US Army Corps of Engineers®
Vicksburg District

Flood Control, Pearl River Basin, Mississippi

PEARL RIVER WATERSHED, MISSISSIPPI

Feasibility Study

MAIN REPORT

Draft & Environmental Impact Statement

Volume I

DRAFT

February 2007

RANKIN-HINDS PEARL RIVER
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IMPORTANT

To the Reader of the 2007 Draft Feasibility Study and Environmental Impact Statement for the Pearl River Watershed

The enclosed Draft 2007 Feasibility Study and Environmental Impact Statement ("FS/EIS") report was never intended to be released to the general public. It was prepared as a draft document to allow the parties involved in the proposed project to internally review, discuss, correct and modify. After it was produced the Rankin Hinds Pearl River Flood and Drainage Control District ("District") identified many issues and concerns in the Draft Report. Some of those are summarized below, but because these issues are throughout the document, not all of the errors, misinformation and other problems are listed in this introduction. Therefore, we ask the reader of this document to understand that many important aspects of the Draft Report are not correct. The updated FS/EIS currently being prepared by the Rankin Hinds Pearl River Flood and Drainage Control District will complete the FS/EIS process begun under the 2007 Draft Report effort and will improve, correct and expand many of the areas of study.

Summary of Issues of Concern – 2007 Draft Report (not in order of importance)

1. Does not include all reasonable alternatives analysis
2. Financial and economic data was outdated or incorrect
3. Critical documentation was incomplete which impacted certain conclusions
4. Hydraulic data was outdated
5. Misrepresented potential impacts of certain alternatives
6. Did not analyze downstream analysis/impacts
7. Costs estimates were incomplete and/inaccurate
8. Certain environmental issues associated with each alternative were not considered

Although the list above does not include all of the many issues and concerns the District has about the draft report, it should give the reader the sense of what to expect when reading the document and that because the analysis is flawed, the conclusion is not supportable. The current schedule for the ongoing FS/EIS projects a draft FS/EIS report in the late spring. In the meantime, if you have any questions on this draft report or the FS/EIS work currently underway, please contact Keith Turner at 601-965-1958 or kturner@watkinseager.com.

PEARL RIVER WATERSHED
FEASIBILITY REPORT

JANUARY 2007

PEARL RIVER WATERSHED
FEASIBILITY REPORT

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PEARL RIVER WATERSHED
FEASIBILITY REPORT

STUDY AUTHORITY

1. Studies of the Pearl River Watershed, Mississippi, were authorized by congressional resolutions adopted 9 May 1979. These authorizations read as follows:

"Resolved by the Committee on Public Works and Transportation of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Pearl River Basin, Mississippi and Louisiana, published as House Document Number 282, Ninety-Second Congress, Second Session, and other pertinent reports, with a particular view toward determining whether any further improvements for flood damage prevention and related purposes are advisable at this time. The alternatives are to be reviewed with local interests to insure a viable, locally supported project.

Resolved by the Committee on Public Works and Transportation of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors is hereby requested to review the report of the Chief of Engineers on the Pearl River and Tributaries, Mississippi, contained in House Document 441, 86th Congress, and other reports with a view to determining whether measures for prevention of flood damages and related purposes are advisable at this time, in Rankin County, Mississippi.

Resolved by the Committee on Environment and Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, and is hereby requested to review the reports of the Chief of Engineers on Pearl River Basin, Mississippi and Louisiana submitted in House Document Numbered 92-282, 92d Congress, 2nd Session and other pertinent reports with a view to determining whether any further improvements for flood damage prevention and related purposes are warranted at this time."

2. Authorization for construction of Shoccoe Dam is contained in Section 401(e) of the Water Resources Development Act (WRDA) of 1986 (Public Law 99-662) which reads as follows:

"(3) PEARL RIVER BASIN, INCLUDING SHOCCOE, MISSISSIPPI.--The Secretary is authorized to construct a project for the purpose of providing flood control for the Pearl River Basin in Mississippi, including, but not limited to, Carthage, Jackson, Monticello, and Columbia, Mississippi, consisting of--

(A) the project for flood control, Pearl River Basin, Mississippi: Report of the Chief of Engineers, dated March 17, 1986, at a total cost of $80,100,000, with an estimated first Federal cost of $56,070,000 and an estimated first non-Federal cost of $24,030,000; and

(B) for the purpose of providing flood control for the upstream areas of the Pearl River Basin in Mississippi--

(i) a combination roadway crossing of the Pearl River and floodwater detention and storage facility in east central Leake County, Mississippi;

(ii) a levee system in the south part of Carthage, Mississippi, which will upgrade, extend, and improve the protective levee system on the south side of Highway 16 in Leake County and the city of Carthage;

(iii) appropriate drainage structure and bridge modifications to expand and improve the stormwater conduits under Mississippi Highway 35, south of Carthage, Mississippi, for the purposes of reducing backwater influence for areas upstream of such highway;

(iv) upstream reservoirs on the Pearl River;

(v) such other structures as may be necessary to alleviate unforeseen flooding in the Leake County area as a result of the construction of the Shoccoe Dry Dam; and

(vi) channel improvements on the upstream Pearl River. For purposes of analyzing the costs and benefits of those portions of the project described in subparagraph (B), the Secretary shall take into account the costs and benefits of that portion of the project described in subparagraph (A)."

STUDY PURPOSE AND SCOPE

3. This report discusses the findings of feasibility studies for the Pearl River Watershed, Mississippi. These studies were conducted in partnership with the Rankin-Hinds Pearl River Flood and Drainage Control District (RHPRFDCD)--the non-Federal sponsor.

4. Previous studies conducted as a part of the comprehensive Pearl River Basin Study found Shoccoe Dam to be the best plan to address flooding problems in the Pearl River Watershed. Shoccoe Dam was authorized for construction by WRDA 86, but was subsequently determined to be unimplementable from a local interest standpoint. The Pearl River Basin Development District (PRBDD) and Hinds County Board of Supervisors requested the U.S. Army Corps of Engineers, Vicksburg District, undertake an investigation of alternative flood control measures. Reconnaissance studies for the Pearl River Watershed were completed in June 1990. These studies focused on evaluation of a comprehensive levee system consisting of approximately 24 miles of new levees and raising approximately 11 miles of the existing levees. Reconnaissance studies indicated that feasibility studies were warranted and a Feasibility Cost-Sharing Agreement (FCSA) was executed with PRBDD on 25 September 1991.

5. The resulting recommended plan documented in a January 1996 draft report was a comprehensive levee system to provide protection from the 1979 flood. The sponsor attempted on two occasions to obtain bonding authority from the state legislature. Both attempts were defeated largely in part to questions over the operation of the Ross Barnett Reservoir and downstream concerns over flooding and bank caving. The study action was suspended in July 1998 because the sponsor was unable to secure a source of funds for their share. The final feasibility report was never completed.

6. In 1996, local interests proposed the LeFleur Lakes (LL) plan, consisting of upper and lower lakes along the Pearl River south of the Ross Barnett Reservoir, as an alternative to the comprehensive levee plan. The lakes would extend from the Ross Barnett Reservoir outlet downstream along the Pearl River to approximately 1 mile southwest of Interstate 20. In order to create the lakes and adjoining flood-free land for commercial development, the plan proposed performing cut and fill operations on the Pearl River. The combined lakes would cover approximately 4,700 acres (4,100 acres of the upper lake and 600 acres of the lower lake) at normal operating levels. Weirs at both the upper and lower lakes would regulate flow.

7. At the request of local interests, an independent evaluation of the LL plan was conducted during June-December 2000 by an Architect-Engineer firm, URS, jointly selected and cost shared equally by the Vicksburg District and PRBDD. The evaluation indicated that the LL plan

could reduce Pearl River flooding in the Jackson area as would the levee plan, at an estimated project cost in excess of $300,000,000.

8. Meetings were held with PRBDD and RHPRFDCD on 5 September 2001 to discuss resumption of studies in Jackson, Mississippi, directed toward developing a compromise plan incorporating aspects of both the levee and lakes plans. Such a plan could potentially provide a high degree of flood protection, be economically feasible and environmentally sustainable, and be supported locally. The RHPRFDCD, in agreement with the PRBDD, indicated they would be the non-Federal sponsor for the resumed study. Based on meeting results, the Vicksburg District requested and received funds to prepare the Project Management Plan (PMP) and FCSA for negotiation with a non-Federal sponsor. Studies would have included all reasonable alternatives. The draft PMP prepared for developing a compromise plan was presented to RHPRFDCD in May 2002.

9. Subsequent to preparing the draft PMP, the non-Federal sponsor requested limiting feasibility studies to include only updating the levee plan recommended in the above-referenced January 1996 draft report, and analyzing only the LL plan. The LL plan could be designated the Locally Preferred Plan (LPP). The sponsor did not want to participate in a study which examined a reasonable array of alternatives. The PMP was revised to reflect a study limited to these two plans. During subsequent coordination activities with the non-Federal sponsor, it was determined that levees downstream of the proposed LL plan lower weir would be needed in

conjunction with the lakes. These areas included south Jackson and Richland. During the conduct of the study, it was determined that levees would also be needed in the Town and Lynch Creek areas. Therefore, studies included investigations of levees for south Jackson, Richland, and Town and Lynch Creeks as components of the LL plan. The FCSA, necessary to resume investigations of "Pearl River Watershed, Mississippi" suspended in July 1998, was signed with RHPRFDCD on 15 October 2003. The RHPRFDCD provided the majority of their 50 percent share of study costs by conducting work-in-kind.

10. The levee plan recommended in the previous study was the only levee plan included in these investigations. The LL plan was evaluated to the same detail as the levee plan. Project features were evaluated to ensure that the latest economic and environmental regulations for acceptability under Federal laws and regulations are met.

11. In February 2006, Congressman Chip Pickering requested a meeting to discuss the LL plan. This meeting, attended by Congressman Pickering, Mr. Leland Speed (Director of Mississippi Economic Development Authority), RHPRFDCD representatives, and Vicksburg District staff, was held in Jackson on 24 February 2006. Congressman Pickering recognized that the LL project would probably not be justified economically, precluding Federal participation in implementation. In that light, he described the likelihood that local interests could pursue LL project implementation independently. Subsequent discussion established that the most logical point in the study process for this decision to be made would be when the preliminary draft

feasibility report was prepared. Although only preliminary costs had been developed at the time, it was already apparent that economic justification, in accordance with Federal guidelines, of the LL plan was unlikely. Therefore, study efforts thereafter concentrated on completing draft documentation for the non-Federal sponsor's use in the National Environmental Policy Act (NEPA) and Section 404 permitting process.

REPORT FORMAT

12. The overall document is comprised of a main report, a DEIS, and supporting documentation. The main report consists of problem identification, plan formulation, description of the levee and LL plans and summary of findings. The DEIS discusses anticipated effects of the proposed plans. The supporting documentation includes technical appendixes. The report has been prepared in general accordance with Engineering Regulation 1105-2-100, "Guidance for Conducting Civil Works Planning Studies."

STUDY AREA DESCRIPTION

GENERAL

13. The Pearl River Basin, as shown on Plate 1, is located in the southern central portion of Mississippi and in a small part of southeastern Louisiana. The primary study area comprises the Pearl River Basin between River Mile (RM) 270.0 just south of Byram, Mississippi, and RM 301.77 at the dam of Ross Barnett Reservoir. Municipalities within the study area include Jackson, Flowood, Pearl, and Richland. The study area includes parts of three

counties--Madison, Hinds, and Rankin. Major tributaries of the Pearl River within the study area include Richland, Caney, Lynch, Town, and Hanging Moss Creeks. This area is shown on Plate 2.

PRIOR STUDIES, REPORTS, AND EXISTING WATER PROJECTS

CORPS STUDIES AND REPORTS

Survey Report Recommending Existing Levee Project

14. A survey study of the Pearl River and Tributaries, Mississippi, was authorized by the Chief of Engineers on 2 May 1949. The survey report was submitted to the South Atlantic Division Engineer by the Mobile District Engineer on 30 June 1959 and recommended a system of levees for Jackson and east Jackson in combination with channel cutoffs and improvements between the levees. Authority for construction of these works is contained in Section 203 of the Flood Control Act of 14 July 1960, Public Law 86-645. Construction was completed in 1968.

Comprehensive Survey of the Pearl
River Basin, Mississippi and Louisiana

15. A comprehensive study of the water and related land resources of the Pearl River Basin was completed in 1970 by the Corps in cooperation with the Departments of the Interior; Agriculture; Health, Education, and Welfare; Transportation; Commerce; the Federal Power Commission; and the States of Mississippi and Louisiana. The resulting comprehensive plan included structural measures in two categories--an early action program and a framework for future planning. In addition, nonstructural measures were recommended in the area of flood plain management, agricultural land and forest management, health, water quality, recreation, fish and wildlife enhancement, preservation of natural areas, data collection, and review of water resource programs and policies. Structural measures in the early action program included three multiple-purpose reservoirs (Ofahoma, Carthage, and Edinburg), land treatment measures, and a pleasure boatway over 302 miles of the Pearl River.

Edinburg Dam Phase I
Design Memorandum (DM)

16. A followup report on the Ofahoma, Carthage, and Edinburg Dam projects was completed by the Mobile District in January 1972 and published as House Document 92-282, 2d Session. It was concluded in that report that only the Edinburg project was economically justified.

17. Phase I DM planning studies on the Edinburg project were authorized in WRDA 74. A special report which provided a brief economic analysis of the project was furnished to Congress in September 1980 in response to a provision in Report Number 96-1086 of the House of Representatives on the Supplemental Appropriations and Recision Bill of 1980. The reevaluation of the Edinburg project in that report indicated that the project was no longer economically justified due to increases in project costs resulting from errors in the preliminary topographic mapping used in the 1970's and changes in water resources policy which resulted in reductions in project benefits. Nevertheless, the Edinburg project, as well as the Ofahoma and Carthage projects, were reevaluated in the Pearl River Basin Interim Report on Flood Control discussed in paragraph 12.

Town Creek, Jackson, Mississippi

18. A survey report on the feasibility of flood protection measures on Town Creek at Jackson was completed in August 1970. The conclusion in that report was that no economically feasible flood control plan for Town Creek could be identified. This report was returned for reevaluation and the authorities requesting that investigation were combined with other authorities responded to in the Pearl River Basin Interim Report on Flood Control discussed in paragraph 12.

Pearl River Basin Interim
Report on Flood Control

19. Following the Easter flood of 1979, numerous House and Senate resolutions were passed directing review by the Corps of various water resource problems in the Pearl River Basin. A comprehensive basin study was initiated to address these resolutions in addition to others which had been previously funded.

20. A reconnaissance report was completed by the Mobile District and approved in November 1981. This report recommended more detailed evaluation of various flooding problems in the Basin to be documented in an interim report on flood control.

21. The 1981 reconnaissance report identified four flood control project elements which appeared economically feasible. These elements were referred to as the "Four Point Plan" and consisted of constructing a wave barrier in the Ross Barnett Reservoir, clearing the floodway below the levees in Jackson, constructing a river bend cutoff through the old sanitary landfill in south Jackson, and removing sediment deposit at the Highway 25 crossing on the Pearl River.

22. The Four Point Plan was authorized for construction in the FY 83 Supplemental Appropriations Bill. Detailed studies indicated that the river bend cutoff was not incrementally justified and was therefore deleted from the plan. The work at Ross Barnett Reservoir was

deleted because of a lack of Federal interest. The Highway 25 work was completed by PRBDD and was reimbursed for the Federal share of these costs. Detailed studies showed the clearing plan should be reduced in scope. DM No. 1, "Flood Control for Jackson, Mississippi," May 1984, contained documentation for the Four Point Plan.

23. "The Pearl River Basin Interim Report on Flood Control," July 1985, recommended construction of a dry dam in the vicinity of Shoccoe, Mississippi. The WRDA 86 authorized construction of Shoccoe Dam. Due to opposition from upstream interests, Shoccoe Dam is not implementable.

Slidell, Louisiana, and
Pearlington, Mississippi

24. An interim report on flood control for Slidell, Louisiana, and Pearlington, Mississippi, was prepared by the Vicksburg District in March 1985. Flood control improvements in Slidell were authorized by Congress in the Supplemental Appropriations Act of 1985 (Public Law 99-88) and in WRDA 86 (Public Law 99-662). The plan of improvement consists of a 4.5-mile levee system providing 200-year protection to subdivisions north of Interstate 10 and a 10.5-mile levee system providing 200-year river and hurricane protection to many of the subdivisions south of Interstate 10. The cost of the recommended plan of improvement is approximately $39.8 million

and will protect some 3,029 existing structures in the project area. A General Design Memorandum (GDM) was prepared in 1992, but was not approved due to inability of the local sponsor to provide local requirements.

Carthage/Leake County, Mississippi,
Interim Flood Control Report

25. Studies to determine the feasibility of flood control measures for Carthage were completed in February 1987. Carthage experiences some flooding from backwater from the Pearl River and from Town Creek, a tributary of the Pearl River which flows through Carthage. Alternatives evaluated included channel improvements and levees. WRDA 86 authorized construction of Shoccoe Dam and additional flood control measures in Leake County and Carthage. The findings from this study were incorporated into the GDM for Shoccoe Dam. None of the alternatives evaluated for Carthage, Leake County, were economically feasible.

Columbia and Picayune, Mississippi,
and Bogalusa, Louisiana, Interim
Flood Control Report

26. Studies to determine the feasibility of flood control measures for the urban areas of Columbia, Picayune, and Bogalusa were completed in February 1989. These cities experience flooding both from backwater from the Pearl River and from tributaries of the Pearl River. Alternatives evaluated included channel improvements, small dry dams, and levees. Results of these studies indicated that none of the plans evaluated were economically justified.

Caney Creek, Mississippi

27. Reconnaissance studies were conducted to investigate urban flood damage reduction and bank stabilization along Caney Creek in southwest Jackson. The reconnaissance study was completed in November 1990. No economically justifiable plan was identified, and further studies were not recommended.

Jackson Metropolitan Area, Mississippi

28. The Vicksburg District prepared a draft 1996 feasibility report for the Jackson Metropolitan Area. This report recommended a comprehensive levee plan to protect the Jackson Metropolitan Area from a flood of the 1979 magnitude. However, the plan was not implementable due to lack of local support and studies were suspended in July 1998. The results of this investigation were incorporated into the current resumed flood control investigation for Jackson entitled, "Pearl River Watershed, Mississippi."

CONTINUING AUTHORITIES, SECTION 205

29. Three flood reconnaissance investigations were conducted under the authority of Section 205 of the Flood Control Act of 1948, as amended. In 1979, the Mobile District

investigated flooding along Richland Creek in Rankin County. This investigation showed that protection of existing development from headwater floods was not economically justified.

30. Flood problems in Mendenhall, Mississippi, were evaluated by the Mobile District in an October 1984 Section 205 Detailed Project Report on Sellers Creek. Measures evaluated included flood plain evacuation, clearing and snagging, upstream impoundments, and channel modifications. None of the plans were economically justified.

31. The Vicksburg District investigated flooding problems in Pearl and Flowood. A plan consisting of approximately 2 miles of channel enlargement on a tributary of Neely Creek was recommended in the Detailed Project Report submitted in May 1988. The project was later discontinued due to the inability to execute a Local Cooperation Agreement (LCA) with the project sponsor.

OTHER CORPS FLOOD-RELATED INVESTIGATIONS

32. Other Corps flood-related reports are as follows:

Dam Safety Report, 1981

Caney Creek Flood Insurance Administration (FIA) Report, 1969

Hanging Moss and White Oak Creeks FIA Report, 1975

Hobolochitto Creek and East and West Hobolochitto Creeks

FIA Report, 1975

Lynch Creek FIA Report, 1971

Pearl River and Neely Creek FIA Report, 1973

Purple Creek FIA Report, 1968

Strong River and Sellers and Terrapin Creeks FIA Report, 1974

Yochanookany River, Dye Ditch, and Munson Creek FIA Report, 1972

STUDIES BY OTHERS

Department of Agriculture Studies

33. The Natural Resources Conservation Service (NRCS), under authority of Public Law 83-566, participated with the Mobile District's study of the Pearl River Basin during the 1983 timeframe. One component of this study involved the identification of potential reservoir sites above Jackson for floodwater storage.

34. The NRCS has completed several investigations in the Pearl River Basin. They include evaluations of flood problems on Sellers Creek in Mendenhall, Town Creek in Carthage, Magees Creek in Tylertown, and certain tributaries in Columbia, Mississippi.

Studies by Local Interests

35. There have been numerous flood control studies on the Pearl River conducted by local interests. The PRBDD retained local engineering firms to develop seven major studies as follows:

a. Michael Baker Engineering Company's 1981 reports on extension of the existing levee system in the Jackson area; Hinds-Rankin levee south and channel improvement; levee system alternatives for Columbia, Monticello, and Morgantown; Jackson highways, railroads, and other encroachments; flood relief in the Jackson, Mississippi, area obtainable by selective clearing; and U.S. Highway 98 at Columbia.

b. Harza Engineering Company's 1982 report on upgrading the Ross Barnett project for flood control.

c. Another Harza Engineering Company's study in 1983 report on the cost effectiveness of Shoccoc Dam, including soil borings.

d. Law Engineering Company's 1981 report on the hydrology and hydraulics of alternative upstream sites.

e. Jim Noblin's 1983 report which contained real estate appraisals for land in the Shoccoe pool and flood damage studies.

f. Engineering Associates, Inc., 1985 report on an evaluation of the 1983 floods and recommendations for improvements in Columbia, Monticello, and Tylertown.

g. Waggoner Engineering, Inc., has conducted numerous topographic surveys and other studies.

36. The Pearl River Valley Water Supply District, the state agency which owns and operates the Ross Barnett project, retained Harza Engineering Company and Simon, Li, and Associates to redesign the fuse plug emergency spillway at the project and develop computer models for the operation of Ross Barnett Reservoir. The city of Jackson has also conducted numerous studies on the Pearl River. The most pertinent study is the evaluation of the Jackson parkway/ levee plan on the west bank of the river from County Line Road to Lakeland Drive. Other municipalities in the Jackson area have retained engineers from time to time to evaluate the impacts of various flood control proposals on their communities.

EXISTING WATER PROJECTS

Jackson Levees

37. The Jackson (Fairgrounds) and East Jackson levees were completed in 1968 by the Corps. The locations of the levees are shown on Plate 1. These protective works consist of two earthen levees, four gated outlets, and two pumping stations. Some 5.34 miles of river channel work was involved in constructing the plan. The Fairgrounds levee protects 420 acres in the fairgrounds area of Jackson on the west side of the river. The longer, East Jackson levee protects 5,870 acres, including the town of Pearl and portions of Flowood and Richland. This project was sponsored by the Rankin-Hinds Pearl River Flood and Drainage Control District, which presently operates and maintains the levees. Maintenance, in addition to maintaining the levee structures, involves periodic removal of vegetation along a 650-foot-wide cleared strip between the levees. In 1984, an extension on the north end of the Fairgrounds levee was constructed to eliminate flanking of the levee, such as occurred during the record flood of April 1979. This extension is approximately 0.2 mile long and protects an additional 380 acres.

38. The Fairgrounds levee top grade was set based on protecting against a 100-year-flood flow of 103,000 cubic feet per second (cfs) with 3 feet of freeboard. Subsequent hydrology studies raised the computed 100-year peak floodflow at Jackson to 111,000 cfs. In view of the increase

of the flow for the 100-year flood event, a study was made to determine the adequacy of the levee protection under present conditions. It was found that the new work accomplished in the floodway since 1968 has lowered the elevation of the 100-year flood stage. The levees now provide protection from the revised 100-year flood (111,000 cfs) with about 2.5 feet of freeboard.

39. The original pumping facilities included three 15-cfs pumps at the Fairgrounds levee and three 150-cfs pumps in the East Jackson levee. In 1993, the Rankin-Hinds Pearl River Flood and Drainage Control District added an additional 45 cfs at the Fairgrounds station and an additional 150 cfs at the East Jackson station.

Floodway Clearing

40. The clearing plan which was completed in 1984 extended from about 0.5 mile below the old Jackson sanitary landfill to Woodrow Wilson Bridge, a total of 3.3 river miles. The plan consisted of 237 acres of complete clearing, 20 acres of selective clearing, and 89 acres of partial clearing. Approximately 39,000 tons of riprap were required for protection around bridges. The clearing plan is shown on Plate 2. To offset unavoidable impacts to fish and wildlife associated with the clearing plan, approximately 320 acres of bottom-land hardwood were acquired as mitigation. The PRBDD is the local sponsor for this project.

Excavation at
Highway 25 Bridge

41. The modification at Highway 25 bridge consisted of removing material from the west bank of the Pearl River approximately 600 feet upstream and downstream of the bridge to increase the conveyance of the stream at that location. This work was completed by PRBDD in 1983. The location of this work is shown on Plate 2.

Richland Creek Watershed

42. A flood control project for the Richland Creek Watershed was completed in 1991 by NRCS under Public Law 83-566. The project included land treatment measures, 3 floodwater-retarding structures, and 17.6 miles of channel work. The plan provides a reduction in headwater flooding along Richland Creek and tributaries and along two relatively small streams in the common flood plain with the Pearl River. The benefits accrue to rural properties, crops, and pasture and urban properties within the city of Richland. Local sponsors are the Richland Creek Watershed Drainage District and Rankin County Soil and Water Conservation District.

Ross Barnett Reservoir

43. The Ross Barnett Reservoir was constructed by the Pearl River Valley Water Supply District, a state-chartered organization, between 1960 and 1962 for the purposes of water supply and recreation. The dam and reservoir location are shown on Plate 2. The earthfill dam is 23,400 feet in length with a maximum height of 64 feet. Elevation at the top of the dam is 308 feet, National Geodetic Vertical Datum (NGVD). The principal spillway consists of ten 40-by 21-foot tainter gates with a discharge capacity of 180,000 cfs. The emergency spillway is a fuse plug type with a discharge capacity of 70,000 cfs.

PLAN FORMULATION

EXISTING CONDITIONS

Physical Setting

44. Basin Characteristics. The Pearl River Basin, as shown on Plate 1, is located in the south-central portion of Mississippi and in a small part of southeastern Louisiana. The river drains an area of 8,760 square miles consisting of all or parts of 23 counties in Mississippi and parts of 3 Louisiana parishes. The Basin has a maximum length of 240 miles and a maximum width of 50 miles. It is bounded on the north by the Tombigbee River Basin, on the east by the

Pascagoula River Basin, on the south by Lake Borgne and the Mississippi Sound, and on the west by the Mississippi River Basin and several coastal streams which drain the eastern portion of Louisiana. There are numerous lakes within the Basin, but only a few of significant size. The largest of these is Ross Barnett Reservoir, which is located on the Pearl River about 12 miles northeast of downtown Jackson.

45. Topography and Physiography. The Pearl River Basin lies within the East Gulf Coastal Plain which is physiographically subdivided into the North Central Hills (or Plateau), Jackson Prairie, Southern Pine Hills, and Coastal Pine Meadows districts. These districts cross the Basin generally in a northwesterly direction. Elevations in the Basin range from sea level in the Coastal Pine Meadows Subdivision to approximately 650 feet, NGVD, in the North Central Hills.

46. Geology and Soils.

a. Geologically, the Pearl River Watershed is not a contained unit because the formations extend beyond the topographic divides into adjoining stream basins. The formations at the surface are sedimentary in origin and range in age from early Eocene to Recent.

b. Sand and clay in various proportions constitute nearly all the immense prism of sedimentary deposits extending from the northern part of the Basin to the coast; a few thin units of marl, limestone, and glauconitic and lignitic material also are present in several places. Individual sand beds are irregular in thickness and few can be traced more than about 5 miles.

However, predominantly sandy zones, as differentiated from predominantly clayey zones, are correlatable over wide areas, some throughout much of the Basin. The formations dip southwestward at 20 to 80 feet per mile throughout the northern three-fourths of the Basin, except where they are interrupted by such structural features as the Jackson Dome and many smaller salt domes. The rate of dip becomes steeper in the southern part of the Basin where pronounced downwarping toward the Mississippi River structural trough has resulted in a dip of 100 feet per mile or more.

47. Stream Characteristics. The Pearl River is formed in Neshoba County, Mississippi, by the confluence of Nanawaya and Tallahaga Creeks and flows southwesterly for 130 miles to the vicinity of Jackson (including the 43-mile-long Ross Barnett Reservoir), then southeasterly for 233 miles to the head of its outlet channels, the Pearl and West Pearl Rivers. The Pearl River has an average fall of approximately 1.0 foot per mile. The river banks, exclusive of the Ross Barnett Reservoir, vary from about 12 to 40 feet high between Edinburg and Jackson and from 20 to 90 feet high between Jackson and the head of the Pearl and West Pearl Rivers. The width of the channel varies from about 100 to 300 feet between Jackson and Edinburg, except for the reach of the Ross Barnett Reservoir, and from about 400 to 1,000 feet below Jackson.

48. Ground Water. Practically all of the ground water is derived from precipitation and reaches the water table through infiltration and percolation. In general, ground water is relatively free from pollution and nearly constant in quality and temperature. The abundant ground-water resources which underlie the Pearl River Basin are generally of good to excellent quality.

Aquifers in the Claiborne Group furnish practically all existing ground-water supplies in the northern third of the Basin. Although the underlying Wilcox Group occupies about 1,000 feet of the freshwater section in that area, it is virtually untapped for water supplies due to its greater depth and the availability of adequate water at shallow depths. Beds of Miocene age constitute sources of ground-water supplies throughout the southern two-thirds of the Basin and are the only significant sources in about one-half of the Basin.

49. Climate.

a. Rainfall in the Basin in general is abundant and well distributed throughout the year. Light snowfall in the Basin is not unusual. However, it accounts for only a small part of the annual precipitation. There is some seasonal variation in rainfall, with the heaviest rains usually occurring in the winter and spring and the lightest during the fall. The average annual precipitation over the Basin is about 57 inches, of which 28 percent occurs in the winter, 28 percent in the spring, 26 percent in the summer, and 18 percent in the fall. Normally, the period of greatest monthly precipitation occurs in March or July and the least in October.

b. Prolonged droughts seldom occur in the Basin. The year 1952, with an average basinwide rainfall of a little over 35 inches, was the driest of record. The record wet year was 1979 when the Basin rainfall averaged nearly 84 inches.

c. Storms occurring in the Pearl River Basin include local thunderstorms, or cloudbursts, and general disturbances of the hurricane and frontal types. Summer storms are generally thunderstorms with high intensities over small areas. Flood-producing storms in the winter and spring are usually frontal storms, covering large areas and lasting from 2 to 4 days. Past records indicate that winter storms are likely to be more intense in the northern part of the Basin and summer storms more intense in the southern part.

Hydrologic Setting

50. Prior to 1979, the flood of record was the 1902 flood which had a recorded peak discharge of 85,000 cfs at the Jackson gage. Prior to 1979, the second greatest flood occurred in 1961 with a peak discharge of 66,000 cfs. These record flood levels were far surpassed when the most damaging flood in Jackson's history occurred in April 1979. In a 2-day period between 12-13 April 1979, rainfall amounts measuring up to 19.6 inches fell over the headwaters of the Basin. The resulting flood had a measured peak at the Jackson gage of 128,000 cfs. The resulting peak stage at the Jackson gage was 43.3 feet, NGVD. In May 1983, another severe rainfall in the upper basin generated a peak flow of 78,600 cfs, resulting in a peak stage of 39.5 feet, NGVD, at the Jackson gage. As published by the U.S. Geological Survey (USGS), the frequencies of the 1979 and 1983 flood events at the Jackson gage were 200- and 35-year flood events, respectively.

Environmental Resources

51. Vegetation in the study area is diverse and consists of typical forested wetland/upland tree species associations. Predominant habitat types include bottom-land hardwoods, cypress-tupelo gum brakes, black willow disturbed areas, pines, mixed pine-hardwoods, pasture/old field, cutover, and open water areas.

52. The Pearl River Basin supports high wildlife populations. Despite the presence of man and his various activities between Ross Barnett Reservoir Dam and Byram, the flood plain continues to be a relatively productive area for wildlife. Wildlife species in the study area include white-tailed deer, mourning dove, gray squirrel, cottontail rabbits, swamp rabbits, bobwhite, raccoon, wood duck, migratory waterfowl, and a host of nongame species. Furbearers are also present in the area, and wild turkey may occasionally utilize the area.

Water Quality

53. The city of Jackson depends upon surface water from the Pearl River for its public water supply. Therefore, the segment of the Pearl River between the Ross Barnett Reservoir Dam and the raw water intake structure (RM 290.6) is classified by the Mississippi Bureau of Pollution Control as public water supply. Between the intake structure and Byram, the Pearl River is classified for fish and wildlife.

Fishery Resources

54. The fishery resources of the Pearl River and Ross Barnett Reservoir, as well as those of Mayes Lake (located north of the Illinois Central Gulf Railroad (ICGR) bridge at RM 290.58, and Crystal Lake (located north of U.S. Highway 80) are heavily utilized by sport fishermen. The Mayes Lake area is part of LeFleur Bluff State Park and is owned, maintained, and operated by the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP). The high quality and proximity of these lakes to a major metropolitan area make fishery resources especially valuable.

Air Quality

55. Air quality for the entire State of Mississippi is considered good. The Jackson area is in total compliance with concentration limits of the National Ambient Air Quality Standards.

Noise

56. Noise problems are limited to those associated with normal day-to-day activities such as air and automobile traffic, construction, and industry. The generation of noise within the proposed study area will be primarily limited to the contribution from automobile traffic over several

highway bridges crossing the Pearl River. There are no sources of excessive noise that can cause problems within the proposed study area.

Recreational Opportunities

57. Recreational opportunities within the proposed study area include both consumptive activities such as hunting and fishing and nonconsumptive activities such as hiking, nature study, and outdoor photography. On the west bank of the river, south of Lakeland Drive, is LeFleur Bluff State Park. This area has been developed primarily for nonconsumptive recreation activities and includes a swimming pool, golf course, tennis courts, picnic areas, playgrounds, and hiking trails. The Mayes Lake area, part of the state park complex, consists of several ponds and oxbow lakes used extensively for fishing and includes easy access and wooden piers for bank fishermen.

Esthetics

58. Much of the proposed study area near Jackson is a forested area void of residential, commercial, or industrial development. The remaining land is visually pleasing, providing diversity to the landscape of the Jackson area. This greenbelt provides a visually relaxing atmosphere for those persons wishing to escape the asphalt and concrete of the nearby Pearl River Watershed.

Cultural Resources

59. Cultural resource surveys were completed on the Pear River Watershed study area. Details of these investigations are presented in Appendix 8.

Endangered Species

60. The Corps requested a list of endangered or threatened species that may occur within the study area in a letter dated 2 June 2004. Three endangered species were identified—the bald eagle, ringed sawback turtle, and gulf sturgeon. Records indicate that the endangered bald eagle is known to occur in the area of the Ross Barnett Reservoir and that the threatened ringed sawback turtle, a species known only from the Pearl River system, has been collected in the study area. The Pearl River has been designated as critical habitat for the gulf sturgeon from the Gulf of Mexico to the Ross Barnett Reservoir.

Development and Economy

61. Socioeconomic Characteristics. The following discussion presents information on the demographic and economic characteristics of Hinds and Rankin Counties, Mississippi. Madison County was not included since less than 1 percent of the county is within the study area.

62. Population. Data from the 1990 Census show a population of 342,000 in the two-county area, an increase of 6.7 percent since 1980. Significantly, this two-county area contained 13.3 percent of the state's 1990 population. Especially strong growth occurred in Rankin County, with a 58 percent increase from 1970 to 1980 and 26.3 percent from 1980 to 1990.

63. Income. With the economic growth in the area, major changes have occurred in the income of the two counties. The 1990 per capita income (PCI) figures for each county showed increases in excess of 70 percent over the 1980 numbers. Rankin County's gain was 80.5 percent (from $8,180 to $14,765), with Hinds County increasing 72 percent from $9,151 to $15,753.

FUTURE WITHOUT-PROJECT CONDITIONS

Environmental Setting

64. The land use of the study area is expected to change little during the anticipated project life. Flood plain zoning restrictions and local experience with flooding will minimize further encroachment into the flood plain. Urbanization is projected to claim approximately 5 percent of undeveloped areas during the project life. Land use practices on woodland areas will continue with landowners allowing forest succession to occur for future timber production. Wildlife population on these lands is projected to remain high. Federal and state water quality requirements are expected to have a stabilizing effect on water quality in the study area.

Hydrologic Setting

65. Without additional flood protection along the Pearl River, periodic flooding will continue to plague residential areas, commercial businesses, industries, and local infrastructure. Little change is expected in the streambed due to sediment deposition or erosion. No change is foreseen in the operation of the Ross Barnett Reservoir which is assumed to function as a run-of-river structure for this study.

PROBLEMS AND OPPORTUNITIES

Flooding

66. The study area is primarily affected by headwater flooding caused by the Pearl River. Headwater flooding is caused by unusually heavy and intense rainfall over the upper Pearl River Basin.

67. Prior to 1979, the flood of record was the 1902 flood which had a recorded peak discharge of 85,000 cfs at the Jackson gage. The modern day flood of record had occurred in 1961 with a peak discharge of 66,000 cfs. These record flood levels were far surpassed by the events of 1979 and 1983. The worst flood in Jackson's history occurred in 1979. In a 2-day period between 12-13 April 1979, rainfall in amounts measuring up to 19.6 inches fell over the headwaters of the Basin. The resulting flood had a measured peak at the Jackson gage of 128,000 cfs measured at the gage in Jackson. Flood damages in Jackson were devastating. In May 1983, another severe rainfall in the upper Basin generated a peak flow at 78,600 cfs at the Jackson gage. The frequencies of the 1979 and 1983 flood events are estimated to be, respectively, 200- and 35-year flood events at the Jackson gage. Because of the severity of these two floods, other floods which occurred between 1979 and 1983 are rarely mentioned. For the record, floods with frequencies

of 5 to 10 years occurred on 21 March 1980, 14-17 April 1981, 6 December 1982, and 8-9 April 1983. This repeated flooding over the 4-year period caused a great deal of trauma to the citizens of Jackson and explains their intense interest in flood control.

68. During the 1979 flood 1,935 houses and 775 businesses were flooded. Damages to these properties were especially severe because the river was above flood stage from 10 to 14 days in some areas. This caused serious disruptions to transportation and communications and stymied the capital city for weeks. In fact, many of the flood victims interviewed indicated that it took 6 months to 1 year for a return to normal conditions.

69. The total physical property damage caused by the 1979 flood was estimated at $233 million in 1979 dollars. Although this flood was devastating, it should be emphasized that it could have been much worse if it were not for some well executed emergency flood-fighting activities. First, the Ross Barnett project, a water supply and recreation lake with no dedicated flood control storage, was used beyond its normal limits to regulate floodflows and reduce the peak flow in Jackson by 17,000 cfs. Had the storm pattern been different or the flood forecasts not been exceptionally accurate, this would not have been possible. Secondly, the Federal flood control levees in Jackson were designed for a 100-year flood flow of 103,000 cfs (the peak flow in 1979 was 128,000 cfs). The Fairground levee on the west side of the river was flanked on the north end, thereby flooding the area behind the levee. However, the East Jackson levee held because of a monumental sandbagging effort when the floodwaters were lapping at the top of the levee.

Had the East Jackson levee been overtopped, there would have been an additional 1,065 homes and 293 businesses flooded. Flood damages in that event would have been about $535 million in 1984 dollars, an increase of about $235 million.

Fish and Wildlife

70. Due to the increased urban environment, suitable habitat for fish and wildlife is being reduced. As urban growth continues in the study area, fish and wildlife habitat areas may be further reduced unless preservation measures are undertaken by local interests. The need exists to protect and enhance fish and wildlife habitat.

Recreation

71. There is a need to provide the local citizens of the study area opportunities to participate in nonconsumptive uses of the area's natural resources such as hiking, picnicking, nature photography, birdwatching, canoeing, nature trails, etc. Such recreational areas could be developed in conjunction with the recommended plan for providing flood protection to the area.

PLANNING OBJECTIVES

72. In accordance with the Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G), the Federal objective of water and related land resources planning is to contribute to National Economic Development (NED) consistent with protecting the nation's environment pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

73. As a result of the problem identification process, the objectives listed below formed the basis for the formulation of alternative plans. These objectives are in consonance with the intent of the P&G and other planning guidance.

a. Reduce flood damages to existing development with the Jackson Metropolitan study area.

b. Minimize adverse environmental impacts through project design.

c. Compensate 100 percent for unavoidable environmental impacts.

PLANNING CONSTRAINTS

General

74. The formulation of alternatives for this study was influenced by the previous draft feasibility study completed in 1996 which recommended a comprehensive levee plan to protect the Jackson Metropolitan Area. Rather than evaluating a full array of alternatives, information from the draft feasibility study was used and updated. Only the levee plan recommended in the previous study was included in this investigation. The locally preferred LL plan, consisting of channel enhancement through dredging and realignment, an island for economic development, and the construction of two weirs that would create two lakes, was included as an additional alternative.

75. As indicated above, during negotiations of the draft PMP with the non-Federal sponsor, which included investigations of all reasonable alternatives, Headquarters, U.S. Army Corps of Engineers (HQUSACE), guidance was received directing the draft PMP be revised to limit feasibility studies to updating the previously proposed levee plan and an analysis of the LL plan. The PMP was subsequently revised to reflect this guidance and the study was conducted accordingly.

Formulation and Evaluation Criteria

76. The comprehensive levee plan and the LL plan were evaluated in accordance with various technical, economic, environmental, and socioeconomic criteria. When applied, these criteria provide the means for responding to the problems and opportunities of the area by selecting a plan in the best public interest, consistent with other developments in the area, and developing an economically feasible solution.

77. Federal policy on multiobjective planning derived from both legislative and executive authorities establishes and defines the national objectives for water resource planning, specifies the range of impacts that must be assessed, and sets forth the conditions and criteria which must be applied when evaluating plans. Plans must be formulated considering benefits and costs, both tangible and intangible, and effects on the environment and social well-being of the community.

78. Plan formulation criteria include published regulations and principles adopted by the Water Resources Council and the Corps regulations. Other criteria used are in compliance with the P&G, NEPA, and Executive Orders 11988 and 11990.

Technical Criteria

79. The Ross Barnett Reservoir will operate as a run-of-river dam and no reduction of peak discharges would be reduced by the reservoir. This criterion is consistent with previous Corps flood control evaluations in the Pearl River Watershed.

80. The economic life of the project was assumed to be 50 years.

81. Unavoidable environmental losses will be mitigated to the extent practicable.

Economic Criteria

82. Benefits and cost should be expressed in comparable terms as fully as possible. Evaluations for the previously recommended comprehensive levee plan and the LL plan are based on November 2006 price levels and the current Federal interest rate of 4-7/8 percent.

83. Each alternative considered in detail must be justified so total beneficial effects (monetary and nonmonetary) associated with the objectives are equal to or exceed the total adverse effects (monetary and nonmonetary) associated with the objectives.

84. Economic impacts of alternatives are based upon the risk analysis procedures described in Engineer Circular 1105-2-205, 25 February 1994.

Environmental Criteria

85. Plans should be formulated to the extent practicable to preserve or improve the quality of the natural environment.

86. Fish and wildlife mitigation features are to be undertaken concurrently with project features.

Socioeconomic Criteria

87. Consideration should be given to evaluating and preserving historical, archeological, and other cultural resources.

88. Consideration should be given to safety, health, community cohesion, and social well-being.

89. Displacement of people by the floods and/or the project should be minimized to the extent practicable.

PRELIMINARY SCREENING

90. The Pearl River Basin Interim Report on Flood Control, July 1985, completed by the Mobile District, recommended Shoccoe Dam to protect the Jackson Metropolitan Area. The draft Jackson Metropolitan Area, Mississippi, completed by the Vicksburg District in January 1996, recommended a comprehensive levee plan. Both studies considered a broad range of flood damage reduction measures in the screening process.

91. The affected public provided assistance in identifying other issues to be evaluated. A NEPA scoping meeting with approximately 400 in attendance was held in Jackson on 23 February 2004 to outline the study procedures and receive public input concerning the study process and problems in the area. An information meeting was held on 11 March 2004 in Biloxi, Mississippi, with approximately 50 in attendance. The transcripts of these meetings are included in Appendix 1.

92. Alternatives considered in this feasibility study to provide flood protection to the Pearl River Watershed include no-action, the comprehensive levee plan, and the LL plan. These alternatives are discussed in the following paragraphs.

NO-ACTION ALTERNATIVE

93. A no-action alternative was considered, but it would not eliminate any of the damages the metropolitan area has historically experienced. This would result in continued flood damage, trauma, and serious disruptions to human endeavors in the capital area and associated impacts to the entire State of Mississippi.

COMPREHENSIVE LEVEE PLAN

GENERAL

94. The comprehensive levee plan consists of constructing approximately 21.9 miles of new levee, 3,720 feet of floodwall, enlarging 10.5 miles of the existing Jackson and East Jackson levees, building 9 box culverts and 9 concrete pipe water control structures, and constructing landside connecting ditches. The comprehensive levee plan is shown on Plate 3. Limited overbank clearing would be required to reduce stages at Lakeland Drive and minimize adverse impacts to the tailwater on the Ross Barnett spillway. This overbank clearing consists of a 100-foot strip on each side of the channel top bank from RM 290.5 to 301.5 and a 400-foot strip across six bendways. Plates 4-V-1 through 4-V-17 in Volume II show the proposed alignment of the levee and the location of major drainage structures and landside connecting ditches.

95. The levees would be fully compacted, have 1 vertical on 3 horizontal side slopes, a 10-foot-wide crown, and a 5-foot-thick impervious riverside face. Because of the 1 vertical on 3 horizontal landside slope, no roadway addition was considered. Any roadway crown addition would have added substantial construction and real estate requirements. For new levee closures required at highways, railroads, etc., an earthen and sandbag closure would be required. The Fairgrounds and East Jackson levee enlargements would be constructed on the landside of the existing levee to minimize the necessity of impervious clay materials. Additional borrow borings would be taken during the preparation of plans and specifications to confirm this.

Levee Segments

96. Each levee segment is described in the following paragraphs:

a. Northeast Jackson levee (Station 0+00 to 301+54). The Northeast Jackson levee (shown on Plates 4-V-1, 4-V-2, and 4-V-3) begins in the Jackson Country Club area near County Line Road and extends southward along the west bank of the Pearl River to Lakeland Drive (Highway 25). This proposed levee segment is approximately 5 miles long and has an average height of 22 feet. From Highway 25, a floodwall would extend south and westward to high

ground just east of Eubanks Creek. This floodwall is required because of the highly developed area south of Lakeland Drive and the close proximity to LeFleur Bluff State Park (Mayes Lakes area).

b. Eubanks Creek (Station 0+00 to 16+96). This segment, shown on Plate 4-V-3, begins at high ground just south of Lakeland Drive and extends southerly to Eubanks Creek, then continues in a westward direction to high ground. The levee would be 0.3 mile long and have an average height of 24.5 feet.

c. Belhaven Creek (Station 0+00 to 17+06). The Belhaven Creek Reach, shown on Plate 4-V-4, is an extension of the existing Fairgrounds levee necessitated by an increase in the level of protection for that area. The levee begins at high ground along the shoulder of the northbound lane of Interstate 55. The average height of the levee is 25 feet and is approximately 0.3 mile long.

d. Fairgrounds levee (Station 0+00 to 92+41). The entire Jackson levee, shown on Plate 4-V-4, will be enlarged to raise it 3 to 5 feet to provide the same level of protection as the new levees. In addition, the extension along the Fortification Street ramp will be raised to the proposed levee design grade and be connected to the Belhaven Creek levee. This segment would be approximately 1,600 feet long.

e. Town and Lynch Creeks levee (Station 0+00 to 71+95). This reach of levee, shown on Plate 4-V-5, begins on high ground near the Old Brandon Road crossing on the Pearl River (Woodrow Wilson Bridge) and proceeds southerly along the west bank of the river. The levee crosses Highway 80 and Interstate 20 before tying into high ground just south of Lynch Creek. The levee is approximately 1.4 miles long and has an average height of 17 feet.

f. South Jackson levee (Station 0+00 to 198+63). The South Jackson levee, shown on Plates 4-V-6 and 4-V-7, begins at high ground approximately 1 mile above the Jackson Sewage Treatment Plant and extends south along the west bank of the river until it reaches the disposal pond levees. A riverside enlargement of the perimeter levee around the plant would be required. The levee would then extend south from that point and ultimately tie back into high ground just north of Elton Road interchange on Interstate 55 south. Approximately 3.8 miles of levee would be required for this portion of the comprehensive levee system and the average height of the levee would be 10 feet.

g. Flowood levee (Station 0+00 to 279+24). This levee, shown on Plates 4-V-8 and 4-V-9, originates on high ground at a point approximately 0.25 mile west of Fannin Road and 1.25 miles north of Highway 25 (Lakeland Drive) and extends southwesterly around a newly developed residential area. From this point, the levee would continue approximately parallel to

Lakeland Drive before turning southwesterly to follow along the east bank of the Pearl River. After crossing Lakeland Drive, the levee would continue to follow the east bank of the river until intersecting the existing East Jackson levee just west of Highway 468. This segment of levee would be approximately 5.3 miles long and have an average height of 13 feet.

h. East Jackson levee (Station 140+00 to 626+25). Approximately 8.7 miles of the existing East Jackson levee, shown on Plates 4-V-10 to 4-V-14, would be raised approximately 2 to 6 feet to provide design flood protection. Also, a 0.5-mile extension would be required at the downstream end tying into the ICGR embankment just north of Childre Road. The upper limits of the levee enlargement would end near Highway 468.

i. Richland levee (Station 0+00 to 264+34). The Richland levee, shown on Plates 4-V-15 to 4-V-17, would be "U-shaped" around the city of Richland. It would begin at high ground east of Highway 49 and extend northwesterly across Highway 49 to a point near the ICGR embankment. From this point, the levee turns westerly until it crosses the ICGR embankment. Then the levee would extend southerly to high ground 0.25 mile southeast of the intersection of Old Highway 49 and the ICGR. Approximately 5 miles of levee would be required for this portion of the levee system with an average height of 13 feet.

Gravity Floodgates

97. Structures recommended to be built through the project levee are listed below.

a. Northeast Jackson.

Station 25+30 - Two 60-inch-diameter concrete pipes

Station 110+93 - Two 12- by 12-foot box culverts

Station 147+18 - One 12- by 12-foot box culvert

Station 235+51 - Two 48-inch-diameter concrete pipes

b. Floodwall extension.

Station 291+11 - One 36-inch-diameter concrete pipe

c. Eubanks Creek.

Station 10+94 - Two 8- by 7-foot box culvert

d. Fairgrounds extension.

Station 9+64 - One 12- by 10-foot box culvert

e. Town and Lynch Creeks.

Station 16+65 - Three 12- by 12-foot box culverts

Station 65+90 - Three 12- by 12-foot box culverts

f. South Jackson.

Station 37+79 - Two 48-inch-diameter concrete pipes

Station 165+34 - Two 9- by 9-foot box culverts

g. Flowood.

Station 41+57 - Two 48-inch-diameter concrete pipes

Station 92+27 - One 48-inch-diameter concrete pipe

Station 175+05 - Two 6- by 5-foot box culverts

Station 197+24 - Two 36-inch-diameter concrete pipes

Station 257+94 - Two 8- by 6-foot box culverts

h. Richland.

Station 31+50 - One 36-inch-diameter concrete pipe

Station 152+74 - Two 48-inch-diameter concrete pipes

Property Relocations

98. Due to the increase in stages between the proposed levees in the vicinity of Lakeland Drive, existing development on each side of Lakeland Drive on the west bank of the Pearl River would be adversely affected. Stages could increase by as much as 1 foot in this area with the larger floods. Early investigations revealed that a levee or floodwall could not be constructed around this development without acquiring many of the 28 buildings at this location. As a result, the recommended plan includes total acquisition of this area. Two other commercial buildings adjacent to the Richland levee will likely require acquisition due to their proximity to Richland Creek.

Mitigation Measures

99. Following the detail design of the comprehensive levee plan, compensation requirements were recomputed. The recommended compensation measure of acquisition and reforestation of frequently flooded cleared lands was evaluated. Based on the analysis in Appendix 2, approximately 1,680 acres would be required to offset adverse terrestrial impacts of the comprehensive levee plan. Due to the fact that mitigation would be accomplished during construction of the project and all lands would be acquired from willing sellers, the specific location of the mitigation land cannot be determined until immediately prior to the time of acquisition. Table 1 depicts the criteria used in the selection of the lands at the time of acquisition. Development measures proposed for the mitigation lands include planting of appropriate open areas in bottom-land hardwood species, establishing necessary access roads, surveying and establishing boundaries, and establishing a management headquarters.

TABLE 1
MITIGATION SITE SELECTION CRITERIA

DRAINAGE BASIN LOCATION CRITERIA
1. Lower Pearl River Basin (south of Jackson and west of Interstate 59)
2. Upper Pearl River Basin (north of Jackson)
3. Bogue Chitto River Basin
4. Bayou Pierre River Basin
5. Mississippi Delta-Yazoo River Basin, Sunflower River Basin, etc.
6. Lower Big Black River Basin (west of Interstate 55)
7. Leaf River Basin
EXISTING LAND USE TYPE CRITERIA
1. Degraded wetlands in riverine flood plains; e.g., abandoned surface mines, actively farmed lands, pasture lands
2. Degraded upland forests in riverine flood plains
3. Cutover forested wetlands
4. Mature bottom-land forests
LAND REHABILITATION METHODS CRITERIA
1. Wetland restoration including replacement of hydrology and woody vegetation
2. Wetland reforestation where hydrology is in place
3. Reforestation of uplands associated with riverine habitats
4. Preservation of a unique habitat or a habitat important to a Federally listed threatened or endangered species
SPECIFIC LAND LOCATION CRITERIA
1. Sites adjacent to state management areas, national wildlife refuges, U.S. Forest Service lands, etc., that are managed for fish and wildlife
2. Sites adjacent to existing forested areas
3. Sites adjacent to farmed areas that would provide corridors between wooded areas
4. Sites adjacent to developed residential areas
5. Sites adjacent to developed commercial areas

SUMMARY OF COMPREHENSIVE LEVEE PLAN

100. Table 2 shows a breakdown of the costs for the comprehensive levee plan. An economic summary is shown in Table 3.

TABLE 2
SUMMARY OF FIRST COST a/
COMPREHENSIVE LEVEE PLAN

Account	Item	Amount ($)
01	Lands and Damages b/	67,282,446
02	Relocations	17,266,188
06	Fish and Wildlife Facilities	695,797
11	Levees and Floodwalls	64,256,458
15	Floodway Control and Diversion Structures	25,122,665
30	Planning, Engineering, and Design	21,802,250
31	Construction Management	9,339,300
	TOTAL	205,765,104

a/ October 2006 price levels.
b/ Includes mitigation lands.

TABLE 3
ECONOMIC SUMMARY
COMPREHENSIVE LEVEE PLAN

Item	Amount
First Cost ($)	205,765,000
Interest During Construction ($)	12,175,000
Total Investment ($)	217,940,000
Interest ($)	10,625,000
Sinking Fund ($)	1,084,000
Annual Operation and Maintenance ($)	123,000
Total Annual Cost ($)	11,832,000
Expected Annual Benefits ($)	13,981,000
Excess Benefits ($)	2,149,000
Benefit-Cost Ratio	1.20
Project Effectiveness (%)	79

DESCRIPTION OF LL PLAN

GENERAL

101. This alternative consists of upper and lower lakes along the Pearl River south of the Ross Barnett Reservoir. The lakes would extend from the Ross Barnett Reservoir outlet downstream along the Pearl River to approximately 3 miles southwest of Interstate 20. The combined lakes would cover approximately 4,727 acres (4,149 acres of the upper lake and 578 acres of the lower lake) at normal operating level. Weirs at both upper and lower lakes would regulate flows. The original LL plan proposed by local interests included two fixed crest weirs. The plan was modified from this original configuration for the purposes of constructability and flood damage reduction. Studies indicated that to significantly reduce flood damages, the upper weir would need to be a gated structure. The lakes would function as "flow thru" reservoirs with

minimal floodwater storage capacity. Flood protection would be provided by the project's lowering stages thru the Jackson Metropolitan Area. The LeFleur Lakes alternative is shown in Plate 4. Major components of the plan are discussed in the paragraphs below.

COMPONENTS OF LL PLAN

Weirs

102. The upper lake would be controlled by a hinge gate crest weir control structure approximately 800 feet long to be located immediately downstream of the Interstate 55 bridge crossing. The lower lake would be controlled by a fixed crest weir located approximately 3 miles downstream of Interstate 20. The upper lake would have a permanent pool elevation of 270.0 feet, NGVD, and the lower lake a permanent pool elevation of 260.0 feet, NGVD.

Channel Improvements

103. The plan includes major channel improvement on the Pearl River from the outlet of the Ross Barnett Reservoir to approximately 3 miles south of Interstate 20, a distance of approximately 16 river miles. Channel improvement includes excavating a 2,000-foot bottom width channel from River Mile (RM) 301.69 (outlet of Ross Barnett) to RM 292.63 (upstream of Lakeland Drive), a 1,500-foot bottom width channel from RM 292.4 (downstream of Lakeland Drive) to RM 288.5 (upstream of Interstate 55), and an approximate 1,000-foot bottom-width

channel from RM 288.2 (downstream of Interstate 55) to RM 284.0. At the request of the Mississippi Department of Transportation and Development, channel excavation will not be performed through any of the existing bridges or the proposed Airport Parkway bridge crossings. The total amount of channel material to be excavated is estimated at approximately 62,050,000 cubic yards.

LL Island and Disposal Areas

104. An island located at approximate RM 290.0 to RM 292.4 would be constructed from excavated material. The island would tie into high ground between the Lakeland Drive Pearl River relief opening bridge and the Pearl River Lakeland Drive bridge. This Island will be approximately 661 acres in size and will be encapsulated by a sheet pile retaining wall up to elevation 285.0 feet, NGVD. Access to the LeFleur Lakes Island will be from Lakeland Drive between the Pearl River bridge and the Pearl River relief opening bridge. Other disposal sites will be located along the Pearl River excavation reaches with the majority of the disposal being located in the overbank area from RM 293.5 to RM 296.0. These disposal sites will be filled to elevation 285.0 feet, NGVD. The island and disposal areas are shown on Plate 4. All disposal sites would be compacted to provide for commercial and other development opportunities.

Gallatin Street Landfill Removal

105. The Gallatin Street Landfill will be removed and excavated through and will be relocated to another landfill. The total amount of material to be removed is estimated at approximately 1.9 million cubic yards.

Utility Relocations

106. The extensive channel excavation and other plan components plan would require the relocation of numerous public utilities. Utilities requiring relocation include 4 natural gas lines, 11 communication lines, 9 electrical distribution lines, 2 drinking water lines, and 2 sanitary sewer lines.

Property Acquisition/Relocation

107. All lands lying in the lake footprint would be acquired in fee title. In addition, a 3-foot flowage easement would be acquired around the perimeter of the permanent pools (flowage easements from elevation 270.0 to 273.0 feet, NGVD, upper pool and 260.0 to 263.0 feet, NGVD, lower pool). Such flowage easements are typically included in Corps impoundments.

The portion of the LeFleur Bluff State Park lying in the Pearl River flood plain will be inundated with the minimum 270.0 feet, NGVD, upper lake pool elevation and require relocation.

Existing Jackson Levee (Fairground Levee)

108. The Jackson Levee will not require modification. However, the gravity outlets will be blocked by the 270.0-foot, NGVD, upper pool elevation which is between the existing 1- and 2-year frequency flowline on the Pearl River at this location. The existing 45-cfs capacity pump station will also not require modification; however, it will be operated to pump all inflows and will pump approximately twice as long from current conditions due to the gravity outlets being blocked. A riverside seepage berm will be required for the entire length of the existing levee along with a layer of riprap for toe protection.

Existing East Jackson Levee

109. The East Jackson Levee also will not need to be raised. The existing gravity outlet structure will be relocated downstream of the lower lake weir with a landside connecting channel to levee station 450+00. No pump modification will be required for the East Jackson Levee Pump Station. A riverside seepage berm will be required for the entire length of the existing

levee along with a layer of riprap for toe protection. A short section of this levee located near RM 291.0 will be relocated to the east to allow for construction of the LeFleur Lakes Island and associated channel improvements.

New Levees

110. Three new levee segments will also be needed to provide a comprehensive flood control plan for the Jackson Metropolitan Area. These include the Town and Lynch Creek Levee, South Jackson Levee, and the Richland Levee included in the comprehensive levee plan alternative. The Town Creek and Lynch Creek Levee will require pump stations on each creek since the lower lake pool elevation of 260.0 feet, NGVD, will be too high to provide gravity outlet flow. These levee segments are discussed below.

a. Town and Lynch Creeks Levee. This segment includes 7,195 feet of new levee. A pump station will be required on each creek with no gravity outlet structure. All inflows will be required to be removed by pumping similar to the existing Jackson levee discussed above. The lower lake pool elevation of 260.0 feet, NGVD, is too high to provide gravity outlet flow. Pump stations providing 2,500 cfs each will be required at stations 16+65 and 65+90. The drainage area of each creek is approximately 15 square miles. Approximately 2,400 feet of slurry trench will be required along the alignment. A riverside seepage berm will be required for the entire length of the new levee along with a layer of riprap for toe protection.

b. South Jackson Levee. This segment includes 19,863 feet of levee. An approximately 1,600-foot connecting ditch would be required along the landside toe upstream of Hardy Creek. A double 48-inch pipe would be required at station 37+79 and a double 9- by 9-foot box at station 165+34. Approximately 7,600 feet of slurry trench will be required.

c. Richland Levee. This segment includes about 26,434 feet of new levee. Approximately 3,200 feet of landside connecting ditch is included at the lower end of the levee. A floodgate will be required to include a single 36-inch pipe at station 31+50. A double 48-inch pipe floodgate will also be required at station 152+74. Local interests have requested the inclusion of a pumping station to remove interior ponding.

Mitigation Measures

111. The recommended compensation measure includes acquisition and reforestation of approximately 8,080 acres of frequently flooded cleared lands to offset adverse terrestrial impacts of the LL plan. The mitigation criteria for selection of land at the time of acquisition shown in the aforementioned Table 1 for the comprehensive levee plan would similarly apply to the LL plan.

SUMMARY OF LL PLAN

112. Table 4 shows a breakdown of the costs for the LL plan. An economic summary is shown in Table 5.

TABLE 4
SUMMARY OF FIRST COSTS a/
LL PLAN

Account	Item	Amount ($)
01	Lands and Damages b/ c/	176,263,497
02	Relocations	38,370,744
06	Fish and Wildlife Facilities	
09	Channels and Canals	776,615,685
11	Levees and Floodwalls	12,177,741
13	Pumping Plants	89,482,322
15	Floodway Control and Diversion Structures	60,287,514
30	Planning, Engineering, and Design	204,132,875
31	Construction Management	71,446,375
	TOTAL	1,428,776,753

a/ October 2006 price levels.
b/ Includes mitigation estimated at approximately $12,401,463.
c/ Excludes costs for relocating LeFleur Bluff State Park.

TABLE 5
ECONOMIC SUMMARY
LL PLAN

Item	Amount
First Cost ($)	1,428,777,000
Interest During Construction ($)	93,409,000
Total Investment ($)	1,522,186,000
Interest ($)	74,207,000
Sinking Fund ($)	7,569,000
Annual Operation and Maintenance ($)	3,175,000
Total Annual Cost ($)	84,951,000
Expected Annual Benefits ($)	16,052,000
Excess Benefits ($)	-68,899,000
Benefit-Cost Ratio	0.2
Project Effectiveness (%)	91

DESIGN AND CONSTRUCTION CONSIDERATIONS

113. Construction of the comprehensive levee plan would require approximately 4 years to complete. The LL plan is estimated to require approximately 8 years to complete. Project design will be based on current technical guidelines and additional engineering data or surveys that may be necessary. Remaining design requirements consist of preparation of plans and specifications for the weirs, pumping stations, island, various levee segments and drainage structures, and preparation of soil reports for various project components.

SUMMARY OF ECONOMIC, ENVIRONMENTAL, AND OTHER SOCIAL EFFECTS

114. Table 6 illustrates the environmental impacts for the comprehensive levee plan and the LL plan.

TABLE 6
SUMMARY OF ENVIRONMENTAL IMPACTS OF THE
COMPREHENSIVE LEVEE PLAN AND LL PLAN

Resource	Impacts
Comprehensive Levee Plan	
Terrestrial Habitat	Net loss of 2,503 AAHUs, 891 acres of bottom-land hardwoods, 60 acres of mixed-pine hardwoods, 34 acres of pine, and 39 acres of cypress-tupelo. Requires 1,680 acres of reforestation/management.
Aquatic Habitat and Fisheries	Temporary degradation of aquatic habitat with corresponding adverse impact to associated fisheries during construction. Borrow areas would create 778 acres of aquatic habitat.
Waterfowl Habitat	Reduction in forested flood plain would have minor adverse impacts to resident, and to a lesser extent, migratory waterfowl.
Water Quality	Increased turbidity and lowered DO levels during construction; no long-term significant impacts.
Ground Water	No impact expected
Endangered Species	No impact expected
Air Quality	Short-term releases of CO, NO, and particulates would be emitted during construction phase; no long-term adverse impacts.
Wetlands	Wetland conversion would total approximately 931 acres. Compensated by terrestrial mitigation.
Cultural Resources	No impact expected
LL Plan	
Terrestrial Habitat	Net loss of 2,183 AAHUs, 4,414 acres of bottom-land hardwoods, 934 acres of mixed-pine hardwoods, 272 acres of pine, and 1,150 acres of cypress-tupelo. Requires 8,080 acres of reforestation/management.
Aquatic Habitat and Fisheries	Temporary degradation of aquatic habitat with corresponding adverse impact to associated fisheries during construction. Borrow areas would create 4,730 acres of aquatic habitat.
Waterfowl Habitat	Reduction in forested flood plain would have minor adverse impacts to resident, and to a lesser extent, migratory waterfowl.
Water Quality	Increased turbidity and lowered DO levels during construction; no long-term significant impacts.
Ground Water	No impact expected
Endangered Species	Impacts to ringed sawback turtle and Gulf sturgeon due to loss of breeding habitat.

TABLE 6 (Cont)

Resource	Impacts
Air Quality	Short-term releases of CO, NO, and particulates would be emitted during construction phase; no long-term adverse impacts.
Wetlands	Wetland conversion would total approximately 2,200 acres. Compensated by terrestrial mitigation.
Cultural Resources	Not available at this time

115. Table 7 shows the System of Accounts. Four accounts (NED, Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE)) are used to display impacts. These four accounts encompass all significant effects of a plan as required by NEPA of 1969 and social well-being as required by Section 122 of the Flood Control Act of 1970. The NED account shows effects on the national economy. The EQ account shows the effects on ecological, cultural, and esthetic attributes of significant natural and cultural resources that cannot be measured in monetary terms. The RED account shows the regional incidence of NED effects, income transfers, and employment effects. The OSE account presents the urban and community impacts and effects on life, health, and safety.

116. Other social effects are summarized in the following paragraphs.

117. Community cohesion and community growth will be strengthened from construction of either flood control plan due to the alleviation/reduction of flood damages and threat of flooding. No adverse impacts to community cohesion are anticipated.

TABLE 6 (Cont)

Resource	Impacts
Air Quality	Short-term releases of CO, NO, and particulates would be emitted during construction phase; no long-term adverse impacts.
Wetlands	Wetland conversion would total approximately 2,200 acres. Compensated by terrestrial mitigation.
Cultural Resources	Not available at this time

115. Table 7 shows the System of Accounts. Four accounts (NED, Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE)) are used to display impacts. These four accounts encompass all significant effects of a plan as required by NEPA of 1969 and social well-being as required by Section 122 of the Flood Control Act of 1970. The NED account shows effects on the national economy. The EQ account shows the effects on ecological, cultural, and esthetic attributes of significant natural and cultural resources that cannot be measured in monetary terms. The RED account shows the regional incidence of NED effects, income transfers, and employment effects. The OSE account presents the urban and community impacts and effects on life, health, and safety.

116. Other social effects are summarized in the following paragraphs.

117. Community cohesion and community growth will be strengthened from construction of either flood control plan due to the alleviation/reduction of flood damages and threat of flooding. No adverse impacts to community cohesion are anticipated.

TABLE 7
SUMMARY COMPARISON, COMPREHENSIVE LEVEE AND LL PLANS
PEARL RIVER WATERSHED, MISSISSIPPI

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Comprehensive Levee Plan	Condition with LeFleur Lakes
1. Description, Base Condition/Plan	Major need exists for alleviation or reduction of flooding from Pearl River. There are 6,551 residential and 1,630 nonresidential structures subject to flooding.	No construction of flood control project. With no-action or without-project conditions, needs described for area would not be met. Existing flooding and flood damages would continue.	Plan provides for 21.1 miles of new levees along the Pearl River and enlarging 11 miles of the existing Fairgrounds and East Jackson levees, constructing 18 gravity floodgates, and 168 acres of overbank clearing.	Plan provides for two lakes with a combined surface area of approximately 4,700 acres south of the Ross Barnett Reservoir. The lakes would extend a total distance of approximately 16 river miles from the Ross Barnett Reservoir to approximately 1 mile south of Interstate 20. Weirs at both the upper lakes would regulate flow. The plan also includes construction of a 619-acre island with excavated material and levees in south Jackson, Richland, and Town and Lynch Creeks.
2. Plan Impacts a/ a. National Economic Development (NED)	(Objective) Flood damage reduction for existing development in metropolitan area. Currently, average annual damages are $11.5 million.	No impact—objectives would not be met.	Net NED benefits are $2.1 million annually.	Net NED benefits are - $68.9 million annually.

TABLE 7 (Cont)

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Comprehensive Levee Plan	Condition with LeFleur Lakes
b. Environmental Quality (EQ)	(Objective) Preservation, protection, and enhancement of area's natural resources/environment.	The current value of most of the area's natural resources and environment will continue.	Plan includes a mitigation plan which would result in acquisition by fee of 1,680 acres of frequently flooded cleared lands to be reforested, increasing terrestrial and wetland resources. Plan will result in unavoidable losses, but mitigation plan replaces the impacted resources.	Plan includes a mitigation plan which would result in acquisition by fee of 8,080 acres of frequently flooded cleared lands to be reforested, increasing terrestrial and wetland resources. Plan will result in unavoidable losses, but mitigation plan replaces the impacted resources. Plan will result in unavoidable loss of that portion of LeFleur's Bluff State Park in the Pearl River flood plain. Park includes camping, day-use areas, fishing, and nature trails.
c. Regional Economic Development (RED)	(Objective) Improvements in regional economic growth and development (added employment, increase income, etc.).	Existing regional economic growth trends would continue.	Total income effects are reflected by total project-related benefits of $13.9 million annually. Project would provide for economic growth and development. Short-term impacts expected on employment/income from project construction.	Total income effects are reflected by total project-related benefits of _____ annually. Island components would provide for significant economic growth and development. Short-term impacts expected on employment/income from project construct.
d. Other Social Effects (OSE)	(Objective) Improvements in well-being of area residents, reflected by desirable economic growth, community cohesion, improvements in quality of life, removal/reduction in threat of flooding and flood damages, etc.	Existing area economic growth conditions would prevail. Threat of flooding and flood damages would continue.	Community cohesion would be strengthened over project life due to alleviation/reduction of flood threat and associated flood damages.	Community cohesion would be strengthened over project life due to alleviation/reduction of flood threat and associated flood damages and job opportunities associated with economic growth and development.

TABLE 7 (Cont)

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Comprehensive Levee Plan	Condition with LeFleur Lakes
3. Plan Evaluation				
a. Acceptability b/	Not applicable.	Unacceptable to local interests.	Acceptable. However, little support exists for the project.	Overall acceptability is unknown. Project is extremely controversial, having both strong support and opposition. Project is supported by community and business leaders due to its flood damage reduction and potential for cost recovery. Project is strongly opposed by environmental interest groups.
b. Completeness c/	Not applicable.	Not applicable.	Remaining flood control needs could be reduced through local flood control improvements.	Remaining flood control needs could be reduced through local flood control improvements.
c. Effectiveness d/	Not applicable.	Not applicable.	Overall, 79 percent reduction in damages.	Overall, 91 percent reduction in damages.
d. Efficiency e/	Not applicable.	Not applicable.	Excess benefits over costs (NED benefits) are $2.1 million annually.	Excess benefits over costs (NED benefits) are $-68.9 million annually.
e. Geographic Scope	Not applicable.	Encompasses study area (economic base area which includes Hinds and Rankin Counties), including the project area.	Encompasses the project area.	Encompasses the project area.
f. Hydrologic Effects	Not applicable.	Not applicable.	Plan includes measures to eliminate adverse hydrologic effects in the project area. No adverse hydrologic effects would occur downstream or upstream of the project area.	Plan includes measures to eliminate adverse hydrologic effects in the project area. No adverse hydrologic effects would occur downstream or upstream of the project area.

TABLE 7 (Cont)

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Comprehensive Levee Plan	Condition with LeFleur Lakes
g. Benefit-Cost Ratio	Not applicable.	Not applicable.	1.20	0.2
h. Reversibility	Not applicable.	Not applicable.	Possible, but highly improbable.	Possible, but highly improbable.
i. Stability	Not applicable.	Continued lack of needed flood protection would create continued significant flood damages and would be a deterrent to area growth and development.	With plan implementation, "medium stability" could be achieved.	With plan implementation, "medium stability" could be achieved.
j. Implementation Responsibility	Not applicable.	Not applicable.	Federal and non-Federal (local sponsor) actions required to implement plan.	Federal and non-Federal (local sponsor) actions required to implement plan.

a/ All impacts measured from "without-project" conditions.

b/ Acceptability is the workability and viability of the recommended plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies.

c/ Completeness is the extent to which the recommended plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. This may require relating the plan to other types of public or private plans if the other plans are crucial to realization of the contributions to the objective.

d/ Effectiveness is the extent the recommended plan alleviates the specified problems and achieves the specified opportunities.

e/ Efficiency is the extent to which the recommended plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment.

a. Implementation of flood control improvement plans are not expected to have any significant impact on study area population trends.

b. Noise created by project construction will be a temporary nuisance with the project area absorbing the impacts of these noises.

c. Any affected residences and businesses will be fully compensated under the terms of Public Law 91-646. Actual displacement will be determined during the plans and specifications phase.

d. Conversion of cleared lands to bottom-land hardwoods for mitigation purposes will provide beneficial impacts to the esthetic value of the area. Land disturbance during project construction will be remedied as construction is completed and vegetation recovers. Reduction in bottom-land hardwoods and wetlands due to project construction will create adverse impacts to esthetic values.

VIEWS OF LOCAL SPONSOR

118. The local sponsor, RHPRFDCD, understands the comprehensive levee plan is economically feasible, but has indicated they do not intend to pursue the plan at this time. The sponsor has indicated they plan to pursue the LL plan as a non-Federal project due to the plan's impact on regional economic growth of the Jackson Metropolitan Area and its potential for cost recovery.

SUMMARY OF COORDINATION, PUBLIC VIEWS, AND COMMENTS

119. Intense coordination has been maintained with the local sponsor. Quarterly meetings of the Executive Committee have been held throughout the study process. Engineers representing RHPRFDCD staff participated regularly during the past 3 years of this study.

120. Coordination has been maintained with state and Federal agencies. The U.S. Fish and Wildlife Service, the Environmental Protection Agency, NRCS, and MDWFP were invited to be cooperating agencies regarding the environmental aspects of the study.

SUMMARY OF FINDINGS

121. At HQUSACE direction, studies were limited to updating the comprehensive levee plan proposed in a draft January 1996 report to protect the Jackson Metropolitan Area and the LL

plan. The LL plan is designated as an LPP. To be recommended as a Federal flood control project, the LPP would have to be economically feasible and meet Federal water resource policy criteria.

COMPREHENSIVE LEVEE PLAN

122. The comprehensive levee plan consists of constructing approximately 21.9 miles of new levee, 3,720 feet of floodwall, enlarging 10.5 miles of the existing Jackson and East Jackson levees, building nine box culverts and nine concrete pipe water control structures, and constructing landside connecting ditches. Limited overbank clearing would be required to reduce stages at Lakeland Drive and minimize adverse impacts to the tailwater on the Ross Barnett spillway. This overbank clearing consists of a 100-foot strip on each side of the channel top bank from RM 290.5 to 301.5 and a 400-foot strip across six bendways. The levees would be fully compacted, have 1 vertical on 3 horizontal side slopes, a 10-foot-wide crown, and a 5-foot-thick impervious riverside face. For new levee closures required at highways, railroads, etc., an earthen and sandbag closure would be required.

123. The plan would result in the net loss of 891 acres of bottom-land hardwoods, 60 acres of mixed-pine hardwoods, 34 acres of pine, and 39 acres of cypress-tupelo. Mitigation requirements are estimated at approximately 1,680 acres of reforestation/management. Total project costs for the comprehensive levee plan are estimated at approximately $205,765,000. Investigations indicate this plan is economically feasible with a benefit-cost ratio of approximately 1.2.

124. The comprehensive levee plan is generally noncontroversial; however, little public support has been expressed for plan implementation.

LL PLAN

125. The LL plan includes upper and lower lakes along the Pearl River south of the Ross Barnett Reservoir. The lakes would extend from the Ross Barnett Reservoir outlet downstream along the Pearl River to approximately 3 miles southwest of Interstate 20. The combined lakes would cover approximately 4,727 acres (4,149 acres of the upper lake and 578 acres of the lower lake) at normal operating level. Weirs at both upper and lower lakes would regulate flows. The lakes would function as "flow through" reservoirs with minimal floodwater storage capacity. Flood protection would be provided by the project's lowering stages through the Jackson Metropolitan Area. Studies indicate the LL plan provides significant flood reduction in the upper reaches of the project area close to Ross Barnett Dam. However, for the plan to provide comprehensive flood control similar to the comprehensive levee plan, levees are needed in the lower reaches of the project area in the vicinity of the lower lake. Stages return to existing conditions downstream of the lower weir.

126. The upper lake would be controlled by a gated weir approximately 800 feet long located immediately downstream of the Interstate 55 bridge crossing. The lower lake would be controlled by a fixed crest weir located approximately 3 miles downstream of Interstate 20. The upper lake would have a permanent pool elevation of 270.0 feet, NGVD, and the lower lake a permanent pool elevation of 260.0 feet, NGVD.

127. The plan includes major channel improvement on the Pearl River from the outlet of the Ross Barnett Reservoir to approximately 3 miles south of Interstate 20, a distance of approximately 16 river miles. The total amount of channel material to be excavated is estimated at approximately 62,000,000 cubic yards. The Gallatin Street Landfill would be excavated through and relocated to another landfill. The total amount of material to be removed is estimated at approximately 1,900,000 cubic yards.

128. An island of approximately 661 acres connecting to high ground on the upstream end of the project between the Lakeland Drive Pearl River relief opening bridge and the Pearl River Lakeland Drive Bridge would be constructed from excavated material. Other disposal sites would be located along the Pearl River excavation reaches. All disposal sites would be compacted to provide for commercial and other development opportunities.

129. The Town and Lynch Creek Levee, South Jackson Levee, and the Richland Levee in the comprehensive levee plan are also included in the LL plan. The Town Creek and Lynch Creek Levee would also require pump stations providing approximately 2,500-cfs pumping capacity on each creek. All inflows will be required to be removed by pumping.

130. The plan would result in the net loss of 4,414 acres of bottom-land hardwoods, 934 acres of mixed-pine hardwoods, 272 acres of pine, and 1,150 acres of cypress-tupelo. Mitigation requirements are estimated at approximately 8,080 acres of reforestation/management. The plan would also result in the unavoidable loss of that portion of the LeFleur Bluff State Park lying within the Pearl River flood plain. Total project costs for the LL plan are estimated at approximately $1,428,775,000. The LL plan is economically infeasible, under Federal NED guidelines, with a benefit-cost ratio of approximately 0.2.

131. The LL plan is extremely controversial with downstream municipalities and other interests. Significant interest has been shown by various publics. Environmental groups oppose the plan largely due to its anticipated impact on natural resources and loss of a portion of the LeFleur Bluff State Park. Flood protection and regional economic development proponents support the plan due to the reduction in flood threat and economic development potential. As an indication of the controversial nature of the plan, the NEPA scoping meeting held in Jackson on 23 February 2004 was attended by approximately 400 individuals. An information meeting, at the request of the State Attorney General, was held on 11 March 2004 in Biloxi, Mississippi, with approximately 50 in attendance. Most in attendance at this meeting were opposed to the project based on perceived potential damages to coastal and marine resources.

CONCLUSIONS

132. The LL plan, as the LPP, is technically feasible, as formulated in this report, and would eliminate approximately 90 percent of the existing flood damages in the Jackson Metropolitan Area. The $1.4 billion cost estimate includes 25 percent contingencies (appropriate for a feasibility study), real estate requirements including mitigation, utility relocations, further engineering and design necessary for contract(s) award, construction, and construction management. The LL plan, under Federal guidelines, is economically infeasible with a benefit-cost ratio of 0.2. This benefit-cost ratio, in accordance with Federal water resource policy, is based on flood damage reduction benefits and not on regional/local development benefits, important to local decisionmakers, which may occur with non-Federal implementation. A regional economic study for the LL plan is being separately conducted by the non-Federal sponsor. The LL plan, as currently proposed, does not meet environmental policy objectives such as avoiding and minimizing impacts on existing habitat, a requirement when implementing a Federal project. A locally implemented plan could include measures to mitigate for any adverse environmental effects.

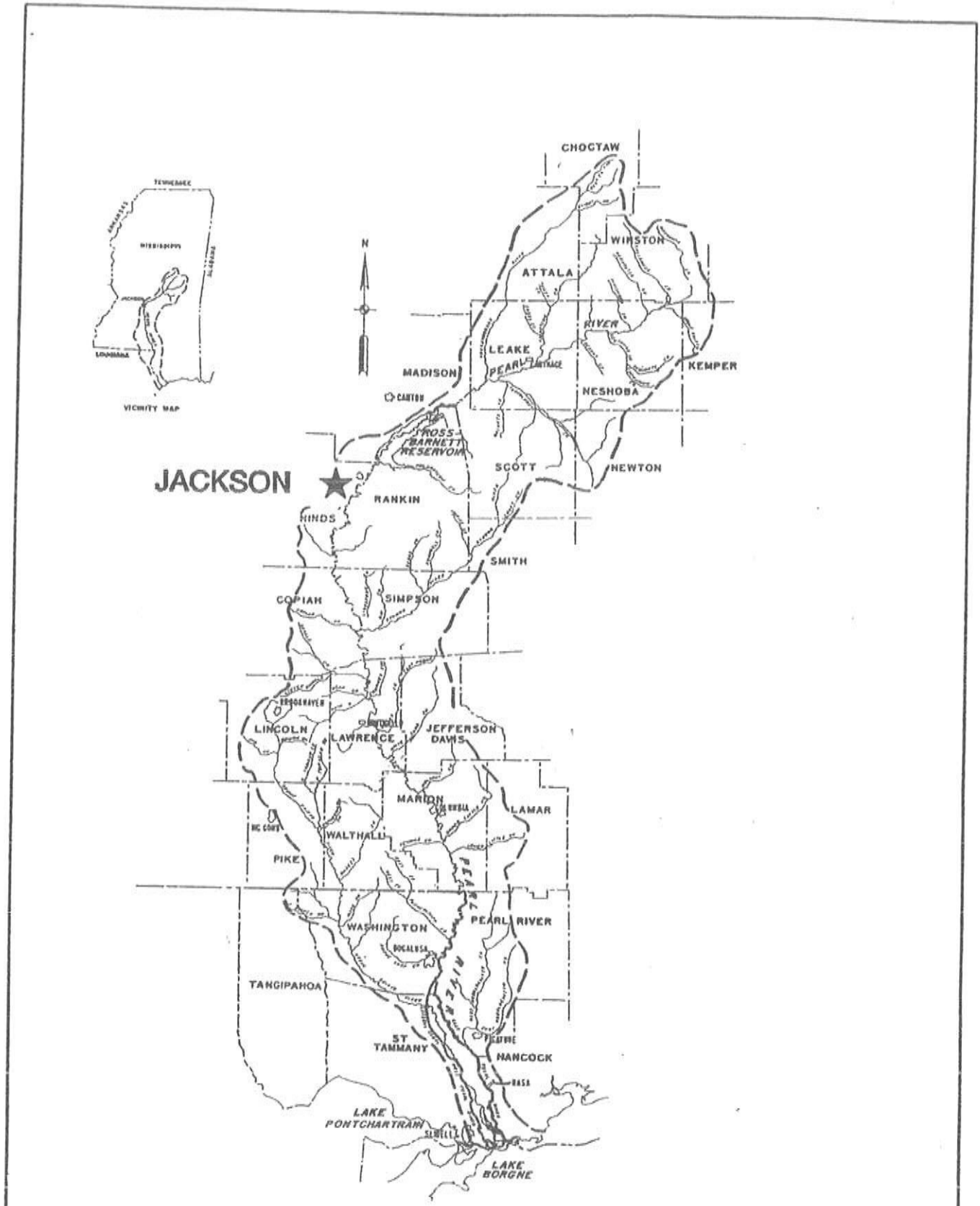
RECOMMENDATIONS

133. Based upon the study conclusions of the levee plan and the LPP, this feasibility study will be brought to a logical conclusion with this preliminary draft report/EIS documentation provided to the local sponsor for their use.

_____ _____

Anthony C. Vesay
Colonel, Corps of Engineers
District Engineer

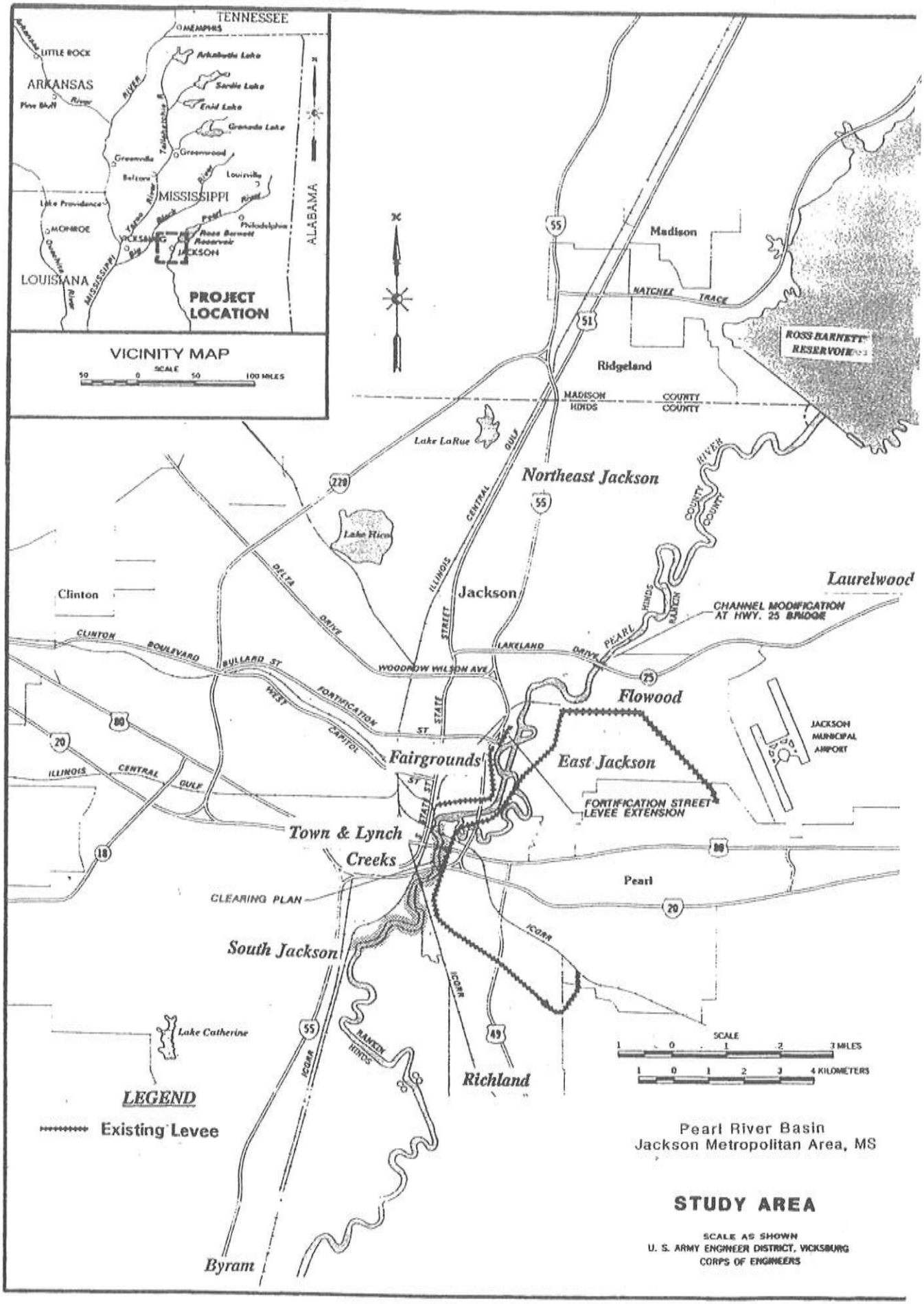
Date



PEARL RIVER BASIN

MISSISSIPPI AND LOUISIANA

PLATE 1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River
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Enid Lake
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Greenville
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Belzoni
Louisville
MISSISSIPPI
Lake Providence
MONROE
VICKSBURG
JACKSON
Ross Barnett Reservoir
Philadelphia
LOUISIANA
ALABAMA
PROJECT LOCATION
VICINITY MAP
SCALE
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NATCHEZ TRACE
ROSS BARNETT RESERVOIR
Ridgeland
MADISON COUNTY
HINDS COUNTY
Lake LaRue
Northeast Jackson
Lake Hico
Clinton
Jackson
Laurelwood
CHANNEL MODIFICATION AT HWY. 25 BRIDGE
CLINTON BOULEVARD
BULLARD ST
WOODROW WILSON AVE
LAKELAND DRIVE
Flowood
JACKSON MUNICIPAL AIRPORT
Fairgrounds
East Jackson
FORTIFICATION STREET LEVEE EXTENSION
ILLINOIS CENTRAL GULF
Town & Lynch Creeks
Pearl
CLEARING PLAN
South Jackson
Lake Catherine
Richland
Byram
LEGEND
Existing Levee
SCALE
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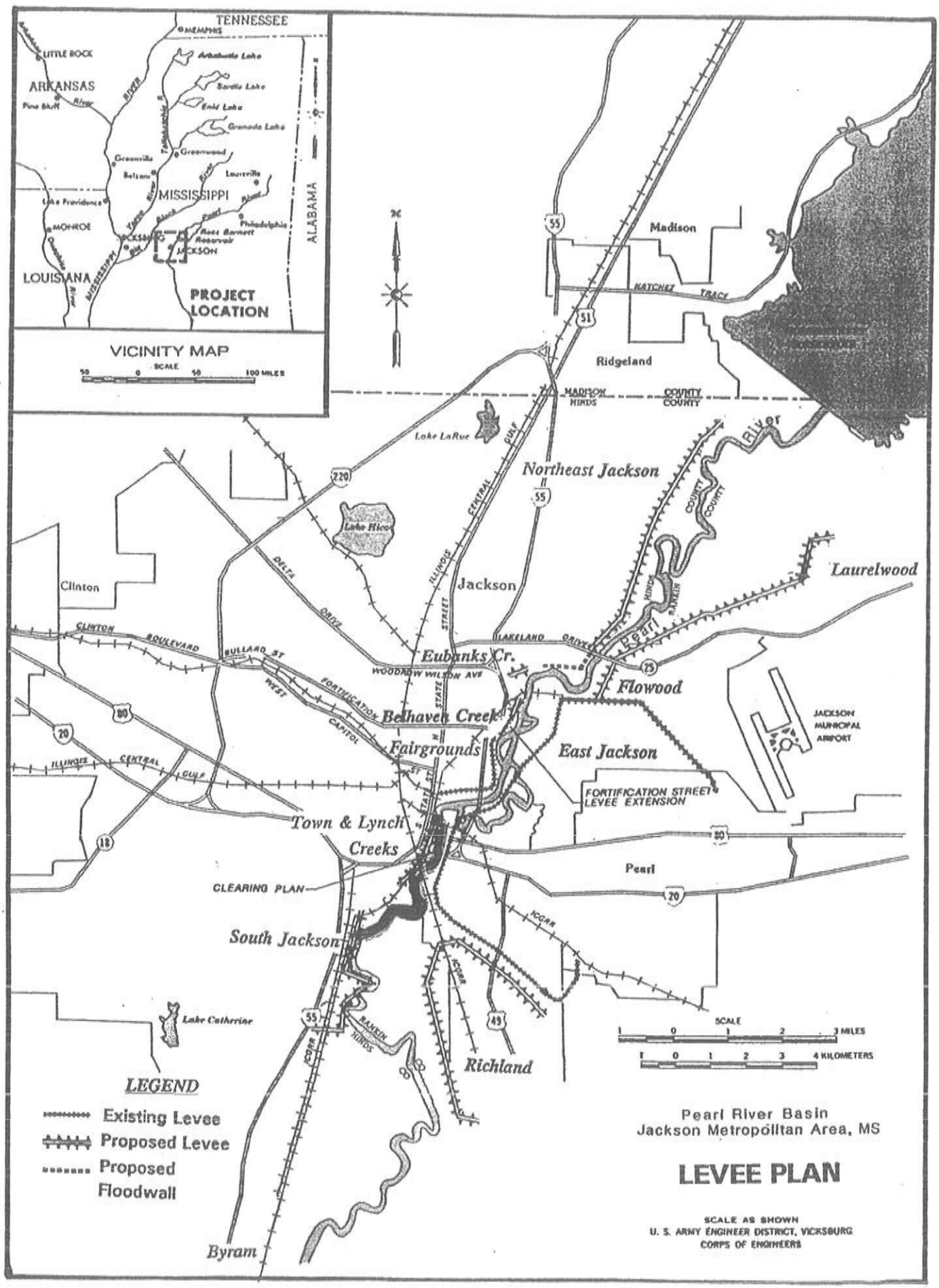
Pearl River Basin
Jackson Metropolitan Area, MS
STUDY AREA
SCALE AS SHOWN
U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS

PLATE 2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Sardis Lake
Enid Lake
Grenada Lake
Greenville
Greenwood
Belzoni
Louisville
Lake Providence
Philadelphia
Ross Barnett Reservoir
PROJECT LOCATION
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SCALE
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MADISON COUNTY
HINDS COUNTY
Lake LaRue
Northeast Jackson
Lake Hico
Clinton
Jackson
Laurelwood
Eubanks Cr.
Flowood
Belhaven Creek
Fairgrounds
East Jackson
JACKSON MUNICIPAL AIRPORT
FORTIFICATION STREET LEVEE EXTENSION
Town & Lynch Creeks
Pearl
CLEARING PLAN
South Jackson
Lake Catherine
Richland
Byram
SCALE
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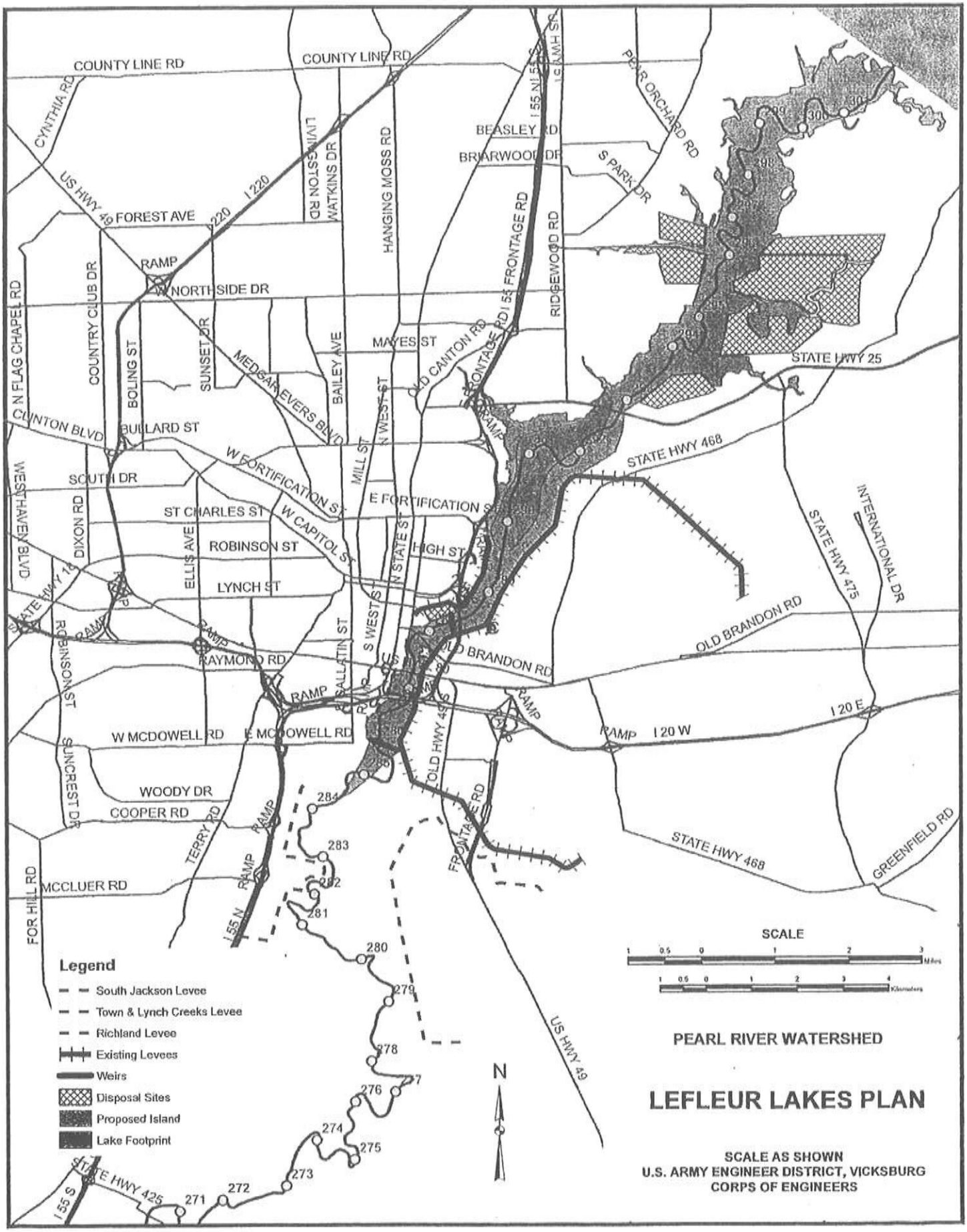
LEGEND
Existing Levee
Proposed Levee
Proposed Floodwall
Pearl River Basin
Jackson Metropolitan Area, MS
LEVEE PLAN
SCALE AS SHOWN
U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS

PLATE 3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CYNTHIA RD
US HWY 49
FOREST AVE
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LYNCHESTON RD
WATKINS DR
HANGING MOSS RD
BEASLEY RD
BRIARWOOD DR
PEAR ORCHARD RD
S PARK DR
I 55 NB
I 55 SB
FRONTAGE RD
RIDGEWOOD RD
RAMP
W NORTHSIDE DR
N FLAG CHAPEL RD
COUNTRY CLUB DR
BOLING ST
SUNSET DR
MEDGAR EVERS BLVD
BAILEY AVE
MAYES ST
OLD CANTON RD
STATE HWY 25
CLINTON BLVD
BULLARD ST
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MILL ST
N WEST ST
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STATE HWY 468
SOUTH DR
WESTHAWEY BLVD
DIXON RD
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W CAPITOL ST
ELLIS AVE
ROBINSON ST
HIGH ST
N STATE ST
STATE HWY 475
INTERNATIONAL DR
STATE HWY 18
LYNCH ST
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OLD BRANDON RD
RAYMOND RD
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WOODY DR
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272
271
Legend
South Jackson Levee
Town & Lynch Creeks Levee
Richland Levee
Existing Levees
Weirs
Disposal Sites
Proposed Island
Lake Footprint
SCALE
N
PEARL RIVER WATERSHED
LEFLEUR LAKES PLAN
SCALE AS SHOWN
U.S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS

PLATE 4

PEARL RIVER WATERSHED
FEASIBILITY REPORT

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
FEBRUARY 2007

PEARL RIVER WATERSHED, MISSISSIPPI
FEASIBILITY REPORT

DRAFT
ENVIRONMENTAL IMPACT STATEMENT

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