Mississippi Valley Division,
Regional Planning and Environment Division South

Pearl River Basin Federal Flood Risk Management Project, Hinds and Rankin Counties, Mississippi
Draft Appendix I – Alternative Project Descriptions

June 2024

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Section 1

Alternative A1: USACE Nonstructural Plan

The nonstructural analysis was based on an inventory of residential and non-residential structures that was developed by USACE in 2023 using the National Structural Inventory version 2.0. An assessment of structures located in the 10 percent, 4 percent, 2 percent, and 1% AEP floodplains was performed for the portions of the study are subject to flooding from the main stem of the Pearl River and backwater flooding on the tributaries (Figures 3-1a through I-1d and Table I-2). Elevation and floodproofing was considered to determine the effectiveness of a nonstructural alternative. For the analysis, residential structures were to be elevated to the 1% AEP/BFE plus one foot, up to 13 feet above the ground, and nonresidential structures were to be floodproofed up to 3 feet above the ground. All nonstructural components would be implemented on a voluntary basis in cooperation with the property owner. The assumption is that there would be 100 percent participation rate; however, for socially vulnerable areas the participation rate based on similar USACE projects, such as Huntington District Section 202 program is that approximately a 50 percent participation rate is typically realized.

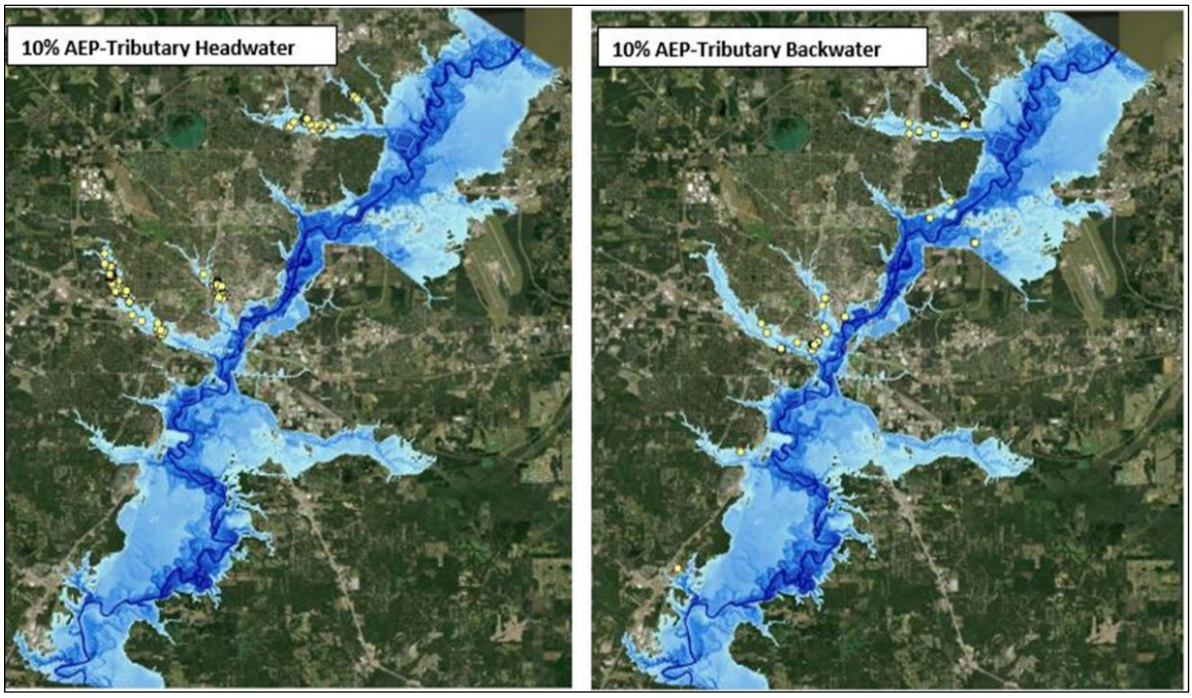

Figure I-1a. Structures inundated from a Cumulative 10% AEP Event separated by Headwater and Backwater Flooding

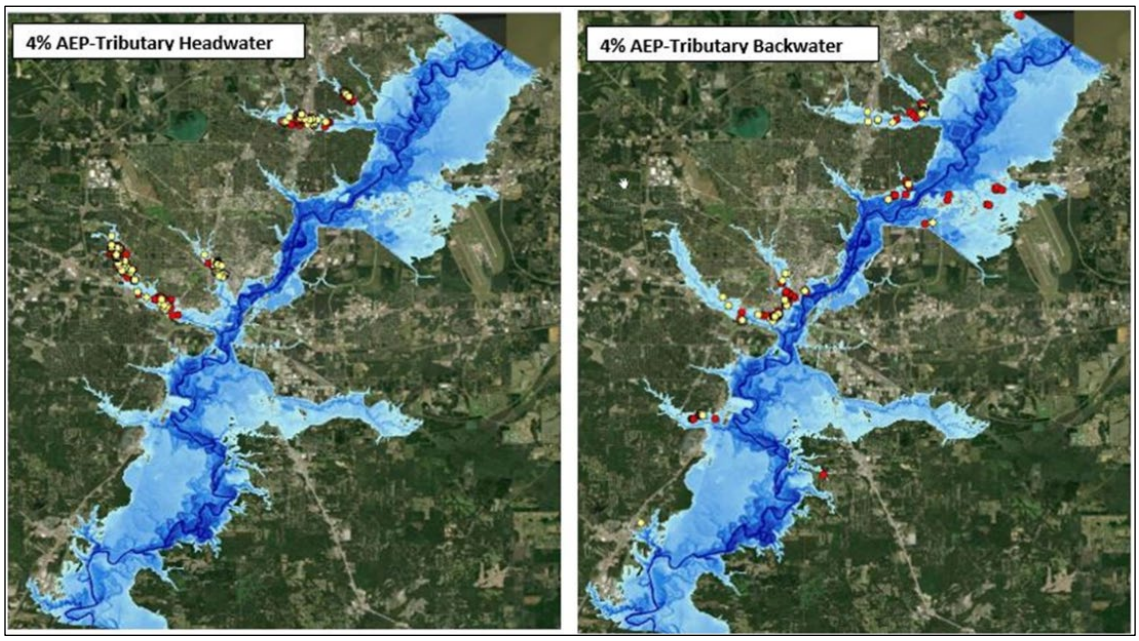

Figure I-1b. Structures Inundated from a Cumulative 4% AEP Event Separated by Headwater and Backwater Flooding

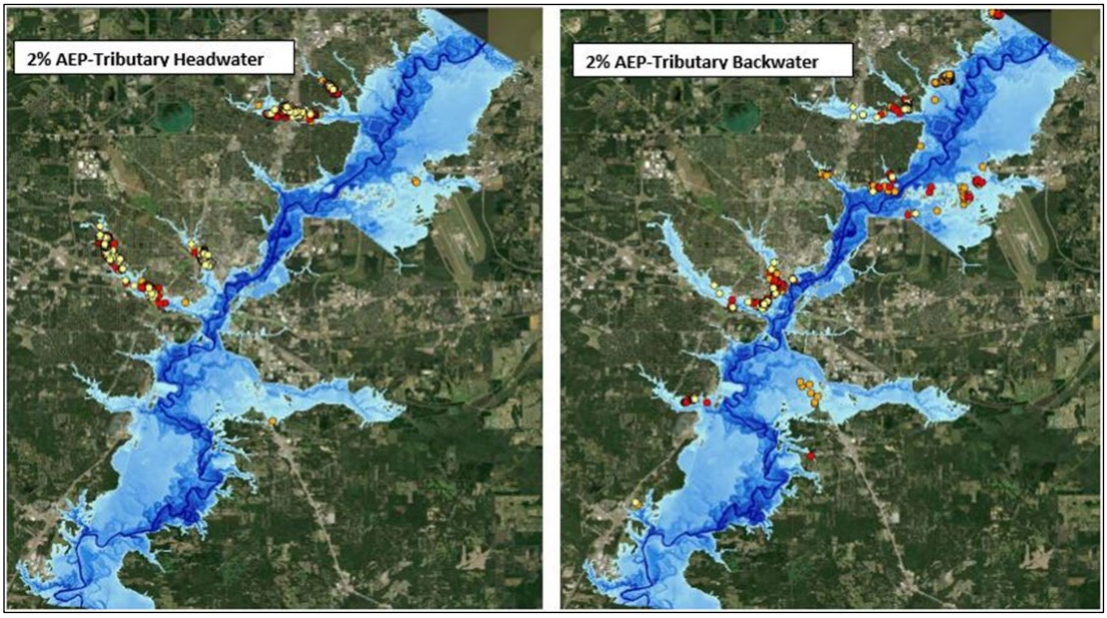

Figure I-1c. Structures Inundated from a Cumulative 2% AEP Event Separated by Headwater and Backwater Flooding

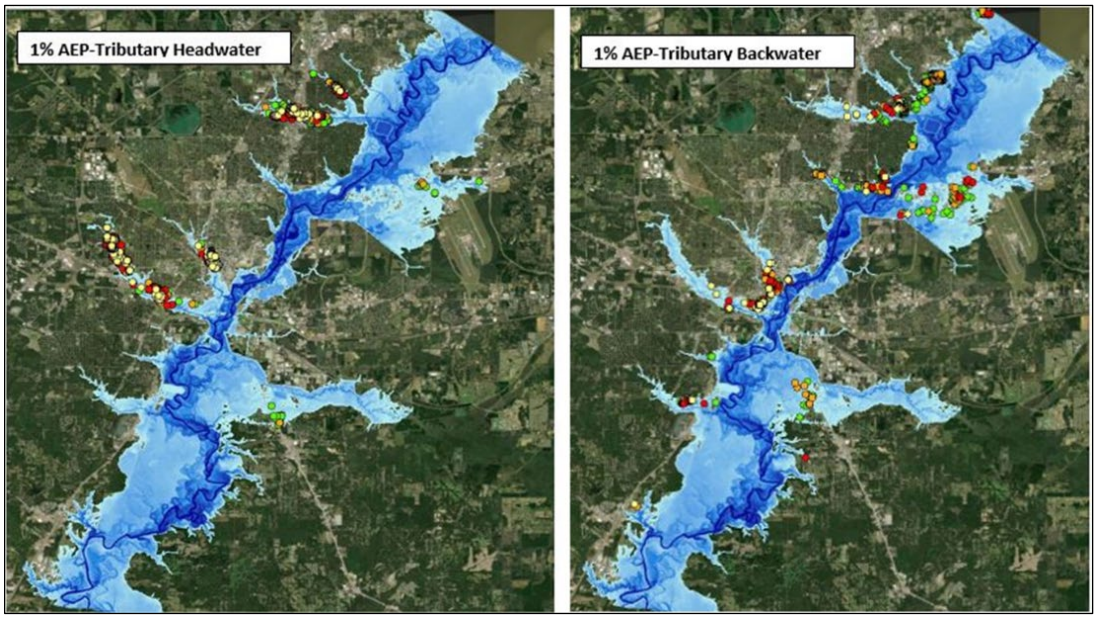

Figure I-1d. Structures Inundated from a Cumulative 1% AEP Event Separated by Headwater and Backwater Flooding (Colored dots represent structures in the following AEP floodplains: green dots are 1% (100 year), orange dots are in the 2% (50 year), red dots are within the 4% (25 year) and yellow dots are within the 10% (10 year)).

Table I-1. Noncumulative Nonstructural Benefits for Study Area for Elevating and Floodproofing, FY24 Price Level and Discount Rate

	(10%AEP)	(4% AEP)	(2% AEP)	(1% AEP)
Project First Cost	18,967,742	31,105,161	76,799,092	154,076,828
Interest During Construction	64,430	105,659	260,874	523,374
Total Investment Cost	19,032,173	31,210,821	77,059,967	154,600,203
AA Investment Cost	704,969	1,156,077	2,854,372	5,726,534
Benefits EAD Reduced	2,259,000	1,751,000	1,793,000	1,466,000
Net Benefits	1,554,031	594,923	(1,061,372)	(4,260,534)
B/C Ratio	3.2	1.5	0.6	0.3

Based on an incremental floodplain analysis, the 10 percent and 4 percent incremental AEP floodplains were both economically justified. Approximately 143 structures, 81 residential and 62 nonresidential, are included in this cumulative 4 percent AEP floodplain. The

cumulative results of the 4 percent AEP floodplain are displayed in Table I-2.This nonstructural plan is referred to as Alternative A1.

Table I-2. Summary of Results for Alternative A1, the USACE modified Nonstructural Plan, FY24 Price Level and Discount Rate

Project First Cost	$50,072,903
Interest During Construction	$170,090
Total Investment Cost	$50,242,993
AA Investment Cost	$1,861,000
Total AA Cost	$1,861,000
Benefits EAD Reduced	$4,010,090
Net Benefits	$2,149,090
B/C Ratio	2.2

These structures have been identified to be preliminarily eligible for the nonstructural alternative. Due to feedback from public meetings in May and June 2023 requesting the option to have properties acquired, the option of nonstructural property acquisition (buyout) on a voluntary basis is included in the nonstructural implementation plan (Appendix K). In addition, 10 of the 600 structures are located within the FEMA Regulated Floodway and would only be eligible for demolition or relocation. Structures located within the FEMA Regulated Floodway, based on preliminary analysis, have relatively similar flood risk in comparison to structures located outside of the FEMA Regulated Floodway.

Table I-3. Nonstructural Plan A1 Structure Type Eligibility

Structure Type	**Public**	**Private-Non-Profit**	**Residential-Non-Historic**	**Residential-Historic**	**Nonresidential**
Property Acquisition & Structure Demolition	x	x	x	x	x
Property Acquisition & Structure Relocation	x	x	x	x	x
Structure Elevation			x	x	x
Structure Dry floodproofing				x	x
Structure Wet floodproofing			x	x	x

Retrofitting of Existing Buildings			x	x	x

NON-STRUCTURAL IMPLEMENTATION APPROACHES

Property Acquisition and Structure Demolition

Property acquisition and structure demolition consists of the acquiring the existing at-risk structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.

Property Acquisition and Structure Relocation

Property acquisition and structure relocation consists of the physical relocation of an existing structure to an area outside of a hazard-prone area and, typically, the acquisition of the underlying land. Relocation must conform to all applicable State and local regulations. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.

Elevation

Elevation is physically raising an existing structure to an elevation to the 1 percent AEP BFE based on year 2082 hydrology or higher if required by USACE or local ordinance. Foundations must be designed to properly address all loads and effects, be appropriately connected to the floor structure above, and utilities must be properly elevated.

Dry Floodproofing

Dry floodproofing is using techniques applied to keep non-residential structures dry by sealing the structure to keep floodwaters out. Dry flood proofing would be completed on eligible structures at or below 3 feet (0.9m) depth.

Wet Floodproofing

Techniques designed to permit floodwaters to enter a structure to prevent or provide resistance to damage from flooding. Wet Floodproofing of a structure interior is intended to counteract hydrostatic pressure on the walls, surface, and support systems of the structure by equalizing interior and exterior water levels during a flood.

Retrofitting of Existing Buildings

Modifications to the structural elements of a building to reduce or eliminate the risk of future flood damage and to protect inhabitants. The structural elements of a building that are essential to protect to prevent damage include foundations, load-bearing walls, beams,

columns, structural floors and roofs, and the connections between these elements. Retrofitting also includes modifications to the nonstructural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Retrofits are primarily defined as modifications to the elements of a building to reduce or eliminate the risk of future damage. Structural retrofits are designed to protect elements such as foundations, load-bearing walls, beams, columns, building envelopes, windows, structural floors, roofs, and the connections between these elements. Nonstructural retrofitting involves the modification of a building or facility's nonstructural elements and may include elevation of heating and ventilation systems to minimize or prevent flood damage.

Section 2

Alternative C: NFI Channel Improvement/Weir/Levee Plan Project Description

Flood risk management benefits are realized by removing areas that constrict the floodplain by deepening the channel and floodplain. By doing this, conveyance of water downstream is improved through the project area. The water surface elevation of the river would be lowered in some places by as much as 8 feet (2.4 m) within the project area. Normal river stages would be permanently elevated. Flood elevations would be reduced within the reach of excavation and upstream of the excavation. Alternative C (Figure I-2 and Table I-4) consists of the construction of channel improvements, demolition of the existing weir near the J. H. Fewell WTP site and construction of a new weir with a low-flow gate structure further downstream for water supply to be continued while simultaneously creating an area of surface water for recreational opportunities, Federal levee improvements (excavated material plan), and upgrading an existing non-Federal ring levee with slurry wall around the Savannah Street WWTP.

Construction of the project would require relocations and/or improvements to various public and private utilities and infrastructure, (Table I-5), avoidance and minimization features required under the ESA, and the creation of new habitat mitigation areas to offset losses within the project's construction footprint areas.

There are 9 transmission lines within the project area. All efforts would be made to avoid, monitor, maintain clearance requirements, and protect these structures. If avoidance is not possible, then utility relocation or raising of lines/protection of structures would be necessary. It is estimated that 5 to 6 of these lines will require additional utility relocation costs. Coordination with the operating entity to determine specific requirements of each transmission line will be conducted during PED.

USACE modeling of Alternative C considered a variety of upgrades to the NFI routing. These included calibration to the recent 2020 flood event, which had not occurred at the time of NFI modeling, incorporating more recent flow record data (1980s to 2022), updating all runs to unsteady state routing, inclusion of tributary coincident flow, and the inclusion of lateral structures to represent the levees (Figure I-3). Updated calibration has shown that the system response has changed since the 1979 event to be more efficient. as illustrated by the comparable events from 1983 and 2020. The two events had similar flows at Pearl River gage in Jackson, but the stage was reduced by approximately 2.9 ft for the 2020 event.

Table I-4. Alternative C Project Key Features

Feature	ALT C		Units
	Quantity NFI (211 report)	Quantity USACE	
NON-STRUCTURAL			
Non-structural plan	acquisition		structures
STRUCTURAL			
Lake Surface Water Area	1700	2562.25	acres
Clearing and Grubbing	2,600	2301.39	acres
Channel Improvements Excavation	1400	1443.25	acres (mcy)
Fill Area	870	858.14	acres (mcy)
Stabilization or armoring for bridge abutments	10	7	bridges
Hard Point in tributary channels to prevent incision/sediment into newly constructed lake		850	Feet (crossing river)
Newly Federalized Levee (inc. slurry wall	1.7	1.7	miles
Slurry Wall Savanna Street WWTP	1.7	1.7	miles
New Slurry wall for seepage of existing features	n/a	1,460 ft	miles
Weir and new gate	1	1	each
Pumps to address interior drainage Impacts	0	2	each
Fish Passage	7000	7000	feet
Canton Club Levee	n/a	n/a	miles
OPERATIONS AND MAINTENANCE			
Weir	Unknown		each
Fish Passage			each
Terrestrial Habitat Mitigation			events
Riverine Habitat Mitigation			events
Lake			each
Pump Station			each
Levees			each
MITIGATION			
Sandbars (material from excavation)	31	NA	acres
Reforest top bank of fish passage	?	?	acres
Riverbank preservation	10	NA	miles
Removal of obsolete aquatic barriers	0	1	structure

connect occupied and suitable unoccupied riverine habitat	0	NA	acres
Open historically lost riverine habitat	0	NA	acres
Terrestrial Habitat Mitigation	5,000	24,760	acres

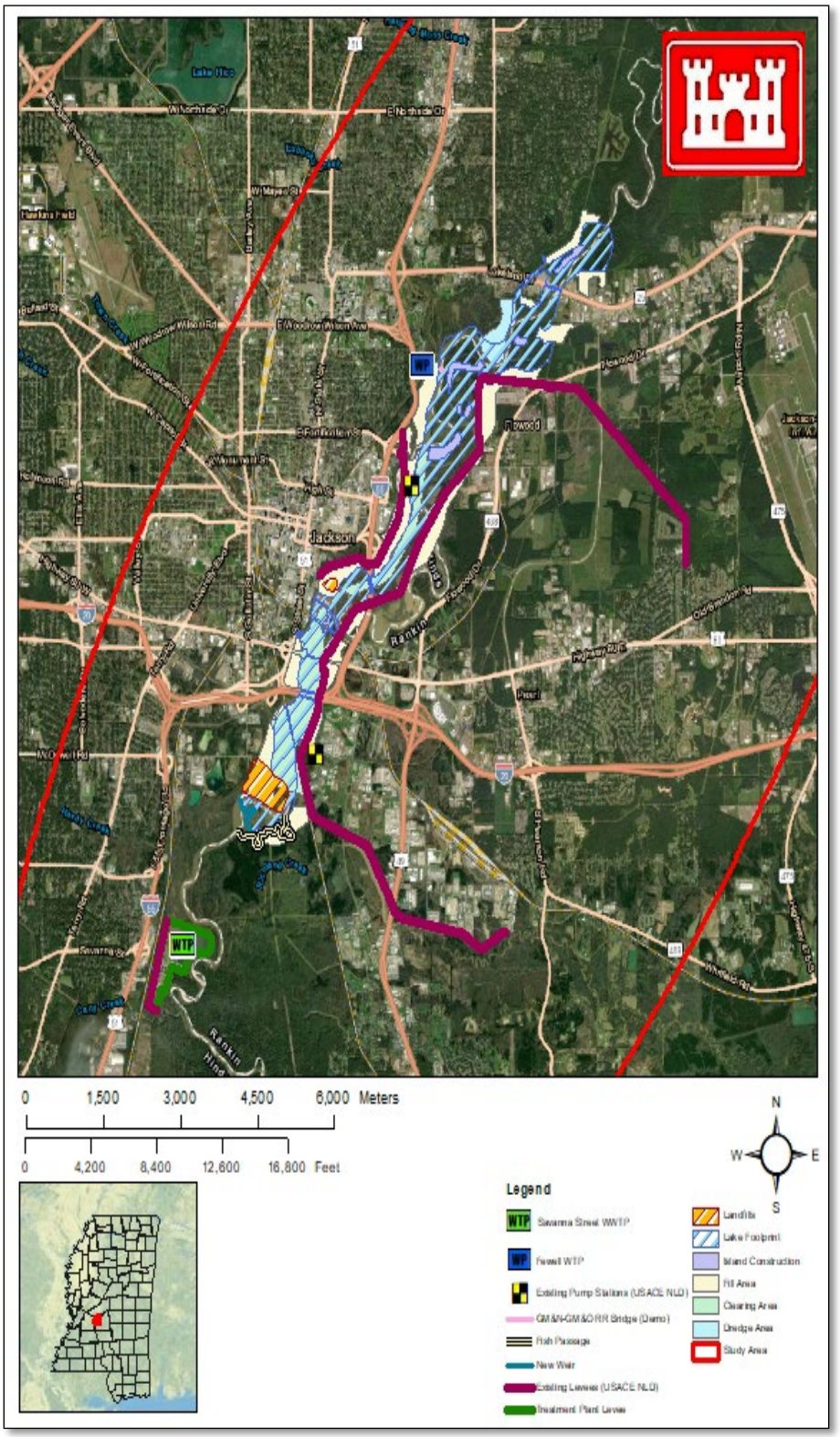

Figure I-2. Alternative C Key Features

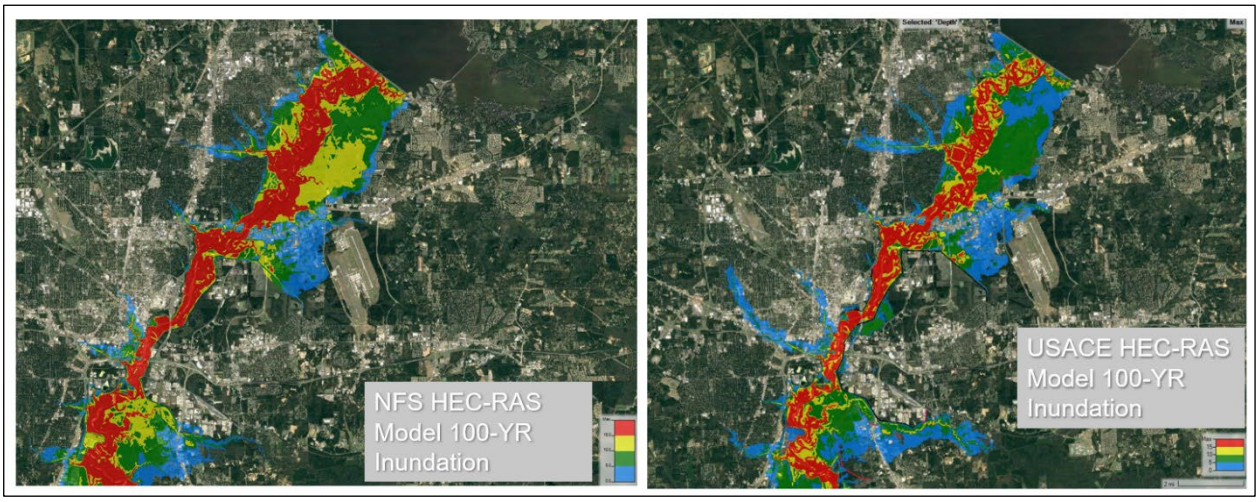

Figure I-3. NFI versus USACE modeling Results for the 1% AEP (100-year) Without Project Routing Scenario

Channel Improvements

Channel improvements (Figure I-4) consist of excavating areas along the Pearl River to improve conveyance from RM 284 to 294. The channel improvement footprint includes approximately 2,557 acres (1034.7 hectares (ha)) in which disturbance would occur. The excavation would be of various widths ranging from 400 to 2,000 feet (121.9-609.6 m) to be determined during the PED phase. Excavation depths would vary between 5-20 feet to meet the proposed bottom elevation of 248.0 NGVD. This total includes 1,692 acres (684.7 ha) in which excavation would occur to deepen the channel overbanks and 865 acres (350.0 ha) that would be used for placement of the excavated fill material. Approximately 20 million cubic yards (19.1 million m^3) of material would be excavated from the floodplain and channel overbanks. The existing river channel would not be widened, instead excavation of the overbank areas would occur.

The preliminary project layout also includes islands within the channel improvement excavation area that would be maintained and/or expanded upon from RM 289.5 to RM 292.0. Further, sand bars would be constructed inside the floodplain and along the existing islands to compensate for the loss of sand bar habitat.

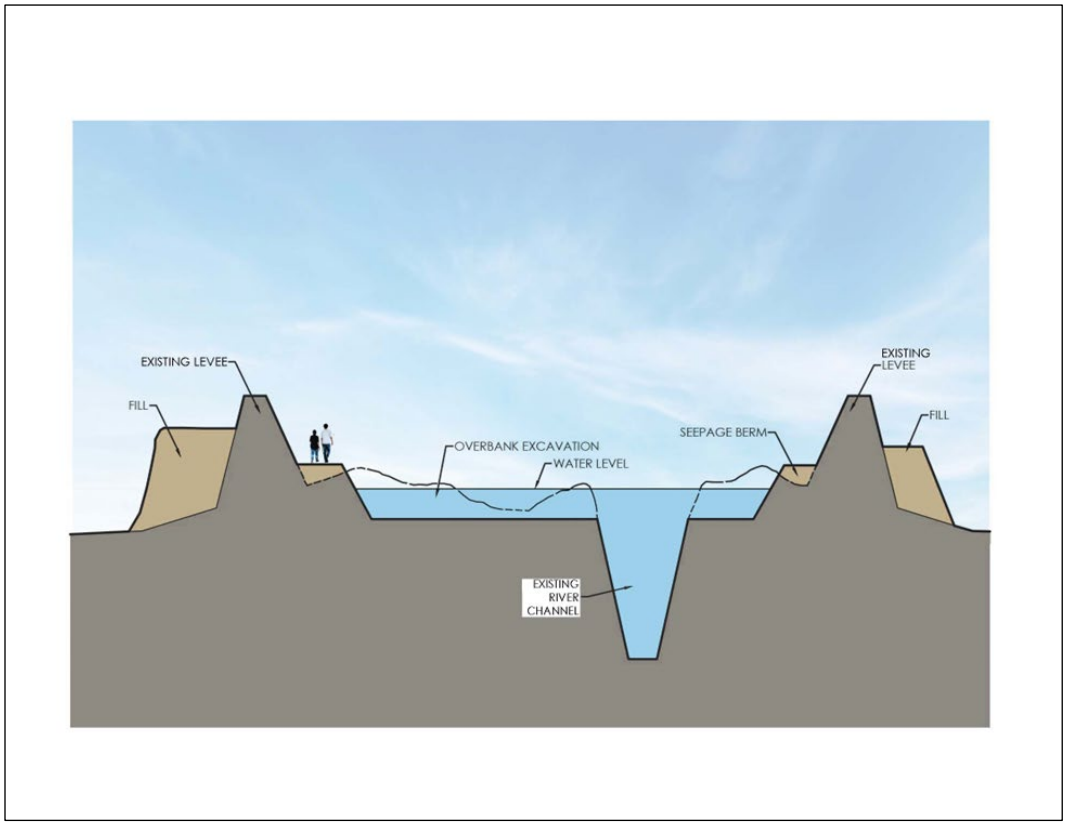

Figure I-4. Channel Improvements with a Relocated Weir

OVERBANK MODIFICATIONS

The existing overbank areas of the Pearl River channel would be lowered to increase conveyance of flood flows. Existing levees would remain in place and would be maintained for flood control and to aid in haul access. The excavation limits near the existing levees would be determined during final design.

The progression upstream would naturally allow for positive and continued dewatering of flooded areas ahead of moving into the next section. The three segments and their main areas of activity are further described in these stationed reaches listed below.

Station 10+00 through 140+00. Specific items included in this reach are the I-20 Interstate bridges (Sta. 95+00±) as well as the U.S. Highway 80 (Sta. 110+00), Old Brandon Road (Sta. 135+00±), and railroad bridges (Sta. 70+00±, Sta. 130+00±). Two high-pressure gas lines run through this reach and would have to be carefully monitored as excavation and grading activities progress. Multiple access points on both sides of the river would have to be maintained and monitored from a perspective of public safety and construction use. Projected quantities for earthwork are approximately 6 million cubic yards (yd^3).

Station 140+00 through 290+00. This reach contains the eastward expansion of the east side levees and the construction of islands in the deepened overbank. Islands would be

formed as part of the excavation activities. As with the previous reach segment, numerous access points would require management and maintenance for use and safety. A creosote slough area (Sta. 240+00±) would be avoided, when possible, to not disturb or cause any objectionable material to be exposed or mixed with other excavated material. In the event avoidance is not possible, the slough area may be excavated and hauled to a separate disposal site, and the remaining exposed surface capped prior to final grading. Projected excavation quantities are 6 million yd^3.

Station 290+00 through 400+00. As with the previous downstream reaches, there are bridges to work around (Highway 25 near Sta. 360+00), and gas lines and transmission lines that must be monitored during earthmoving operations. Depending on the final design, Mayes Lake (Sta. 310+00±) may need tie-in work to maintain its current level. A determination about the tie-in work would be made during the PED phase. An existing abandoned railroad embankment of the Gulf, Mobile & Northern/Gulf Mobile and Ohio (GM&N/GM&O) Railroad Bridge could also be affected and was removed in H&H modeling. Some island forming work would be required in this reach. The existing weir at the water works bend near Station 290+00 would remain undisturbed until completion of the new weir at the downstream terminus as to maintain water supply for the treatment plant. Projected excavation quantities in this reach are approximately 8 million cubic yards.

Hardpoints at Base of Tributaries

Multiple tributary inflow points exist within this reach and Alternative C would add a hardpoint, via a riprap chute to prevent backward erosion at each tributary inflow where the excavation of overbanks decreased the tributary channel bottom elevation at or near the confluence of those tributaries with the Pearl River.

Maintenance and Reinforcement of Bridge Abutments of Bridges (if required)

Stabilization or armoring, such as riprap, slope paving, slide repairs, etc., is required to ensure structural of integrity of various bridge structures due to changed conditions with this alternative. This work will be carried out prior to clearing and any major channel work. Following its own analysis, the Mississippi Department of Transportation (MDOT) has informed the Rankin-Hinds Flood Control District (the Flood Control District), MDOT agrees to collaborate with the Flood Control District in “the advancement of this project and to ensure countermeasures are included, if determined necessary during the future design process.” (Letter to G. Rhoads, dated February 26, 2024) To this end, the Flood Control District developed a range of cost estimates for potential structural and hydraulic countermeasures that could be recommended if countermeasures are determined necessary. The array of countermeasure features analyzed will mitigate potential impacts to MDOT bridges that will be identified during the PED phase. The estimated cost for these features is based upon known costs for the construction of hydraulic and structural countermeasures on another MDOT project at downstream hydraulic crossings of the Pearl River. When additional information becomes available during PED, adjustments to the design can and will be made to reduce potential impacts. Any proposed countermeasure

design and implementation will be conducted with MDOT's concurrence, review, and approval.

Rough estimations of the level of effort required to mitigate for bridge impacts include improvements for approximately 36 bents, 12 piers, abutment scour, as well as funding to conduct monitoring surveys. A pile is a concrete post that is driven into the ground to act as a leg or support for a bridge. A bent is a combination of the cap and the pile. Together, with other bents, act as supports for the entire bridge.

There are a total of 2 active railroad bridges within the project area. All efforts would be made to avoid, monitor, and protect these structures. Additional modeling is required to validate these assumptions during PED. If avoidance is not possible, then coordination with the operating entity to determine specific requirements of each railway bridge will be conducted during PED. All alterations of railroad bridges would be in accordance with Section 3 of the 1946 Flood Control Act (22 USC 701p).

Description of work is consistent for both Alternative C and CTO. The difference is that the extent of improvements for the selected structures would be expected to be larger for the Alternative C.

Excavated Material Plan

Federal levees exist within much of this reach and Alternative C would use the existing levees, upgraded with excess excavation placed behind them. Excavated fill would be placed in designated disposal areas on the protected side of existing levees. These areas would be graded to be at the same elevation or lower than existing levees and grassed to establish long-term erosion control. Additional riprap or other armoring would be placed as required during the final grading operations.

The excavated material disposal fill areas placed on the protected side of levees would impact approximately 465.6 acres (188.4 ha) (Figure I-5). Clearing of wooded areas to the east of the proposed new banks (small areas on the west side) would be cleared and grubbed ahead of receiving excavated material from the channel overbank excavation. The excavated material would be used to create a substantial new land mass within the Jackson MSA. The new land mass created behind the levees would range from 200 to over 1,000 feet (121.9-304.8 m) in width. The newly created riverfront area would allow for expanded riverfront access, natural areas, and commercial development, along with recreational opportunities.

If any structures are to be built on top of any portion of the maintenance berm designed or used a seepage control, the berms would be overbuilt and utilities or any other structure or penetrations would be limited to within the overbuilt section. Penetrations trough the berm could become seepage exit points, and this is specified to limit fracture through the main berm.

Where water would be permanently ponded against the riverside slope, these areas would require a 40-foot-wide semi-compacted impervious riverside maintenance berm to limit

seepage through the levee. The typical details include a detail of the berm assumed to extend the entire length of any levee section where water is pooled. The berm would have a crown elevation 3 feet above normal pool, a 1V on 40H top slope and a 1V on 3H toe slope. No removal of the riverside blanket near the existing levees is anticipated.

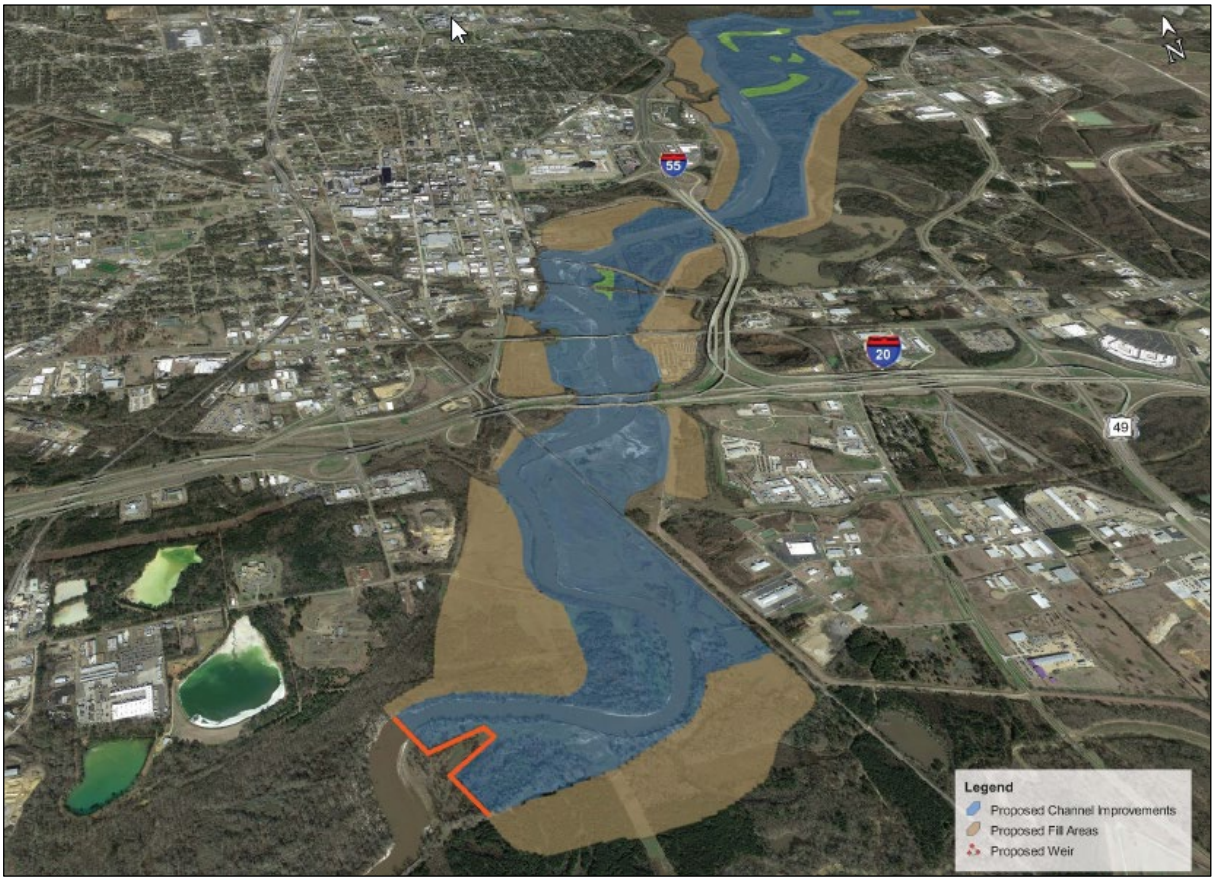

Figure I-5. Plan View of Proposed Channel Improvements Excavated Material Plan, and Weir with Gate

Structure Demolition

The existing weir located at RM 291 near the J. H. Fewell WTP site would be demolished and replaced with a new weir further downstream near RM 284.3 at the south end of the channel improvements area. In the area surrounding the J. H. Fewell WTP, Plan C calls for the demolition of the J.H. Fewell Weir located at RM 291, which is currently set to approximately elevation 250 feet. Dredging would be conducted to elevation 248 feet. It is undetermined if the water intake structures and access way of the J. H. Fewell WTP would need further modification. Demolition may also be required at all or part of the abandoned GM&N/GM&O Railroad Bridge since it was removed in H&H modeling. Figure I-

6 shows the excavation extent provided in the black polygon with the WTP, weir and intake structures. The length of area (including the island) directly along the railroad bridge is approximately 3,600 feet.

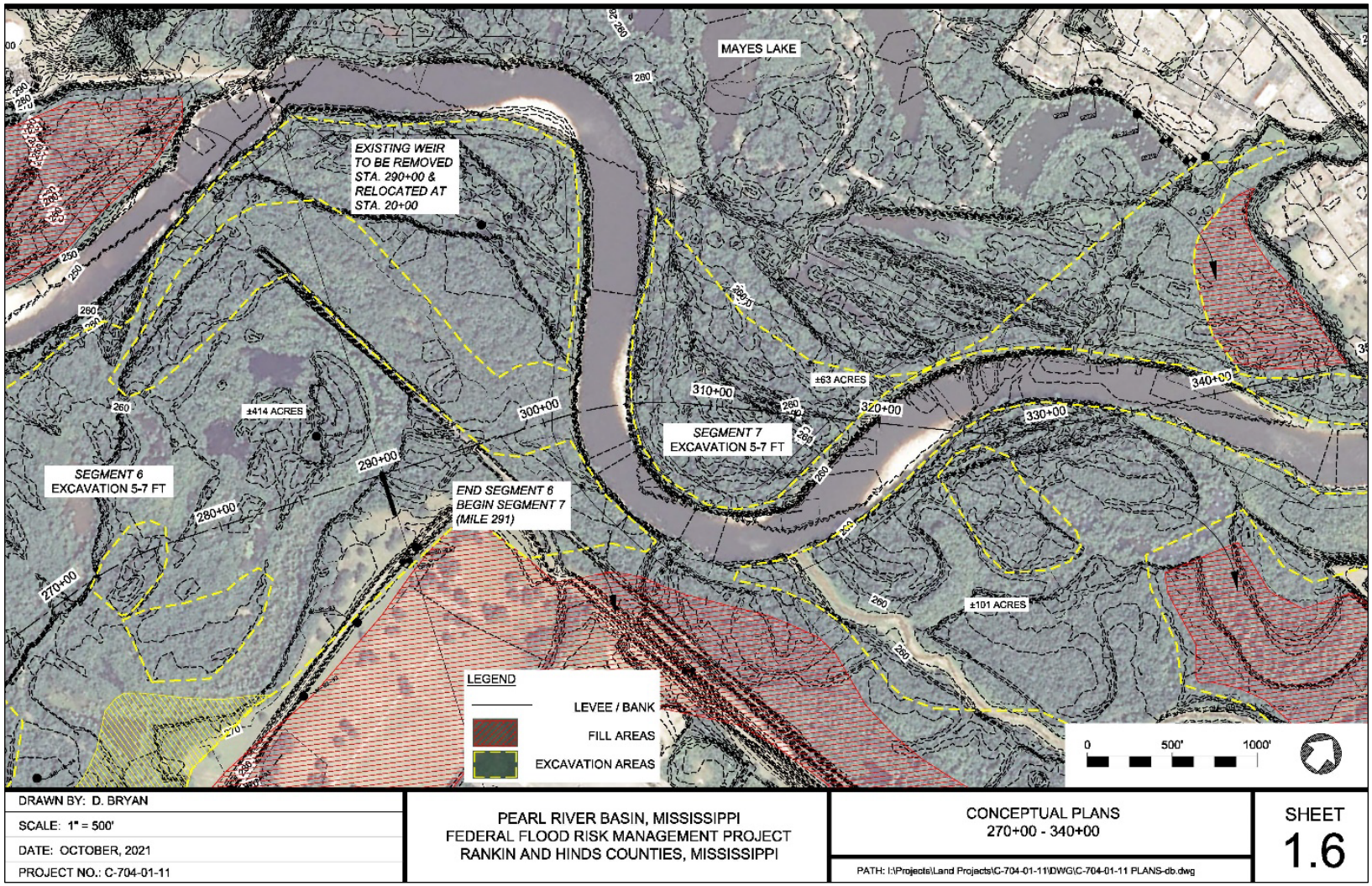

Figure I-6. Proposed Excavation Extent for Demolition of the J.H. Fewell Weir

Construction of New Weir and Gate with Fish Ladder

The demolished weir would be replaced with a new weir constructed downstream near RM 284.3 at the south end of the channel improvements area. The purpose of the new weir would be to maintain the baseline low-water level for water supply at the J. H. Fewell WTP within the channel improvements area. The new weir would provide for a significantly larger body of water within the Pearl River channel to the north of the weir. Downstream low-water hydrologic flows (extreme drought condition minimum flows) within the Pearl River channel would be maintained by means of a 12 x 12-foot low-flow gate. The gate is also required for any future maintenance which requires drawdown of the lake. Portions of weir would be submerged during flood events thereby allowing excess water to pass downstream. Water would pass over the weir with inflow into the lake approximately equaling outflow at any given time (with the exception of the extreme drought, which has a minimum release and outflow could be greater than inflow. However, this is expected to rarely occur, as the Ross Barnett Reservoir also has a minimum release requirement that would pass through the system). As opposed to the existing weir, the replacement weir would be constructed to a higher elevation of 258 NGVD vs. the current of 250 NGVD, and a larger width of 1,500 feet along an approximately 1 mile (1.6 km) stretch on the southern end of the proposed channel improvements area. This weir would impound an area of approximately 2600 acres. Baffle blocks to help prevent floating solids from flowing over the weir are part of the conceptual designs. Further, additional excavation for the fish ladder would occur along the left descending bank of the relocated weir in the project area. The fish ladder has been conceptually designed to be approximately 7,300 feet (2,225.0 m) in length. The fish passage design will be coordinated with The Service and state agencies during the PED phase.

The proposed weir meets USACE and State criteria to be defined as a dam based on the height of the structure and water storage. Additional costs were added to the NFI project cost to account for a redesign and constructing the weir to higher USACE and State criteria for a dam. Rough cost estimates were derived using some unit costs from the NFI. A more refined cost estimate would be done once the dam is redesigned to meet USACE and State criteria.

The proposed weir does not provide any flood control benefits, and construction of the weir necessitates additional pumping needs at existing levees as well as seepage protection in the form of berms and slurry walls on existing levee features upstream of the weir. However, the weir provides a lake surface for future water supply concerns, as well as adding attractive locations for recreation and future economic development. Public recreation facilities within the floodplain (i.e., boat ramps and landings, pedestrian access points, public and RV parks, natural areas, and trails) are not part of Alternative C; however, at a later time, those features may be added by other entities as a result of the weir's new expanded year-round recreational water body.

Additional Pumping Needs at Existing Levees

The existing levees contain drainage structures that allow water to drain from the interior of the leveed area when the Pearl River is low. When the Pearl River water level is high, the drainage structures are closed, and pump stations are used to pump water out of the leveed area. The original design (original levee construction) of these features called for the drainage structure to handle a 1 percent AEP interior drainage flow and the pumps were originally designed for a smaller event. Later additional pump capacity was added without additional study (see: 2007 Report for details). The proposed new weir would maintain a minimum pool at elevation 258.0 ft. Due to the new pool elevation, the drainage structures would have at least 9 ft of water covering the structures at all times and would no longer be able to operate and prevent the new reservoir from flooding the interior leveed areas. Additional pumping capacity would be installed to mitigate for the loss of capacity of the drainage structures. In addition, some of the proposed fill areas in the NFI plan would fill in part of the sump that is presently used to store water for pumping. The NFI did not perform an interior flooding analysis to determine mitigation features for the loss of the use of the drainage structures. This analysis would need to be completed if Alternative C is selected for construction. Additionally, the Operation and Maintenance (O&M) of the additional pumping would need to be substantially updated from the existing O&M plan for the pumping ability and constant operations prior to construction. Costs for this effort are estimated to range from $100 million to $200 million depending on the size of the pump stations needed. Cost estimates (adjusted for inflation) were based off recent experience with pump cost estimation from studies or actual construction, such as the proposed pump station for the *Raritan Bay and Sandy Hook Bay Hurricane Sandy Limited Reevaluation Report*, dated September 2016, and pump station construction in the Trinity River Corridor were also used to verify cost ranges.

Newly Federalized Levee

An existing non-Federal levee protects the Savanna Street WWTP near RM 282. As part of Alternative C, the levee would undergo maintenance and additional upgrades, so the levee meets the freeboard needed for certification for a 1 percent AEP flood event in advance of the main construction phases (Figure I-7). The levee section proposed for the new Federalized levee around the WWTP consists of a 10-foot crown width with 1V on 3H landside and riverside slopes. If needed, a slurry wall for seepage mitigation would be added. At this location, additional pumps would not be needed to provide protection behind levees since the existing pumps are already in progress of being replaced as part of the Section 219 Environmental Infrastructure Program as discussed in Section 1.5.2 of this report.

Principal features of the work include mobilizing and demobilizing, clearing, and grubbing, removing, and stockpiling any existing crushed stone surface, semi-compacted levee embankment, traverses, adding new crushed stone surfacing, mowing, turfing, erosion control matting, preventing storm water pollution, and providing environmental

protection. Additional work could include trenching and the creation and backfill of a concrete slurry wall within the levee footprint.

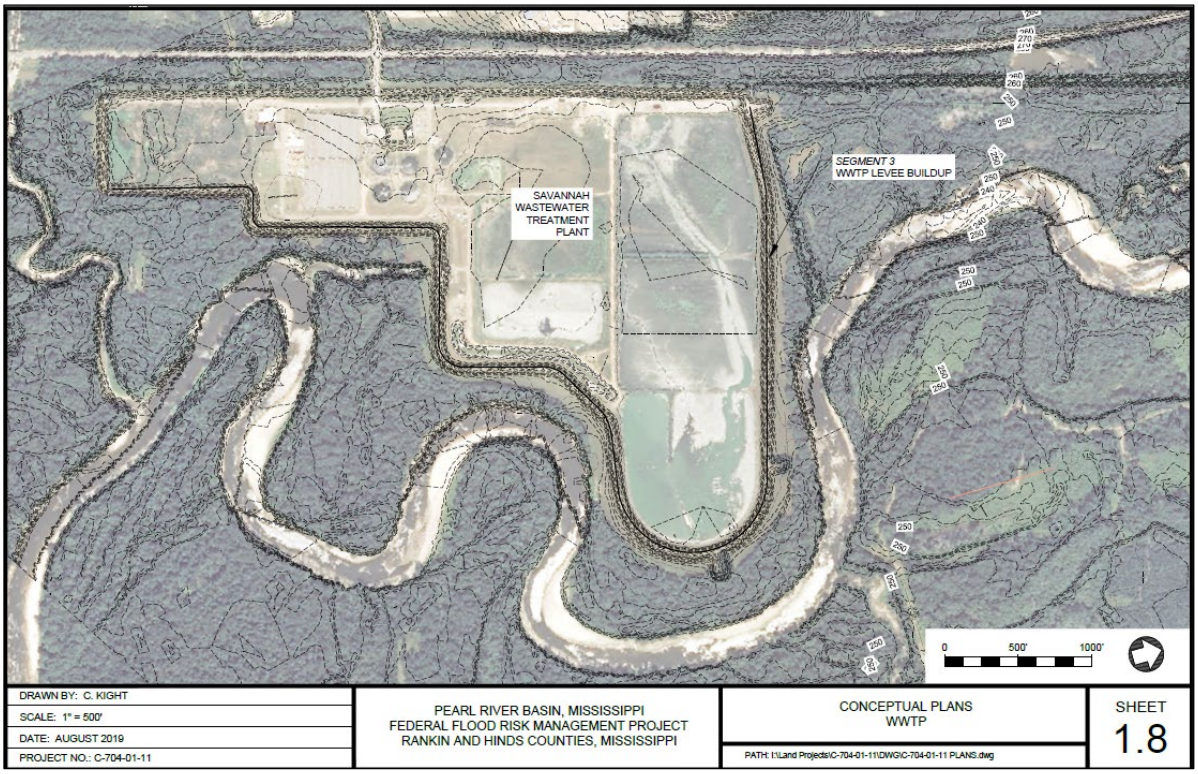

Figure I-7. Proposed Federalized Levee at WWTP

BORROW PLAN

A borrow plan has not been developed at this stage of the analysis. It is conceivable that there is enough borrow material from the material excavated from within the channel but it is unknown at this time if the material is suitable for constructing levees. Should the excavated material within the channel be determined to be unsuitable, borrow material would need to be obtained from another source for construction of any levees. There are potential borrow sources identified within close proximity of the project area (10-mile radius). Reference Figure I-8 for a potential source. Borrow opportunities would be further investigated during PED and a supplemental NEPA document would be prepared at that time.

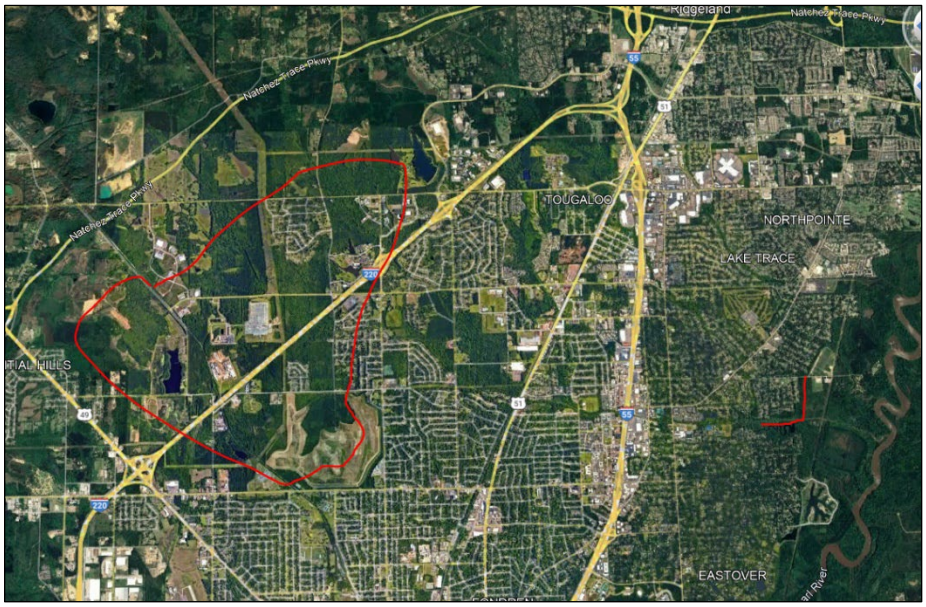

Figure I-8 Potential Borrow Sources

Property Relocations

Alternate C includes removing the abandoned GM&N/GM&O Railroad Bridge and embankment, relocating or reconstructing property of others, bridge counter measures, utilities and lands or interests purchased for such relocations and conveyed to others. All alterations of railroad bridges would be in accordance with Section 3 of the 1946 Flood Control Act (22 USC 701p). Of the 2,750 acres needed for the implementation of Alternative C, the NFI owns the real estate for approximately 1,120 acres.

Relocations also include the removal of existing historical unpermitted solid waste units in the floodplain, removal and capping of an existing potential HTRW site, and remediating as necessary at full NFI responsibility, including (Figure I-9):

- An existing automotive salvage yard.
- Mitigation features may be required for Gulf States Creosote Company Site.
- Additional capping and bank stabilization features would be required for unpermitted LeFleur's Landing Site (Jefferson Street Landfill).
- Excavation and removal of approximately half of the closed and sealed Gallatin Street Landfill Site of proposed channel improvements.

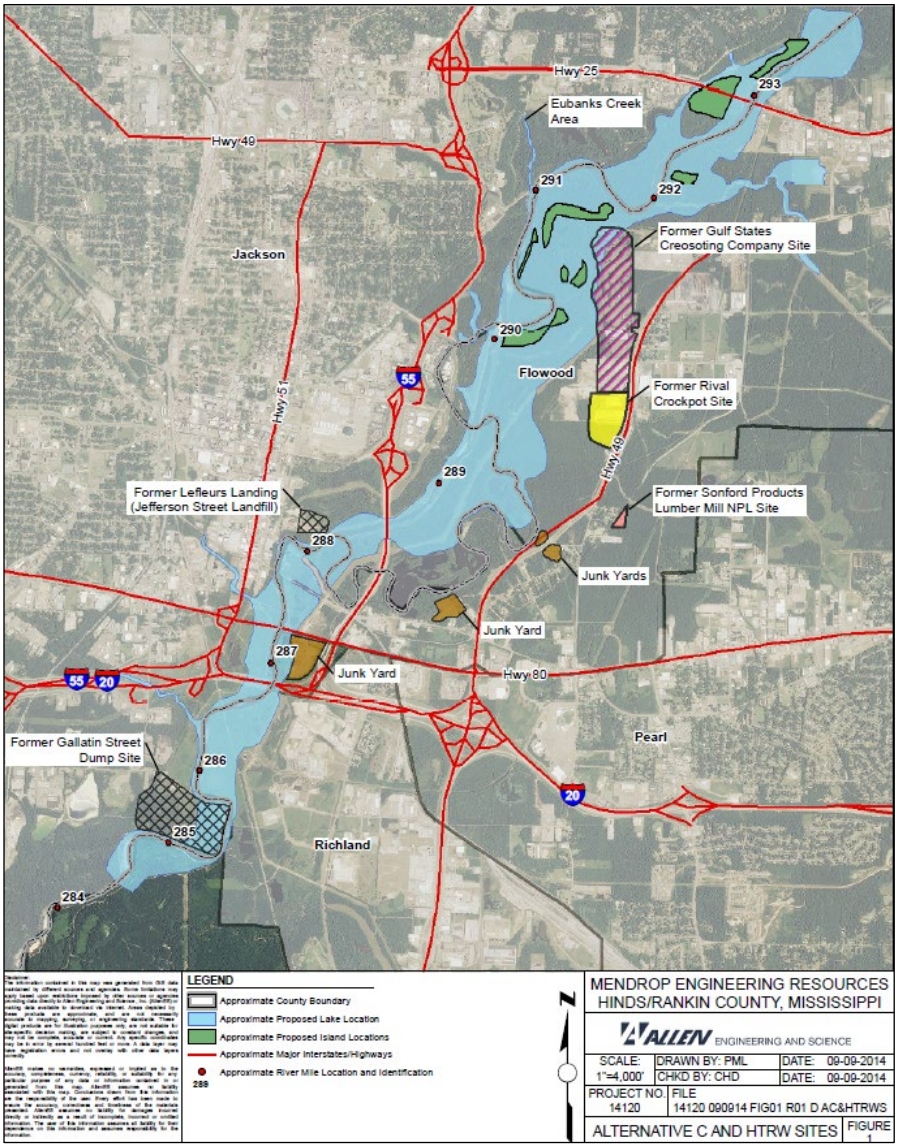

Figure I-9. Known and Potential HTRW Sites within Project Area

The Gulf States Creosote Company Site is located within the project area. The site, or portions thereof, may require avoidance, remediation, or some other mitigating features. The unpermitted LeFleur's Landing Site is also located along the edge of the proposed channel improvement excavation area. It would require additional capping and bank stabilization features due to potential leaching of landfill waste and groundwater movement in the area. Remediation design and coordination with appropriate local, State, and Federal agencies would determine site actions to eliminate potential leaching of landfill waste to the groundwater and movement of groundwater into the proposed channel improvement.

Groundwater controls and a slurry wall may be appropriate remedial actions in this event. The proposed channel improvement excavation area would also bisect the unpermitted Gallatin Street Landfill Site; therefore, excavation and removal of approximately half of the

landfill site would be required to construct the proposed channel improvement. This excavated material would then be incorporated into the current remaining landfill area to further elevate the area, cap the area, and provide bank stabilization. Final remedial designs would be coordinated with appropriate Federal and State agencies to determine necessary actions to prevent and/or eliminate potential leaching of landfill waste chemicals to the groundwater and movement of groundwater into the proposed channel improvement area prior to the initiation of excavation activities at this location. Again, groundwater controls and a slurry wall may be appropriate remedial actions.

OPERATIONS AND MAINTENANCE (CHANNEL, WEIR, SEEPAGE BERMS, FISH PASSAGE, LEVEE UPDATES)

Operations and Maintenance is ongoing for existing features within the Rankin-Hinds AOR, additional Operations and Maintenance will be implemented for each constructed feature to USACE Standards. Existing Levee and Pumping Plant manuals will be updated. New features, such as the new weir and lake will require development of new O&M manuals. - The district commander is responsible for developing an OMRR&R manual for each project and separable element constructed under a separate project cooperation agreement (PCA), or functional portion of a project or separable element, reporting the status of the manual through the project management system as required by ER 5-7-1(FR). Normally, the Engineering Division will be assigned the overall responsibility for preparing a draft OMRR&R manual with appropriate inputs from other disciplines and, in consultation with the project sponsor, furnishing the draft manual to the project manager for coordination with the project sponsor, and preparing the final OMRR&R manual for approval. For a functional portion, the OMRR&R manual is an interim manual pending completion of the entire project or separable element. The major subordinate commander is responsible for review and approval of the manual. The project sponsor, normally through a permanent committee consisting of our headed by an official usually called the "superintendent" is responsible for carrying out the provisions of the OMRR&R manual. The OMRR&R manual will include coverage of all OMRR&R subjects required by the PCA and existing regulations, in detail sufficient to ensure proper OMRR&R accomplishment by the project sponsor. Project sponsors, subject to review and approval of the district commander, may prepare supplements to the manual.

Section 3

Alternative Combination Thereof Plan

The USACE evaluated various combinations of the project features to determine a combination that would maximize the flood risk reduction benefits while reducing adverse impacts and costs. Based on H&H modeling and agency coordination, the CTO Alternatives could be comprised of the following features with or without a weir (Alternative D and Alternative E):

- Alternative A1 Non-Structural Plan
- Excavation of Main Channel
- Federal levee improvements
- New weir construction including a fish ladder.
- Non-Federal levee improvements (Savannah Street WWTP)
- Levees
- Bridge modifications
- Mitigation features

CTO FEATURE SUMMARY

The Alternative CTO would provide similar flood risk reduction as the NFI Alternative C with a smaller footprint. Table I-5 Provides a listing of the project features of the CTO alternative with and without a weir. Based on H&H modeling, the weir would be located in a different location from the weir identified in Alternative C. Figure I-10 shows the location of the proposed weir.

Table I-5. CTO Alternative Project Features and Quantities

Feature	ALT CTO W/WEIR (Alt D) Quantity	ALT CTO WO/WEIR (Alt E) Quantity	Units
NON-STRUCTURAL			
Non-structural plan	60 43 residential 17 nonresidential	60 43 residential 17 nonresidential	structures
STRUCTURAL			
Lake Surface Water Area	1706	0	acres
Clearing and Grubbing *	1,501	1,501	acres

Channel Improvements Excavation *	1016 (11.3-14.1)	1016 (11.3-14.1)	acres (mcy)
Fill Area *	485 (14.7-18.4)	585 (14.7-18.4)	acres (mcy)
Stabilization or armoring for bridge abutments *	7	7	bridges
Hard Point in tributary channels to prevent incision/sediment into newly constructed lake *	750	750	Feet (crossing river)
Newly Federalized Levee (inc. slurry wall*	1.7	1.7	miles
Slurry Wall Savanna Street WWTP*	1.7	1.7	miles
New Slurry wall for seepage of existing features**	Up to 1.3	0	miles
Weir and new gate **	1	0	each
Pumps to address interior drainage Impacts **	1	0	each
Fish Passage **	5,000-6,000	0	feet
Canton Club Levee***	1.4	1.4	miles
OPERATIONS AND MAINTENANCE			
Weir	1	0	each
Fish Passage	?	0	each
Terrestrial Habitat Mitigation	11	11	events
Riverine Habitat Mitigation	?	0	events
Lake	1	0	each
Pump Station	1	0	each
Levees	2	2	each
MITIGATION			
Sandbars (material from excavation)	31	0	acres
Reforest top bank of fish passage	?	0	acres
Riverbank preservation	10	10	miles
Removal of obsolete aquatic barriers	1	0	structure
Connect occupied and suitable unoccupied riverine habitat	?	0	acres
Open historically lost riverine habitat	?	0	acres
Terrestrial Habitat Mitigation	10,762	10,762	acres

* Components of Alt C Excavation

** Components of Alt C Weir

***Feature from Alternative B

Nonstructural Component

The nonstructural analysis was conducted based on a residential and non-residential structure inventory developed by USACE in 2023 using the National Structural Inventory database of structures, version 2.0. An assessment of structures located in the 10 percent, 4

percent, 2 percent, and 1 percent AEP floodplains in the Post Project Construction was performed (reference Appendix N for more details). The NS features Elevation and floodproofing of structures were used to determine the effectiveness of a nonstructural alternative. For the analysis, residential structures would be elevated to the 1 percent AEP BFE based on year 2082 hydrology up to 13 feet above the ground and nonresidential structures to be floodproofed up to 3 feet above the ground. Participation in the nonstructural plan would on a voluntary basis by the property owner.

As a result of feedback from the public meetings held in May and June 2023, the option to include property acquisition (buyout) on a voluntary basis is included in the nonstructural implementation plan (Appendix N). Full details regarding the Non-structural Implementation Plan are included in Appendix N.

NFI Channel Improvement/Weir/Levee Plan Components

The Alternative CTO provides similar flood risk reduction at the NFI Alternative C with a smaller footprint. Alternative CTO consists of the construction of channel improvements, a new weir with a low-flow gate structure downstream for future potential water supply while simultaneously creating a lake area for recreational opportunities (Figure I-10). Federal levee improvements (excavated material plan) and raising an existing non-Federal ring levee (the Savannah Street WWTP Levee).

Modifications include constructing a weir upstream of the location identified for Alternative C, reducing excavation limits which reduces fill areas and thus reducing environmental impacts throughout the project footprint. The new weir would have a lower elevation than proposed for alternative C as well as a reduction in the overbank excavation limits. These changes could reduce environmental impacts especially to HTRW sites within the project footprint.

The Alternative CTO seeks to realize flood risk management through a reduced scope of measures that provide similar levels of flood risk reduction as Alternative C. Flood risk management is realized through lowering of the channel overbanks within the project footprint, thereby improving conveyance of water through the project area and lowering the water surface elevation of the river in some places within the project area over 4 feet (1.2 m). Water surface elevation reductions due to this excavation would provide reduction of flood elevations not only within the reach of excavation, but additional elevation reductions upstream for over 8 miles upstream of the excavation limits.

Construction of the project would require relocations and/or improvements to various public and private utilities and infrastructure, mitigating potential HTRW and other hazardous waste sites within the floodplain, avoidance and minimization features required under the Endangered Species Act, and the creation of new habitat mitigation areas to offset losses within the project’s construction footprint areas.

There are a total of 9 transmission lines within the project area. All efforts would be made to avoid, monitor, maintain required clearance, and protect these structures. If avoidance is not possible, then utility relocation or raising of lines/protection of structures would be necessary. It is estimated that 4 to 5 of these lines will require additional utility relocation costs. Coordination with the operating entity to determine specific requirements of each transmission line will be conducted during PED.

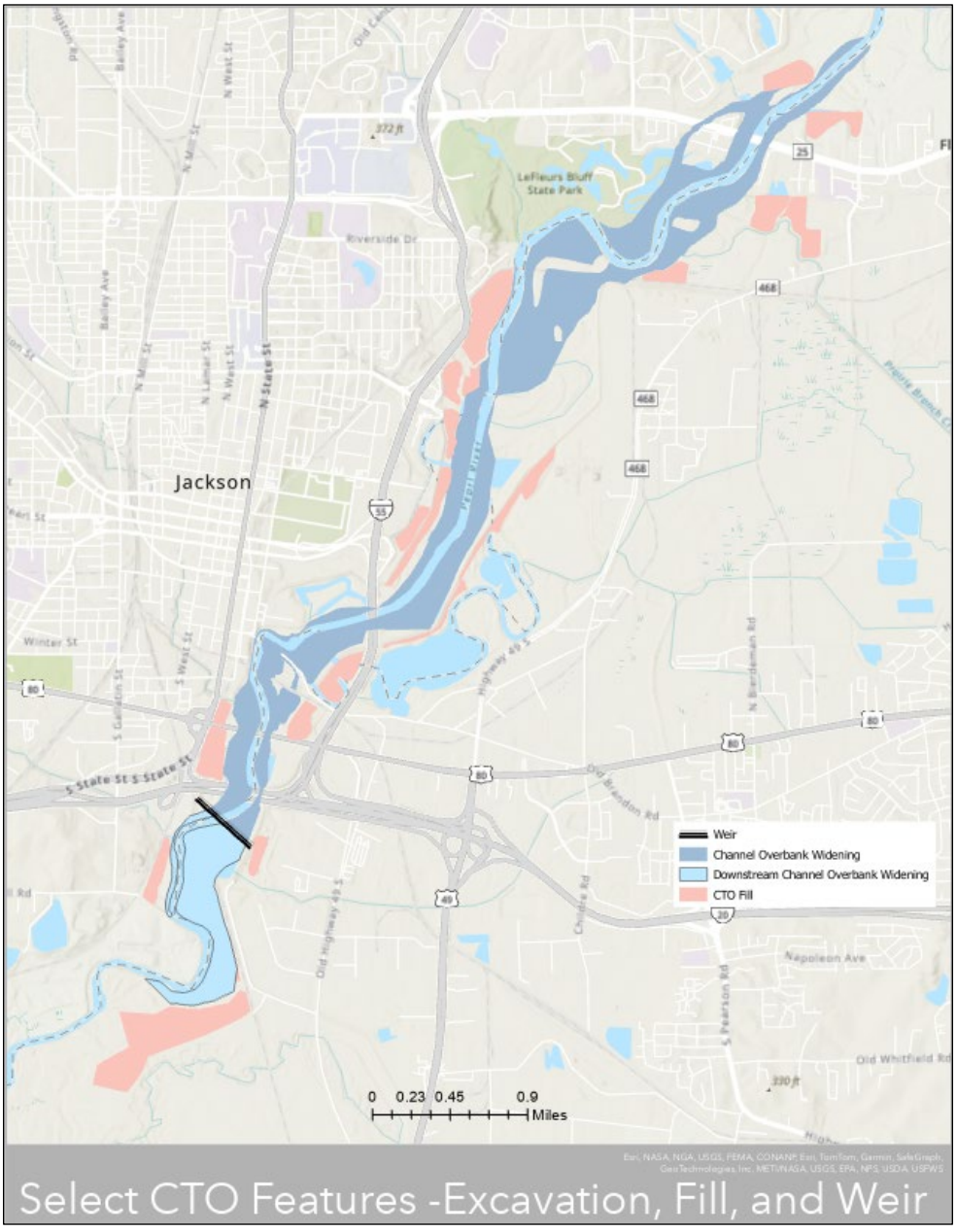

Figure I-10. Select CTO Features – Excavation, Fill, and Weir

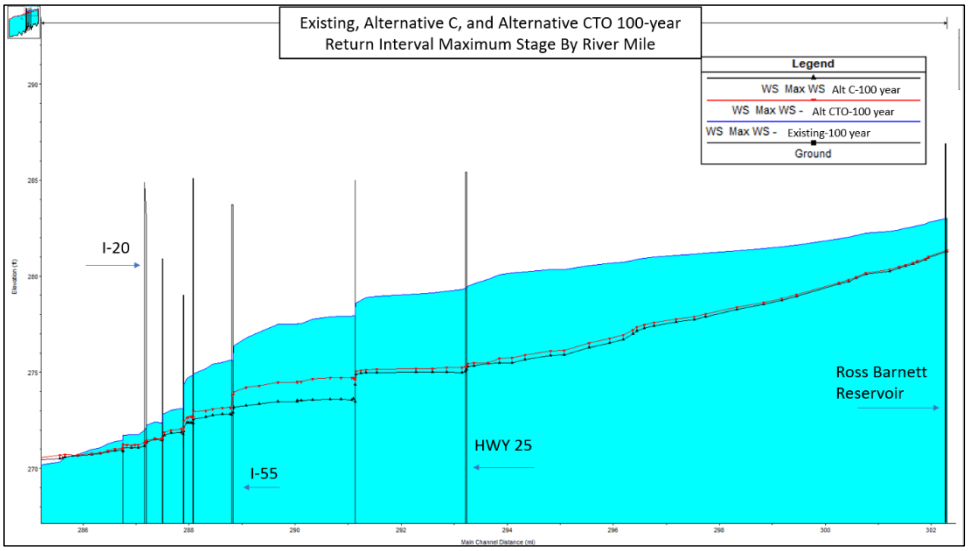

Figure I-11. USACE modeling Results for the 1% AEP (100-year) With and Without Project Routing Scenario

Channel Improvements

Channel improvements (Figure I-12) consist of excavating areas along the Pearl River to improve conveyance from RM 285 to 294., which included river reaches previously channelized during the existing levee construction. The channel improvement footprint includes excavation of up to 1,016 acres. Of the total 1,016 acres, approximately 853 acres are located above the proposed weir, and approximately 163 acres are located below the proposed weir. The width of excavation would vary ranging from 500 to 2,600 feet (152-793 m) including the river width. The actual widths would be determined during the PED phase. The depth of excavation would vary between 0 -15 feet to meet the proposed bottom elevation of 250.0 feet NGVD. The quantity of material excavated from the floodplain and channel overbanks would range from 11.3 to 14.1 million cubic yards (8.6-10.7 million m^3) of material. The existing river channel will not be widened, instead excavation of the overbank areas will occur.

The preliminary project layout includes islands within the channel improvement excavation area that would be maintained and/or expanded upon from RM 288.0 to RM 292.0. Further, sand bars could be constructed inside the floodplain and along the existing islands to compensate for the loss of sand bar habitat.

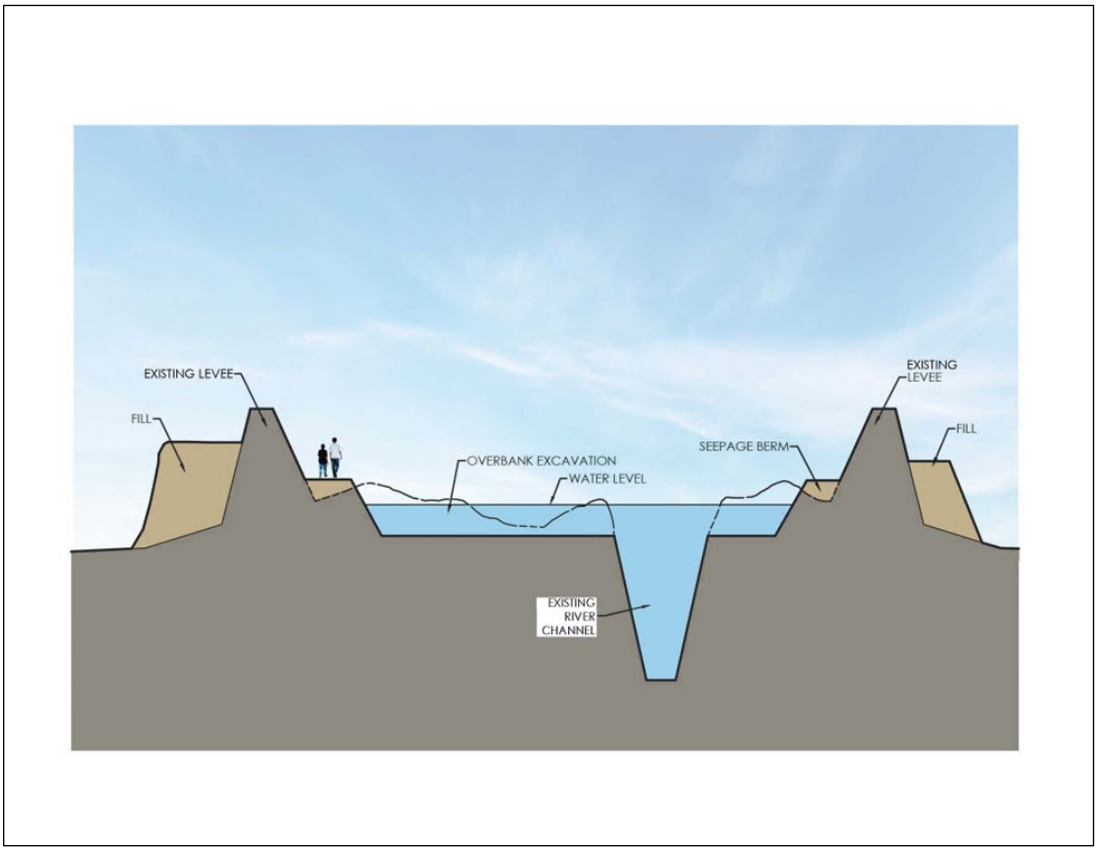

Figure I-12. Channel Improvements with a Relocated Weir

Overbank Modifications

The existing overbank areas of the Pearl River channel would be lowered to increase conveyance of flood flows. Existing levees would remain in place and would be maintained to increase this control and to aid in haul access. Excavation limits near the existing levees would be determined during final design.

Station 10+00 through 140+00. Specific items included in this reach are the I-20 Interstate bridges (Sta. 95+00±) as well as the U.S. Highway 80 (Sta. 110+00), Old Brandon Road (Sta. 135+00±), and railroad bridges (Sta. 70+00±, Sta. 130+00±). Two high-pressure gas lines run through this reach and will would have to be carefully monitored as excavation and grading activities progress. Multiple access points on both sides of the river would have to be maintained and monitored from a perspective of public safety and construction use.

Station 140+00 through 290+00. This reach contains excavating the overbank areas around high points such that high points would appear as islands. As with the previous reach segment, numerous access points would require management and maintenance for use and safety. A creosote slough area (Sta. 240+00±) will be avoided during construction, to not disturb or cause any objectionable material to be exposed or mixed with other excavated material.

Station 290+00 through 400+00. As with the previous downstream reaches, there are bridges to work around (Highway 25 near Sta. 360+00), and gas lines and transmission lines that must be monitored during earthmoving operations. Depending on the final design, Mayes Lake (Sta. 310+00±) may need tie-in work to maintain its current level. A determination about the tie-in work would be made during the PED phase. An existing abandoned railroad embankment of the Gulf, Mobile & Northern/Gulf Mobile and Ohio (GM&N/GM&O) Railroad Bridge could also be affected and was removed in H&H modeling. Some excavation would be required in this reach such that high points would appear as islands. The existing weir at the water works bend near Station 290+00 would remain undisturbed.

Excavated Material Plan (Fill material)

Alternative CTO would upgrade the existing federal levees by placing excavated material on the protected side of the levees. Excavated fill material would also be placed in designated disposal areas in other locations within the flood plain. The disposal fill areas would impact approximately 485 acres (151 ha) (Figure I-10).

Clearing and grubbing of approximately 1501 acres would occur prior to placement of the excavated fill material from the channel lowering. The excavated fill material would be used to create land areas ranging from 6.5 to 88 acres (2.6 – 21 hectares) within the Jackson MSA. The newly created areas could allow for expanded riverfront access, natural areas, and commercial development, along with recreational opportunities. The Jackson MSA has significant historical and cultural site presence, final site locations would be adjusted during PED following completion of cultural resource surveys.

Fill material placed behind levees would be graded to the same elevation or lower than existing levees, compacted for suitably for future land development. However, if any structures are built on top of any portion of the maintenance berm designed or used as a seepage control, the berms would need to be overbuilt and utilities or any other structure or penetrations would be limited to within the overbuilt section.

Where water would be permanently ponded against the riverside slope, these areas will require a 40-foot-wide semi-compacted impervious riverside maintenance berm to limit seepage through the levee. The berm assumed to extend the entire length of any levee section where water is pooled. No removal of the riverside blanket near the existing levees is anticipated. A riverside blanket refers to a top layer of clay and/or silt soil with low

permeability constructed on the riverside of a levee to reduce the movement of water underneath the levee.

If any structures are to be built on top of any portion of the maintenance berm designed or used a seepage control, the berms would be overbuilt and utilities or any other structure or penetrations would be limited to within the overbuilt section. Penetrations trough the berm could become seepage exit points, and this is specified to limit fracture through the main berm.

Material Provided to NFI

Up to 1,660,000 cy (1,269,000 3) of fill material (estimated as 100 acres (40.5 hectares) of fill 10 feet high) would be provided to the NFI for additional usage within the project footprint. This material would either hauled directly from the excavation site or moved to a staging area for removal by the NFI. Existing fill areas would be used as staging areas after clearing and grubbing but prior to fill activities.

Hardpoints at Base of Tributaries

Multiple tributary inflow points exist within this reach and Alternative CTO will add a hardpoint, via a rock chute to prevent backward erosion at each tributary inflow where the excavation of overbanks decreased the tributary channel bottom elevation at or near the confluence of those tributaries with the Pearl River.

Reinforcement of Bridge Abutments or Replacement of Bridges (if required)

If any stabilization or armoring, such as riprap, slope paving, slide repairs, etc., is required, it will be carried out prior to clearing and any major channel work. Following its own analysis, the Mississippi Department of Transportation (MDOT) has informed the Rankin-Hinds Flood Control District (the Flood Control District), that MDOT agrees to collaborate with the Flood Control District in “the advancement of this project and to ensure countermeasures are included, if determined necessary during the future design process.” (Letter to G. Rhoads, dated February 26, 2024) To this end, the Flood Control District developed a range of cost estimates for potential structural and hydraulic countermeasures that could be recommended if countermeasures are determined necessary. The array of countermeasure features analyzed will mitigate potential impacts to MDOT bridges that will be identified during the PED phase. The estimated cost for these features is based upon known costs for the construction of hydraulic and structural countermeasures on another MDOT project at downstream hydraulic crossings of the Pearl River. When additional information becomes available during PED, adjustments to the design can and will be made to reduce potential impacts. Any proposed countermeasure design and implementation will be conducted with MDOT’s concurrence, review, and approval.

Rough estimations of the level of effort required to mitigate for bridge impacts include improvements for approximately 36 bents, 12 piers, abutment scour, as well as funding to conduct monitoring surveys. A pile is a concrete post that is driven into the ground to act as

a leg or support for a bridge. A bent is a combination of the cap and the pile. Together, with other bents, act as supports for the entire bridge.

There are a total of 2 active railroad bridges within the project area. All efforts would be made to avoid, monitor, and protect these structures. Additional modeling is required to validate these assumptions during PED. If avoidance is not possible, then coordination with the operating entity to determine specific requirements of each railway bridge will be conducted during PED. All alterations of railroad bridges would be in accordance with Section 3 of the 1946 Flood Control Act (22 USC 701p).

Construction of New Weir and Gate with Fish Ladder

Alternative CTO may include a new weir to be constructed near RM 286.5 at the southern end of the channel improvements area. It should be noted that the CTO alternative does not include any modifications to the existing J. H. Fewell weir. This new weir would provide for a larger body of water within the Pearl River channel to the north of the weir and fish ladder. Downstream low-water hydrologic flows (extreme drought condition minimum flows) within the Pearl River channel would be maintained by means of a 12 x 12-foot low-flow gate. Also note that the gate is required for any future maintenance which requires drawdown of the lake. Portions of the weir would be submerged during normal flow allowing excess water to pass downstream. Water would pass over the weir with inflow into the lake approximately equaling outflow at any given time (with the exception of the extreme drought, which has a minimum release and outflow could be greater than inflow. However, this is expected to very rarely occur, as the Ross Barnett Reservoir also has a minimum release requirement that would pass through the system). As opposed to the existing weir, the new weir would be constructed to a higher elevation of approximately 256 feet. NAVD 88 with a length of up to 1,700 feet with a fish ladder located on the southern end of the proposed channel improvements area. The weir would impound approximately 6 feet of water along the excavated overbanks (about 1350 ft) and up to 22 feet in the approximately 350 feet across the main channel. This would impound an area of approximately 1706 acres, of this area approximately 637 acres are upstream of the Fewell Water Treatment Plant Weir. Downstream erosion protection from flow over the weir are part of the conceptual designs.

A fish ladder (Figure I-13) would be excavated around the relocated weir within the project area. The fish ladder is conceptually designed to be approximately between 5,000 - 6,000 feet (1524-1829 m) in length. The fish ladder would be constructed at an approximate 0.004 ft/ft slope and tie into the Conway Slough which connects to the Pearl River 0.8 miles downstream of the CN Railroad Bridge. The fish ladder design would be coordinated with US Fish and Wildlife, state agencies and Tribes during the PED phase.

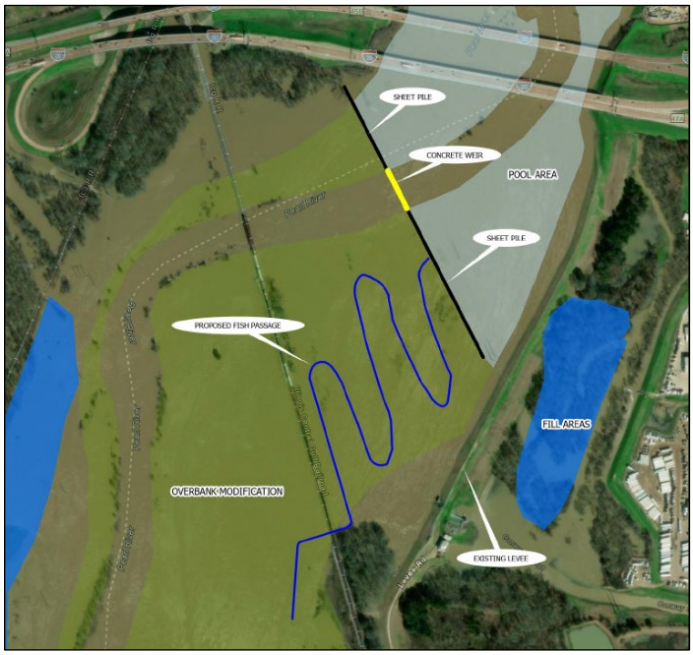

Figure I-13. Proposed Weir (Black) and Fish Ladder (Blue) Exact Dam Design to be determined in PED

The proposed weir meets USACE and State criteria to be defined as a dam based on the height of the structure and water storage. As a result, the dam would be designed and constructed to meet USACE and State criteria for a dam.

The construction of a weir without excavation of the overbanks has not been sufficiently investigated to ensure that inducements do not occur. Construction of the weir without channel conveyance improvement was not analyzed and would require additional study if selected.

The proposed weir does not provide any flood control benefits, and construction of the weir necessitates additional pumping needs at existing levees as well as seepage protection in the form of berms and slurry walls on existing levee features upstream of the weir. However, the weir provides a lake surface for future water supply concerns, as well as adding attractive locations for recreation and future economic development. The proposed weir would result in an expanded, year-round recreational water body capable of supporting recreational facilities. Potential recreation sites would be limited to areas disturbed by construction and design of these facilities would be coordinated during PED (Figure I-14). The potential recreational opportunities could include boat ramps, camping areas, fishing piers, trails, or wildlife viewing areas.

Implementation of this alternative would be subject to the non-Federal sponsor agreeing to comply with the applicable federal laws and policies prescribed in the model Partnership Agreement for Authorized Structural Flood Risk Management Projects. The Flood Control District, the non-Federal sponsor, anticipates recreation operations will be solely its responsibility. As such, recreation design and construction would be cost shared.

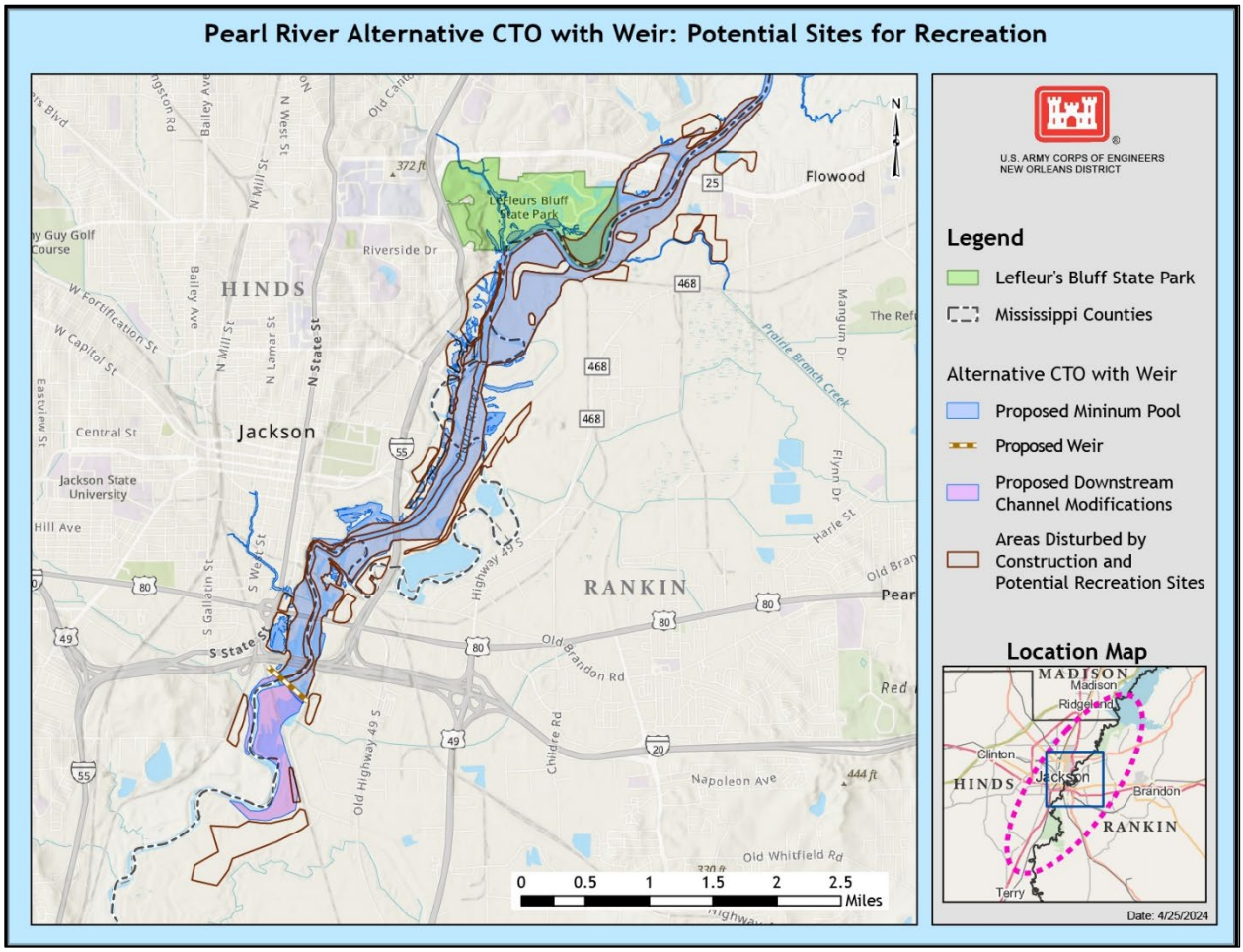

Figure I-14. Potential Sites for Recreational Features

Pumping Needs at Existing Levees

The existing levees contain drainage structures that allow water to drain from the interior of the leveed area when the Pearl River is low. When the Pearl River water level is high, the drainage structures are closed, and pump stations are used to pump water out of the leveed area. The original design of these features called for the drainage structure to handle a 1

percent AEP interior drainage flow and the pumps were originally designed for a smaller event.

Alternative CTO calls for the construction of a new weir with a minimum pool at elevation 256.0 ft. As a result, the drainage for the Jackson Fairgrounds Levee would always impound at least multiple feet of water on the structure and would no longer be able to operate via gravity flow in order to prevent the new lake from flooding the interior leveed areas.

The proposed new weir was placed upstream of the East Jackson Levee drainage structure, so the pool should not impact the operation of the drainage structure. Additional pumping capacity would be needed to mitigate for the loss of capacity of the gravity flow drainage at the Jackson Fairgrounds Levee. Additionally, the Operation and Maintenance of the additional pumps would need to be substantially updated from the existing O&M plan for the pumping capacity and constant operations.

Savannah Street WWTP Levee

This is an existing non-Federal levee that provides flood risk reduction to the Savanna Street WWTP near RM 282 (Jackson-East Jackson Flood Control Project NLDID: 14050000124). The levee would undergo maintenance and additional upgrades to meet the freeboard necessary to meet a 1 percent AEP flood event in advance of the main construction phases (Figure I-15). The new Federalized levee around the WWTP consists of a 10-foot crown width with 1V on 3H landside and riverside slopes. If needed, a slurry wall for seepage mitigation would be added. Additional pumps would not be needed since the existing pumps are being replaced as part of the Section 219 Environmental Infrastructure Program discussed in Section 1.5.2 of this report.

Principal features of the work include mobilizing and demobilizing, clearing and grubbing, removing and stockpiling any existing crushed stone surface, semi compacted levee embankment, traverses, adding new crushed stone surfacing, mowing, turfing, erosion control matting, preventing storm water pollution, and providing environmental protection. Additional work could include trenching and the creation and backfill of a concrete slurry wall within the levee footprint.

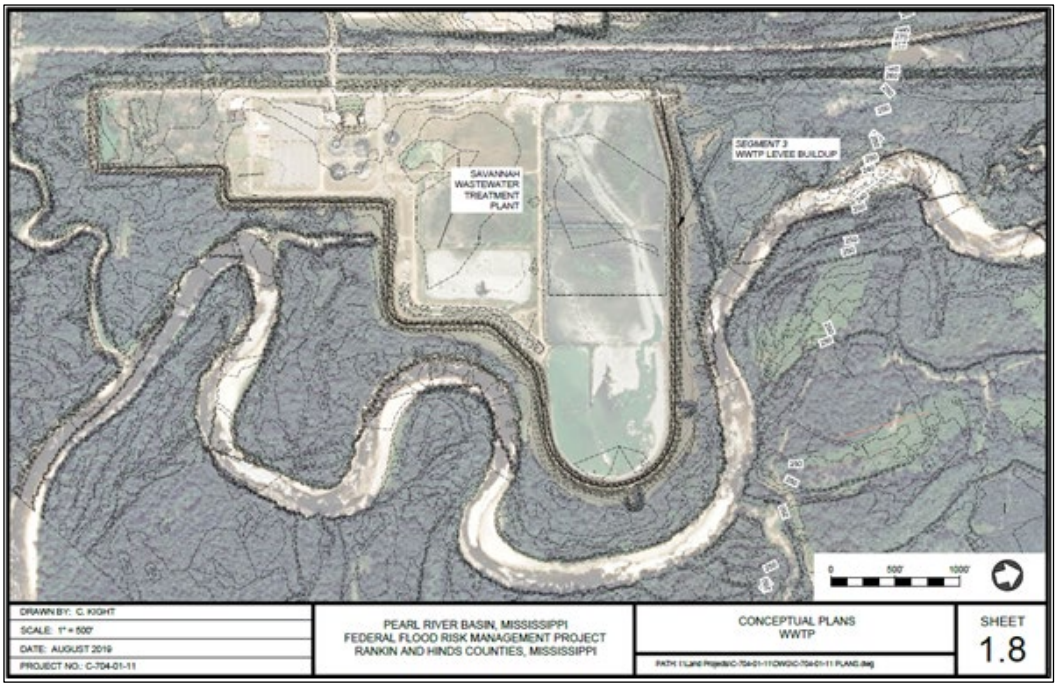

Figure I-15. Proposed Federalized Levee at Savannah WWTP

Operations and Maintenance

Operations and Maintenance is ongoing for existing features within the Rankin-Hinds AOR, additional Operations and Maintenance will be implemented for each constructed feature to USACE Standards. Existing Levee and Pumping Plant manuals will be updated. New features, such as the Canton Club Levee and the new weir and lake will require development of new O&M manuals. The district commander is responsible for developing an OMRR&R manual for each project and separable element constructed under a separate project cooperation agreement (PCA), or functional portion of a project or separable element, reporting the status of the manual through the project management system as required by ER 5-7-1(FR). Normally, the Engineering Division will be assigned the overall responsibility for preparing a draft OMRR&R manual with appropriate inputs from other disciplines and, in consultation with the project sponsor, furnishing the draft manual to the project manager for coordination with the project sponsor, and preparing the final OMRR&R manual for approval. For a functional portion, the OMRR&R manual is an interim manual pending completion of the entire project or separable element. The major subordinate commander is responsible for review and approval of the manual. The project sponsor, normally through a permanent committee consisting of our headed by an official usually called the "superintendent" is responsible for carrying out the provisions of the OMRR&R manual. The OMRR&R manual will include coverage of all OMRR&R subjects required by the PCA and existing regulations, in detail sufficient to ensure proper OMRR&R accomplishment by the project sponsor. Project sponsors, subject to review and approval of the district commander, may prepare supplements to the manual.

Levees Plan

Canton Club Levee

A levee segment of approximately 1.5 miles is proposed on the west bank of the Pearl River in northeast Jackson (Figure I-16). This levee would provide additional flood risk reduction for approximately 100 acres of high density developed neighborhoods. This area is bounded on the north by the North Canton Club Circle and Beechcrest Drive on the South. It is estimated this would reduce flood risk for over 250 homes.

Figure I-16. Proposed Canton Club Levee (orange line)

Principal features of the work include mobilizing and demobilizing equipment, clearing and grubbing, removing and stockpiling any existing crushed stone surface, semi compacted levee embankment, traverses, adding new crushed stone surfacing, mowing, turfing, erosion control matting, preventing storm water pollution, and providing environmental protection.

If additional borrow is necessary, the borrow areas would be acquired by the NFI and furnished by the Government to the contractor (government furnished borrow). Some small areas could be more appropriate for the construction of a short floodwall, typically an I or T wall, could be more appropriate for some small areas due to space constraints, though

further analysis would be required. Constructing a less designed berm could be more appropriate where smaller loadings would occur.

Construction of the project will require relocations and/or improvements to various public and private utilities and infrastructure, avoidance and minimization features required under the ESA, and the creation of new habitat mitigation areas to offset losses within the project's construction footprint areas.

Borrow Plan

A borrow plan has not been developed at this stage of the analysis. It is conceivable that there is enough borrow material from the material excavated but it is unknown at this time if the material is suitable for constructing levees. Should the excavated material be determined to be unsuitable, borrow material would need to be identified for construction of any levees. There are potential borrow sources within close proximity of the project area (10-mile radius). Reference Figure 3-8 for potential source. Borrow opportunities would be further investigated during PED and a supplemental NEPA document would be prepared at that time.

Operations and Maintenance (Canton Club Levee)

Operations and Maintenance will be implemented for each constructed feature to USACE Standards. The district commander is responsible for developing an OMRR&R manual for each project and separable element constructed under a separate project cooperation agreement (PCA), or functional portion of a project or separable element, reporting the status of the manual through the project management system as required by ER 5-7-1(FR). Normally, the Engineering Division will be assigned the overall responsibility for preparing a draft OMRR&R manual with appropriate inputs from other disciplines and, in consultation with the project sponsor, furnishing the draft manual to the project manager for coordination with the project sponsor, and preparing the final OMRR&R manual for approval. For a functional portion, the OMRR&R manual is an interim manual pending completion of the entire project or separable element. The major subordinate commander is responsible for review and approval of the manual. The project sponsor, normally through a permanent committee consisting of our headed by an official usually called the "superintendent" is responsible for carrying out the provisions of the OMRR&R manual. The OMRR&R manual will include coverage of all OMRR&R subjects required by the PCA and existing regulations, in detail sufficient to ensure proper OMRR&R accomplishment by the project sponsor. Project sponsors, subject to review and approval of the district commander, may prepare supplements to the manual. OBJ

Mitigation Component

Habitat Mitigation would be achieved by implementing Corps constructed mitigation projects and/or purchasing of mitigation bank credits. Further planning and analysis would be

completed during PED to determine which strategies, stand alone or combined, would fully compensate for habitat impacts.

Mitigation features may be required for Gulf States Creosote Company Site. The Creosote Slough is located within the project area. The site, or portions thereof, may require avoidance, remediation, or some other mitigating features. Groundwater controls and a slurry wall may be appropriate remedial actions in this event. Final remedial designs would be coordinated with appropriate Federal and State agencies to determine necessary actions to prevent and/or eliminate potential leaching of chemicals to the groundwater and movement of groundwater into the proposed channel improvement area prior to the initiation of excavation activities at this location.

Coordination with appropriate local, State, and Federal agencies would determine site actions to eliminate potential leaching of landfill waste to the groundwater and movement of groundwater into the proposed channel improvement.