are beneficial from a water quality standpoint. Therefore, this letter represents the intent of the Mississippi Department of Natural Resources to accept the plan and sign the Memorandum of Agreement.

Sincerely,

*Charlie L. Blalock*

Charlie L. Blalock  
Executive Director

CLB:hdb

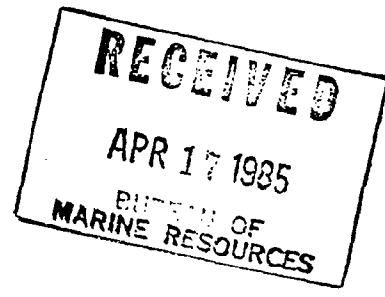
*Jerry*



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

APR 12 1985

F/SER113:EK  
904-234-5061



Dr. Richard Leard  
Mississippi Department of  
Wildlife Conservation  
Bureau of Marine Resources  
P.O. Drawer 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

This is in response to your memorandum of April 3, 1985, to the members of the Special Management Area Task Force in which you requested a preliminary letter of commitment from the participating agencies. Dr. Edwin Keppner, our agency representative, has recommended that the Special Area Management Plan for the Port of Pascagoula be accepted and that the Memorandum of Agreement be signed.

The current plan represents three years of work and has resulted in an overall development plan for water-dependent activities in the Port of Pascagoula. It is the intent of the National Marine Fisheries Service to sign the Memorandum of Agreement upon completion and review of the remaining environmental documents.

Sincerely yours,

*Jack T. Brawner*

Jack T. Brawner  
Regional Director



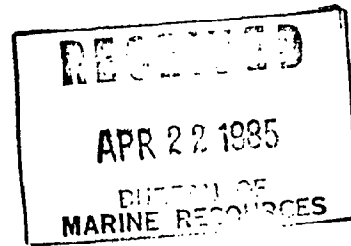


A handwritten signature in black ink, appearing to be "Jerry".

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET  
ATLANTA, GEORGIA 30365



APR 18 1985

4PM-EA/RGR

Dr. Richard L. Leard  
Mississippi Department of Wildlife  
Conservation  
Bureau of Marine Resources  
P.O. Drawer 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

This Agency is appreciative of the opportunity to participate in the Pascagoula Harbor Special Management Area Plan as part of the Coastal Zone Management Program for the State of Mississippi. We believe this is a positive approach to solving some of the problems that exist in most harbors throughout the Region.

The planning effort for Pascagoula Harbor should prove productive for orderly future development of the harbor. It is the intent of the Environmental Protection Agency to sign the Memorandum of Agreement between the Resource Agencies and the Pascagoula Port Authority formally stating agreement to the Plan.

Sincerely yours,

A handwritten signature in black ink, appearing to be "Charles R. Jeter".

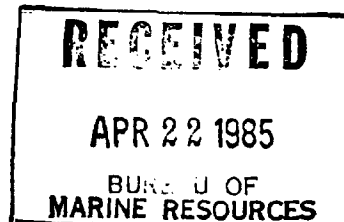
Charles R. Jeter  
Regional Administrator





*Jerry*

DEPARTMENT OF THE ARMY  
MOBILE DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 2288  
MOBILE, ALABAMA 36628-0001



REPLY TO  
ATTENTION OF:

April 19, 1985

Environmental Studies  
and Evaluation Section

Dr. Richard L. Leard  
Director  
Bureau of Marine Resources  
Mississippi Department of  
Wildlife Conservation  
Post Office Drawer 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

Reference is made to your memorandum of April 3, 1985, to the Task Force members of the Pascagoula Special Management Area (SMA) Plan concerning preliminary letters of commitment for the plan. My staff has indicated that the plan adequately reflects the concerns of the Corps of Engineers and have recommended that the plan be accepted and the Memorandum of Agreement signed.

The draft documentation is currently being reviewed by the Office of the Chief of Engineers in accordance with Corps policy. This letter represents the intent of the Corps of Engineers, Mobile District, to sign the Pascagoula SMA Memorandum of Agreement.

We believe that the planning efforts that have taken place concerning this effort will prove extremely useful to the participants of the SMA.

Sincerely,

*for Roy A. Prince, LTC*

Patrick J. Kelly  
Colonel, CE  
District Engineer



MEMORANDUM

April 29, 1985

WILLIAM A. ALLAIN  
Governor

**MISSISSIPPI  
DEPARTMENT  
OF WILDLIFE  
CONSERVATION**

**Bureau of  
Marine Resources**

P. O. Drawer 959  
Long Beach, MS 39560  
(601) 864-4602  
Enforcement  
Division - 374-3205

Commissioners:

Jim Hunter McCaleb  
Cleveland, MS

Lonnie Tadlock  
Morton, MS

A. G. Williams  
Osyka, MS

Joseph W. Gex  
Bay St. Louis, MS

S. T. Rayburn  
Oxford, MS

Lon Strong  
Executive Director

Richard L. Leard  
Bureau Director

TO: Pascagoula SMA and Pascagoula SMA Revision Files

FROM: Gary J. Cuevas

SUBJ: Mississippi Commission on Wildlife Conservation Action

The Mississippi Commission on Wildlife Conservation on April 15, 1985 authorized the staff of the Bureau of Marine Resources to begin the initiation of the procedures to incorporate the Pascagoula SMA plan into the Mississippi Coastal Program.

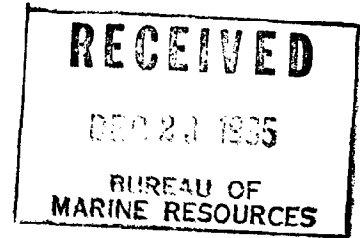
This action signifies the Commission's intent to eventually sign the MOA and implement the SMA plan.

**APPENDIX B:**

**ENVIRONMENTAL ASSESSMENT AND 404(b)(1) EVALUATION**



**DEPARTMENT OF THE ARMY**  
MOBILE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 2288  
MOBILE, ALABAMA 36628-0001  
December 20, 1985



REPLY TO  
ATTENTION OF:

Coastal Environment Section

Dr. Richard L. Leard  
Director  
Mississippi Bureau of Marine Resources  
Post Office Drawer 959  
Long Beach, Mississippi 39560

Dear Dr. Leard:

Enclosed are signed copies of the Environmental Assessment, Finding of No Significant Impact and 404(b)(1) Evaluation prepared by the Mobile District for the Port of Pascagoula Special Management Area Plan. These revised documents incorporate the changes discussed at the September 18, 1985 meeting relative to the Navy Homeport proposal.

The Mobile District is happy to have been part of the planning process for this and looks forward to working under the plan. Should you have any further questions, feel free to contact Dr. Susan Ivester Rees of my staff at (205)694-3857.

Sincerely,

A handwritten signature in dark ink, appearing to read "C. Hilton Dunn, Jr.", written over the typed name.

C. Hilton Dunn, Jr.  
Colonel, CE  
District Engineer

Enclosures

ENVIRONMENTAL ASSESSMENT  
AND  
FINDING OF NO SIGNIFICANT IMPACT (FONSI)  
PORT OF PASCAGOULA  
SPECIAL MANAGEMENT AREA

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ENVIRONMENTAL ASSESSMENT  
PORT OF PASCAGOULA  
SPECIAL MANAGEMENT AREA PLAN

1.0 Description of the Proposed Action. The purpose of this environmental assessment is to discuss the impacts associated with the incorporation of the Port of Pascagoula Special Management Area (SMA) Plan into the Mississippi Coastal Program (MCP). The Pascagoula SMA provides for a balance between the needs of development and environmental conservation in the region bounded on the north generally by US Highway 90, on the east by the Mississippi/Alabama state line, on the west by the west bank of the West Pascagoula River, and on the south by an imaginary east-west line in the Gulf of Mexico just north of 30°10' N (Figure EA-1). When the SMA Plan is incorporated into the MCP, it will become an authoritative, specific interpretation of the MCP for the area within the SMA boundary and will serve as the basis for state coastal wetlands permit decisions within these boundaries. The SMA process does not, however, eliminate case-by-case permit decisions nor does it guarantee future permit issuance. The SMA plan will be in effect for 15 years from the date of signing of the Memorandum of Agreement by all participating agencies. Participating agencies are: Mississippi Bureau of Marine Resources, Mississippi Bureau of Pollution Control, Mississippi Department of Archives and History, US Army Corps of Engineers, Environmental Protection Agency, US Fish and Wildlife Service, National Marine Fisheries Service, Jackson County Port Authority, and Jackson County Board of Supervisors.

The Port of Pascagoula SMA contains three major elements: area specific development proposals; a dredged material disposal management plan; and a mitigation plan for environmental resource losses associated with development. These elements are discussed in detail below.

1.1 Area-Specific Provisions. Proposed development of six areas within the SMA boundary is specifically included in the proposed action (See Figure EA-2).

1.1a Greenwood Island West - The development by the City of Pascagoula of a recreational marina on the west side of Greenwood Island is acceptable provided that the proposed access road does not adversely affect the long-term dredged material disposal management plan for the Greenwood Island disposal site. Dredged material will be deposited in an upland site or an existing, approved, diked disposal site.

1.1b Greenwood Island East - Full development on the east side of Greenwood Island for water dependent industry is an acceptable action provided the following major conditions are met: (1) new dredging and disposal requirements do not adversely affect the long-term dredged material disposal management plan for the Greenwood Island disposal site; (2) future water quality impacts and cultural resource assessments are addressed through

state review of the individual industrial activities and best available technology and; (3) the identified cultural resource site is preserved according to Federal and Mississippi Department of Archives and History criteria.

1.1c Upper Bayou Casotte - Northward extension of the Bayou Casotte Channel toward the Jackson County airport is an acceptable action. However, new channel construction and filling for new development will avoid the West Prong wetland area. The channel dimensions will be determined by: (1) present and future industrial needs; (2) engineering requirements associated with channel proximity to the gypsum disposal pile; (3) availability of adequate dredged material disposal capacity; (4) design criteria to minimize water quality impacts associated with dead-end canals; and (5) economic feasibility. The area immediately north of the existing terminus of the Bayou Casotte channel can be dredged for use as a turning basin or retained for use as a dredged material disposal area for port and private use. Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology.

1.1d Singing River Island - Development on the north and east sides of Singing River Island is an acceptable activity provided the following conditions are met: (1) new development does not adversely affect the long-term dredged material disposal management plan for the Singing River Island disposal site; (2) new development will not extend the existing shoreline of Singing River Island; (3) future water quality impacts and cultural resource assessments are addressed through state review of individual industrial activities and best available technology; and (4) Singing River Island wetlands on the west and south will be preserved for the life of the Plan and the existing disposal area on the island will not be increased in size beyond that required by the long-term management plan. A transportation corridor to serve this new development is an acceptable activity provided the following conditions are met: (1) that portion of the corridor over waterbottoms or wetlands is supported by pilings; (2) any work channel necessary for construction of the corridor will be dredged west and north of the corridor, and the work channel will be limited to a bottom width of 90 feet and a depth no greater than ten feet; (3) the centerline of the north/south portion of the corridor, including work channel, will be located 2,000 feet west of the present western property line of Litton; (4) any wetland area disturbed by construction will be restored to pre-project conditions.

1.1e Pascagoula River Harbor - Dredging and development of the "D-dock" area and associated filling and use of wetlands east of the Ingalls' access road and south of US Highway 90 is an acceptable activity. Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology.



1.1f Middle River Area - The Middle River management unit includes the area bounded by the Mississippi Sound from the west bank of the West Pascagoula River to a north-south extension of Litton's western boundary, all south of the L & N Railroad. It is the intent of the Plan that no development in the Middle River Area will occur during the 15-year life of the Plan. With the exception of the transportation corridor to Singing River Island described above, Jackson County Board of Supervisors (JCBS)/Jackson County Port Authority (JCPA) will not develop or propose to develop in this area during the life of the Plan. Should a transportation corridor be constructed to Singing River Island, such as proposed for the U.S. Navy Homeporting and described in paragraph 1.1d above, then that area west and north of the causeway will not be developed for a period of at least 50 years, and the area east of the corridor to Litton's western property line will not be developed for a period of at least 15 years. Litton, however, may file a written proposal with the Bureau of Marine Resources, Plan Trustee, for expansion onto public lands in the Middle River Area immediately adjacent to the existing shipyard on the west bank of the Pascagoula River. If such a proposal is submitted, and approved by JCBS/JCPA, the participating agencies will review such proposal and evaluate the need for any amendment to the SMA Plan prior to the submission of any permit application.

1.2 Dredged Material Disposal Management Plan. As part of the SMA planning efforts, the Corps of Engineers in cooperation with the Jackson County Port Authority developed a management plan for the long-term disposal of dredged material for the maintenance of the authorized Federal navigation project at Pascagoula Harbor. The plan includes guidelines to achieve the following specific objectives: (1) maximize volumetric disposal capacity at the three confined disposal areas over their remaining useful life; (2) dewater and densify fine-grained material, to the greatest extent practicable, to further increase storage capacity and improve potential for productive use; (3) reclaim and remove usable coarse-grained and dewatered fine-grained material for productive uses; and (4) plan, construct, and use disposal areas in a manner consistent with state water quality standards, the state coastal zone management plan, and Federal laws and regulations regarding the protection of water and air resources, cultural resources, and fish and wildlife resources. A copy of the plan is included as Appendix E.

1.3 Mitigation Plan. With the exception of the proposed development of Greenwood Island West which would be sponsored by the City of Pascagoula, all other proposals considered in the SMA would be developed by the Jackson County Port Authority/Jackson County Board of Supervisors. As mitigation for losses resulting from construction of the marina at Greenwood Island West, the City of Pascagoula will restore approximately 14 acres of former wetlands impacted by the old US Highway 90 roadway. As mitigation for the remaining area-specific provisions as discussed in Section 1.1 of this assessment, 3500 acres of county-owned lands in the Bangs Lake area will be preserved in perpetuity. These lands will be conveyed to the Mississippi Commission on Wildlife Conservation for subsequent incorporation into the State's Wildlife Heritage Program. All development of this property will be barred except that essential for public access and enjoyment, technical

study or information gathering, and wetlands enhancement, creation, or restoration. Provision of a reliable navigation channel in Bayou Cumbest is an acceptable activity provided that a suitable dredged material disposal plan can be developed. Also as part of the SMA mitigation plan the Jackson County Board of Supervisors/Jackson County Port Authority will not develop or propose to develop in the Middle River Area during the life of the Plan. Should a transportation corridor be constructed to Singing River Island, such as that described in 1.1d above, then that area west and north of the causeway will not be developed for a period of at least 50 years, and the area east of the corridor to Litton's western property line will not be developed for a period of at least 15 years. In addition, any wetlands disturbed during the construction of the transportation corridor and work channel would be restored to their natural condition upon completion of the channel.

In addition to these specific mitigation plans two other options were identified as acceptable for compensation for any unavoidable losses incurred as a result of development activities not specified in the SMA Plan. The Highway 90 Mitigation Area, although partially outside SMA boundaries, was identified as a possible site for enhancement, creation, or restoration of wetlands. Also, privately owned lands in the Bangs Lake area would be considered as potential mitigation opportunity areas for wetlands enhancement, creation, restoration, and/or preservation.

1.4 Other General Provisions of the SMA Plan. Identification in the planning stage and/or appropriate preservation or mitigation of significant cultural resources shall be carried out for the area-specific provisions as discussed in Section 1.1 of this assessment. Significant cultural resources on public property shall be designated as Mississippi Landmarks at the discretion of the Mississippi Department of Archives and History.

Applications for development on privately owned or leased land within the SMA boundary (other than in the Middle River Area as described in Section 1.1 above) will be reviewed under the normal permitting process and be subject to mitigation as identified through this process.

The improvement, development, and expansion of public port facilities and Federally authorized projects in the Pascagoula SMA are acceptable uses. Such uses shall conform with applicable state and Federal laws and regulations.

Except as specifically amended by the SMA Plan, the existing provisions of the MCP, including rules, regulations, guidelines, and procedures contained in Chapter 8 of the MCP, will remain in effect.

2.0 Need for the Proposed Action. Section 57-15-6 of the Mississippi Code of 1972 directed the Mississippi Marine Resources Council (now Bureau of Marine Resources) to prepare and implement a coastal program that established guidelines and procedures pursuant to the following goals:

(a) To provide for reasonable industrial expansion in the coastal area and to insure the efficient utilization of waterfront industrial sites so that suitable sites are conserved for water dependent industry;

(b) To conserve the resources of the coastal area for this and succeeding generations in accordance with the public policies expressed in Sections 39-7-3, 49-15-1, 49-17-3, 49-27-3 and 51-3-1, Mississippi Code of 1972;

(c) To consider the national interest involved in planning for and in the siting of facilities in the coastal area;

(d) To encourage the preservation of natural scenic qualities in the coastal area;

(e) To assist local governments in the provision of public facilities and services in a manner consistent with the coastal program; and

(f) To insure the effective, coordinated implementation of public policy in the coastal area of Mississippi comprised of Hancock, Harrison and Jackson Counties.

In addition Paragraph 5 of this Section of the Mississippi Code instructs: "After consultation with county port authorities, development commissions, and port and harbor commissions having jurisdiction in the coastal area, the council shall prepare as part of the coastal program a long-term plan for the development of suitable sites for water dependent industry. The council shall include in this plan provisions for the disposal of spoil material from dredging operations. In designating suitable sites for water dependent industry, the council shall consider the nature and extent of specific alterations that would serve a higher public interest pursuant to the development of these sites".

The legislation also provides that the council may enter into agreements with Federal, state, public or private agencies, departments, institutions, firms, corporations or persons to carry out its policies.

As described in the Mississippi Coastal Program of 1980, Special Management Areas are designated because their economic or recreational opportunities can be effectively realized in an environmentally sound way through site specific planning and management. The purpose of these designations are four-fold: (1) to apply the general provisions of the coastal program to specific geographical areas; (2) to streamline regulatory decisions in these areas through planning for and resolving permit conflicts in advance of individual development projects being implemented; (3) to coordinate regulatory decisions with the affirmative development efforts of the coastal program and of local governments; and (4) to provide assistance to local governments to plan for public facilities and services in areas whose use is historically, economically, and culturally tied to coastal waters.

The planning for the Port of Pascagoula Special Management Area began in early 1982 with the establishment of a Task Force whose role was to prepare the management plan and in so doing provide for the orderly development of suitable sites and protection of the coastal resource. Preliminary Letters of Commitment to the proposed Pascagoula SMA were signed by each of the

participating agencies in May 1985 and conveyance of the Bangs Lake property has begun. The sequence of steps leading to the implementation of the Port of Pascagoula SMA is described in detail in Chapter 4 of the SMA Plan which this assessment accompanies.

This Environmental Assessment and FONSI and accompanying 404(b)(1) Evaluation relate not only to the implementation of the Special Management Area Plan but also to a programmatic assessment of development actions which will require Department of Army permits via Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. The preparation of this environmental documentation allowed for the assessment of the cumulative impacts of the proposed actions and the preparation of a comprehensive mitigation plan to offset these impacts. Due to the conceptual nature, however, of many of the proposed development activities supplemental environmental documentation may be required for a specific action. This supplemental environmental documentation would be prepared by the Corps of Engineers prior to permit issuance.

3.0 Existing Environmental Setting Without the Project. The Port of Pascagoula SMA is located in Jackson County in southeastern Mississippi. Pascagoula, the largest city within the county, has a population of approximately 118,000 and serves as a major industrial and market center. The Special Management Area encompasses the region bounded on the north generally by US Highway 90, on the east by the Mississippi/Alabama state line, on the west by the west bank of the West Pascagoula River, and on the south by an imaginary east-west line in the Gulf of Mexico just north of 30° 10' N (Figure EA-1). Significant structural features within this area include the deep draft navigation project, numerous shipbuilding and related industries, oil refinery facilities, chemical industries and other water dependent industries.

The major biotic communities within the project area are nearshore Gulf of Mexico, estuarine and palustrine open waters, emergent wetlands, aquatic beds, barrier island, bottomland and upland forests, agricultural, and urban areas. Numerous game animals and migratory waterfowl utilize the vegetative habitats. Commercial fisheries utilize the wetland and open water areas of the SMA region throughout their life cycles. Many of the economically important commercial species are dependent upon the resources provided by the estuarine system. A number of threatened or endangered species may occur within the study area, however none of the actions considered herein would impact any of these species. Currently there are no designated critical habitats of endangered species with the SMA boundaries. The critical habitat of the Mississippi Sandhill Crane (Grus canadensis) lies to the west of the SMA region, however none of the actions considered in this assessment would impact this species or its' habitat.

The Mississippi Coastal Program and Final Environmental Impact Statement, prepared by the Mississippi Department of Wildlife Conservation (Bureau of Marine Resources) and US Department of Commerce, National Oceanic and

Atmospheric Administration, Office of Coastal Zone Management, and coordinated to concerned Federal, state, and local agencies and the public on 22 August 1980 briefly summarized the environmental setting for the MCP which pertains to the areas of Hancock, Harrison and Jackson Counties including the waters of the Mississippi territorial sea. More recent discussions on the resources of the region in question may be found in the US Army Corps of Engineers Mississippi Sound and Adjacent Areas Study report (1984), the US Army Corps of Engineers Environmental Assessment for the Implementation of a Comprehensive Disposal Site Management Plan and Open Water Disposal, Maintenance Dredging Activities, Upper Pascagoula Harbor, Jackson County, Mississippi (circulated in January 1985), and the US Army Corps of Engineers Pascagoula Harbor, Mississippi Feasibility Report and Final Environmental Impact Statement (1985). A more detailed discussion of the environmental resources of the Port of Pascagoula SMA is contained in Chapter 3 the Special Management Area Plan which this Environmental Assessment accompanies.

4.0 Probable Environmental Impact of the Proposed Action. The environmental impacts associated with the adoption of the Port of Pascagoula SMA are associated with the area specific provisions, the long-term dredged material management plan, and the mitigation plan as discussed in Section 1 above.

4.1a Greenwood Island West. Development of this area as planned would result in the filling of approximately 12 acres of wetlands and shallow water bottoms and dredging of approximately 7 acres of wetlands and shallow water bottoms to a depth of minus 8 feet NGVD during the construction of the proposed recreational marina. Wetlands in the area are characterized by a Spartina alterniflora fringe and a mixture of Juncus roemerianus, S. patens, and Baccharis halimifolia landward of the fringe. Shallow water bottoms in this area have been described as highly productive coastal margin muds (USACE, 1984). Construction of the marina would result in the loss of the vegetated habitat and attendant wildlife. Shallow bottoms would be converted to deeper bottoms which would provide habitat for many of the same species which utilize the shallow bottoms. Also associated with the construction activities would be short term and minor increases in turbidity, nutrient abundance, and noise. These impacts are to be mitigated with the restoration of approximately 14 acres of previously impacted wetlands within the general area.

4.1b Greenwood Island East. Development of this area into a water dependent industrial site would result in the filling of 70 acres of wetlands on Greenwood Island and the filling of 10 acres of shallow water bottoms within Bayou Casotte. The wetlands and water bottoms to be filled are similar to those described for Greenwood Island West above. In addition, an undetermined number of acres in the mouth of Bayou Casotte would be converted to deep (38-foot) bottoms with the construction of the proposed turning basin. Also associated with the construction activities would be short term and minor increases in turbidity, nutrient abundance,

and noise levels. These losses are to be mitigated through the preservation, in perpetuity, of 3500 acres of county owned lands (wetlands) in the Bangs Lake area.

4.1c Upper Bayou Casotte. A conceptual development plan was submitted during the SMA planning process which would result in the filling of 18 acres of wetlands during construction of the industrial site and dredging of 12 acres of wetlands in the extension of the Bayou Casotte Channel. Additional impacts could result with the full development of this area as outlined in Section 1.1c above. The wetlands in this area are more diverse than those described for Greenwood Island due to the addition of more species characteristic of brackish areas. The wetlands proposed for development are in areas which have been previously impacted by various activities. The highly productive 'West Prong' wetlands would be preserved from development during the life of the plan. These impacts are to be mitigated through the preservation, in perpetuity, of 3500 acres of county owned lands (wetlands) in the Bangs Lake area.

4.1d Singing River Island. The conceptual plan as presented to the SMA Task Force involved the filling of an undetermined number of acres of wetlands on the north and east sides of the Singing River Island disposal site during the construction of water dependent facilities. This filling of wetlands, however, would not result in the extension of the island shoreline. In addition an approximately 7,900-foot long causeway may be constructed from the mainland to the island. The construction of the causeway, should it proceed, would require the construction of a 175-foot by 10-foot work channel with a bottom width of 90 feet from south of the Double Barrel disposal area to the island. Approximately 11.6 acres of wetlands and 20 acres of waterbottoms would be dredged during construction of the work channel. The materials dredged from these areas would be sidecast onto adjacent lands resulting in the covering of approximately 13.3 acres of wetland and 22.9 acres of waterbottoms. Wetlands in this area are characterized by S. alterniflora, J. roemerianus, and S. patens. Because of the conceptual nature of the plan other impacts could occur with the development of these facilities including filling and or dredging of shallow water bottoms. These impacts will be mitigated for by the preservation, in perpetuity, of 3500 acres of county owned lands (wetlands) in the Bangs Lake area. In addition, upon completion of the causeway, the wetland area impacted, approximately 24.9 acres, would be restored to natural conditions. The waterbottoms impacted would not be restored and the work channel in open water would not be filled.

4.1e Pascagoula River Harbor. Construction of the 'D-Dock' wharf facility would result in the conversion of 19 acres including a formerly used disposal site, a fringe of roseau cane (Phragmites communis) and shallow water bottoms to an 11-acre 38-foot deep basin and 8 acres of docks and associated structures. In addition, five areas have been designated to accept excavated materials. Use of these areas would result in the filling of approximately 56 acres of which 8.7 acres comprise a pond and 39 acres are impounded wetlands, 34 acres of which have been disturbed by previous

activities. The pond, which is isolated from tidal action, is vegetated with cattails (Typha spp.) along its west and northeast perimeters. The impounded wetlands are characterized by Spartina patens, Scirpus robustus, Juncus roemerianus, Phragmites communis, Myrica cerifera, Baccharis halimifolia, and Salix nigra. Loss of these areas would impact numerous small mammals and passerine and wading birds. These impacts are to be mitigated through the preservation, in perpetuity, of 3500 acres of county owned lands (wetlands) in the Bangs Lake area.

4.1f Middle River. The Middle River area is an extensive pristine brackish wetland in the delta region of the Pascagoula River System. Should a transportation corridor be constructed to Singing River Island, a work channel on the west side of the proposed corridor route would be acceptable under the SMA Plan. The only development that can be considered in this area during the life of the SMA plan is a potential proposal by Litton Industries to expand their west bank shipyard facilities onto public lands immediately adjacent to the existing facilities. Any proposal would have to be submitted to Bureau of Marine Resources and approved by JCBS/JCPA prior to review by the signatory agencies. The signatory agencies would then evaluate the need for an amendment to the SMA. Any amendment deemed necessary would be accomplished in accordance with the procedures set forth in the Operating Provisions of the SMA Plan.

Generic impacts associated with the use of Middle River wetlands would result in significant losses to the estuarine ecosystem of eastern Mississippi Sound in terms of habitat reduction, detrital export reduction, water quality degradation, and loss of storm energy abatement capabilities. To compensate for these losses, a mitigation plan would be required in addition to that considered in this SMA plan.

4.2 The management plan for the long-term use of the confined disposal sites at Greenwood Island, Singing River Island and Lowery Island (Double Barrel site) will reduce the need for additional confined disposal sites to accommodate the maintenance of the federal navigation project by maximizing the useful life of these sites. In order for the management plan to be effective, a dewatering period of approximately 16 months duration will be required. During this time disposal into these sites would be curtailed except on an emergency basis. In addition limits to the amount of non-federal quantities which can be placed on the sites during a time period are specified. In developing the conceptual management plan, it was assumed that only maintenance materials would be placed in these sites. A more detailed plan is currently being prepared which will specify the quantities of material to be placed in the sites and the period of dewatering. This management plan could result in impacts to non-federal dredging interests, including state, public and private concerns, by restricting their use to the time immediately before or after maintenance of the federal project.

The application of the management plan could result in the need for additional confined or upland disposal sites to be used by non-federal

interests for material which could not be placed in the existing sites in a manner which would be compatible with the management activities. All efforts would be made, however, to finalize a plan which best responds to the needs of all, not just the federal navigation project, relative to disposal of dredged materials.

4.3 The proposed mitigation plans will sufficiently offset the losses associated with the area specific provisions discussed above. In addition other areas have been identified as suitable for mitigation efforts for proposals not specifically covered by this SMA Plan.

4.3a The restoration of approximately 14 acres of impacted wetlands in the Highway 90 mitigation area will mitigate for the filling of approximately 12 acres of wetlands on the western side of Greenwood Island. This restoration and subsequent protection of the area will serve to enhance the productivity of the area in question as well as to provide habitat for mammals and birds which utilize these areas.

4.3b The preservation of 3500 acres of county owned wetlands within the Bangs Lake area will ensure the continued productivity of the Point aux Chenes Bay area.

4.3c The restoration of any wetland areas impacted by the proposed transportation corridor to Singing River Island would offset the impacts caused by the construction of the required work channel.

4.3d The preservation of Middle River wetlands for at least 15 years will serve to maintain the productivity of the Pascagoula River delta area.

4.3e The designation of privately owned lands within the Bangs Lake area as suitable for additional mitigative efforts presents an excellent opportunity for the preservation of a large expanse of highly productive and environmentally sensitive estuarine wetland in Mississippi. The impacts associated with this action would be a positive step toward maintaining coastal resources within Mississippi.

4.4 The proposed action will have no adverse impacts on endangered species or cultural resources. The proposed action is consistent with the Mississippi Coastal Program.

5.0 Any Adverse Environmental Effects Which Cannot Be Avoided. Section 4 of this assessment discusses the impacts associated with the area specific development proposals considered in the Port of Pascagoula SMA. The adverse environmental effects are associated with the filling of wetlands in the development of facilities for water dependent activities. There are no other practicable alternatives to these actions. These adverse impacts will be mitigated through the restoration of degraded wetlands, the restoration of wetlands impacted through the construction of the transportation corridor



to Singing River Island, the preservation of the Middle River wetlands for a period of from 15 to 50 years, and the preservation, in perpetuity, of 3500 acres of wetlands in the Bangs Lake area.

6.0 Alternatives to the Proposed Action. The only alternative to this action which has been considered is the "No Action" alternative. Under the "No Action" alternative, the general provisions of the Mississippi Coastal Program would continue to be applied to the region defined in Section 1.0 of this assessment.

The specific goals related to SMA plan would not be achieved under the "No Action" alternative (See Section 2.0, page EA-5). The "No Action" alternative would not provide for an integrated planned balance between the needs of development and environmental conservation. Each of the specific development proposals would be dealt with on an individual basis with the associated expenditure of manpower and financial resources. The opportunity to adequately assess and mitigate for cumulative impacts of these several proposals would be lost. There would not be a comprehensive long-term management plan for the confined disposal sites in the area and the savings accredited to this plan in disposal capacity would not be realized. The pristine Bangs Lake wetlands would remain as property of Jackson County and could be subject to development pressures in the future. The Middle River area would be subject to development pressures in the absence of the SMA Plan.

7.0 Relationship of Plan to Environmental Requirements. The relationship of the proposed SMA to Federal statutes is shown on Table EA-1.

8.0 Consideration of the 404(b)(1) Guidelines. The effects of the proposed discharges of dredged materials were evaluated in this Environmental Assessment including consideration of the 404(b)(1) Guidelines (Appendix C). The effects of the proposed discharges included the conversion of at least 143 acres of wetlands and 23 acres of shallow water bottoms to industrial sites; insignificant impacts from the release of chemical constituents; and changes in the biological communities. A detailed discussion of the effects of the discharge of dredged material is contained in Section 4 of the Environmental Assessment. Feasible alternatives to the proposed discharge have been considered and none that are practicable will have less adverse impact on the aquatic or semi-aquatic ecosystem. The proposed discharges would have no unacceptable environmental impacts on the aquatic and semiaquatic ecosystem. The discharges will be accomplished under conditions which will minimize, to the extent practicable, adverse environmental effects on the aquatic and semiaquatic sites. Unavoidable impacts are adequately mitigated through restoration and preservation of wetlands. The disposal sites are being specified through application of the 404(b)(1) Guidelines.

9.0 Coordination with Others. Planning for the Port of Pascagoula Special Management Area began in early 1982 with the establishment of a Task Force. Members of the Task Force included: Mississippi Bureau of Marine Resources (BMR), Mississippi Bureau of Pollution Control, Mississippi Department of Archives and History, US Army Corps of Engineers, Environmental Protection Agency, US Fish and Wildlife Service, National Marine Fisheries Service, Jackson County Port Authority, and Jackson County Board of Supervisors. The role of the Task Force was to prepare the management plan and in so doing, provide for the orderly development of suitable sites and protection of the coastal resources. Preliminary Letters of Commitment were signed by the signatory (task force) agencies in early May 1985. The draft Environmental Assessment, Finding of No Significant Impact (FONSI), and 404(b)(1) Evaluation were reviewed by the task force members in July 1985. A public hearing on the Special Management Area Plan was held 25 September 1985. Comments received at the hearing and during the review period have been addressed in the text of the SMA document.

Table EA-1

Relationship of Plan to Environmental Requirements

Federal Statute	Compliance
Archeological and Historic Preservation Act	FC
Clean Air Act	FC *
Clean Water Act	FC
Coastal Zone Management Act	FC *
Endangered Species Act	FC
Estuary Protection Act	NA
Federal Water Project Recreation Act	FC
Fish and Wildlife Coordination Act	FC
Land and Water Conservation Fund Act	FC
Marine Protection, Research and Sanctuaries Act	FC
National Historic Preservation Act	FC
National Environmental Policy Act	FC *
Rivers and Harbors Act	FC
Watershed Protection and Flood Prevention Act	NA
Wild and Scenic Rivers Act	NA

The compliance categories used in this table were assigned based upon the following definitions:

Full Compliance (FC) - The plan has met all requirements of the statute for this stage of planning.

\* Compliance with the Coastal Zone Management Act will be met upon the amendment of the Mississippi Coastal Program to incorporate the Port of Pascagoula SMA. Compliance with the National Environmental Policy Act will be met upon the signing of the Final Environmental Assessment and Finding of No Significant Impact. Compliance with the Clean Air Act will be noted upon completion of coordination with the Environmental Protection Agency pursuant to Section 307 and 176(c) of the Act.

Partial Compliance (PC) - The plan has not met all the requirements of the statute for this stage of planning.

Noncompliance (NC) - The plan is in violation of a requirement of the statute.

Not Applicable (NA) - The requirements of the statute are not applicable to the plan.

FINDING OF NO SIGNIFICANT IMPACT  
(FONSI)  
FOR  
PORT OF PASCAGOULA  
SPECIAL MANAGEMENT AREA PLAN

Based on the results of the Environmental Assessment and the 404(b)(1) Evaluation, it is concluded that the environmental impacts associated with the considered action are minor and that the preparation of an Environmental Impact Statement is not required. Specific factors considered in making this determination include:

- a. Turbidity generated by the dredging and disposal operations would be short-term and minor in nature and within the natural variability of the system. Future water quality impacts will be addressed through state review of the individual industrial activities and best available technology. See page EA-6 through EA-8, Section 4.1, of the Environmental Assessment.
- b. Unavoidable impacts have been mitigated. See page EA-9, Section 4.3, of the Environmental Assessment.
- c. The material to be disposed contains no substances in excess of toxic effluent standards or prohibited under Section 307 of the Clean Water Act. See page EA-10, Section 8.0, of the Environmental Assessment.
- d. No endangered or threatened species or their critical habitat would be affected by the proposed work. See page EA-6, Section 3.0, of the Environmental Assessment.
- e. The archeological site on Greenwood Island would be preserved according to Federal and Mississippi Department of Archives and History criteria. At the other sites in question cultural resource assessments will be addressed through state review of individual industrial activities and best available technology. See page EA-1 through EA-3, Section 1.1, of the Environmental Assessment.
- f. Feasible alternatives to the proposed discharges have been considered and none that are practicable will have less adverse impacts on the aquatic and semiaquatic ecosystem.
- g. There are no unacceptable environmental impacts on the aquatic and semiaquatic ecosystem as a result of the proposed discharges.
- h. The discharges will be accomplished under conditions which will minimize, to the extent practicable, adverse environmental effects to the aquatic and semiaquatic ecosystem.

i. The discharge would not violate the Specified Protection Measures for Marine Sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

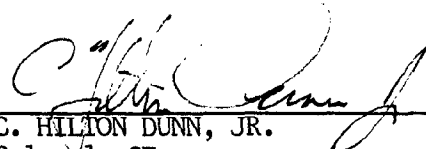
j. All adverse effects on human health and welfare resultant from the proposed discharge of fill materials have been mitigated. Included in these effects are impacts to municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values would not occur. See page EA-9, Section 4.3, of the Environmental Assessment.

k. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems have been included in this evaluation.

The proposed discharge has been evaluated in accordance with the 404(b)(1) Guidelines promulgated by the Environmental Protection Agency, dated 5 September 1975, and found to have no significant effects on the environment.

DATE

20 Dec 85

  
C. HILTON DUNN, JR.  
Colonel, CE  
District Engineer

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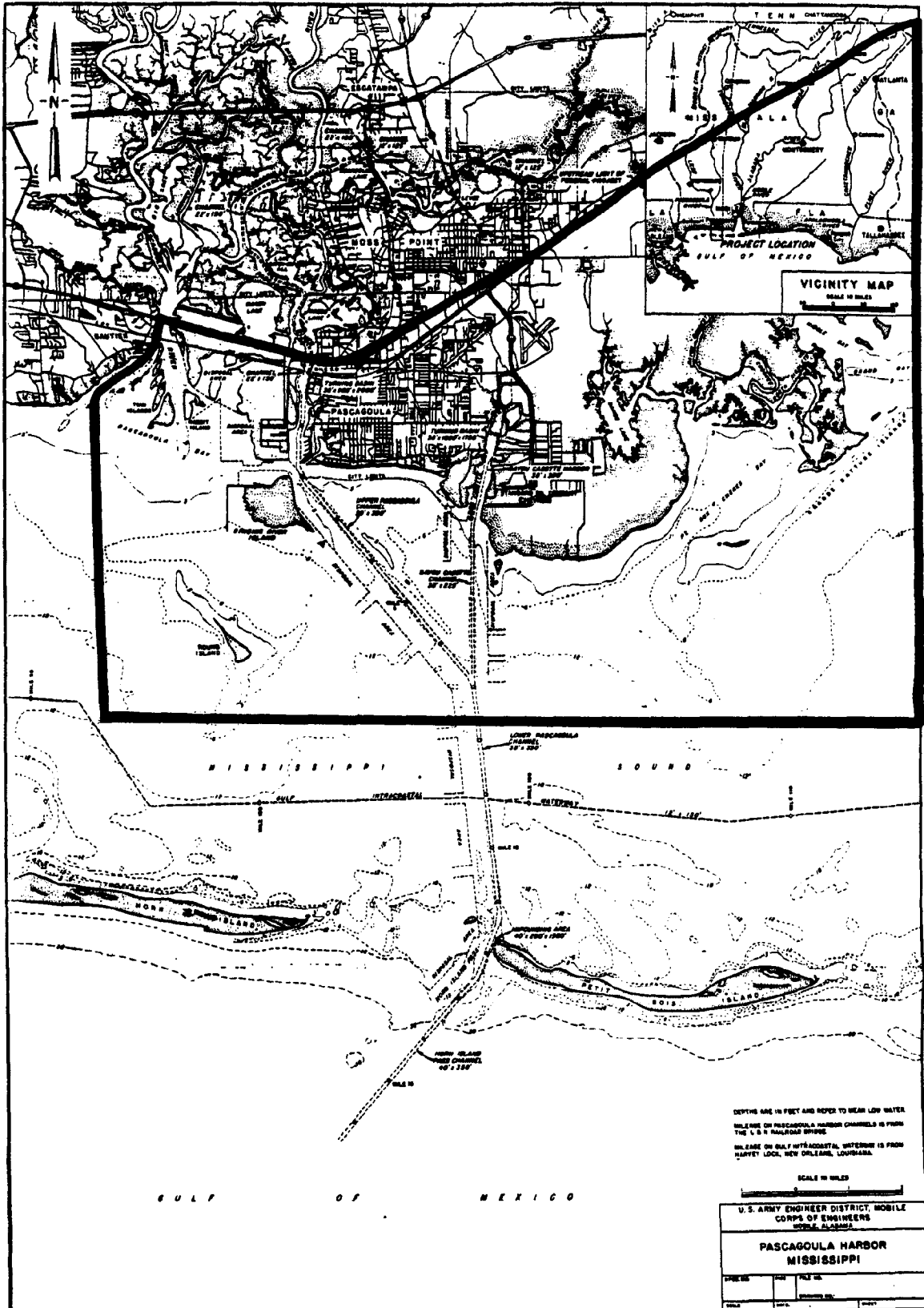


Figure EA-1 Port of Pascagoula Special Management Area

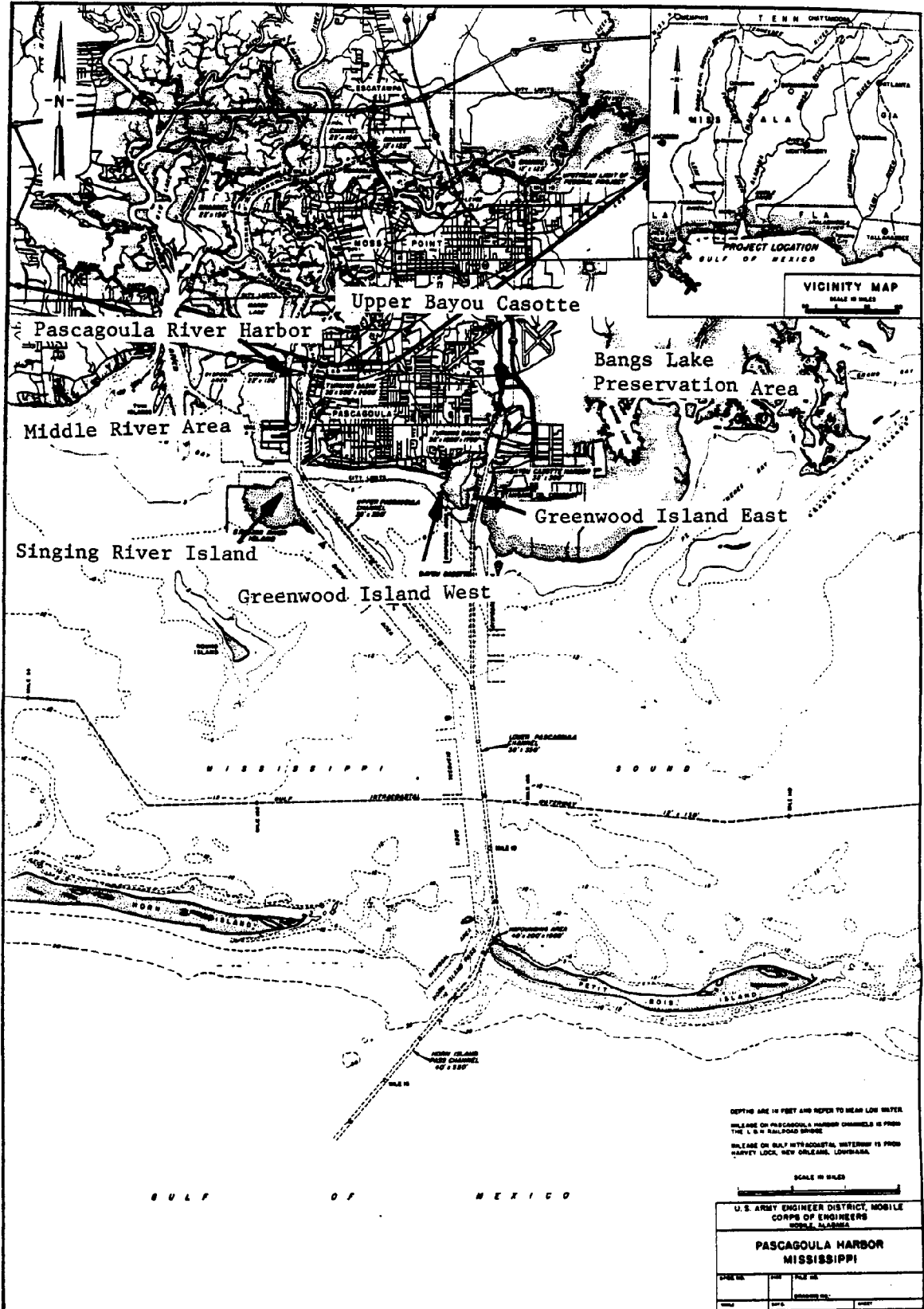


Figure EA-2 Area Specific Development Provisions



404(b)(1) Evaluation

Section 404(b)(1) Evaluation  
for  
Port of Pascagoula  
Special Management Area Plan

1.0 Project Description.

1.1 Location. The Port of Pascagoula Special Management Area (SMA) Plan applies to the region bounded on the north generally by US Highway 90, on the east by the Mississippi/Alabama state line, on the west by the west bank of the West Pascagoula River, and on the south by an imaginary east-west line in the Gulf of Mexico just north of 30° 10' N.

1.2 General Description. The proposed plan consists of three major elements: area specific development proposals; a dredged material disposal management plan; and a mitigation plan offsetting unavoidable environmental resource losses. The area specific development proposals would result in the filling of emergent wetlands and shallow water bottoms and are described in detail below.

1.2a Greenwood Island West - The development by the City of Pascagoula of a recreational marina on the west side of Greenwood Island is acceptable provided that the proposed access road does not adversely affect the long-term dredged material disposal management plan for the Greenwood Island disposal site. Dredged material will be deposited in an upland site or an existing, approved, diked disposal site.

1.2b Greenwood Island East - Full development on the east side of Greenwood Island for water dependent industry is an acceptable action provided the following major conditions are met: (1) new dredging and disposal requirements do not adversely affect the long-term dredged material disposal management plan for the Greenwood Island disposal site; (2) future water quality impacts and cultural resource assessments are addressed through state review of the individual industrial activities and best available technology; and (3) the identified cultural resource site is preserved according to Federal and Mississippi Department of Archives and History criteria.

1.2c Upper Bayou Casotte - Northward extension of the Bayou Casotte Channel toward the Jackson County Airport is an acceptable action. However, new channel construction and filling for new development will avoid the West Prong wetland area. The channel dimensions will be determined by: (1) present and future industrial needs; (2) engineering requirements associated with channel proximity to the gypsum disposal pile; (3) availability of adequate dredged material disposal capacity; (4) design criteria to minimize water quality impacts associated with dead-end canals; and (5) economic feasibility. The area immediately north of the existing terminus of the Bayou Casotte channel can be dredged for use as a turning basin or retained for use as a dredged material disposal area for port and private use.

Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology.

1.2d Singing River Island - Development on the north and east sides of Singing River Island is an acceptable activity provided the following conditions are met: (1) new development does not adversely affect the long-term dredged material disposal management plan for the Singing River Island disposal site; (2) new development will not extend the existing shoreline of Singing River Island; (3) future water quality impacts and cultural resource assessments are addressed through state review of individual industrial activities and best available technology; and (4) Singing River Island wetlands on the west and south will be preserved for the life of the Plan and the existing disposal area on the island will not be increased in size beyond that required by the long-term management plan. A transportation corridor to serve this new development is an acceptable activity provided that the following conditions are met: (1) that portion of the corridor over water bottoms or wetland is supported by pilings; (2) any work channel necessary for construction of the corridor will be dredged west and north of the corridor, and the work channel will be limited to a bottom width of 90 feet and a depth no greater than ten feet; (3) the centerline of the north/south portion of the corridor, including work channel, will be located 2,000 feet west of the present western property line of Litton; and (4) any wetland disturbed by construction will be restored to pre-project conditions.

1.2e Pascagoula River Harbor - Dredging and development of the "D-dock" area and associated filling and use of wetlands east of the Ingalls' access road and south of US Highway 90 is an acceptable activity. Future water quality impacts and cultural resource assessments will be addressed through state review of individual industrial activities and best available technology.

1.2f Middle River Area - The Middle River management unit includes the area bounded by the Mississippi Sound from the west bank of the West Pascagoula River to a north-south extension of Litton's western boundary, all south of the L & N Railroad. It is the intent of the Plan that no development in the Middle River Area will occur during the 15-year life of the Plan. With the exception of the transportation corridor to Singing River Island described above, Jackson County Board of Supervisors (JCBS)/Jackson County Port Authority (JCPA) will not develop or propose to develop in this area during the life of the Plan. Should the transportation corridor be constructed, then that area west and north of the causeway will not be developed for a period of at least 50 years, and the area east of the corridor to Litton's western property line will not be developed for a period of at least 15 years. Litton, however may file a written proposal with the Bureau of Marine Resources, Plan Trustee, for expansion onto public lands in the Middle River Area immediately adjacent to the existing shipyard on the west bank of the Pascagoula River. If such a proposal is submitted, and approved by JCBS/JCPA, the participating agencies will review such proposal and

evaluate the need for any amendment to the SMA Plan prior to the submission of any permit application.

1.3 Authority and Purpose. Section 57-15-6 of the Mississippi Code of 1972 directed the Mississippi Marine Resources Council (now Bureau of Marine Resources) to prepare and implement a coastal program that established guidelines and procedures pursuant to the following goals:

(a) To provide for reasonable industrial expansion in the coastal area and to insure the efficient utilization of waterfront industrial sites so that suitable sites are conserved for water dependent industry;

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In addition Paragraph 5 of this Section of the Mississippi Code instructs: "After consultation with county port authorities, development commissions, and port and harbor commissions having jurisdiction in the coastal area, the council shall prepare as part of the coastal program a long-term plan for the development of suitable sites for water dependent industry. The council shall include in this plan provisions for the disposal of spoil material from dredging operations. In designating suitable sites for water dependent industry, the council shall consider the nature and extent of specific alterations that would serve a higher public interest pursuant to the development of these sites".

The legislation also provides that the council may enter into agreements with Federal, state, public or private agencies, departments, institutions, firms, corporations or persons to carry out its policies.

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governments to plan for public facilities and services in areas whose use is historically, economically, and culturally tied to coastal waters.

This 404(b)(1) Evaluation relates not only to the implementation of the Special Management Area Plan but also to a programmatic assessment of development actions which will require a Department of Army permit via Section 404 of the Clean Water Act. The preparation of this evaluation allowed for the assessment of the cumulative impacts of the proposed actions and the preparation of a comprehensive mitigation plan to offset these impacts. Due to the conceptual nature, however, of many of the proposed development activities supplemental environmental documentation may be required for a specific action. This supplemental environmental documentation would be prepared by the Corps of Engineers prior to permit issuance.

1.4 General Description of Dredged or Fill Material. The material to be disposed would consist of sand, silt, and clay sized materials dredged from areas adjacent to the proposed developments as well as materials suitable for fill for construction of industrial sites. The total yardage to be disposed has not yet been determined. The development of "D-dock" wharf facility (see section 1.2e) would involve the dredging and disposal of approximately 490,000 cubic yards of sand, clay, and silt materials from the East Pascagoula River. The development of Greenwood Island West (see section 1.2a) would involve the dredging and disposal of approximately 151,400 cubic yards of sand material from the western edge of Greenwood Island and Bayou Chico.

1.5 Description of the Proposed Discharge Site(s) for Fill Material.

1.5a Greenwood Island West. The discharge site consists of approximately 12 acres of wetlands and shallow water bottoms. Wetlands in the area are characterized by a Spartina alterniflora fringe and a mixture of Juncus roemerianus, S. patens, and Baccharis halimifolia landward of the fringe. Shallow water bottoms in this area have been described as highly productive coastal margin muds (USACE, 1984).

1.5b Greenwood Island East. This discharge site consists of approximately 70 acres of wetlands on Greenwood Island and the filling of 10 acres of shallow water bottoms within Bayou Casotte. The wetlands and water bottoms to be filled are similar to those described for Greenwood Island West above.

1.5c Upper Bayou Casotte. A conceptual development plan was submitted during the SMA planning process in which the discharge site was approximately 18 acres of wetlands. The wetlands in this area are more diverse than those described for Greenwood Island due to the addition of more species characteristic of brackish areas including Scirpus robustus, Phragmites communis, and Typha sp. These discharge sites have been previously impacted by various activities.

1.5d Singing River Island. The conceptual discharge site as presented to the SMA Task Force consisted of an undetermined number of acres of wetlands on the north and east sides of the Singing River Island disposal site. Additional shallow water bottoms along the north and east of Singing River Island could be impacted depending on the level of development actually undertaken, however, the existing shoreline would not be extended. The construction of the transportation corridor and associated work channel would result in the deposition of approximately 163,581 cubic yards of material on wetland areas and 208,566 cubic yards of material in open water along side the work channel. These wetland areas are characterized by Spartina alterniflora, Juncus roemerianus, and S. patens.

1.5e Pascagoula River Harbor. The discharge site associated with the 'D-Dock' wharf facility is an 8 acre portion of a formerly used disposal site. In addition, five areas have been designated to accept excavated materials. Use of these areas would result in the filling of approximately 56 acres of which 8.7 acres comprise a pond and 39 acres are impounded wetlands, 34 acres of which have been disturbed by previous activities. The pond, which is isolated from tidal action, is vegetated with cattails (Typha spp.) along its west and northeast perimeters. The impounded wetlands are characterized by Spartina patens, Scirpus robustus, Juncus roemerianus, Phragmites communis, Myrica cerifera, Baccharis halimifolia, and Salix nigra.

1.6 Description of Disposal Method. Disposal would in most cases be accomplished using a hydraulic pipeline dredge. It is possible that other disposal methods would also be used including clamshell dredge and/or dump trucks.

## 2.0 Factual Determinations.

2.1 Physical Substrate Determinations. The disposal of fill materials would result in changes in elevation from shallow bottom and emergent wetland elevations to those specified by Federal and state regulations for water dependent industrial sites. Sediment type would be substantially altered with the fill and subsequent construction of the facilities. Approximately 23 acres of shallow subtidal lands and 143 acres of emergent wetlands would be buried. Movement of the fill material is not anticipated to occur since the discharge areas would be bulkheaded. In addition, should the construction of the transportation corridor to Singing River Island be accomplished, approximately 22.9 acres of water bottoms would be filled with depths not to be shallower than - 4 feet MSL and 13.3 acres of marsh would be temporarily filled.

2.2 Water Circulation, Fluctuation, and Salinity Determinations. The discharges would have no significant impacts on salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, or nutrients or cause eutrophication in Mississippi Sound, Bayou Casotte, or East Pascagoula River. The fill would have no impact on current patterns, velocity, or

hydrologic regime. The fill would not affect normal water level fluctuations or salinity gradients.

2.3 Suspended Particulate/Turbidity Determinations. The impact of the proposed discharges on suspended particulate and turbidity of Mississippi Sound, Bayou Casotte, or East Pascagoula River would be insignificant and of a temporary nature and within the range of natural conditions of these water bodies. Any impacts on light penetration and/or dissolved oxygen would be insignificant and short-term. There would be no introduction of toxic materials or pathogens and the aesthetic quality of the water column would not be impacted. Future water quality impacts will be addressed through state review of the individual industrial activities and best available technology.

2.4 Contaminant Determinations. Extensive studies on pollution transport into Mississippi Sound indicate that although the load of pollutants into the Escatawpa and East Pascagoula Rivers and Bayou Casotte is high, the contaminants become trapped in the sediments and are contained in the immediate vicinity of the sources (Lytle and Lytle, 1984).

Chemical analyses of the channels of the Federally authorized navigation project were conducted in 1983 as part of the feasibility studies on deepening the channels (GeoScience, Inc., 1983 and USACE, 1985). These analyses indicated that nitrogen compounds and total phosphorus were detected in significant quantities in sediments but only total Kjeldahl nitrogen (TKN) and ammonia were released into the water column in appreciable quantities following elutriation of sediments. Phosphorus showed a potentially lowered release level.

Arsenic, chromium, iron, lead, nickel, and zinc were found in concentrations greater than those recorded in natural estuarine sediments. Analyses indicate that these forms are tightly bound to the sediments, predominantly montmorillonite clays. These relatively high levels of certain metals in the sediments do not appear to pose any particular hazard with respect to dredge disruption of sediments.

A number of high molecular weight hydrocarbons were also identified from the channel sediments but in concentrations felt to be representative of shipping channels. These compounds were not released into the overlying water during elutriation and therefore should have no significant detrimental effects on aquatic life. With the exception of DDD, DDE, and PCB's, no chlorinated hydrocarbon pesticides were detected in the sediments. The levels of DDD, DDE, and PCB's were insignificant and reflect the ubiquitous nature and world-wide contamination observed with these compounds. None were released during elutriation.

Although these compounds are not released from the sediments during dredging and disposal, they would be available to deposit feeding organisms in the area of deposition. Since these compounds are widespread in the sediments of the SMA region and due to the limited mobility of these organisms, the

organisms are currently exposed to these contaminants and the proposed action would not result in additional significant impacts to aquatic life.

2.5 Aquatic Ecosystem and Organism Determinations. The fill of the proposed discharge sites would have no significant impacts on phytoplankton or zooplankton. The disposal on the shallow water sites and emergent wetland sites would cover and destroy any benthic organisms present in these areas. Any nektonic organisms utilizing the shallow water areas would be precluded from use of the sites. The construction of the bulkheads would provide firm substrate for the attachment of sessile organisms. There would be no significant effects on the aquatic food web. The proposed discharges would not affect any aquatic sanctuaries or refuges. Approximately 166 acres of wetlands would be filled during the life of the SMA. There would be no impacts to mud flats or vegetated shallows. Coral reefs and riffle and pool complexes are not present in the SMA area. No threatened or endangered species would be impacted by the proposed action. No other wildlife would be significantly impacted. The use of the proposed discharge sites has been mitigated through the restoration of approximately 14 acres of impacted wetlands in the Highway 90 mitigation area, the preservation of the Middle River wetlands for from 15 to 50 years, and the preservation, in perpetuity, of 3500 acres of wetlands in the Bangs Lake area.

2.6 Proposed Disposal Site Determinations. The State of Mississippi determines mixing zones on a case-by-case basis. For similar disposal activities, the State has established a mixing zone of 750 feet. In all cases, mixing zones would be restricted to as small an area as feasible. Since all the discharges would occur in confined areas it is reasonable to expect that any reasonable mixing zone requirements established by the State would be met. Future water quality impacts resulting from the establishment of industrial facilities would be addressed through state review and best available technology. State of Mississippi water quality classification for the areas in question is for recreational use, closed to shellfish harvest. The disposal operations would not alter constituent concentrations established for this use and would be in compliance, to the maximum extent practicable, with all applicable water quality standards. There would be no impacts to municipal and private water supplies, recreational and commercial fisheries, water-related recreation or aesthetics. There would be no impact to any park, national and historic monument, national seashores, wilderness areas, research sites or similar preserves.

2.7 Determination of Cumulative Effects on the Aquatic Ecosystem. The data and information presented suggest that the utilization of the proposed discharge sites would have no significant cumulative adverse effects on the aquatic ecosystem.

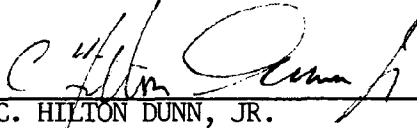
2.8 Determination of Secondary Effects on the Aquatic Ecosystem. The preservation of the Bangs Lake mitigation area, restoration of approximately 14 acres in the Highway 90 mitigation area, and the protection of the Middle River wetlands will beneficially impact the aquatic ecosystem.



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

- a. No significant adaptations of the guidelines were made relative to this evaluation.
- b. No alternatives to the proposed action are practicable which would have less adverse impact.
- c. The planned disposal of materials would not violate any applicable State water quality standards.
- d. The discharge would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- e. As required by the Coastal Zone Management Act, the proposed action is consistent with the Mississippi Coastal Program.
- f. Use of the proposed discharge sites would not harm any endangered species or their critical habitat.
- g. The discharge would not violate the Specified Protection Measures for Marine Sanctuaries designated by the Marine Protection, Research, and Sanctuaries Act of 1972.
- h. All adverse effects on human health and welfare resultant from the proposed discharge of fill materials have been mitigated through the preservation of 3500 acres of pristine wetlands in the Bangs Lake area, restoration of impacted wetlands, and protection of the Middle River area. Included in these effects are impacts to municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values would not occur.
- i. Appropriate steps to minimize potential adverse impacts of the discharge on aquatic systems have been included in this evaluation.
- j. On the basis of the guidelines, the proposed sites for the discharge of fill materials are specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

20 Dec 85  
DATE

  
C. HILTON DUNN, JR.  
Colonel, CE  
District Engineer

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Lytle, J. S. and T. F. Lytle. 1984. Pollutant Transport in Mississippi Sound. Pre-print Final Report to Mississippi-Alabama Sea Grant Consortium. Project No.: R/ER-2. Ocean Springs, MS.

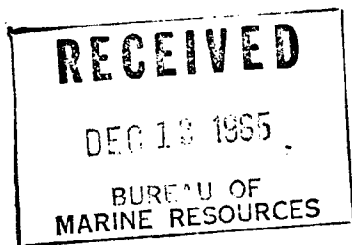
US Army Corps of Engineers. 1984. Mississippi Sound and Adjacent Areas Dredged Material Disposal Study. Feasibility Report. US Army Engineer District, Mobile, AL.

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\_\_\_\_\_. 1985. Pascagoula Harbor, Mississippi. Feasibility Report and Final Environmental Impact Statement. US Army Engineer District, Mobile, AL.

**APPENDIX C:**

**CONDITIONAL AGREEMENT FOR TRANSFER OF REAL PROPERTY**



6/24/85

CONDITIONAL AGREEMENT FOR TRANSFER  
OF REAL PROPERTY

WHEREAS the Bureau of Marine Resources, herein Bureau, and the Jackson County Port Authority, herein Port, and Jackson County Board of Supervisors, herein County, are presently negotiating in an attempt to establish a Special Management Area Plan for the Port of Pascagoula; and

WHEREAS the parties have heretofore reduced their negotiations to a draft Special Management Area Plan attached hereto as "Exhibit A", wherein the Port and/or County would be allowed to apply for permits for water dependent development activities as described in Subsection B.2.3.4. and 5. of the aforementioned draft Special Management Area Plan; and

WHEREAS it has been heretofore agreed that if the development of said properties is carried out that mitigation for one, or all, of the above mentioned tracts described in Subsection B.2.3.4. and 5 will be the transfer of approximately 3,500 acres of wildlife habitat to the Mississippi Commission on Wildlife Conservation on behalf of the State of Mississippi to be held by it in its present state and managed for the benefit of future generations.

The TRANSFERORS, the Port and County, hereby conditionally bind themselves to transfer and the TRANSFEREE, Mississippi Department of Wildlife Conservation on behalf of the State of Mississippi, hereby binds itself to accept the hereinafter described property on the terms and conditions stipulated in the following schedule.

(1) DESCRIPTION: The description is as follows:

3,500 acres in the Bangs Lake-Bayou Cumbest area of Jackson County, Mississippi, said tract being more particularly described as follows:

(DESCRIPTION)

This property being the same as that transferred by the State of Mississippi to the Jackson County Port Authority and/or Jackson County by (warranty deed to describe Instruments with appropriate references to land records Index Information.)

(2) CONDITION PRECEDENT: The parties must be able to agree to the contents of a draft Special Management Area Plan and provide letters of commitment from the agencies participating in the SMA process by April 30, 1985. (See "Exhibit B")

(3) CONSIDERATION: Consideration for the transfer of the subject property is the signing of the Memorandum of Agreement by the TRANSFEREE. It is the intent of the parties hereto that as additional consideration the TRANSFERORS will not be required to engage in any other mitigation for permits for activities as described in Subsection B.2.3.4. and 5. of the aforementioned draft Special Management Area Plan so long as these projects are conducted in accordance with said Plan. It is expressly understood that the transfer of the property shall be final and shall not be affected by the failure of the TRANSFERORS to apply for, or receive, permits to develop said proposed projects.

(4) TIME FOR PERFORMANCE: Upon the signing of this agreement, the TRANSFERORS will have thirty (30) days in which to present the TRANSFEREE with a definite legal description, including a list of tracts by Section, Township, and Range, and an Abstract of Title. The TRANSFEREE will have ninety (90) days in which to examine title to determine if it is acceptable.

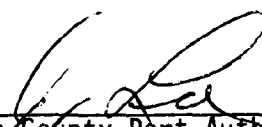
(5) CONSUMMATION OF THE TRADE: The TRANSFERORS will execute the warranty deed upon presentation of the Memorandum of Agreement for their signatures.


(6) FORM OF THE DEED: The property is to be conveyed by general warranty deed with definite description. Title will vest in the Commission on Wildlife Conservation on behalf of the State of Mississippi in accordance with Miss. Code Ann. Section 49-5-61 through 49-5-85, and will be transferred to the state for the express purpose of conserving an area of natural habitat in its present state. The warranty deed will contain the following language restricting the future use of said property:


"Said property is transferred to the Commission on Wildlife Conservation on behalf of the State of Mississippi to be held in perpetuity in its present condition as a natural area preserve, and said property shall be protected, preserved, and managed in a manner consistent with the Port of Pascagoula Special Management Are Plan and the intent and purposes of the Mississippi Natural Heritage Law of 1978, Miss. Code Ann. Section 49-5-141 through 49-5-157 (1972 Supp.)"

(7) TITLE: Title must be acceptable to Transferees.

This agreement is entered into this the <sup>13<sup>th</sup></sup>~~26<sup>th</sup>~~ day of <sup>November</sup>~~June~~ of the year 1985  
A.D. by:

  
Jackson County Port Authority  
Dated: 11/26/85

  
Jackson County Board of Supervisors  
Dated: November 13, 1985

  
Department of Wildlife Conservation  
Dated: 12/13/85

**APPENDIX D:**

**MEMORANDUM OF AGREEMENT**

MEMORANDUM OF AGREEMENT FOR IMPLEMENTING  
THE PORT OF PASCAGOULA SMA PLAN

PART I: PARTICIPATING FEDERAL, STATE AND LOCAL AGENCIES AND  
AUTHORITIES

U. S. Army Corps of Engineers, Mobile District, U. S. Fish & Wildlife Service, U. S. Environmental Protection Agency, National Marine Fisheries Service, Mississippi Department of Natural Resources, Bureau of Pollution Control, Mississippi Department of Wildlife Conservation, Bureau of Marine Resources, Mississippi Department of Archives and History, Jackson County Board of Supervisors and Jackson County Port Authority.

These parties are authorized to enter into this memorandum by the following acts, statutes, and regulations:

1. U. S. Army Corps of Engineers, Mobile District - Coastal Zone Management Act of 1972, 16 U.S.C. §1451, et seq.
2. U. S. Fish and Wildlife Service - Fish and Wildlife Act of 1956, as amended, 6 U.S.C. §742 f(a) and the Fish and Wildlife Coordination Act, as amended, 16 U.S.C. §661 et seq.
3. National Marine Fisheries Service - Fish and Wildlife Act of 1956, as amended, 6 U.S.C. §742 f(a) and the Fish and Wildlife Coordination Act, as amended, 16 U.S.C. §661 et seq.
4. Mississippi Department of Natural Resources, Bureau of Pollution Control - Miss. Code Ann. §§49-2-9 and 13 (1972) and Miss. Code Ann. §§49-17-13 and 17 (1972).
5. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources - Miss. Code Ann. §49-4-9 and 49-4-13 (1972) and Miss. Code Ann. §57-15-5 (1972).
6. Mississippi Department of Archives and History- Miss. Code Ann. §38-9-5-5 (1972).
7. Jackson County Board of Supervisors - Miss. Code Ann. §§59-1-19 and 21 (1972).
8. Jackson County Port Authority - Miss. Code Ann. §§59-1-19 and 21 (1972).

PART II: MEMORANDUM

WHEREAS, the parties to this agreement recognize the importance of the Port of Pascagoula, and the importance of coastal wetlands and associated estuarine areas and cultural resources as essential elements to the economic well-being and overall quality of life enjoyed by the citizens of Jackson County and all of Mississippi; and

WHEREAS, these signatory agencies recognize the need for protecting wetland and cultural resources while continuing waterfront development for water dependent industry within the Port of Pascagoula and therefore, also recognize the concomitant need for a comprehensive and environmentally acceptable development plan for the Port of Pascagoula; and



WHEREAS, the signatory agencies have participated in the formulation of such a plan, known as the Port of Pascagoula Special Management Area (SMA) Plan; and

WHEREAS, the purpose of the SMA Plan and this agreement is to establish an area-wide plan and mechanisms which will expedite regulatory authorizations, generally streamline and coordinate regulatory decisions and ensure the implementation of environmentally acceptable water dependent development proposals, protect sensitive and valuable coastal resources and mitigate for unavoidable impacts to coastal resources; and

WHEREAS, the public has had an opportunity to review and provide comments on said Plan at a public hearing held on September 25, 1985; and

WHEREAS, the Mississippi Commission on Wildlife Conservation has approved the Plan and will incorporate same into the Mississippi Coastal Program upon execution of this Memorandum; and

WHEREAS, notwithstanding any provisions of this agreement, nothing shall commit the U. S. Government to incurring financial obligations under this agreement, except to the extent that funds may be provided in Appropriations Acts of Congress; and

WHEREAS, during the performance of this agreement, the parties hereto agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The parties hereto will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin; and

WHEREAS, no member or delegate of Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit; and

WHEREAS, this agreement may be modified or amended upon mutual agreement by the parties hereto. Any such modifications or amendment shall be in writing and executed by the parties hereto and incorporated herein and by reference made a part of this agreement; and

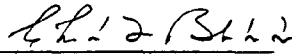
WHEREAS, this agreement constitutes the complete agreement between the parties hereto; and

WHEREAS, the effective date of this agreement is March 11, 1986.


IN WITNESS WHEREOF, the duly authorized representatives of the parties hereto have affixed their signatures to this agreement on this the 11th day of March 1986.

Part III: Signature

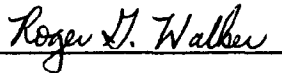
Mississippi Department of  
Natural Resources

BY: 

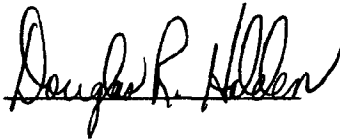
Mississippi Department of  
Wildlife Conservation

BY: 

Mississippi Department of  
Archives and History

BY: 

Jackson County Board of  
Supervisors

BY: 

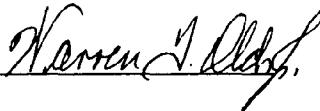
U. S. Army Corps of Engineers  
Mobile District

BY: 


U. S. Environmental Protection  
Agency

BY: 

U. S. Fish & Wildlife Service

BY: 

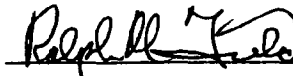
National Marine Fisheries  
Service

BY: 

Jackson County Port Authority

BY: 

Witness

BY: 

**APPENDIX E:**

**PASCAGOULA HARBOR MANAGEMENT PLAN FOR  
LONG-TERM DISPOSAL OF DREDGED MATERIAL**

## PASCAGOULA HARBOR, MISSISSIPPI

### Management Plan for Long-Term Disposal of Dredged Material

#### INTRODUCTION

Project Description. The Mobile District Corps of Engineers (COE) is responsible for the maintenance of authorized Federal navigation project at Pascagoula Harbor, Mississippi. Authorized dimensions of these navigation channels which are shown in Figure 1 are as follows:

40 feet deep and 350 feet wide from the Gulf of Mexico through Horn Island Pass including an impoundment area for littoral drift measuring 40 feet deep, 200 feet wide and about 1,500 feet long adjacent to the channel at the west end of Petit Bois Island;

38 feet deep and 350 feet wide in Mississippi Sound and Pascagoula River to a turning basin 38 feet deep, 2,000 feet long and 950 feet wide on the west side of the river below the railroad bridge;

38 feet deep and 225 feet wide from the ship channel in Mississippi Sound to the mouth of Bayou Casotte;

38 feet deep and 300 feet wide in Bayou Casotte to a turning basin 38 feet deep, 1,000 feet wide and 1,750 feet long.

Development of the Pascagoula Harbor Project has been a cooperative endeavor between the COE and the Jackson County Port Authority (JCPA). Under this arrangement and by law, the JCPA is the local sponsor for the project and is responsible for, among other things, dredging in berthing areas and interior access channels, maintaining public terminal facilities, and providing disposal areas with necessary retaining dikes for dredged material.

Management strategy. The development of a management strategy for dredging the Federal navigation channels at Pascagoula involves three basic elements: Formulation of a strategy, implementation of the strategy, and evaluation and control. Formulation of a strategy is the function and purpose of this document, that is, to state explicitly the objectives and policies of the COE with respect to the Federal maintenance dredging responsibilities. Moreover, this document will recommend implementation of that strategy and an evaluation and control system to monitor the effectiveness of the strategy.

The term management strategy implies a long-term plan. Indeed, strategy formulation is the process of developing long-term plans to effectively deal with engineering and environmental opportunities and challenges. Previously, planning for dredging and dredged material disposal at Pascagoula Harbor has been short-range in nature. Continuation of this type planning would result in an inefficient use of resources, both economic and environmental. Development of a long-range management strategy will facilitate a more efficient use of these limited resources.

Section 148 of Public Law 94-587, the Water Resources Development Act of 1976 encourages the utilization of management practices to extend the useful life of existing disposal areas so that the need for newly dredged material disposal areas is kept to a minimum. Accordingly, this document examines several management techniques including dike raising, coordinating Federal and non-Federal disposal activities, and consolidation and dewatering of dredged material.

This report includes descriptions of all information and data accumulated, assumptions required, alternatives considered, methodologies and procedures used, and the overall rationale governing the recommendations for operation and management of the confined disposal areas. Recommendations are made concerning implementation of these guidelines, monitoring the progress and effectiveness of the management activities, and refinement of the guidelines.

Scope. The geographic scope of this report is limited to the Pascagoula River channel and the Bayou Casotte channel to their junction in Mississippi Sound. Disposal areas considered herein include Double Barrel, Singing River Island, and Greenwood Island. Analyses regarding disposal area storage capacity were performed using readily available data, collecting maintenance material samples, and extrapolating experience gained with similar sediments in Mobile Harbor. Refinement of specific site management plans by collecting further site-specific data will be required as a part of the implementation of this strategic management plan and will be described herein.

Related Efforts. Previous studies under the Corps of Engineers' Dredged Material Research Program (DMRP) have resulted in general guidelines for designing, operating, and managing dredged material containment area, dewatering fine grained dredged material, and disposal area reuse management. Development of specific management techniques for Pascagoula Harbor is based on the general guidelines provided by the DMRP.

Two other studies are being conducted by the Mobile District that may provide additional information in the development of a long-term dredged material disposal plan. One study is determining the need and feasibility of deepening the existing Federal navigation channel at Pascagoula. To the extent that information concerning the probable economically justifiable depth and associated dredging quantities is available, they will be considered in this report. A second study, the Mississippi Sound and Adjacent Areas Study, is investigating the existing dredging and dredged material disposal practices in Mississippi Sound and adjacent areas to determine how these practices should be modified. The development of a long-range disposal plan is consistent with the recommendations being developed in the Mississippi Sound Study. Further, environmental information presented herein was, in part, derived from the Mississippi Sound Study.

SMA Planning. The Pascagoula Harbor and Bayou Casotte industrial areas have been designated as Special Management Areas (SMA) under the Mississippi Coastal Program (MCP). The MCP is the state coastal management program established under the authority of and financial assistance provided by the Federal Coastal Zone Management Act. The SMA designation places special emphasis on coastal areas in Mississippi of unique importance to the economy

and environment of the state where competition for the utilization of the area's resources is particularly strong. Planning to provide for adequate dredged material disposal areas to sustain both Federal and non-Federal dredging requirements in concert with industrial expansion and environmental protection is a primary objective of SMA planning. The SMA planning process uses interdisciplinary task force approach, involving the local port authority, Federal and state environmental agencies, and the COE. Ultimately, the plan will be subjected to public review and input and approval by the Governor of Mississippi and the Federal Office of Coastal Zone Management before it is incorporated into the MCP.

Report Organization. In general, this report is divided into a main report and supporting appendices. More specifically, the main report addressed the following topics:

- Federal and non-Federal dredging and disposal history
- Description of existing disposal areas
- Dredged material characteristics
- Development Plans
- Planning constraints
- Alternatives considered
- Alternatives considered in detail
- Factors affecting storage capacity
- Effect of combined Federal and non-Federal use of confined disposal areas
- Economics of existing Federal dredging practices
- Storage capacity evaluation
- Implementation considerations

Objectives. The strategic management plan developed herein includes operation and management guidelines to achieve the following specific objectives:

Maximize volumetric disposal capacity at the three confined disposal areas over their remaining useful life.

Dewater and densify fine-general material to the greatest extent practicable, to further increase storage capacity and improve potential for productive use.

Reclaim and remove usable coarse-grained and dewatered fine-grained material for productive uses.

Plan, construct, and use disposal areas in a manner consistent with state water quality standards, the state coastal zone management plan, and Federal laws and regulations regarding the protection of water and air resources, cultural resources, and fish and wildlife resources.

## HISTORICAL BACKGROUND

Federal Dredging History. During the period from February to December 1963, the Pascagoula/Bayou Casotte navigation channel system was widened and deepened to its present dimensions. Subsequently, sixteen separate dredging contracts have been issued for maintenance dredging in Reaches 1, 2, and 3 shown on Figure 2.

Volumes of material removed are computed from before and after cross section soundings performed by the COE, and are reported in two ways. Net yardage is the amount of material removed to restore the channel to its design dimensions with an allowable overdepth of 2 feet, and is the contract payment amount. Gross yardage includes the amount of overdredging performed due to bank instability and sloughing of material into the channel during dredging. A definition sketch showing gross and net yardage amounts is given in Figure 3.

Dredge data is typically summarized for each contract on "History Cards" which are kept at COE Mobile District offices. These cards provide information on gross and net yardages of dredge material removed, dates of operation, pumping hours in contract, unit price, and description of material removed.

Tables 1 through 3 summarize the dredging histories for each reach. Included in these tables are the dredging dates corresponding to each contract period, the temporal midpoint (julian date) of each contract, the time interval since the last contract, gross and net yardages removed, the length of actual dredge travel within the reach, and the calculated gross and net shoaling rates.

TABLE 1

DREDGING EVENT SUMMARY

REACH 1: PASCAGOULA HARBOR AND CHANNEL  
 LOCATION: STA. 0+00 AT BEACON 44 TO N. END TAN. 1  
 REACH LENGTH: 10,552 FEET

CONTRACT NO.	DREDGING PERIOD	JULIAN DATE (CENTERED ON EVENT)	TIME SINCE LAST EVENT (DAYS)	YARDAGE GROSS	YARDAGE NET	FULL CHANNEL DREDGE ADVANCE (FEET)	SHOALING RATE (CY/FT-MONTH) GROSS	SHOALING RATE (CY/FT-MONTH) NET
63-258	8-18-63 TO 12-31-63	297 1963	0					
66-288	12-23-65 TO 1-31-66	11 1966	809	282,081	240,359	4,973	1.01	0.86
67-C-0055	4-1-67 TO 4-16-67	98 1967	452	697,460	324,550	5,829	4.46	2.34
68-C-0082	5-1-68 TO 6-1-68	136 1968	403	344,160	219,280	4,750	2.47	4.25
69-C-0197	5-23-69 TO 5-31-69	147 1969	376	302,730	252,275	10,552	2.33	2.90
71-C-0091	8-18-72 TO 9-13-72	243 1972	1,101	600,000	367,047	9,190	1.46	1.01
75-C-0078	1-15-75 TO 3-11-75	42 1975	894	931,290	700,184	10,000	3.01	3.02
77-C-0105	7-30-77 TO 10-25-77	254 1977	942	42,150	19,755	2,000	0.13	0.77
78-C-0196	10-28-78 TO 12-10-78	322 1978	433	660,545	310,950	6,977	4.41	2.20
80-C-0017	12-1-79 TO 12-15-79	342 1979	385	485,987	134,120	5,860	3.65	3.57
81-C-0202	12-3-81 TO 12-10-81	340 1981	728	152,451	80,010	3,029	0.61	1.71

AVERAGE SHOALING RATE, ENTIRE PERIOD OF RECORD: 1.97 (CY/FT-MONTH)

- NOTES: 1) GROSS SHOALING RATE= GROSS YARDAGE/(TIME INTERVAL \* REACH LENGTH)  
 2) NET SHOALING RATE=((NET YARDAGE)/(GROSS YARDAGE)+1)(GROSS YARDAGE-NET YARDAGE) 1-1)  
 (TIME INTERVAL \* REACH LENGTH)

SOURCE: CHANNEL SHOALING INVESTIGATION, PASCAGOULA HARBOR AND NAVIGATION CHANNELS, BY SIMONS, LI AND ASSOCIATES, OCTOBER 8, 1983.



TABLE 2

DREDGING EVENT SUMMARY

REACH 2: PASCAGOULA SOUND CHANNEL (UPPER)  
 LOCATION: BEACON 44 TO P. 1.  
 REACH LENGTH: 25,454 FEET

CONTRACT NO.	DREDGING PERIOD	JULIAN DATE (CENTERED ON EVENT)	TIME SINCE LAST EVENT (DAYS)	YARDAGE		FULL CHANNEL DREDGE ADVANCE (FEET)	SHOALING RATE (CY/FT-MONTH)	
				GROSS	NET		GROSS	NET
63-258	3-24-63 TO 2-14-64	246 1963	0					
65-221	12- 1-64 TO 12-16-64	342 1964	461	1,796,863	1,322,354	20,858	4.67	3.44
66-288	1- 1-66 TO 5-27-66	74 1966	462	271,485	202,630	8,250	0.70	1.76
67-C-0055	2-24-67 TO 4-16-67	80 1967	371	1,563,949	1,213,106	22,250	5.05	4.14
68-C-0082	5- 1-68 TO 5-31-68	136 1968	421	2,003,007	1,409,687	25,454	5.70	5.01
69-C-0197	5-23-69 TO 7- 3-69	163 1969	392	490,526	251,377	3,000	1.50	2.58
71-C-0116	4-29-71 TO 6- 6-71	138 1971	705	835,100	615,820	9,000	1.42	1.45
71-C-0091	8-18-72 TO 9-13-72	243 1972	470	900,060	596,406	9,650	2.29	2.08
73-C-0115	4-22-73 TO 7- 4-73	148 1973	270	338,350	249,180	10,500	1.50	2.45
74-C-0132	5-23-74 TO 6-11-74	152 1974	369	1,171,788	993,187	14,000	3.81	3.51
75-C-0078	1-15-75 TO 3-11-75	42 1975	255	285,391	214,569	5,657	1.34	1.85
76-C-0038	9-15-75 TO 12-12-75	302 1975	260	79,240	44,512	1,600	0.37	0.53
77-C-0105	7-30-77 TO 10-25-77	254 1977	682	1,849,040	866,640	25,454	3.25	1.58
80-C-0017	10- 8-79 TO 1-25-80	335 1979	811	3,315,757	2,031,730	25,454	4.90	4.45
81-C-0202	9-26-81 TO 12- 2-81	302 1981	697	2,112,840	1,333,510	21,000	3.63	4.50
1983	3- 1-83 TO 3- 1-83	60 1983	488	69,640	69,640	2,878	0.17	2.08

AVERAGE SHOALING RATE, ENTIRE PERIOD OF RECORD: 2.88 (CY/FT-MONTH)

NOTES: 1) GROSS SHOALING RATE = GROSS YARDAGE / (TIME INTERVAL \* REACH LENGTH)  
 2) NET SHOALING RATE = (NET YARDAGE) / ((GROSS YARDAGE - NET YARDAGE) \* REACH LENGTH)

SOURCE: CHANNEL SHOALING INVESTIGATION, PASCAGOULA HARBOR AND NAVIGATION

TABLE 3

DREDGING EVENT SUMMARY

REACH 3: BAYOU CASOTTE NAVIGATION CHANNEL AND HARBOR  
 LOCATION: P. 1. to 241+10N  
 REACH LENGTH: 24,110 FEET

CONTRACT NO	DREDGING PERIOD	JULIAN DATE (CENTERED ON EVENT)	TIME SINCE LAST EVENT (DAYS)	YARDAGE GROSS - NET	FULL CHANNEL DREDGE ADVANCE (FEET)	SHOALING RATE CY/FT-MONTH GROSS - NET
63-258	4-4-63 TO 3-9-64	263 1963	0			
65-221	11-11-64 TO 11-30-64	324 1964	426	1,319,800	1,099,833	3.92 3.27
67-C-0055	1-18-67 TO 2-23-67	36 1967	807	1,514,758	1,235,477	2.37 2.28
68-C-0082	4-8-68 TO 4-30-68	109 1968	438	937,379	749,900	2.71 2.97
69-C-0197	7-4-69 TO 7-27-69	196 1969	452	1,398,809	1,091,113	3.91 3.68
71-C-0116	6-7-71 TO 7-14-71	176 1971	710	1,743,337	1,402,719	3.11 3.05
73-C-0115	4-22-73 TO 7-4-73	148 1973	702	1,249,890	920,495	2.25 2.27
74-C-0117	8-12-74 TO 8-18-74	166 1974	383	264,443	207,797	0.87 1.77
76-C-0038	9-15-75 TO 12-12-75	302 1975	501	765,660	430,100	1.93 1.23
77-C-0185	7-30-77 TO 10-25-77	254 1977	682	452,882	218,732	0.84 1.03
78-C-0196	10-12-78 TO 12-23-78	321 1978	432	770,050	361,927	2.25 1.70
80-C-0017	10-10-79 TO 11-18-79	302 1979	346	2,296,129	1,069,947	8.40 5.40
81-C-0202	9-23-81 TO 10-19-81	279 1981	707	1,013,406	632,747	1.81 3.33
1983	3-01-83 TO 3-01-83	60 1983	511	649,790	649,790	1.61 2.55

AVERAGE SHOALING RATE, ENTIRE PERIOD OF RECORD: 2.56 (CY/FT-MONTH)

- NOTES: 1) GROSS SHOALING RATE = GROSS YARDAGE / (TIME INTERVAL \* REACH LENGTH)  
 2) NET SHOALING RATE = ((NET YARDAGE) / (TIME INTERVAL \* REACH LENGTH)) - ((GROSS YARDAGE - NET YARDAGE) / (TIME INTERVAL \* REACH LENGTH))

SOURCE: CHANNEL SHOALING INVESTIGATION, PASCAGOULA HARBOR AND NAVIGATION CHANNELS, BY SIMONS, LI AND ASSOCIATES, OCTOBER 8, 1983.

## EXISTING DISPOSAL AREAS

Physical Description. The Singing River Island is about 480 acres in size. The island was built over a number of years by the desposition of dredged material by private interests and the Corps of Engineers. The existing diked area within the island is about 200 acres, consisting of a 90 acre cell at about elevation 17 feet, which most recently served as the primary ponding area for silty maintenance material, and a 110 acre cell of primarily sandy material ranging from elevation 17 feet up to about 28 feet. Current effective elevation is 14 feet, although a portion of the dike has been raised to 24 feet. The Singing River Island site, which is located just south and west of the mouth of Pascagoula River, generally has accommodated maintenance material from about Station 40+00 South in the Mississippi Sound portion of the ship channel to about station 42+00 North in the river portion of the channel. These reaches are identified on Figure 4.

The Double Barrel area, following a 1983 expansion to the east, is now approximately 128 acres in size and is located on the west bank of Pascagoula River, south of the L&N Railroad. This site generally accommodates maintenance material dredged from Station 42+00 North to the L&N Railroad Bridge (see Figure 4). The current effective dike elevation is 15 to 16 feet.

Greenwood Island is approximately 189 acres in size and is located on the west side of the mouth of Bayou Casotte. This site generally accommodates maintenance material dredged from the Bayou Casotte Channel from its intersection with the shoreline to its terminus in Bayou Casotte. The current effective dike elevation is 18-19 feet. The diked area is approximtely 101 acres.

Remaining Capacities. The remaining capacities of the disposal areas were evaluated for the conditions tabulated below. The evaluation of storage capacities was based on the premise that the existing containment dikes would not be raised with the exception of the dikes around the perimeter of the Singing River Island disposal area. Dike raising in some areas of the Singing River site to about elevation 24 feet is required to bring the dikes to approximately the same level.

<u>Disposal Area</u>	<u>Area (acres)</u>	<u>Dredged* Volume (cubic yards)</u>	<u>Lift Thick- ness (feet)</u>	<u>Frequency of Placement (months)</u>
Singing River Island	203	621,100	3.0	18
Double Barrel	115	566,400	4.8	18
Greenwood Island	101	112,500	1.1	18

\*Federal and Non-Federal in-situ volumes of material to be dredged.

The Singing River Island and Double Barrel disposal areas could be operated and managed under these conditions for approximately 8 dredging cycles or about 9 years before dike raising would be required. The Greenwood Island disposal area would have a service life of approximately 15 years before dike raising would be required.

## SEDIMENT PROPERTIES

Disturbed "grab" samples of sediment were obtained at the Pascagoula River and Bayou Casotte sites. Results of lab testing are summarized below:

### Pascagoula River Site - "7" Grab Samples

Composite Description: Organic clay (OH), high "with a trace of sand, black

<u>Soil Property</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Range</u>
Sand Content, (% > .075mm)	8.1	8.4	2-26
Organic Content (Loss on ignition),%	13.5	1.5	10.9-15.4
Specific Gravity	2.57	0.03	2.54-2.62
Liquid Limit	128	16	104-150
Plastic Limit	32	4	27-38
Plasticity Index	95	13	77-114

### Bayou Cassotte Site - "5" Grab Samples

Composite Description: Fat clay (CH), slightly organic with some sand, black

<u>Soil Property</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Range</u>
Sand Content, %	34	14	25-28
Loss on Ignition, %	7.8	1.1	6.4-8.8
Specific Gravity	2.67	0.01	2.66-2.69
Liquid Limit	77	13	55-88
Plastic Limit	20	2	17-22
Plasticity Index	57	11	38-66

Consolidation test data needed for a storage capacity evaluation has not been obtained for samples at either site. For this preliminary evaluation, consolidation test data obtained by the Waterways Experiment Station (WES) on samples from North Blakeley Island Disposal Area near Mobile, Alabama were used. The material at North Blakely Island had the following properties:

### Upper Polecat Bay (Mobile) Site

Composite Description: Fat clay (CH), slightly organic with a trace of sand, black

<u>Soil Property</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Range</u>
Sand Content, %	9	—	—
Organic Content, %	7	—	approx. 6-8
Specific Gravity	2.65	—	2.62-2.67
Liquid Limit	98	13	64-112
Plastic Limit	37	4	28-42
Plasticity Index	61	10	36-76

A summary the mean sediment property values at the three sites is presented below:

<u>Soil Property</u>	<u>Upper Polecat Bay (Mobile)</u>	<u>Pascagoula River Site</u>	<u>Bayou Casotte Site</u>
Sand Content	9	8.1	34
Organic Content	7	13.5	7.8
Specific Gravity	2.65	2.57	2.67
Liquid Limit	98	128	77
Plastic Limit	37	32	20
Plasticity Index	61	95	57

Based on correlations with index properties (primarily liquid limit and organic content), it should be anticipated that the material at the Pascagoula River Site will probably have a larger initial slurry void and be more compressible, less permeable, and more difficult to use as a construction material than that at North Blakley Island whereas the reverse is true when comparing the Bayou Casotte Site to North Blakeley. The effects of these differences on the storage capacities of the disposal areas are unknown at present, but they could be significant. Consolidation testing and additional analysis are recommended to assess the storage capacities more thoroughly.

#### DEVELOPMENT PLANS.

Federal. The feasibility of deepening and widening the Pascagoula Harbor ship channels is being investigated by the COE in response to a Congressional resolution adopted on September 23, 1965 by the Public Works Committee of the U. S. Senate. Alternative plans for deepening and/or widening will be formulated in such a manner that the capacities of Singing River Island, Double Barrel, and Greenwood Island disposal areas for maintenance material will not be affected or will be provided for in the recommendations of the feasibility study.

Non-Federal. Development plans of the Jackson County Port Authority that may have an impact on the capacity and management of the three disposal areas have been considered in this report. Specific plans considered which are shown on Figure 4 are the following:

Greenwood Island East. These are water-related industrial sites. Port Authority plans include a barge fleeting area and terminal development. The area, approximately 65 acres, includes a proposed rail spur from the airport site to the east side of Greenwood Island.

North and East sides of Singing River Island. This area is a part of the lands designated by the 1982 Legislature for industrial development. In order to facilitate such development, a utility corridor from U. S. 90 to the Island is proposed. The scope of and exact location of the corridor will be determined by the needs of the future development on the Island.

JCPA has indicated a desire to utilize some dewatered dredge material from the Greenwood Island disposal area in the development of Greenwood Island East. The volume of material to be used is unknown at this time but is not expected to significantly affect the capacity of the site.

Development of the north and east side of Singing River Island would affect the life and capacity of the Singing River Island disposal area. The

scale of development and when the development would occur are important factors. The impacts of this development on the management plan are not described in this report.

Disposal of dredged material from channel construction projects planned by JCPA have not been included in this management plan. In developing this management plan, it has been assumed that material from these projects will not be disposed in the three disposal areas considered.

#### PLANNING CONSTRAINTS.

Jurisdictional Wetlands. Wetlands, the filling of which is regulated by Section 404 of the Clean Water Act are administratively defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that, under normal circumstances, support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs similar areas."

In asserting jurisdiction over Section 404 wetlands, the Assessment and Monitoring Section, Regulatory Branch of COE uses the 3 parameters as set forth by the wetland definition.

- a. Inundation or saturation by surface or groundwater.
- b. Prevalence of wetland vegetation.
- c. Saturated soil (hydric soil).

In a natural wetland, all 3 parameters are usually present and a line delineating the wetland vegetation limits also delineates the limits of inundation or saturation and hydric soil. On disturbed wetlands, filled wetlands or created fast lands, a common sense approach is applied since the 3 parameter criterion breaks down.

On a natural wetland area, the vegetation can be removed mechanically, chemically or by fire, but the hydric soils and inundation or saturation persists; the vegetation given time will grow back. In this situation, jurisdiction is exerted.

A marsh filled prior to the regulations or an upland area filled with material dredged from a marsh can support an extensive community of some wetland plants (especially Spartina patens and Phragmites communis) in areas that are not inundated or saturated due to raised elevation and may or may not contain hydric soils. In areas such as these which are usually found along extensive residential canal systems, jurisdiction is not exerted.

On fast lands created in shallow bottoms by filling with hydraulic dredged material, wetland vegetation can grow in extensive areas. Those areas that are not saturated by surface or groundwater and are not inundated by tidal fluctuations or high water due to their elevation, can support stands of certain wetland species as pioneer species. However, they do not grow in dense heavy pure stands as they do in a natural marsh. These areas are in time dominated by upland species or transition zone species, lacking hydric soil and the inundation or saturation; jurisdiction is not exerted.

On the edges of pumped land at lower elevations inundated by the tide or saturated by groundwater, the vegetation can be dominated by lush stands of wetland species; however, the soil can not be identified as a hydric soil using the Munsell color charts. This type of manmade wetland functions as wetland, the interface between the aquatic ecosystem and the artificial ecosystem, and has a positive effect on water quality.

Bodies of water contained by manmade dikes for the containment of hydraulic dredged disposal material, or for the collection and retention of water for a settling basin, or treatment ponds or lagoons, all designed to meet other requirements of the Clean Water Act, are not waters of the United States. Therefore, they are not subject to Section 404 jurisdiction.

On Singing River Island, personnel of the Assessment and Monitoring Section did not exert Section 404 jurisdiction in the following areas that contained wetland vegetation:

- a. Diked areas trapping rainwater.
- b. Excavations outside the dikes, with no surface water connection to the waters of Mississippi Sound.
- c. Manmade land outside of the dikes that are not inundated by the tide on surface or saturated on groundwater due to their higher elevation.

Retaining Dike Design. Dike heights, crown widths, and side slopes are variables which are primarily dependent on foundation conditions, embankment material, construction methods and project objectives. Before a dike can be adequately designed, a reasonably representative concept of the arrangement and physical properties of the foundation and embankment materials must be attained. Previously placed dredged material, if sufficiently dried, can often make adequate material for dike construction. Preliminary field investigations have been conducted in the Pascagoula and Bayou Casotte channels to determine the general physical properties of the material to be dredged which will later be used for dike construction; however, no geotechnical investigations of the foundations of the containment areas have been conducted at this time. This being the case, it is not possible to arrive at any specific conclusions relative to the design of the containment dikes. However, in the absence of the required geotechnical data during this stage of the study a recommendation as to ultimate dike heights and cross-sections can be made based on past construction experience for dikes constructed in coastal areas with similar site conditions. In review of existing disposal areas in and around the Mobile, Alabama area, it was found that dikes could be constructed to heights between 30 and 35 feet on the prevailing soft foundations. Applying state-of-the-art design and construction procedures such as containment dikes reinforced with geotechnical fabric and staged construction, it is anticipated that containment dikes up to 40 feet in height may be constructed on soft foundations without exceeding the bearing capacity of the supporting material. The crown width will be dependent on required usage for maintenance operations and, to some degree, stability requirements. However, a minimum crown width of 12 feet is recommended. Dike slopes should be established on the basis of stability of the dike with respect to shear strength and should be no steeper than 1V on 2H. Containment dike slopes of 1V on 3H are recommended at this time. Thus, for the reasons

stated above, the design section for the containment dikes will be limited to an ultimate height of 40 feet and will consist of a 12 foot crest width with 1V on 3H slopes. It should be noted that one should never rely on experience alone in a design effort but should use it as a guide and supplement to an exploration program, especially in areas of soft foundations. Therefore, in future more detailed studies of this project, a thorough geotechnical investigation of each containment site is recommended.

#### ALTERNATIVES.

For the Double Barrel site and Greenwood Island this study did not consider alternative dike alignments. For Singing River Island, however, five different alignments have been considered as shown on Figure 6. These alignments have been developed as a result of past coordination with Federal and state agencies. Based on a jurisdictional wetlands determination together with an analysis of disposal area life and capacity, only two alignments have been considered in detail and are described subsequently.

#### ALTERNATIVES CONSIDERED IN DETAIL.

Singing River Island Alternative 1. Under this alternative the existing diked area which encompasses about 203 acres would be utilized to the maximum extent practicable. Over the useful life of the disposal area, dikes would ultimately be raised to 40 feet. This dike alignment is shown on Figure 6.

Singing River Island Alternative 2. Under this alternative the diked area on Singing River Island would be expanded to include an additional 130 acres into the site on the east and north sides of the existing diked areas. This dike alignment was selected to avoid what is considered to be jurisdictional wetlands within the context of Section 404, Clean Water Act. Three areas of Singing River Island, although lacking hydric soils were deemed under Section 404 jurisdiction and were not included with the new dike area under this alternative. They were the south and west sides of the island a small tidally influenced area on the northern edge of the island on the west end of the planted pines. The areas of made land, below the 4-foot contour are vegetated by lush stands of Spartina patens with a fringing Spartina alternifolia marsh. This marsh area also contains some Distichlis spicata, Juncus roemerianus and Salicornia. In the southeast corner on the south side is an extensive stand of Scirpus robustus in a large shallow depression. The north side and the east side of the island, mostly above the 6 foot contour, were found to be uplands outside of Section 404 jurisdiction. The northside is vegetated chiefly with Panicum virgatum, Andropogon virginica, assorted asters with thin stands of stunted Spartina patens. There is a young stand of planted pines Pinus sp. adjacent to the beach in the middle of the north side. On the eastside of the island, outside of the now active dikes, is about 20 acres contained by an intact dike that contains approximately 10 acres of standing water. There is a dense stand of Phragmites communis on the north end of this area. The rest of the east side of the island to be enclosed by this alternative dike above the 4-foot contour is chiefly Andropogon virginica, sparse Spartina patens and scattered Baccharis halimifolia, and Myrica cerifera bushes with heavy concentrations of Golden Rod Salidageo sp., and Blackberry brambles, Rubus sp. with occasional Cactus Opuntia compressa. All dikes would be constructed using material from inside the disposal area. The dike



alignment for this alternative is shown in Figure 6. Over the useful life of the disposal area, dikes would ultimately be raised to 40 feet.

Double Barrel Disposal Area Alternative. The existing diked area at the Double Barrel site encompasses about 115 acres. No additional expansion of this area has been considered. Ultimate dike height at this site would be 40 feet.

Greenwood Island Alternative. The existing dikes at Greenwood Island encompass about 101 acres. No additional expansion of this site has been considered. Dike heights at this site would ultimately 40 feet.

#### FACTORS AFFECTING STORAGE CAPACITY

Dredged Material and Foundation Consolidation. After dredged material is placed within a containment area, it undergoes sedimentation and self-weight consolidation, resulting in gains in storage capacity. The placement of dredged material also imposes a loading on the containment area foundation; therefore, additional settlement may result due to consolidation of compressible foundation soils. Settlement due to consolidation is therefore a major factor in the estimation of long-term storage capacity. Since the consolidation process is slow, especially in the case of fine-grained materials, total settlement for a given lift may not have taken place before the containment area is required for additional placement of dredged material. For this reason, the time consolidation relationship is also an important consideration in estimating long-term containment area storage capacity. Consolidation test data for the channel sediment and for the disposal area foundations has not been obtained for this project. For this preliminary evaluation, consolidation test data obtained by WES on foundation samples from North Blakely Island Disposal Area, Mobile, AL and on sediment samples from upper Mobile Harbor were used in the analysis. The effect of any differences in the consolidation characteristics of these materials is unknown at the present time, but, primarily due to the organic content of the material in the Pascagoula area, they could be significant. A complete foundation investigation is recommended for each disposal site. In addition, consolidation testing for both foundation and sediment samples is recommended to assess the storage capacities more accurately.

Desiccation Due to Evaporation. Since the dredge material disposal sites are exposed to drying, some additional subsidence due to desiccation of material will take place, even in the absence of active dewatering efforts. Several factors affect desiccation: (1) precipitation rates (2) evaporation rates (3) area exposed to evaporation/precipitation, and (4) time of exposure. The evaluation of desiccation for this study was based on monthly evaporation and precipitation rates for Mobile, AL. Any differences between between evaporation and precipitation rates from Mobile, AL to Pasagoula, MS, is expected to be minor and, therefore, should not have a significant impact on the results of this evaluation.

Dredged Material Dewatering. Active dewatering programs are implemented to assist the natural process of evaporative drying. The most successful dewatering techniques involve efforts to accelerate natural drying and desiccation of dredged material through increased surface drainage. Prior research has indicated this approach is effective from both a technical and economic standpoint. Drainage trenches placed adjacent and parallel to the

dikes and within the disposal area interior, leading to the outflow weirs, would allow rapid runoff of precipitation and prevent water ponding. This would allow evaporative forces to more efficiently dewater the dredged material. Subsequent precipitation runoff will flow through desiccated cracks in the crust to the trenches and, hence, to the weirs and offsite. As drying continues, the crust desiccation cracks become deeper and the depth of site drainage trenches should be progressively increased, so that water will not pond in desiccation cracks, thus the name "progressive trenching" for the process.

Additional containment storage capacity can be gained through active site management aimed at dewatering dredged material. If an active dewatering program is implemented, a saving in storage capacity and service life between 30 and 40 percent could be realized. The assumption of a well managed dewatering program was made in evaluating the disposal alternatives considered in this report.

Reclamation and Use. Reclamation of fine-grained material for dike upgrading onsite will restore storage capacity. If dikes must be raised to provide adequate storage capacity for the next lift of dredged material, the use of suitable dried dredged material from within the containment area for this purpose will be beneficial. In addition to eliminating the costs associated with the acquisition of borrow, additional storage capacity is generated by removing material from within the area. It is not presently known whether the dried dredged material from the study area will be suitable for dike construction due to its relatively high organic content and associated low shear strength. Further testing should be considered in order to evaluate this material's potential for use in raising the containment dikes. In any event, the volumes involved are quite small in comparison to total volumes of material placed within the disposal area. Therefore, reclamation and removal of material was not considered in projecting the storage life of the disposal areas.

Lift Thickness. Gains in long-term storage capacity of containment areas through natural drying processes can be increased by placing the material in thin lifts. The thinner the lift of fine-grained dredged material placed in a disposal area, the more rapidly a lift may be dewatered and returned to a more stable soil form. Optimum lift thicknesses are those in which complete lift dewatering is possible before the beginning of the next disposal cycle, thus, maximizing the consolidation/desiccation of each lift and, in turn, the storage capacity and life of the disposal areas.

Prior research for dredged material at the Craney Island Disposal Area near Norfolk, VA indicates lift thicknesses in excess of 5 feet begin to significantly affect desiccation and consolidation behavior. Further, thicknesses in excess of about 4 feet showed correspondingly less reduction due to the fact that the entire lift is not dewatered in the available drying period. It was recommended for this site evaluation that lift thicknesses applied over an annual period should be limited to 6 feet or less to avoid significant reduction in dewatering benefits.

Lift thicknesses were determined for the Pascagoula River and Bayou Casotte Channel disposal areas. The dredged material from the Pascagoula River Channel was proportioned to the Singing River Island and Double Barrel Disposal areas during each dredging cycle so that the disposal areas would

have approximately equal service lives. The resulting lift thicknesses varied between 2.5 feet and 5.0 feet for the alternatives that were evaluated. Proportioning the dredged material to these sites to obtain approximately equal service lives is desirable to avoid excessive lift thicknesses as a result of placing the entire Pascagoula maintenance volume into the remaining disposal area. The lift thickness determined for the Greenwood Island Disposal Area (Bayou Casotte Channel) was slightly in excess of 1 foot.

As mentioned elsewhere in this report, consolidation testing for the channel maintenance material to be deposited in these disposal areas has not been conducted at this time, and, as a preliminary evaluation, data from Mobile Harbor sediments were used in the study. Therefore, at the present time, the maximum optimum lift thickness is unknown for the sediments to be dredged from the Pascagoula River and Bayou Casotte channels. However, it is anticipated that the maximum optimum lift thickness will not be exceeded if the material from the Pascagoula channel is proportioned so that the Singing River Island and Double Barrel disposal areas have approximately equal service lives.

#### EFFECT OF COMBINED FEDERAL AND NON-FEDERAL USE OF CONFINED DISPOSAL SITES

The Mobile District dredges relatively large volumes of material from the Pascagoula River and Bayou Casotte Channels at periodic intervals of about 18 months. Assuming that approximately 2 months will be required for the actual dredging, a dredged material dewatering program could be implemented over the remaining 16 months to remove water from the dredged material by evaporative dewatering, shrinking its volume and increasing site disposal capacity, and thus, useful site life.

Application of an appropriate dredged material dewatering plan and a continuing disposal site operation and management program could result in an additional 30-40% increase in useful disposal site life. However, in order to realize this increase in useful site life, a dewatering program must be conducted over the entire interval between disposal cycles. In this regard, the net effect of periodic small volume disposal into any disposal site by the JCPA and/or private interests would be to cover the entire site with water during the dredging and disposal operation, negating, for the period of dredging/disposal, the effects of any ongoing dewatering activities, and, after disposal, to place a thin, high water content slurry over the partially dewatered Federal disposal lift, further hindering evaporative drying of the large volume of maintenance material.

The reduction in total site capacity caused by disposal of JCPA/private interest dredging will be fairly small compared to the long-term reduction in site capacity caused from interference with an ongoing dredged material dewatering program. Also, while the volume of material to be dredged by periodic Federal channel maintenance and the frequency of dredging are reasonably well known, data of similar precision are not available concerning the frequency of JCPA/private interest dredging.

Thus, any long-term solution for confined disposal of maintenance dredging in the Pascagoula River and/or Bayou Casotte Channel would benefit from separation of Federal and non-Federal disposal requirements, such that each agency can conduct its dredging and disposal activities without

hindering the other's activities. As an alternative to separation of disposal requirements, the non-Federal dredging interests could accommodate their dredging needs to the approximate 18 month frequency Federal channel maintenance dredging activities.

STORAGE CAPACITY EVALUATIONS

Singing River Island and Double Barrel Disposal Areas. The storage capacities for the Singing River Island and the Double Barrel disposal areas were evaluated for the alternatives discussed above. The dredged material from the Pascagoula River Channel was proportioned to each site for the alternatives that were considered so that the service lives of these two sites would be approximately equal. The data for alternative plans analyzed is summarized in the following tabulations:

---

Plan 1 - Existing Double Barrel Site with the  
Existing Singing River Island Site

---

Disposal Area	Area (acres)	Dredged* Volume (cu yds)	Lift Thickness (feet)	Frequency of Placement (months)
Singing River Island Alt. 1	203	706,600	3.4	18
Double Barrel	115	480,900	4.1	18

---



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Plan 2 - Existing Double Barrel Site with Singing River Island  
Alt. 2 - Jurisdictional Limits

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Disposal Area	Area (acres)	Dredged* Volume (cu yds)	Lift Thickness (feet)	Frequency of Placement (months)
Singing River Isld. Alt. 2	333	839,600	3.0	18
Double Barrel	115	347,900	2.5	18

---

\*Federal and non-Federal in-situ volumes of material to be dredged.

For Plan 1, the analysis indicates that the disposal areas could be operated between 30 and 40 years before reaching an average surface elevation near +40 ft., the limiting dike elevation, at which time dike stability would require reevaluation. The results of the evaluation of Plan 2 indicates that the disposal areas could be operated between 45 and 55 years. The assumptions of surface water management, active dewatering, limiting dike heights of 40 ft., and foundation and sediment consolidation data from the

Upper Mobile Harbor area were made in evaluating the storage capacities of these disposal areas.

Greenwood Island Disposal Area. The storage capacity for the Greenwood Island disposal area was evaluated for the conditions tabulated below:

Area - 101 Acres  
Dredged Volume - 112,500 cubic yards (Federal and non-Federal)  
Lift thickness - 1.1 feet  
Frequency of Placement - 18 months

Results of the analysis for the conditions shown above indicate that the Greenwood Island disposal area could be operated in excess of 50 years before reaching an average surface elevation near +40 ft., the limiting dike elevation, at which time dike stability would require reevaluation. The assumptions of surface water management, active dewatering, limiting dike heights of 40 feet, and foundation and sediment consolidation data from the Upper Mobile Harbor area were made in evaluating the storage capacities of this disposal area.

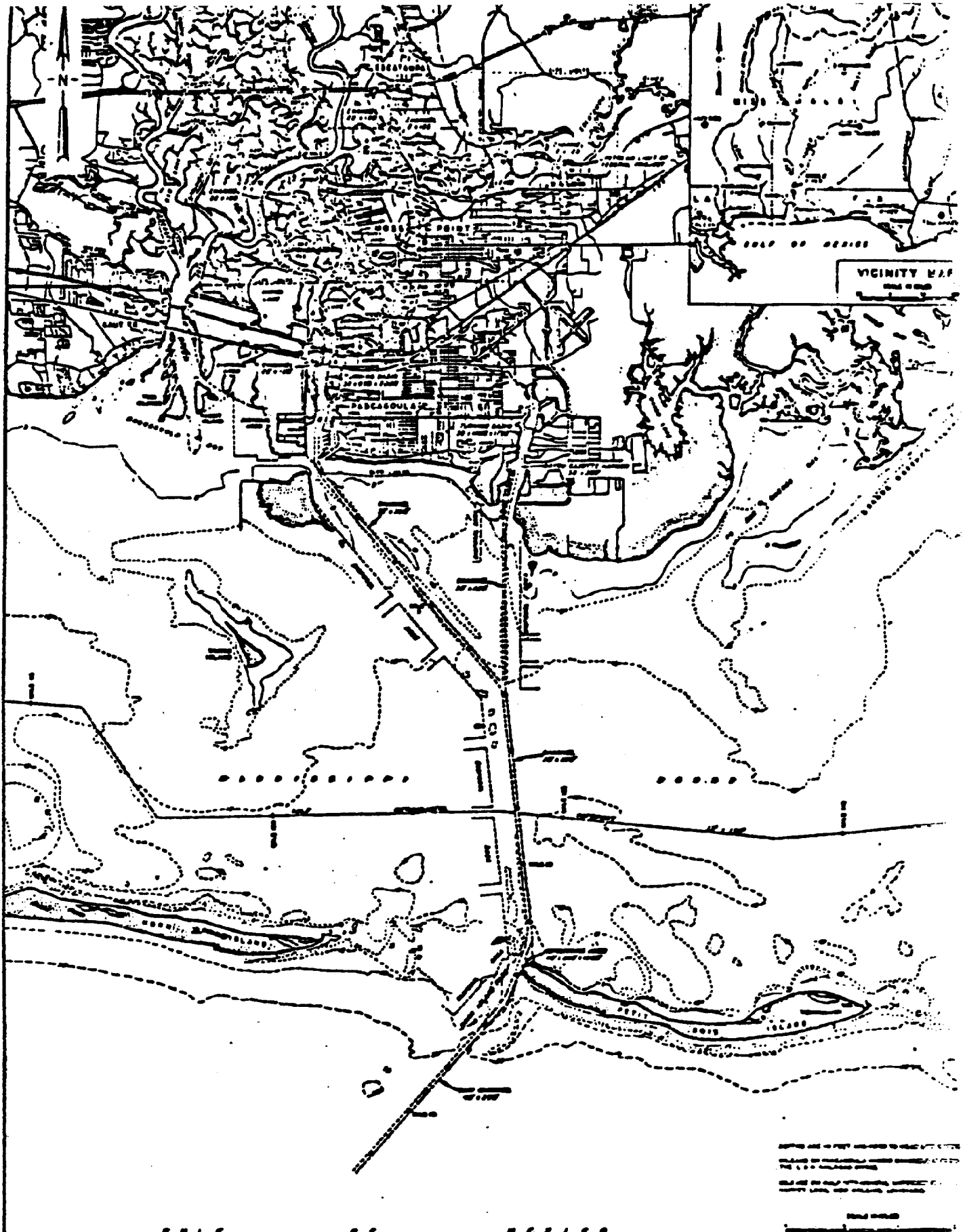
#### ECONOMICS OF DREDGING AND DISPOSAL AREA MANAGEMENT.

(Data for this section are not available at this time, but will be added subsequently.)

#### IMPLEMENTATION CONSIDERATIONS.

Recommended Engineering Investigations. Implementation of this plan will require additional engineering investigations to confirm and refine the assumptions utilized herein. A complete foundation investigation is recommended for each disposal site. In addition, consolidation testing for both foundation and sediment samples is recommended to assess the storage capacities more accurately. This would enable a refinement of the recommended dike heights as well as consolidation characteristics.

Sequencing of Federal/Non-Federal Disposal Activities. As indicated previously, Federal dredging occurs, on the the average, on 18 month intervals. Non-Federal dredging, however, occurs on a 24 to 36 month interval. To achieve the consolidation/dessication results described previously, non-Federal disposal into the sites will need to occur at about the same time as Federal disposal. It is recognized that Federal and non-Federal dredging requirements do not occur on regular intervals. Accordingly, close continuing coordination will be required to assure optimal use of the disposal areas.



PASCAGOULA HARBOR, MISS.  
 FIGURE I - PROJECT FEATURES

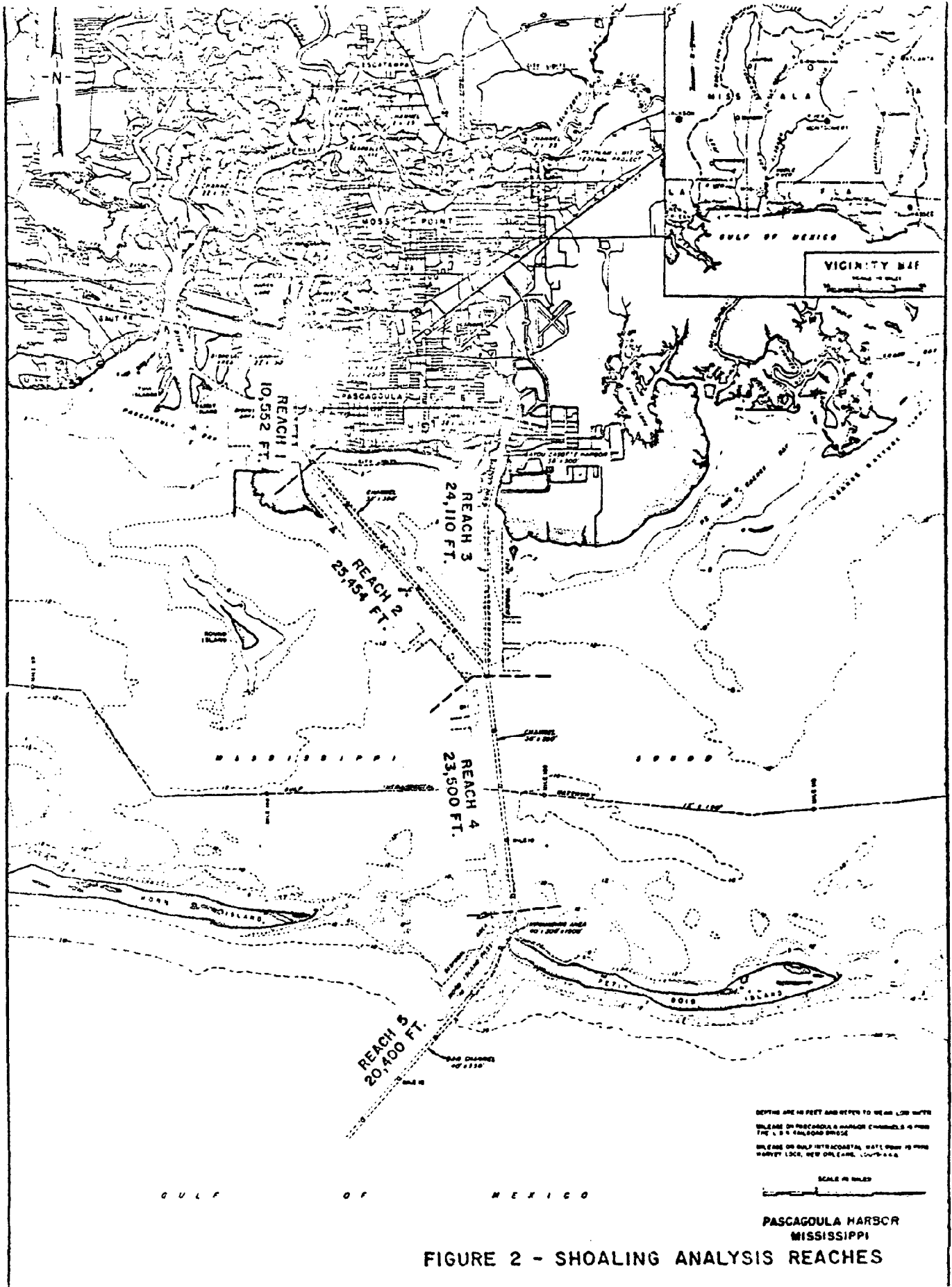
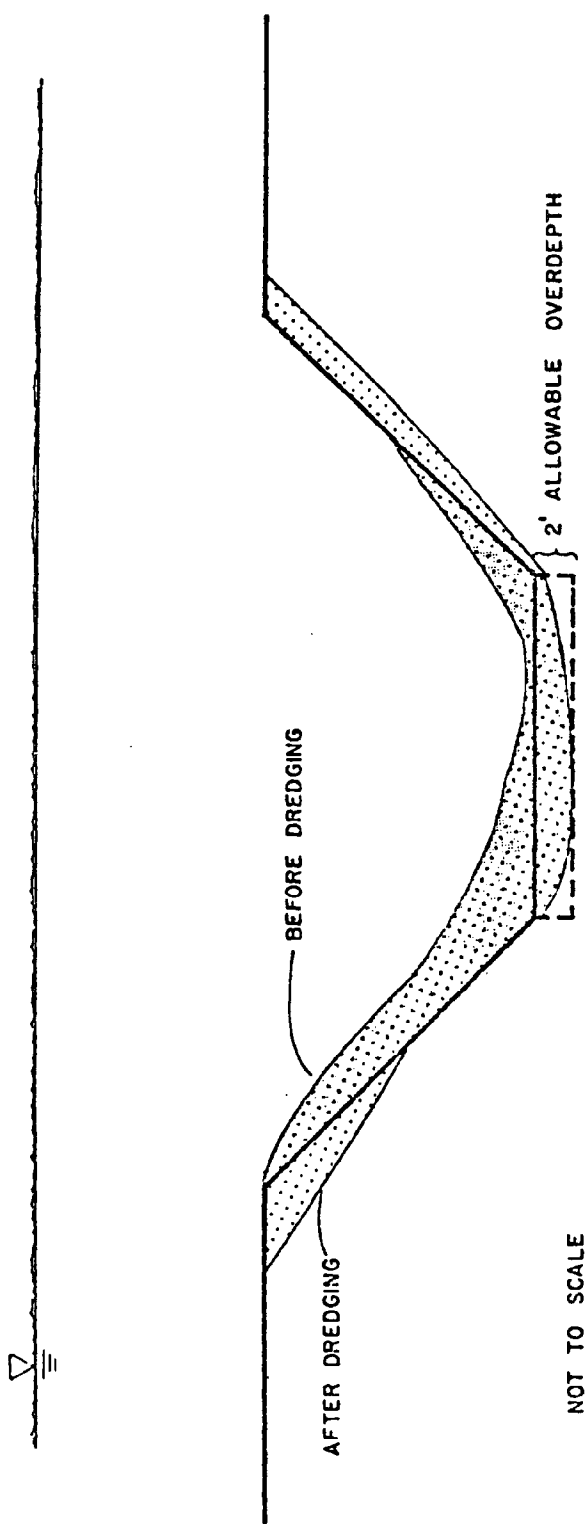



FIGURE 2 - SHOALING ANALYSIS REACHES



$$\text{GROSS SHOALING RATE}_i = (\text{GROSS YARDAGE})_i \div (\text{REACH LENGTH} \times \text{TIME INTERVAL}_{i-1 \text{ to } i})$$

$$\text{NET SHOALING RATE}_i = \left[ \text{NET YARDAGE}_i + (\text{GROSS - NET})_{i-1} \right] \div (\text{REACH LENGTH} \times \text{TIME INTERVAL}_{i-1 \text{ to } i})$$

REQUIRED CHANNEL DIMENSIONS:

 GROSS YARDAGE


 NET YARDAGE

FIGURE 3 -- SHOALING RATE DETERMINATION



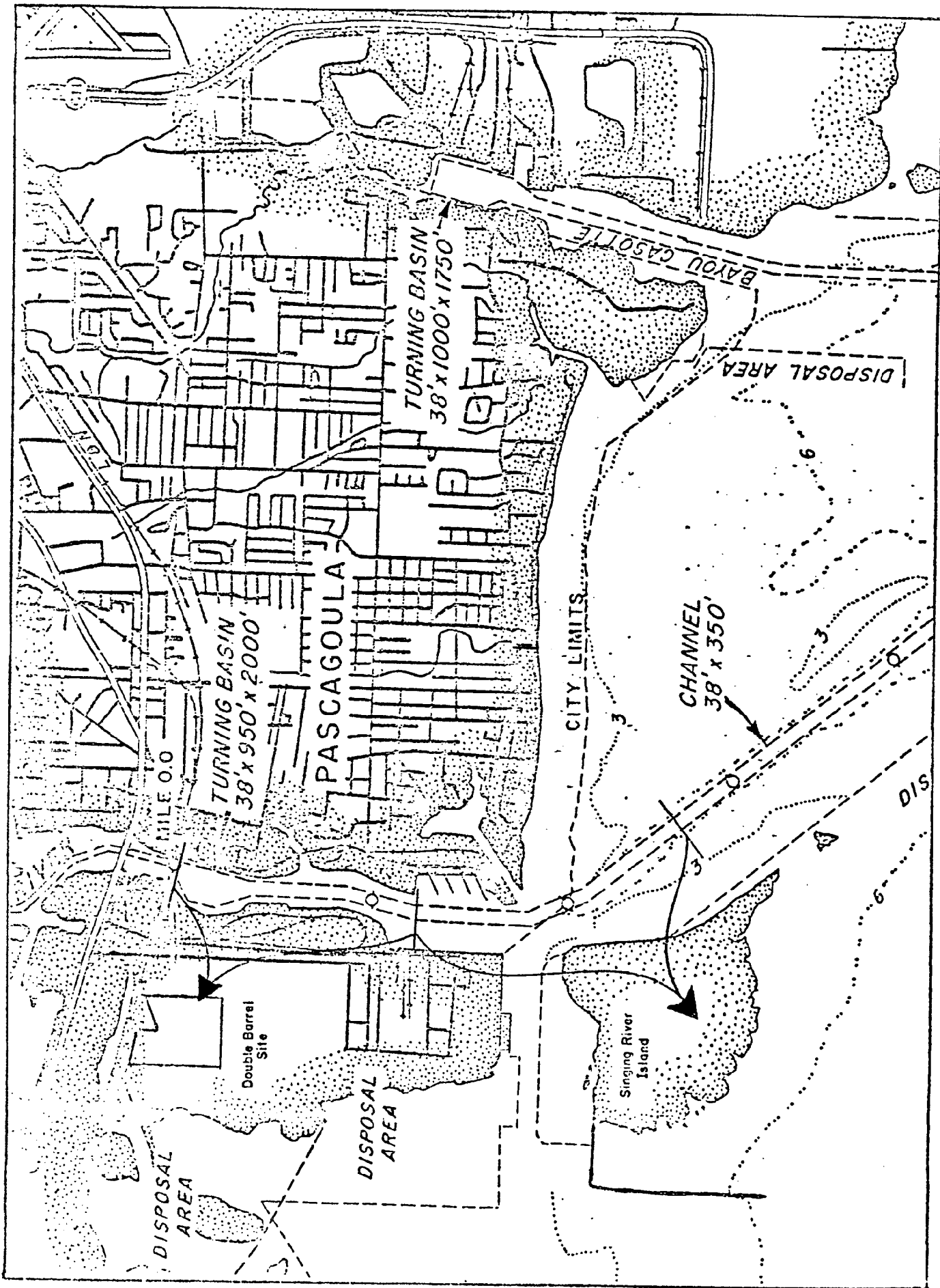
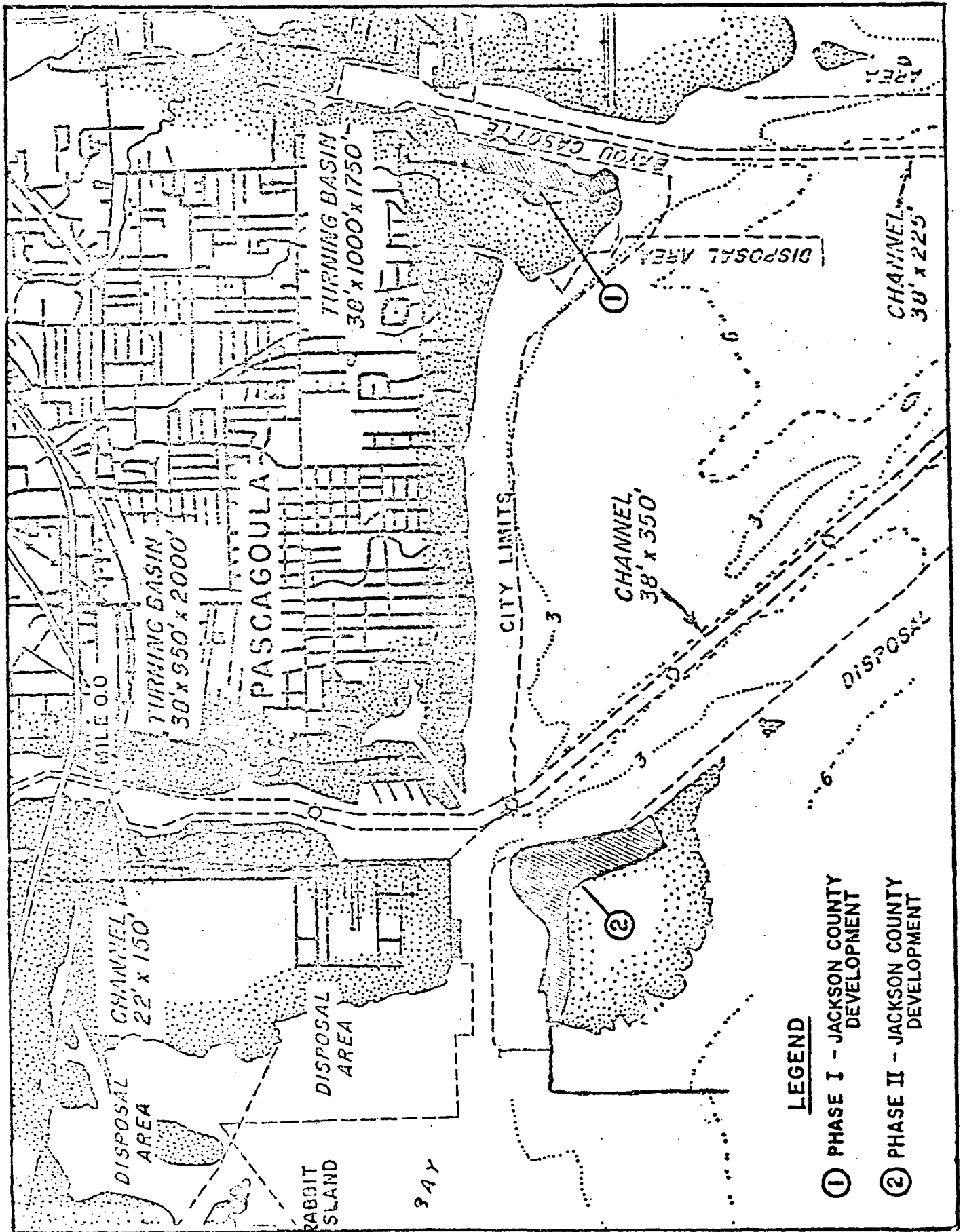


FIGURE 4 - DREDGING REACHES AND DISPOSAL LOCATIONS



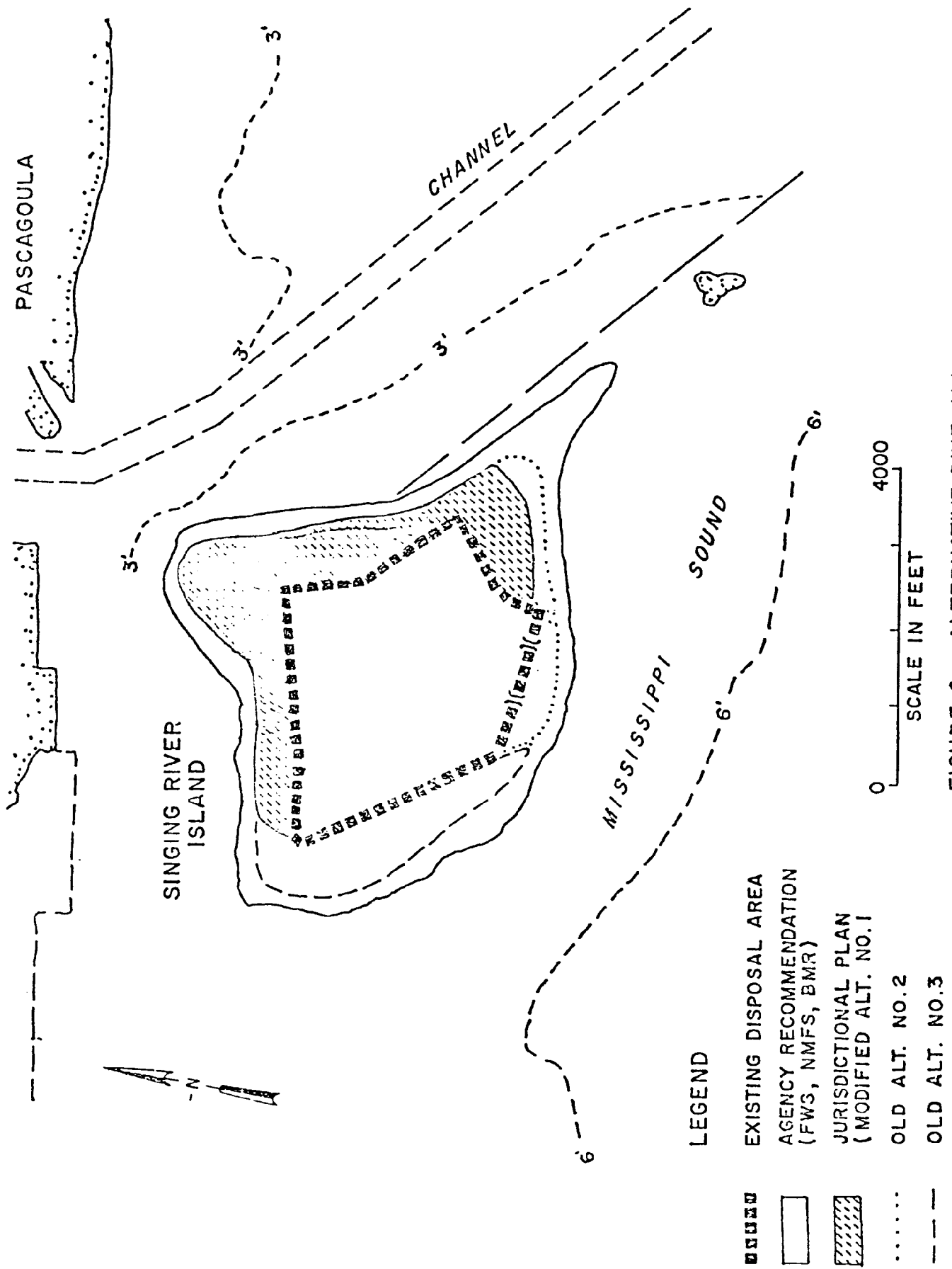


FIGURE 6 - ALTERNATIVE DIKE ALIGNMENTS CONSIDERED

**APPENDIX F:**

**BANGS LAKE WARRANTY DEED**

STATE OF MISSISSIPPI

COUNTY OF JACKSON

WARRANTY DEED

FOR AND IN CONSIDERATION OF the sum of Ten Dollars (\$10.00) cash in hand paid and other good and valuable consideration, the receipt of all of which is hereby acknowledged, JACKSON COUNTY, MISSISSIPPI, ACTING THROUGH THE JACKSON COUNTY BOARD OF SUPERVISORS AND THE JACKSON COUNTY PORT AUTHORITY does hereby sell, convey and warrant unto the MISSISSIPPI COMMISSION ON WILDLIFE CONSERVATION ON BEHALF OF THE STATE OF MISSISSIPPI that certain parcel of land in Jackson County, Mississippi, more particularly described as follows:

Commencing at the Northeast corner of the Southeast Quarter of the Northeast Quarter, Section 2, Township 8 South, Range 5 West, runs thence West 5,280 feet to the Section line dividing Sections 2 and 3, Township 8 South, Range 5 West, runs thence South 1,320 feet to the Northeast Corner of the Southeast Quarter of Section 3, Township 8 South, Range 5 West, runs thence West 2,640 feet to the Mid Section Line of Section 3, Township 8 South, Range 5 West, runs thence South along the Mid Section Line of Sections 3, 10 and 15, Township 8 South, Range 5 West, a distance of 13,200 feet to the Section Line dividing Sections 15 and 22, Township 8 South, Range 5 West, runs thence West 1,320 feet to the Northwest Corner of the Northeast Quarter of the Northwest Quarter of Section 22, Township 8 South, Range 5 West, runs thence South 5,280 feet to the Section Line dividing Section 22 and Fractional Section 27, Township 8 South, Range 5 West, runs thence West a distance of 1,320 feet to the Northwest corner of Fractional Section 27, Township 8 South, Range 5 West, runs thence South along the Section Line between Fractional Sections 27 and 28, Township 8 South, Range 5 West to the mean water line of the Mississippi Sound, runs thence Northeasterly and Northerly along the mean water line of the Mississippi Sound to a point at which the mean water line of the Mississippi Sound is intersected by the Section line dividing Fractional Sections 11 and 14, Township 8 South, Range 5 West, runs thence West to the Northeast corner of Section 15, Township 8 South, Range 5 West, runs thence North a distance of 2,640 feet to the Northeast Corner of the Southeast Quarter of Section 10, Township 8 South, Range 5 West, runs thence East a distance of 2,640

feet to the Northeast corner of the Southwest Quarter of Fractional Section 11, Township 8 South, Range 5 West, runs thence North 2,640 feet to the Section Line dividing Fractional Section 11 and Section 2, Township 8 South, Range 5 West, runs thence East a distance of 2,640 feet to the Southeast Corner of Section 2, Township 8 South, Range 5 West, runs thence North 3,960 feet to the point of beginning. This tract contains 3,265 acres, more or less, per the attached plat. The real property herein described is the the South Half of the North Half and the South Half of Section 2, the Southeast Quarter of Section 3, the East Half of Section 10, the East Half of Section 15, the East Half of the West Half and the East Half of Section 22, Fractional Section 27, Fractional Section 26, Fractional Section 23, Fractional Section 14, and the Northwest Quarter of Fractional Section 11, all being located in Township 8 South, Range 5 West, Jackson County, Mississippi, LESS AND EXCEPT the West half of the Northwest Quarter of the Southwest Quarter of Section 2, Township 8 South, Range 5 West.

LESS AND EXCEPT any portion of the above described property which is not owned or otherwise held in trust by the State of Mississippi.

Said property consists of Three Thousand Two Hundred Sixty-five (3,265) Acres, more or less, consisting of, in whole or in part, submerged water bottoms below the watermark of ordinary high tide and publicly owned accretions above the watermark of ordinary tide. Since the parties have not made a survey of the mean high water line, made on, or investigation as to the condition of the land as of 1817, the year Mississippi was admitted to the Union, it is impossible to determine with certainty that land, if any, which is susceptible to private ownership. By this instrument, Jackson County conveys and warrants title in fee simple to all land within the above description which is not public trust land, if any. By accepting this deed, the State of Mississippi makes no representation that any of the land within the above description is susceptible to private ownership, and the State of Mississippi will not be estopped to deny the title of Jackson County or its predecessors in title.

The above described property above the mean high water line in private ownership is transferred to the Commission on Wildlife

Conservation on behalf of the State of Mississippi to be held in perpetuity in its present condition as a natural area preserve and said property shall be protected, preserved, and managed in a manner consistent with the intent and purposes of the Mississippi Natural Heritage Law of 1978, Miss. Code Ann., §49-5-141 through 49-5-157 (1972 Supp).

WITNESS OUR SIGNATURES, this the 11<sup>th</sup> day of March, A.D., 1986.

JACKSON COUNTY, MISSISSIPPI  
ACTING THROUGH THE JACKSON  
COUNTY PORT AUTHORITY

BY:   
JERRY LEE, President

ATTEST:

  
JOHNNY S. TILLMAN, Secretary

JACKSON COUNTY, MISSISSIPPI  
ACTING THROUGH THE JACKSON  
COUNTY BOARD OF SUPERVISORS

BY:   
DOUGLAS R. HOLDEN, President

ST:

  
LYNN PRESLEY, Clerk

STATE OF MISSISSIPPI

COUNTY OF JACKSON

PERSONALLY APPEARED before me, the undersigned authority of law, in and for said County and State, JERRY LEE and JOHNNY S. TILLMAN, President and Secretary, respectively, of the JACKSON COUNTY PORT AUTHORITY, each of whom acknowledged that as such President and Secretary, they signed and delivered the above and foregoing instrument of writing for and on behalf of said Port Authority, and as its act and deed, after being first duly author-

ized so to do, and that the said Johnny S. Tillman, Secretary, further acknowledged that he affixed to said instrument the Official Seal of Said Authority.

GIVEN under my hand and Official Seal of Office, this the 11<sup>th</sup> day of March, 1986.

Marilyn B. Guardia  
NOTARY PUBLIC

MY COMMISSION EXPIRES:  
~~MARILYN B. GUARDIA~~ Notary Public  
~~My Commission Expires December 6, 1988~~

STATE OF MISSISSIPPI  
COUNTY OF JACKSON

PERSONALLY APPEARED before me, the undersigned authority of law, in and for said County and State, DOUGLAS R. HOLDEN and LYNN PRESLEY, President and Clerk, respectively, of the BOARD OF SUPERVISORS OF JACKSON COUNTY, MISSISSIPPI, each of whom acknowledged that as such President and Clerk, they signed and delivered the above and foregoing instrument of writing for and on behalf of said Board of Supervisors, and as its act and deed, after being first duly authorized so to do, and that the said LYNN PRESLEY, Clerk, further acknowledged that he affixed to said instrument the Official Seal of said County.

GIVEN under my hand and Official Seal of Office, this the 11<sup>th</sup> day of March, 1986.

Marilyn B. Guardia  
NOTARY PUBLIC

MY COMMISSION EXPIRES:  
~~MARILYN B. GUARDIA~~ Notary Public  
~~My Commission Expires December 6, 1988~~



**BANGS LAKE PROPERTY  
JACKSON COUNTY PORT AUTHORITY**

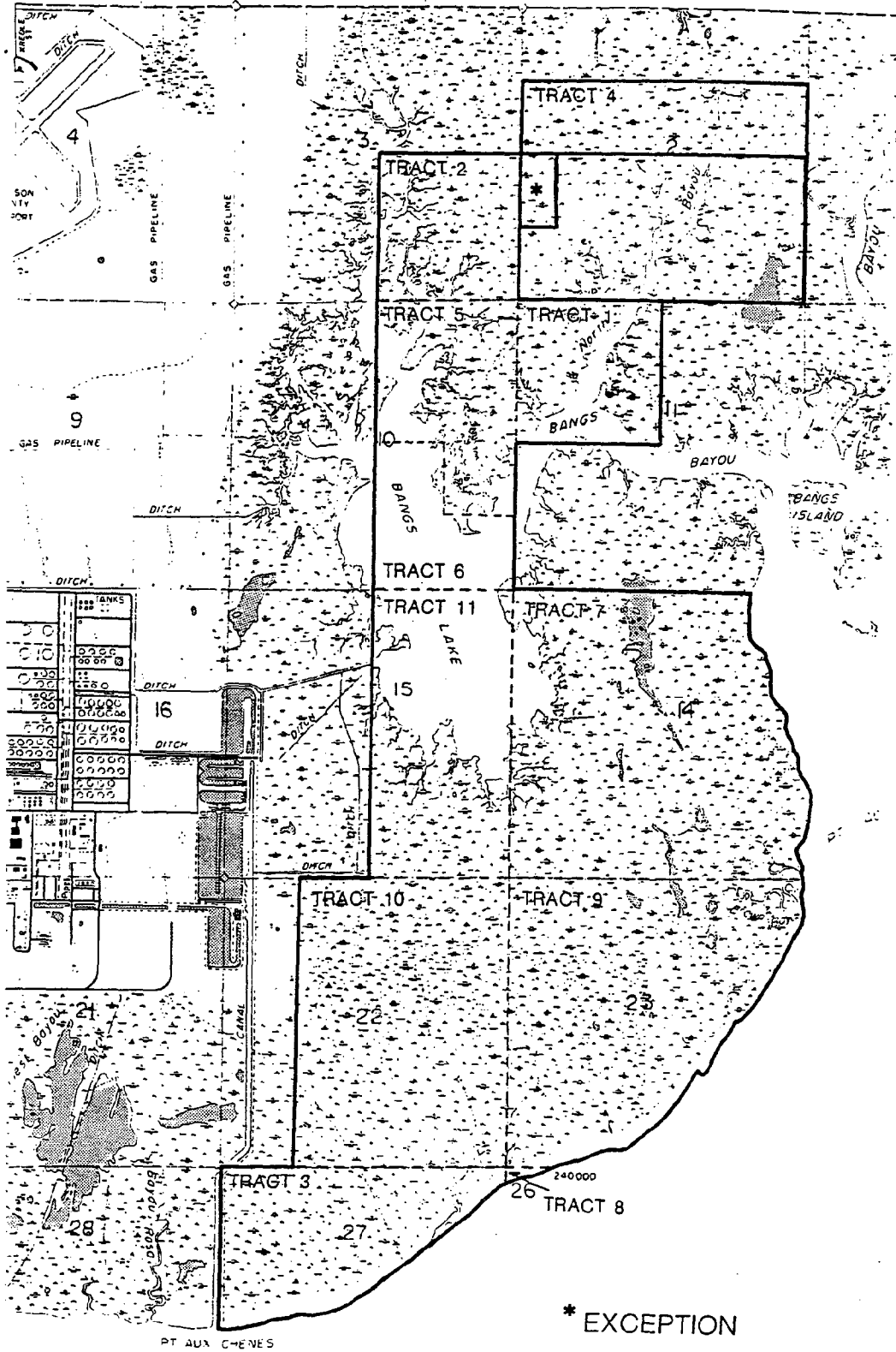


TABLE 1			
Year	1985	1990	1995
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