DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS LA 70118-3651

Regional Planning and Environment
Division South
Environmental Planning Branch

XXXX, 2024

DRAFT

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

SUPPLEMENTAL SECOND DRAFT INTEGRATED FEASIBILITY REPORT WITH ENVIRONMENTAL ASSESSMENT #600

AMITE RIVER AND TRIBUTARIES EAST OF THE MISSISSIPPI RIVER, LOUISIANA

Description of the Proposed Action

The United States Army Corps of Engineers (USACE), Mississippi Valley Division (MVD), New Orleans District (CEMVN), Regional Planning and Environment Division South (RPEDS), prepared the final Integrated Feasibility Report and Environmental Assessment #600 (*FIFR/EA*) in accordance with the National Environmental Policy Act of 1969, as amended. The FIFR/EA addresses flood risk reduction solutions to reduce flood damages caused by rainfall in the Amite River Basin. The final recommendation is contained in the report of the Chief of Engineers, dated TBD.

A Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR/EIS) associated with this study was released on November 26, 2019 for concurrent public, technical, legal, and policy review. Significant technical and policy concerns associated with the DIFR/EIS's tentatively selected plan were identified during this review. Due to these concerns the CEMVN re-evaluated alternatives to inform the decision on the recommended plan, as documented in the FIFR/EA.

The FIFR/EA, incorporated herein by reference, evaluated a full range of reasonable alternatives for flood risk management. The recommended plan is Plan 4: Nonstructural National Economic Development (NED) Plan with additive for Other Social Effects (OSE) Increment 2 and includes voluntary elevation of approximately 2,918 residential structures and voluntary floodproofing of approximately 380 nonresidential structures in East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, and Ascension Parishes in Louisiana.

Factors Considered in Determination

In addition to the no action alternative (Plan 1), three alternatives were assessed for potential impacts: the nonstructural-only NED plan (Plan 2) and two incremental total benefits plans that include all structures eligible within Plan 2 and expand eligibility to include additional structures in areas experiencing social vulnerability (Plans 3 & 4). Impacts to important relevant resources were assessed, including impacts to wildlife, threatened and endangered species, geology, soil

and water bottoms, prime and unique farmland, water quality, cultural and historic resources, aesthetics, recreation, environmental justice, and socioeconomics.

The proposed action would have no direct, indirect, or cumulative significant impacts to the relevant resources.

All reasonable means of avoiding and minimizing adverse environmental effects have been adopted.

EXECUTIVE ORDER (E.O.) 11988 FLOODPLAIN MANAGEMENT

Executive Order 11988 directs Federal agencies to reduce flood loss risk; minimize flood impacts on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by flood plains. Agencies must consider alternatives to avoid adverse and incompatible development in the flood plain. If the only practical alternative requires action in the flood plain, agencies must design or modify their action to minimize adverse impacts. The proposed action is in compliance with E.O. 11988 because it would only include non-structural measures and not result in development of the floodplain.

EXECUTIVE ORDER 11990 PROTECTION OF WETLANDS

The purpose of Executive Order (E.O.) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". The proposed action would not impact wetlands and therefore is in compliance with E.O. 11990.

COASTAL ZONE MANAGENT ACT

The Coastal Zone Management Act (CZMA) requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." Coordination with Louisiana Department of Natural Resources regarding consistency with the CZMA is in progress and would be completed before finalization of the FONSI.

ENDANGERED SPECIES ACT

The Endangered Species Act (ESA) is designed to protect and recover threatened and endangered (T&E) species of fish, wildlife and plants. No plants were identified as being threatened or endangered in the project area. If a manatee(s) is sighted within 100 yards of the project area, moving equipment must be kept at least 50 feet away from the manatee or shut down. There would be restrictions on vessel operation, restrictions on the use of siltation barriers, and mandatory signage designed to avoid any harm to manatees in the project area as stated in the draft FWCAR. Based on review of existing data and in coordination with the FWS guidelines, the CEMVN finds that there would be no effect on threatened and endangered species with implementation of this project.

MIGRATORY BIRD TREATY ACT

The project area is known to support colonial nesting wading/water birds (e.g., herons, egrets, ibis, night-herons and roseate spoonbills) and shorebirds (terns and gulls). Based on review of existing data, and with the use of FWS guidelines, the CEMVN finds that implementation of the proposed actions would have no effect on colonial nesting water/wading birds or shorebirds. FWS and USACE biologists would survey the proposed project area before project implementation to confirm no nesting activity as suitable habitat and the potential for nesting exist within the project area. If active nesting exists within 1,000 feet (water birds) or 1,300 feet (shorebirds) of construction activities then USACE, in coordination with FWS, would develop specific measures to avoid potential adverse impacts to those species. A detailed nesting prevention plan may be necessary in order to deter birds from nesting within the aforementioned buffer zones in order to avoid potential adverse impacts. If a nesting prevention plan is necessary, it would be prepared in coordination with FWS.

The bald eagle was removed from the List of Endangered and Threatened Species in August 2007, but continues to be protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act of 1918, as amended (MBTA). During nesting season, construction must take place outside of FWS/LDWF buffer zones. A USACE Biologist and a FWS Biologist would survey for nesting birds. This would be done prior to the start of project implementation.

FISH AND WILDLIFE COORDINATION ACT OF 1934

The Fish and Wildlife Coordination Act (FWCA) provides authority for the FWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. The FWS reviewed the proposed action described in the FIFR/EA. The draft Fish and Wildlife Coordination Act Report (FWCAR) can be found in FIFR/EA Appendix D-1. Responses to draft FWCAR comments are included in the FIFR/EA. The following commitments, as recommended by the USFWS are an integral part of the proposed action:

During project implementation, a qualified biologist will inspect proposed implementation sites for the presence of documented and undocumented wading bird nesting colonies and bald eagles. All implementation activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting implementation activity within 1,000 feet of a wading bird colony is not feasible, the CPRA should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies. During implementation activities, if a bald eagle nest is within or adjacent to the proposed project area, coordination with USFWS will occur to ensure compliance with their bald and golden eagle guidelines to the maximum extent practicable.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

A phase I environmental site assessment is required for all USACE civil works projects to facilitate early identification and appropriate consideration of potential hazardous, toxic, and

radioactive waste (HTRW) problems. A preliminary HTRW phase 1 environmental site assessment was conducted for the current draft SSDIFR/EA, and no HTRW concerns were identified. The proposed action would include an individual HTRW assessment for each structure as a part of implementing nonstructural measures should this plan become authorized. If during the individual HTRW assessment, a recognized environmental condition (REC) is identified, it would be incumbent upon the property owner to address the REC in order to be considered a part of the program.

E.O. 12898 ENVIRONMENTAL JUSTICE

E.O. 12898 of 1994 and the Department of Defense's Strategy on Environmental Justice of 1995 directs Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. There are no significant or disproportionate adverse impacts to minority or low-income populations.

NATIONAL HISTORIC PRESERVATION ACT OF 1966

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE determined that historic properties may be adversely affected by the recommended plan. The USACE, Advisory Council on Historic Preservation, Louisiana State Historic Preservation Office, Mississippi State Historic Preservation Office, Non-Federal Sponsor, Federally-Recognized tribes, and other identified consulting parties entered into a project-specific Programmatic Agreement (PA), dated TBD. The PA would then govern USACE's subsequent NHPA compliance efforts.

TRIBAL CONSULTATION

It is the policy of the Federal Government to consult with Federally-Recognized Tribal Governments on a Government-to-Government basis as required in E.O. 13175 ("Consultation and Coordination with Indian Tribal Governments;" U.S. President 2000). The CEMVN is consulting in accordance with NHPA, E.O. 13175, and its 2012 Tribal Policy. The USACE intends to keep the lines of communication open throughout the study, relying on the Section 106 Process to capture significant Tribal concerns regarding historic properties, but remains open to the need to undertake Government-to-Government consultation, as necessary.

Public Involvement

Public review of the Second Supplemental Draft Integrated Feasibility Report and Environmental Assessment #600 and draft FONSI would be completed on January 29, 2024. All comments submitted during the public review period would be responded to in the FIFR/EA.

Decision

The CEMVN has assessed the environmental impacts of the proposed action on relevant resources in the FIFR/EA and has determined that the proposed action would have no significant impact on the natural and human environment.

DEPARTMENT OF THE ARMY
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Implementing the proposed project would consist of elevating approximately 2,918 residential structures and floodproofing approximately 380 nonresidential structures East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, and Ascension Parishes in Louisiana.

I have reviewed the FIFR/EA and have considered public and agency comments and recommendations. I have determined that the recommended plan would have no significant impact on the natural and human environment. Therefore, an Environmental Impact Statement will not be prepared.

_____
Date

_____
CULLEN A. JONES, P.E., PMP
COL, EN
Commanding

Mississippi Valley Division,
Regional Planning and Environment Division South

Amite River and Tributaries East of the Mississippi River, Louisiana

Supplemental Second Draft Integrated Feasibility Report with Environmental Assessment #600

December 2023

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Cover Page

Amite River and Tributaries, East of the Mississippi River, Louisiana

Supplemental Second Draft Integrated Feasibility Report and Environmental Assessment #600

Counties/Parishes:	Amite, Lincoln, Franklin, and Wilkinson Mississippi; Counties East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, St. James, St. John the Baptist, and Ascension Louisiana Parishes
Lead Agency:	U.S. Army Corps of Engineers, New Orleans District
Cooperating Agencies:	U.S. Fish and Wildlife Service; U.S. Environmental Protection Agency; U.S. Geological Survey; U.S. Department of Agriculture-National Resource Conservation Agency

Abstract: The Amite River and Tributaries, East of the Mississippi River, Louisiana Feasibility Study (study) for flood damage reduction is authorized by the Resolution of the Committee on Public Works of the United States Senate, adopted on April 14, 1967. The study was funded by the Bipartisan Budget Act of 2018 (P.L. 115-123), Division B, Subdivision 1, Title IV. The study area includes I portions of Amite, Lincoln, Franklin, and Wilkinson Counties in Mississippi, as well as East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, St. James, St. John the Baptist, and Ascension Parishes in Louisiana. The Supplemental Second Draft Integrated Feasibility Report and Environmental Assessment contains, among other things, sections on plan formulation, analysis of potential environmental impacts and consequences, alternatives analysis, mitigation, and a description of the Tentatively Selected Plan (proposed action). The proposed action includes 3,298 nonstructural residential elevations and nonresidential floodproofing for eligible structures East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, and Ascension Parishes in Louisiana.

Date Comments must be Received by: 29 January 2024

Estimated Total Cost of EA Preparation: To be provided in the final report.

For further Information, please visit the study website at:
https://www.mvn.usace.army.mil/Amite-River-and-Tributaries/ or contact:

U.S. Army Corps of Engineers
Attention: Chief, Environmental Branch
CEMVN–PDS, Room 136,
7400 Leake Avenue New Orleans, LA 70118
Email: AmiteFS@usace.army.mil

Executive Summary

The United States Army Corps of Engineers (USACE), Mississippi Valley Division (MVD), New Orleans District (CEMVN), Regional Planning and Environment Division South (RPEDS), prepared this Supplemental Second Draft Integrated Feasibility Report and Environmental Assessment #600 (SSDIFR/EA). The SSDIFR/EA reflects the collaboration of the Non-Federal Sponsor (NFS), cooperating agencies, stakeholders, and members of the public. The Tentatively Selected Plan (TSP), or Proposed Action, is supported by the NFS.

The purpose of the Amite River and Tributaries, East of the Mississippi River, Louisiana, Feasibility Study (study) is to investigate flood risk reduction solutions to reduce flood damages caused by rainfall in the Amite River Basin (ARB). The NFS is the State of Louisiana, acting by and through, the Louisiana Department of Transportation and Development (LADOTD). A Feasibility Cost Share Agreement (FCSA) was executed between the Department of the Army and the NFS on October 3, 2018. The study is authorized by the Resolution of the Committee on Public Works of the United States Senate, adopted on April 14, 1967. The study is funded through the Bipartisan Budget Act of 2018 (BBA-18) (P.L. 115-123), Division B, Subdivision 1, Title IV, and is 100 percent federally funded.

Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR/EIS)

The USACE conducted concurrent review of the DIFR/EIS, including public, technical, legal, and policy reviews, as well as Independent External Peer Review (IEPR) upon its public release on November 26, 2019. The TSP of the 2019 DIFR/EIS was an estimated $2.3 billion-dollar new large-scale dry dam with a nonstructural component to address residual risk over a 2200 mi^2 study area. During review, the TSP was identified to have extensive technical and policy concerns, which found the dam was constrained by site conditions that made it in-feasible as designed and potentially increased life safety risk. The 2020 Battelle IEPR report is located on the USACE Amite project website. https://www.mvn.usace.army.mil/Amite-River-and-Tributaries/

Supplemental Second Draft Integrated Feasibility Report and Environmental Assessment (SSDIFR/EA)

Additional resources were approved by the Assistant Secretary of the Army for Civil Works ASA(CW) in November 2022 in order to complete the complex feasibility study due to the size of the study area, differing stakeholder viewpoints, compliance with Engineering Regulations (ERs) and the complexities of addressing social vulnerability which includes environmental justice (EJ). An additional $1.91M and 20 months, to the original $3M and 136 months, was allocated to complete critical tasks to inform the decision on the TSP. The SSDIFR/EA documents the critical tasks to inform the decision on the revised TSP.

Study Area - The study area is the ARB. The ARB begins in southwest Mississippi and flows southward, crossing the state line into southeastern Louisiana. The ARB includes 2,200 square miles consisting of portions of Amite, Lincoln, Franklin, and Wilkinson Counties in Mississippi, as well as East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, St.

James, St. John the Baptist, and Ascension Parishes in Louisiana. The study area is similar to the 1984 Amite Rivers and Tributaries Flood Control Initial Evaluation Study by USACE; however, it has been expanded to include areas that are impacted by backwater and coastal flooding to the southeast and east because they are hydraulically connected to the ARB and its tributaries.

No significant flood risks associated with the ARB and its tributaries were identified within Mississippi; therefore, no structures have been identified as eligible for the TSP. The Mississippi Soil and Water Conservation Commission preliminary confirmed on November 19, 2018, that there are "no major flood risk problems in Mississippi from the ARB but may be some minor ones associated with bank carving/sloughing from periodic heavy rains."

Problems and Opportunities (Purpose and Need) -

The primary problem identified in the study area is the risk of flood damages from the Amite River and its tributaries to human life and flood damages of residential and nonresidential structures. Critical infrastructure throughout the region is also at risk of flood damages, including the I-10 and I-12 transportation corridors, government facilities, and schools. The ARB primarily has flooding from two different sources. The upper basin flooding is caused from headwater flooding from rainfall events. The lower basin flooding is caused by a combination of drainage from headwaters and backwater flooding from tides, wind setup as well as flooding from storm surge events. Opportunities to address the identified problems include:

- Risk reduction to life, land, property, and infrastructure from flooding.
- Work with local communities to manage flood risk.
- Increase the resiliency of the vitally important I-10/I-12 transportation corridor.
- Prevent degradation to fish and wildlife habitat.
- Afford access to recreation (boating, bike trails, camping, swimming, and sightseeing facilities).

Planning Objectives/Constraints – *Planning objectives* represent desired positive changes to future conditions. All of the objectives focus on alternatives within the study area and within the 50-year period of analysis from 2026 to 2076. The planning objectives are as follows:

- reduce risk to human life from flooding;
- reduce rainfall flood damages in the ARB to industrial, commercial, and agricultural facilities and to residential and nonresidential structures;
- reduce interruption to the nation's transportation corridors, particularly the I-10/I-12 infrastructure;
- reduce risk to critical infrastructure (e.g. medical centers, schools, transportation, etc.).

Planning Process and Alternatives Considered - The USACE's planning process was followed, which included identifying problems and opportunities, inventorying, and forecasting conditions, identifying measures, creating alternatives and continually reevaluating the

management measures within the alternatives and screening measures through the selection of the Final Array of Alternatives and the TSP.

Thirty-four nonstructural and structural management measures of a variety of scales were identified for evaluation to reduce the risk of flood damages within the ARB. The range of management measures were refined to 19 based on preliminary analyses of effectiveness, efficiency, acceptability, and completeness, which is detailed in Appendix F: Plan Formulation, based on the planning objectives, existing data, professional judgment, avoiding constraints, and addressing the opportunities and problems within the study area. See Table 4-1 in Section 4.

The initial array of alternatives were identified using one or more of the 19 management measures that were carried forward after the screening evaluation. Fifteen alternatives were assembled for the initial array of alternatives through the plan formulation process, which include alternatives for no action and nonstructural. Two additional alternatives were identified through public scoping.

Most alternatives assessed had very little reduction in flood risk and thus limited benefits. The less frequent annual exceedance probability (AEP) events (0.04 AEP up) cause the majority of flooding issues in the ARB. The rainfall events, combined with a steep hydraulic gradient from the headlands of the basin to the flat middle and lower basins, provide for a significant backwater effect at the lower end of the system at Lake Maurepas. Once the water accumulates and backs up, it can no longer exit the basin and the basin begins to fill. This unique hydrology was evaluated with numerous measures and alternatives that resulted in primarily shifting water from one place to another within the damage areas while not reducing the backwater effect and thus not allowing water to drain from the basin. The parishes in the study area have a combined population of about 900,000 with more than half of the population living in East Baton Rouge Parish. The study area has over 260,000 structures and of those, about 80 percent are in the central portion of the ARB north of Bayou Manchac. Many of the alternatives, such as channel improvements and diversions, were located where there were not many structures, so there were limited benefits. The remaining structural alternatives that were not screened were those that provided storage of water to attenuate flooding downstream in heavily developed areas. Those structural alternatives are included in the focused array of alternatives.

The focused array of alternatives are the same alternatives as previously identified in the final array in the publicly released 2019 DIFR/EIS. Three alternatives were screened due to negative net benefits: the nonstructural plan for a 0.02 AEP floodplain, large scale 0.04 AEP wet Darlington Dam, and the three 0.01 AEP dry dams on the Darlington, Lilley, and Bluff Creeks. The remaining alternatives were, Alternative 10 for an 0.01 AEP dry dam on Sandy Creek, Alternative 12 .04 AEP dry Darlington Dam, and Alternative 13 nonstructural for 0.4 AEP. The alternative carried forward and chosen to be the TSP based on the 2019 economic evaluation was Alternative 12, an 0.04 AEP dry Darlington Dam because it had the highest net economic benefit.

The TSP in the publicly released 2019 DIFR/EIS, Alternative 12 of the SSDIFR/EA focused array, was a $2.3 billion dry dam and nonstructural measures to address residual risk. This plan, while preliminarily determined to be feasible, revealed technical and policy concerns that were raised during its public, policy, and technical reviews. Based on the concerns and available information, the Dry Dam alternative does not meet USACE tolerable risk guidelines due to economic risk/cost effectiveness, potential societal life risk, and environmental acceptability. For these reasons, the Dry Dam alternative (including Alternative 10: Sandy Creek Dry Dam) has been removed from further consideration consistent with USACE policy of acceptability and implementability in accordance with Engineering Regulation (ER) 1105-2-100.

With removal of the Dry Dam alternative from further consideration, the next highest NED alternative and likely the only economically justified one, is the 0.04 AEP nonstructural plan. To further assess the 0.04 AEP nonstructural only plan, three plans were developed as well as revisions to existing conditions to account for projects that alter the hydrology H&H models for inclusion of storm surge downstream boundary conditions. The first developed plan identified was the Nonstructural NED Plan using a new USACE method of logical aggregation. Two additional plans were identified to increase benefits in the Other Social Effects (OSE) account, which is one of the four accounts USACE uses to identify benefits of plans in accordance with the USACE 2014 Principles, Requirements and Interagency Guidelines (PRG). This comprehensive assessment of the four accounts is used to identify the Total Benefits Plan. Expanding the NED plan to include socially vulnerable (SV) areas, increased the OSE benefits.

Plan 2: Nonstructural NED Plan- Floodproofing or elevation of 3,117 structures located in the 0.1 (46 aggregates), 0.2 (5 aggregates), or 0.4 (6 aggregates) floodplain to 0.01 AEP Base Flood Elevation (BFE). Plan 2 would include the elevation of 2,748 residential structures and floodproofing of 369 nonresidential structures.

Plan 3: Nonstructural NED Plan + OSE Increment 1- Floodproofing or elevation of 3,189 structures located in the 0.1 (54 aggregates), 0.2 (8 aggregates), or 0.4 (6 aggregates) floodplain to 0.01 AEP BFE. Plan 3 would include the elevation of 2,815 residential structures and floodproofing of 374 nonresidential structures.

Plan 4: Nonstructural NED Plan + OSE Increment 2- Floodproofing or elevation of 3,298 structures located in the 0.1 (59 aggregates), 0.2 (13 aggregates) or 0.4 (7 aggregates) floodplain to 0.01 AEP BFE. Plan 4 would include the elevation of 2,918 residential structures and floodproofing of 380 nonresidential structures.

Risk Reduction- The term 0.01 AEP level of risk reduction, refers to a level of reduced risk of rainfall, riverine, or storm surge driven flooding that the project has a 1 percent chance of experiencing each year. Different combinations of size, intensity, and track of rainfall and coastal storm could result in a 0.01 probability of a surge and/or rainfall event.

For evaluation purposes, the cost of raising and flood proofing was used to determine the cost of the nonstructural plans since the study area is most often receiving damages resulting from widespread, low-level flooding; raising and floodproofing were determined to be more cost

effective than other nonstructural measures such as buyouts or relocations when assessing on a grouping of aggregations using the USACE logical aggregation method.

The measures in the Final Array of Alternative Plans were evaluated for economics and then to the planning objectives and the formulation criteria as given and defined in the Principles and Guidelines (P&G) Section VI.1.6.2(c). They were subsequentially compared to the four Federal accounts (Table ES-1) that are used to assess the effects of the final array of alternatives. This evaluation and screening informs the decision in selecting the TSP.

Table ES-1. P&G Four Federal Accounts Assessment

Four Accounts	Plan 2: NED Plan	Plan 3: NED + OSE Increment 1	Plan 4: NED + OSE Increment 2
National Economic Development (NED)	Avg. Annual Benefits $ 59.8 M Avg. Annual Costs $54.6 through 58.0 M Net Annual Benefits $5.1 through 1.8 M BCR- 1.09 through 1.03	Avg. Annual Benefits $60.6 M Avg. Annual Costs $56.1 through 59.6 M Net Annual Benefits $4.4 M through 942 K BCR- 1.08 through 1.02	Avg. Annual Benefits $61.4 M Avg. Annual Costs $58.0 through 61.6 M Net Annual Benefits $3.4 M through (178) K BCR- 1.06 through 0.997
Environmental Quality (EQ)	No significant impacts to the environment.	No significant impacts to the environment.	No significant impacts to the environment.
Regional Economic Development (RED)	Value Added: $1,391,463,000 FTE Jobs: 14,521	Value Added: $1,429,854,000 FTE Jobs: 14,925	Value Added: $1,478,086,040 FTE Jobs: 14,429
OSE	Overall minor positive benefits associated with the NED nonstructural plan. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes.	Both Minor & Moderate positive benefits are associated with Plan 2. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes.	Both Minor & Moderate positive benefits are associated with Plan 2. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes.

Ranges are 10-18% Preconstruction Engineering & Design (PED) costs
Fiscal Year (FY) 24 Interest 2.75% and 2024 Price Level
Cost Share 35% NFS and 65% Federal

Identifying the TSP - CEMVN is presently pursuing a policy exception for the following USACE Policy: ER 1105-2-100 2-3(f)(1) stating: “The National Economic Development (NED) Plan. For all project purposes except ecosystem restoration, the alternative plan that reasonably maximizes net economic benefits consistent with protecting the Nation’s

environment, the NED plan, shall be selected. The Assistant Secretary of the Army for Civil Works (ASA (CW)) may grant an exception when there are overriding reasons for selecting another plan based upon comprehensive benefits or other Federal, State, local and international concerns."

Currently, the TSP is Plan 4: Nonstructural Plan with additive for OSE for positive and negative economic benefits because it provides flood risk reduction in terms of national economic development along with the added benefit of flood risk reduction to vulnerable and disadvantaged communities, maximizing the OSE account (Table ES-2). While this plan is not the NED Plan, it provides the best level comprehensively assessed benefits for flood risk reduction to the ARB study area and is the Total Benefits Plan for this study. If the policy exception is not granted, the TSP will default to Plan 2: Nonstructural NED Plan.

Table ES-2. Summary of Costs and Benefits of the TSP (Plan 4: Total Benefits Plan) and the NED Plan

Item	NED: Plan 2	TSP: Plan 4
Total Annual Benefits:	$59.8 M	$61.4 M
Damage Category: Structure, Contents, Vehicles, and Debris Removal		
Total First Costs	$1.47 through 1.56 B	$1.56 through 1.66 B
Interest During Construction	$5.0 through 5.3 M	$5.3 through 5.6 M
Annual Operation & Maintenance Costs	TBD	TBD
Total Annual Costs	$54.6 through 58.0 M	$58.0 through 61.6 M
B/C Ratio	1.09 through 1.03	1.06 through 0.9997
Expected Annual Net Benefits	$5.1 through 1.8 M	$3.4 M through (178) K

Ranges are 10-18% PED costs

FY 24 Interest 2.75% and 2024 Price Level

Cost Share 35% NFS and 65% Federal

Subject to project authorization, appropriation and availability of funding, full environmental compliance, and execution of a binding agreement with the NFS, construction is currently scheduled to begin in 2026. The schedule assumes that implementation of the Nonstructural Plan will occur over an approximate 10-year period with approximately 500 structures to be elevated and/or floodproofed a year after an 18-month PED phase. The project requires construction authorization and the appropriation of construction funds. A continuous funding stream is needed to complete this project within the anticipated timeline, which requires continuing appropriations from Congress and the State of Louisiana to fund the detailed design phase and fully fund construction contracts.

In order to be preliminarily eligible for inclusion in the Plan, the following criteria must be met:

1. The structure must have a first-floor elevation at or below the applicable floodplain (which may be a 0.1, 0.04, 0.02 AEP year floodplain depending on the location of the structure), based on hydrologic conditions predicted to occur in 2026 (the beginning of the 50-year period of analysis) at a specific location.
2. The elevation or floodproofing measures proposed for the structure must be economically justified based on an aggregation or sub aggregation level that are anticipated to be avoided over the 50-year period of analysis (years 2026-2076) unless they have been identified eligible based on SV criteria and included in the next highest aggregation regardless of economic justification.
3. The structure must have a permanent foundation and be permanently immobilized and affixed or anchored to the ground, as required by applicable law, and must be legally classified as immoveable real property under state law. Notwithstanding the provisions of La. R.S. 9:1149.6, a manufactured, modular, or mobile homeowner and any subsequent owner of an immobilized manufactured, modular, or mobile home, may not de-immobilize the manufactured, modular, or mobile home in the future, by detachment, removal, act of de-immobilization, or any other method. Manufactured, modular, and mobile homes that do not meet these requirements are not eligible for elevation. This criterion only applies to residential uses of manufactured, modular, and mobile homes.

The following work tasks were assumed for cost estimation purposes. No USACE Federal funds will be used to restore, replace, or repair a structure or bring a structure into compliance with applicable building and other codes. All work will require the issuance of state and local government permits prior to the commencement of any onsite construction. Elements of structure work that are deemed to be potentially eligible costs include, but are not limited to: design costs; costs of obtaining all required permits (i.e., zoning or land use approvals, environmental permits or required certifications, historic preservation approvals and Section 106 NHPA consultation in accordance with the PA; including any required mitigation measures, building permits, etc.): costs for title searches and the review of title documents; survey and inspection costs.

Elevation of Residential Structures

No additions to the habitable spaces of a structure (including but not limited to, outbuildings, detached garages, sheds, etc.) will be permitted in the performance of the elevation work. Elements of structure elevation work that are potentially eligible project costs include the following tasks:

- Raising the roof and extending the walls of a side structure attached to the main structure (i.e., garage);
- Raising mechanical equipment (e.g., air conditioner, furnace, water heater, electrical panel, fuel storage, valves, or meters);
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;

- Meeting access requirements of applicable building and other codes (e.g., stairs with landings, guardrails) and/or the Americans with Disabilities Act;
- Creating large vent openings in the foundation and walls to meet requirements for floodwater entry and exit;
- Special access improvements (e.g., elevators, lifts, ramps, etc.) when a satisfactory written medical opinion is provided by a medical doctor who is active, in good standing and licensed by the State of Louisiana, stating that special handicapped access is required for a handicapped or mobility challenged property owner and/or the property owner's family member and/or other person currently residing in the structure, and/or by a tenant currently occupying the structure. Multiple access points may also be eligible where necessary to meet state and/or local building and other code requirements;
- Removal of any trees and other vegetation which restrict the elevation work;
- Debris removal (all demolition debris (hazardous and non-hazardous) shall be removed and taken to an approved landfill;
- Site grading and site restoration including grading landscaping to it preconstruction condition but it cannot adversely affect drainage of adjacent properties;
- Temporary site protection measures during the elevation work such as temporary construction fencing;
- Allowable relocation assistance funds for displaced tenants who are unable to occupy the structure during the elevation process in accordance with the Uniform Relocation Assistance (URA) and Real Property Acquisition Policies for Federal and Federally Assisted Programs of 1970, Public Law 91-646, 84 Stat. 1984 (42 U.S.C. 4601), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987, Title IV of Public Law 100-17, 101 Stat. 246-256. Relocation assistance for tenants who cannot live in the structure during the elevation process, may include, among other thing, advisory services, eligible reasonable out-of-pocket expenses incurred during temporary displacement (e.g., moving and storage of household goods required to be removed during construction, temporary quarters, meals, etc.);
- If additional work is required as a condition of building permit issuance, and if such work is not listed as eligible herein, the property owner will be required to fund and conduct such additional work. In no event shall the structure be elevated if USACE determines that the structure is not physically sound and/or capable of being raised safely.

Dry Floodproofing of Nonresidential Structures

Elements of structure work that are deemed to be potentially eligible dry floodproofing costs include, the following tasks:

- Installation of backflow valves;
- Closures on doors, windows, stairwells and vents-- temporary or permanent;
- Rearranging or protecting damageable real property components--e.g., relocate or raise utilities;

- Sump pumps and sub-drains;
- Water resistant material; water resistant window coverings, doors and jambs; waterproof adhesives; sealants and compounds, and floor drains;
- Plastic sheeting around the walls;
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- Removal of any trees that restrict the dry floodproofing of a structure;
- Temporary site protection measures during site work.

Wet Floodproofing of Nonresidential Structures

Elements of structure work that are deemed to be potentially eligible wet floodproofing costs include the following tasks:

- Wet floodproofing of the structure;
- Engineered flood vents;
- Flood-resistant construction materials such as rigid foam board wall insulation or cement board and molding within the interior of the building,
- Elevation and wet floodproofing of electric outlets,
- Concrete floor treatment and interior wall and floor sealer/stains;
- Exterior paint coatings;
- Sand/water blasting or other manual removal of rusted coatings and application of epoxy coatings;
- Elevation and wet floodproofing of mechanical and electrical equipment;
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- Removal of any trees which restrict the elevation of a structure;
- Temporary site protection measures during site work.

Final Feasibility Design of the Tentatively Selected Plan:
Subsequent to the public release of this draft report, USACE will conduct additional engineering, economic, and environmental assessment of the TSP. EJ outreach will be performed prior to USACE selection of the Recommended Plan and concurrently with public meetings. The nonstructural plan will be optimized to present alternatives based on consideration of EJ benefits as part of OSE, as well as the other 3 P&G accounts.

Residual Risk and Damages
The TSP will greatly reduce, but not eliminate all future flood risk damages and residual risk would remain in the study area. Additionally, the structures eligible for inclusion in the nonstructural plans were based only on rainfall flood risk. This leaves a large number of structures, approximately 50 percent of the structures with residual flood risk within the study area (See Appendix G Table G:5-3) not included in the TSP that would have been if the plan formulation used coastal hydraulic conditions in addition to rainfall to develop alternatives. This would require additional authorization and is outside of the study purpose.

The residual risk, along with the potential consequences, will be communicated to the NFS and will become a requirement of any communication and evacuation plan when this plan is implemented.

Environmental Summary: A NOI to prepare an EIS was published in the Federal Register (Volume 84, No. 63) on April 2, 2019. The scoping period ended on July 8, 2019. Three public scoping meetings were conducted within the study area on April 24 and 25, 2019 with Facebook live streaming. Comments were accepted via written correspondence and emails. Approximately 80 non–USACE people attended the meetings in person and the Facebook live streaming had over 6,000 views. Scoping identified four areas of concern: flooding, dredging opportunities, levee opportunities, and nature-based engineering. People are concerned about inducement of flooding into other areas and proposed further investigation in alternative formulation and specific areas of concern. Feedback from the public scoping meeting resulted in the identification of one additional measure, which was proposed by the Healthy Gulf Collaborative, regarding conversion of sand and gravel mines to bottomland hardwoods habitat for flood control.

A meeting was conducted on June 18, 2019, with collaborative stakeholders, the NFS, resource agencies, and Federally-Recognized Tribes to present the preliminary final array of alternatives and the screening rationale of the alternatives that were screened. As a result, three agencies, (The U.S. Fish and Wildlife Service (USFWS), Louisiana Department of Environmental Quality (LDEQ), and Louisiana Department of Wildlife and Fisheries (LDWF) requested an evaluation of river restoration, which resulted in the addition of another alternative, restoration of river meanders.

After the additional resources were approved to reassess the dry dam and further evaluate nonstructural alternatives, EJ outreach meetings were conducted on February 28, 2023, and March 1, 2023, to inform and engage residents about the flood risk reduction measures.

A Public notice of availability of the ART draft IFR and DEIS was published in the Baton Rouge and New Orleans Advocate for the 45-day comment period beginning November 29, 2019 and ending January 13, 2019. A total of 139 public comments were received during the comment period and covered a variety of themes. These include:

- Five Cultural – comments all pertaining to cemeteries in the Darlington Dam project footprint.
- Two Environmental Justice – A comment regarding the impact on children in the study area (60 percent) coming from low-income families and one chain letter from EPA, Region 6 five individuals recommending an update to the environmental justice impact assessment and mitigation plan.
- Thirty-five Project Features – General comments involving support/opposition for project features. These were focused on the structures associated with the conceptual design of the Darlington Dry Dam.
- Eighteen No General Response – Specialized comments that would require further evaluation in design of the project features.

Consultation and coordination with resource agencies is on-going and would be concluded prior to signature of the Finding of No Significant Impact.

Timeline: This SSDIFR/EA is available for a 30-day public review and comment beginning 15 December 2023. The official closing date for comments is 29 January 2024, 30 days from the public review start date. be mailed or emailed to:

U.S. Army Corps of Engineers
Attention: Chief, Environmental Branch
CEMVN–PDS, Room 136,
7400 Leake Avenue
New Orleans, LA 70118
Email: AmiteFS@usace.army.mil

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Section 1
Introduction

The United States Army Corps of Engineers (USACE), Mississippi Valley Division (MVD), New Orleans District (CEMVN), Regional Planning and Environment Division South (RPEDS), prepared this Supplemental Second Draft Integrated Feasibility Report and Environmental Assessment (SSDIFR/EA). It includes input from the Non-Federal Sponsor (NFS), agencies, and the public. The SSDIFR/EA reflects the collaboration of the NFS, cooperating agencies, stakeholders, and members of the public. The Tentatively Selected Plan (TSP), or Proposed Action, is supported by the NFS.

The purpose of the ART study is to investigate flood risk solutions to reduce the risk of flood damages caused bey rainfall in the ARB.

1.1 STUDY SCOPE

The ART SSDIFR/EA is an interim response to the study authority to investigate and determine the extent of Federal interest in plans that reduce flood risk along the ARB. The effect of flooding from the Amite River and its tributaries was studied, but localized flooding in adjacent communities was not studied. The study investigated alternatives for flood risk management (FRM) and identified and evaluated a full range of reasonable alternatives, including the no action alternative. The results of the study are presented in this decision document, which is an integrated Feasibility Report and National Environmental Policy Act of 1969 (NEPA) Environmental Assessment document, in accordance with the USACE's Planning Guidance Notebook, ER 1105-2-100.

1.2 STUDY AUTHORITY

The study is funded using appropriations from the Bipartisan Budget Act of 2018 (Public Law 115-123) ("BBA-18"), H. R. 1892—13, Title IV, Corps of Engineers—Civil, Department of the Army, Investigations, where funds for are being made available for the expenses related to the completion, or initiation and completion, of flood and storm damage risk reduction, including shore protection studies, which are currently authorized or which are authorized after the date of enactment of this the act, to reduce risk from future floods and hurricanes. The funds are at full Federal expense and funds made available for high-priority studies of projects in states and insular areas with more than one flood related major disaster declared pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S. Code [U.S.C.] 5121 et seq.) in calendar years 2014, 2015, 2016, or 2017.

The ART study area is included based on the August 2016 flooding over southeast and south-central Louisiana and is a continuing investigation under the authorization provided by the Resolution of the Committee on Public Works of the United States Senate, adopted on April 14, 1967.

> "RESOLVED BY THE COMMITTEE ON 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, be, and is hereby requested to review the report of the chief of Engineers on Amite River and Tributaries, Louisiana, published as House Document Numbered 419, Eighty-fourth Congress. And other pertinent reports, with a view to determining whether the existing project should be modified in any way at this time with particular reference to additional improvements for flood control and related purposes on Amite River, Bayou Manchac, and Comite River and their tributaries." Committee on Public Works, 1967."

1.3 NON-FEDERAL SPONSOR

The NFS is the Louisiana Department of Transportation and Development (LADOTD). This supplemental feasibility study, funded through the BBA-18, is 100 percent federally funded. A feasibility cost sharing agreement was executed on October 3, 2018.

1.4 STUDY AREA AND MAP

The study area is the ARB and its tributaries. The ARB begins in southwest Mississippi and flows southward, crossing the state line into southeastern Louisiana. The ARB includes 2,200 square miles flowing into the Amite River and its tributaries (Figure 1-1). It includes portions of Amite, Lincoln, Franklin, and Wilkinson Counties in Mississippi, as well as East Feliciana, St. Helena, East Baton Rouge, Livingston, Iberville, St. James, St. John the Baptist, and Ascension Parishes in Louisiana.

The study area is similar to the 1984 Amite Rivers and Tributaries Flood Control Initial Evaluation Study by USACE; however, it has been expanded to include areas that are impacted by backwater flooding to the southeast and east because they are hydraulically connected to the ARB and its tributaries. Also, structures located within St. John the Baptist and St. James Parish were removed from the study assessment after the final array of alternatives were identified. This was due to one USACE project and study that are currently active within those parishes that are also addressing flood risk.

No significant flood risks associated with the ARB and its tributaries were identified within Mississippi. The Mississippi Soil and Water Conservation Commission preliminary confirmed on November 19, 2018, that there are "no major flood risk problems in Mississippi from the ARB but may be some minor ones associated with bank carving/sloughing from periodic heavy rains." Therefore, the development of alternatives was focused on Louisiana.

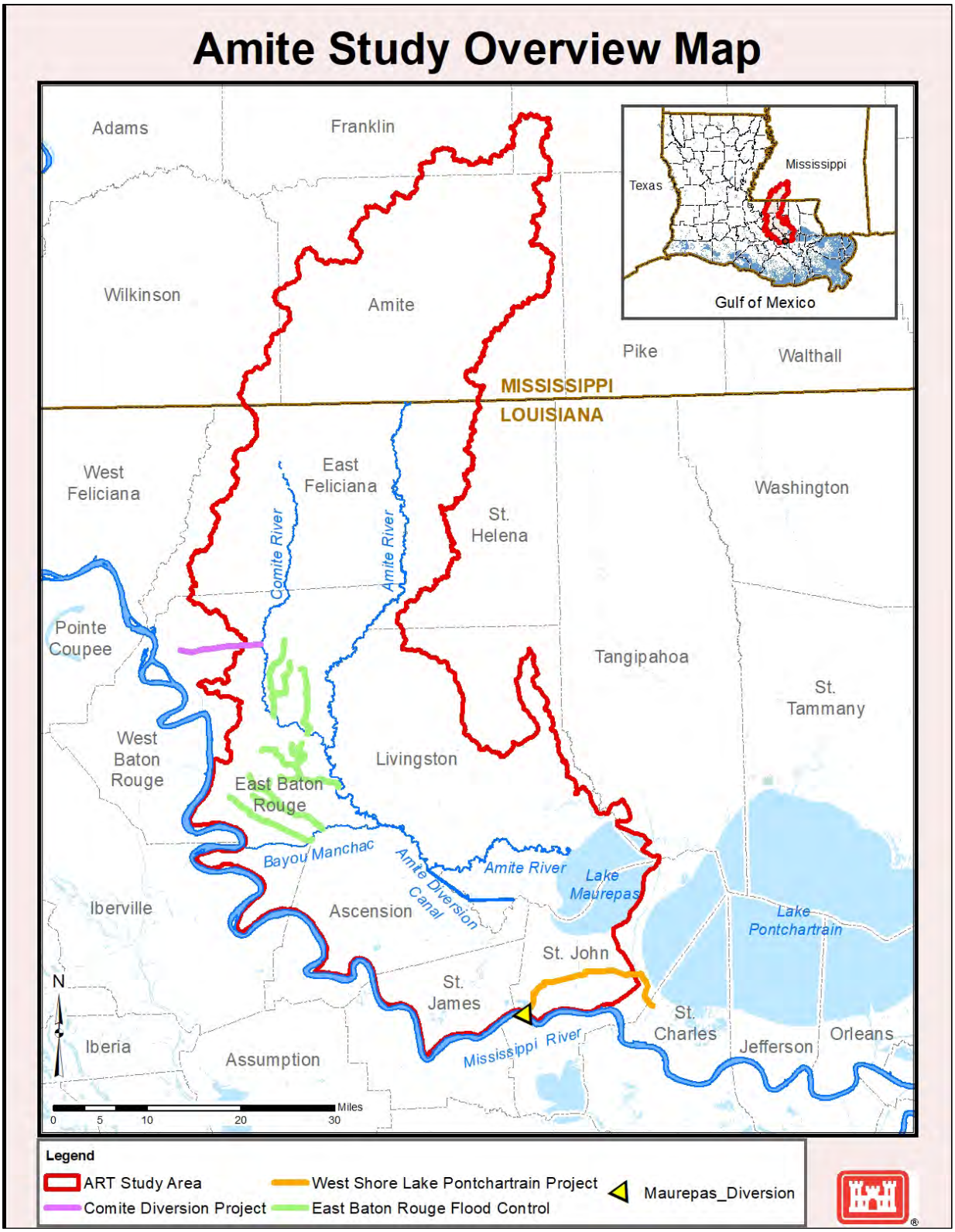

Figure 1-1. ART Study Area

1.5 PRIOR REPORTS, EXISTING WATER PROJECTS, AND ONGOING PROGRAMS

A number of prior reports and studies by USACE, as well as other agencies, were reviewed and used in writing of the SSDIFR/EA. Information from the documents in Table 1-1 was deemed the most significant to problem identification and plan formulation.

USACE FRM Constructed Projects

There is one existing FRM USACE constructed project in the study area that was authorized on August 9, 1955 (construction was completed in 1964). Pursuant to the 1955 authorization, the NFSs for that project are responsible for its operation and maintenance (O&M). The 1955 authorization states:

> "Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That improvements in the interest of flood control and drainage be undertaken in the Amite River, Bayou Manchac and the Comite River, such work to be prosecuted under the direction of the Secretary of the Army and the supervision of the Chief of Engineers, substantially in accordance with a survey report entitled "Survey Report of Amite River and Tributaries La.," of the district engineer, Corps of Engineers, New Orleans District, dated June 8, 1955, approved by the division engineer, Corps of Engineers, Lower Mississippi Valley Division, and submitted to the Board of Engineers for Rivers and Harbors on July 5, 1955 at an estimated first cost to the United States of $3,008,000: Provided, That local interest comply with the provisions in the district engineer's recommendations, including the contribution of 24.7 per centum of actual cost in cash or equivalent work as approved by the Chief of Engineers, for Comite River, presently estimated at $67,000." House of Representatives, 1956.

The 1955 authorized constructed features include the following:

- Bayou Manchac-Clearing and snagging on bayou from the mouth to below Ward Creek at mile 7.81.
- Comite River-Channel enlargement and realignment on Comite River from its mouth to Cypress Bayou at mile 10
- Blind River-Intermittent Clearing/snagging on Blind River below Lake Maurepas
- Amite River-Enlargement/realignment between Bayou Manchac (mile 35.75) to control weir at (mile 25.3); intermittent clearing/snagging from mouth Comite (mile 54) to Bayou Manchac (mile 35.75)
- Amite Diversion Channel-Construct weir and diversion 19 miles long from mile 25.3 on the Amite to mile 4.8 on the Blind River. Weir original design 1,500' at sea level divided into 1,000 & 500' sections and then modified to include 5x20' boat way.

USACE FRM Studies and In Construction Projects

There are several authorized USACE studies and construction projects, which may impact the hydrology of the ARB when construction is completed. They include the following:

- Comite River Diversion Project-The Amite H&H model has the authorized project in place (Appendix H). The project is located in East Baton Rouge Parish, LA in the southern portion of the Comite River Basin and currently in construction. The features will provide urban flood damage reduction to reduce risks from rainfall events/headwater flooding for residents in the area. The primary project features include a control structure at the Comite River, a control structure at Lilly Bayou, three control drop structures at the intersections of the diversion channel with White, Cypress and Baton Rouge Bayous, a drop control structure in the vicinity of McHugh Road, two railroad bridges, four highway bridges and one parish road bridge (USACE, 2023a).
- Comite Resiliency Study- The study recommendations will be completed after this study effort. If a project is authorized and appropriated from the Comite Resiliency Study during the implementation of a project associated with the ARB study effort, it will be assessed at that time.
- East Baton Rouge (EBR) Flood Risk Reduction Project- The authorized project is intended to reduce flooding along 5 sub-basins throughout the EBR Parish, including Jones Creek, Ward Creek, Bayou Fountain, Blackwater Bayou, and Beaver Bayou. The project is in construction consisting of improvements to 50 miles of channels, including clearing and snagging, channel enlargement, and placement of riprap to reduce the risk of flood damages during heavy rainfall events (USACE,2023b). Sensitivity tests were run to see how adjusting these 5 inflow hydrographs would impact water surface elevations (WSE) throughout ARB. These tests showed that even right next to the inflow locations, WSE increases were less than 0.02 feet for the 25-year event. Therefore, the EBR project was not incorporated into H&H model (Appendix H).
- Westshore Lake Pontchartrain (WSLP) Project - The project is located in southeast Louisiana on the east-bank of the Mississippi River in St. Charles, St. John the Baptist, and St. James parishes in southeast Louisiana. The project is currently in construction and includes a 100-year level risk reduction system extending from the Bonnet Carre spillway to Garyville (USACE,2023c). The project was not included in the ARB H&H model geometry (Appendix H). The impact of the levee project on water levels in the study area was determined based on ADCIRC modeling that WSE increase due to the WSLP project will be less than 0.1 feet in the ARB project area.
- WSLP Resiliency Study- The study assessment and recommendations, which includes locally focused flood risk assessment of this subarea that includes St John the Baptist and St. James Parishes will be completed after this study effort. It is not anticipated any recommendations from the WSLP resiliency study will impact this one since the structural inventory for St. John the Baptist and St. James Parish were removed from the nonstructural plan assessment.

- Maurepas Diversion-This is a mitigation feature of the WSLP project and is not included in the ART H&H model since it was determined to not have an effect on USACE plan selection for this study due to the location and minimal hydraulic influence. The Maurepas Diversion is a 2,000 cubic foot per second (cfs) freshwater diversion to be constructed by Louisiana Coastal Protection and Restoration Authority (CPRA) that will reconnect the Mississippi River to the Maurepas Swamp, strategically delivering nutrient-laden river water to restore a degraded Cypress-Tupelo swamp (CPRA, 2023).

The State of Louisiana is in the process of developing a comprehensive State Watershed Plan. Per the 2018 Phase 1 Investigation Report for the Louisiana Statewide Comprehensive Water Based Floodplain Management Program (LWFMP) that informed the creation of the Louisiana Watershed Initiative (LWI):

> "Currently, Louisiana various different jurisdictions, including city/parish planning, perform Floodplain Management activities in a largely uncoordinated fashion. Additionally, various jurisdictions, including city/parish planning and zoning departments or public works, regulate or undertake activities that affect floodplains independently, even when they affect the same watersheds. Floodplain issues are managed within political jurisdictions, often without mechanism to consider the effects on other jurisdictions or the watershed on a whole." LWFMP, 2018

The LWI has continued to develop guidance and planning documents to develop a more holistic approach to watershed management across the state. The Operational Guidance for State Agencies was developed to increase policy and programmatic alignment among state agencies in advance of the State Watershed Plan. Currently, the Initial State Watershed Plan provides the framework for the development of regional watershed management plans. Detailed watershed information and planning will reside within the regional plans, which will be incorporated into the state plan.

Several programs provide funding to the study area for floodplain-related activities, as provided in Table 1-2. Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOSHEP) coordinates funds from grants for Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation Program (PDM). Office of Community of Development (OCD) coordinates funds from the Community Development Block Grant (CDBG). Statewide support (CAPP-SSSE) funds are coordinated by the Analysis Team of LA Watershed Initiative, GOSHEP and LADOTD.

Based on communication with the GOSHEP, LADOTD, and OCD, the current programs and projects with funding that may have an impact on the hydrology of the ARB are presented in Table 1-3. Additionally, the Louisiana Watershed Resiliency Study is currently ongoing by the Federal Emergency Management Agency (FEMA) and the state has applied to FEMA for a Housing and Urban Development grant.

Table 1-1. Relevant Prior Reports and Studies

Year	Study/Report/Environmental Document Title	Data Source	Consistency	Structural Measures	Non-Structural Measures	FWOP Conditions
Comprehensive Planning Studies						
1980	LA Coastal Resources Program	X	X	X	X	X
1999	Coast 2050: Toward a Sustainable Coastal LA	X	X	X	X	X
2004	LA Coastal Area (LCA), LA Ecosystem Restoration Study	X	X	X	X	X
2017	Louisiana State Master Plan by Coastal Protection and Restoration Authority	X	X	X	X	X
2017	Louisiana Watershed Resiliency Study: Developed Following the March and August 2016 Floods by Federal Emergency Management Agency, Mitigation Branch, Hazard Performance Analysis Group	X	X	X	X	X
2017	Characterization of Peak Streamflows and Flood Inundation of Selected Areas in Louisiana from the August 2016 Flood by United States Geological Survey (USGS) for FEMA	X	X			X
Flood Damage Risk Reduction Projects and Reports						
1888	Preliminary Examination of Bayou Manchac, Louisiana by USACE	X				
1907	Pass Manchac, Louisiana House Doc 882, 60th Congress, 1st Session	X				
1912	Completed Pass Manchac Project by USACE via the River and Harbor Act of 6/24/1910	X				X
1927	Amite River and Bayou Manchac, Louisiana Navigation Project was authorized. (7'X60' navigation canal)	X				X
1928	USACE completes navigation channel improvements in the ARB from Denham Springs to Lake Maurepas.	X				X
1930	Amite River and Bayou Manchac, Louisiana Feasibility Report by USACE	X	X			X
1953-1967	LA DPW and East Baton Rouge improvements to Wards Creek, Clay Cut Bayou, Jacks Bayou, Bayou Duplantier and White Bayou.	X				
1955	ARB and Tributaries Flood Control Study by USACE	X	X	X	X	X
1956	USACE Chief of Engineers Report: Amite River and Tributaries	X	X	X	X	X
1964	USACE completes channel improvements to upstream portions of Amite River, and to lower portions of Comite River, Blind River, and Bayou Manchac; including construction of the Amite River Diversion Canal and weir	X	X	X	X	X
1971	Bayou Fountain: Floodplain Information Report for East Baton Rouge Parish by USACE	X	X			X
1972	Amite Rivers and Tributaries: Preliminary Evaluation Report by USACE	X	X			X
1972	Ward Creek and Tribes: Floodplain Information Report for East Baton Rouge Parish by USACE	X	X			X

Year	Study/Report/Environmental Document Title	Data Source	Consistency	Structural Measures	Non-Structural Measures	FWOP Conditions
1974	Clay Cut Bayou, Jones Creek and Tributaries: Flood plain Information Report For East Baton Rouge Parish by USACE	X	X			X
1976	Hurricane Creek, Monte Sano Bayou and Tribes: Floodplain Information Report for East Baton Rouge Parish by USACE	X	X			X
1976	Cypress Bayou and Tributaries: Floodplain Information Report for East Baton Rouge Parish by USACE	X	X	X	X	X
1979	Bayou Manchac and Amite River Louisiana Feasibility Report by USACE	X	X	X	X	X
1984	Amite Rivers and Tribes: Flood Control Initial Evaluation Study by USACE	X	X	X	X	X
1989	Amite River Flood Control Study Report for LADOTD	X	X	X		X
1990	Amite River and Tributaries, Louisiana, Comite River Basin Feasibility Study by USACE	X	X	X	X	X
1990	Land Use and Development Plan (Horizon Plan) for the City of Baton Rouge	X	X			X
1991	Comite River Final EIS by USACE	X	X			X
1991	Amite River And Tributaries Study - Feasibility Report on Comite River Basin by USACE	X	X	X	X	X
1992	Amite River and Tributaries Darlington Reservoir Feasibility Study by USACE	X	X	X	X	X
1995	Comite River Design Memorandum No. 1 by USACE	X	X	X	X	X
1995	Final Environmental Assessment (EA #222) Amite River and Tributaries Louisiana, Comite River Basin, Revision Of Diversion Channel Alignment And Other Changes by USACE	X	X			X
1995	Amite Rivers and Tributaries East Baton Rouge Flood Control Projects by USACE	X	X	X	X	X
1995	Study to Lower Stages along the Amite River (3 Low Impact Dry Dams) by C.E. Matrailer P.E. & Cecil E. Soileau P.E.	X	X	X		
1995	ARB Flood Control Program for LADOTD	X	X	X		
1996	Post Authorization Change Report for the Comite River Diversion Plan by USACE	X	X	X	X	X
1997	Livingston Parish Feasibility Study for channel improvement for Flood Control by USACE	X	X	X	X	X
1997	Darlington Reservoir Re-evaluation Study by USACE	X		X		
1998	ARBC in conjunction with USGS, LADOTD and LOEP and USACE establish a Flood Warning System for the ARB	X	X		X	X
1999	Comite River Diversion Construction Authority WRDA August 17, 1999	X				X
1999	Amite River Sand & Gravel Mine Reclamation Demonstration Project for LADOTD	X	X			

Year	Study/Report/Environmental Document Title	Data Source	Consistency	Structural Measures	Non-Structural Measures	FWOP Conditions
2000	Amite River and Tributaries Ecosystem Restoration Reconnaissance Study by USACE	X	X			
2002	Environmental Assessment, Lilly Bayou Control Structure, Phase 1 EA# 222-A by USACE	X	X	X	X	X
2005	City of Baton Rouge and East Baton Rouge Parish Bridge Location Index Map by City of Baton Rouge & East Baton Rouge Parish	X	X			X
2005	Frog Bayou and Alligator Bayou Comprehensive Flood Risk Reduction Plan for the Pontchartrain Levee District	X	X			X
2007	Fluvial Instability and Channel Degradation of Amite River and its Tributaries, Southwest Mississippi and Southeast Louisiana by ERDC Geotechnical and Structures Lab	X	X	X	X	X
2007	East Baton Rouge Flood Control Project Authority WRDA 2007	X				X
2011	Amite River Field Investigation and Geomorphic Assessment by ERDC Coastal & Hydraulics Laboratory	X	X		X	X
2014	West Shore Lake Pontchartrain Hurricane and Storm Damage Risk Reduction Study by USACE	X	X	X	X	X
2015	ARB Floodplain Management Plan by Gulf Engineers and Consultants for ARB Drainage and Water Conservation District	X	X	X	X	X
2016	August 2016 Flood Preliminary Report ARB	X	X	X	X	X
2017	Hydrologic and Hydraulic Numerical Model of the ARB-Detailed Work Plan, Detailed Cost Estimate and Schedule Proposal	X	X			X
2018	West Shore Lake Pontchartrain Hurricane and Storm Damage Risk Reduction Study by USACE	X	X	X	X	X
2018	St. James/Ascension Storm Surge Flood Protection Project by The Pontchartrain Levee District	X	X	X	X	X
2018	Bayou Conway & Panama Canal Drainage Improvement Project by The Pontchartrain Levee District	X	X	X		X
2018	Laurel Ridge Levee Extension Project Ascension Parish by The Pontchartrain Levee District	X	X	X	X	X
2019	Investigation into the Potential Hydraulic Impacts of Dredging the Lower Amite River for LADOTD	X	X	X		
2019	ARB Numerical Model Project Report for LADOTD	X	X			X
2019	Investigation into the Impacts of the Darlington Reservoir Concept for LADOTD	X	X	X		X
2019	Draft Integrated Feasibility Report and Environmental for Impact Statement Amite River and Tributaries, East of the Mississippi River, Louisiana	X	X	X	X	X
2019	Amite River and Tributaries-Comprehensive Study East of the Mississippi River, Louisiana. Environmental Impact Statement Final Scoping Report	X	X	X	X	X

Year	Study/Report/Environmental Document Title	Data Source	Consistency	Structural Measures	Non-Structural Measures	FWOP Conditions
2020	Final Independent External Peer Review Report (IEPR) Amite River and Tributaries – East of the Mississippi River, Louisiana, Feasibility Study	X	X	X	X	X
2020	Comment Response Record for the IEPR of the Amite River and Tributaries – East of the Mississippi River, Louisiana, Feasibility Study USACE Final Evaluator Responses and Panel Final Back Checks	X	X	X	X	X

Table 1-2. Funding Sources for Floodplain Related Activities within the Study Area

Funding Source	Type	Grantor	Funding Range ($ Millions)
Federal Emergency Management Agency (FEMA) Public Assistance (PA)	Post disaster (Non-recurring)	Federal	Varies based on eligible recovery and mitigation scopes of work following a major presidential disaster declaration.
HMGP	Post disaster (Non-recurring)	Federal	Varies based on amount of total federal assistance
FMA	Non-disaster (recurring)	Federal	Varies based on amount appropriated annually by congress, from the NFIP
PDM	Non-disaster (recurring)	Federal	Varies based on amount appropriated annually by congress
CDBG	Post-disaster (Non-recurring)	Federal	$65 to $13,400
Gulf of Mexico Energy Security Act (GOMESA)	Recurring	Federal	$0.1 to $8 (previous) $70 predicted
Statewide Flood Control Program	Recurring	State	$10 to $20

Source: LWFMP, 2018.

Table 1-3. Current Funded Programs/Projects within the Study Area

Program	Project Title	Parish
FMA	FMA-PJ-06-LA-2017-024	East Baton Rouge
FMA	EBR Acquisition/Demolition & Elevation	East Baton Rouge
FMA	Livingston FMA 2016 Acquisition & Elevation	Livingston Parish Council
FMA	FY 17 Flood Mitigation Assistance	Livingston Parish Council
HMGP	Livingston Parish 4263 Elevation Project	Livingston Parish Council
HMGP	St. Helena Parish Home Acquisition	St. Helena Parish
FMA	St. John the Baptist Parish Elevation Project	St. John The Baptist
HMGP	Drainage Improvements	St. John The Baptist

Section 2
Problems and Opportunities (Purpose and Need)

2.1 SPECIFIC PROBLEMS AND OPPORTUNITIES

The study area has previously experienced riverine flooding from excessive rainfall events, in addition to residual flood damages associated with hurricanes and tropical storms. Since 1851, the paths of 52 tropical events have crossed the study area. The paths and intensities of these storms are shown in Figure 2-1. The FEMA flood claims for the most recent events to impact the area are shown in Table 2-1. Table 2-2 shows the flood claims paid between 1978 and September 2018 for all counties and parishes in the study area. The table includes the number of claims, number of paid losses, and the total amount paid in the dollar value at the time of the payment. The table excludes losses that were not covered by flood insurance.

The most recent event to affect the study area was the 2016 Louisiana flood resulting from rainfall. This event brought catastrophic flooding damage to Baton Rouge and the surrounding areas with both localized flooding and riverine flooding from the Amite and Comite Rivers and their tributaries. In August 2016, the President issued disaster declarations for parishes in the ARB due to impacts from “The Great Flood of 2016.” The flood was responsible directly and indirectly for 13 deaths across all parishes (Louisiana Department of Health, 2023) and the rescue of at least 19,000 people (Louisiana National Guard Public Affairs Office, 2016). The study area experienced historic flooding to thousands of homes and businesses and impacts to the Nation's critical infrastructure because both the I-10 and I-12 transportation systems were shut down for days. Major urban centers in the ARB saw significant flooding, well outside of normal flood stages.

The study will provide FRM alternatives to reduce the risks to public, commercial, and residential property, real estate, infrastructure, and human life; increase the reliability of the Nation’s transportation corridor (I-10-I-12); and enhance public education and awareness of flood risks.

Problems

The primary problem identified in the study area is the risk of flood damages from the Amite River and its tributaries to human life and flood damages of residential and nonresidential structures. Critical infrastructure throughout the regions includes the I-10 and I-12 transportation corridors, government facilities, and schools. This critical infrastructure is expected to have increased risk of damage from rainfall events. Problems are based on the need of evaluating flood risk management in the ARB and depend on addressing the planning goal and objectives (See Section 2.2).

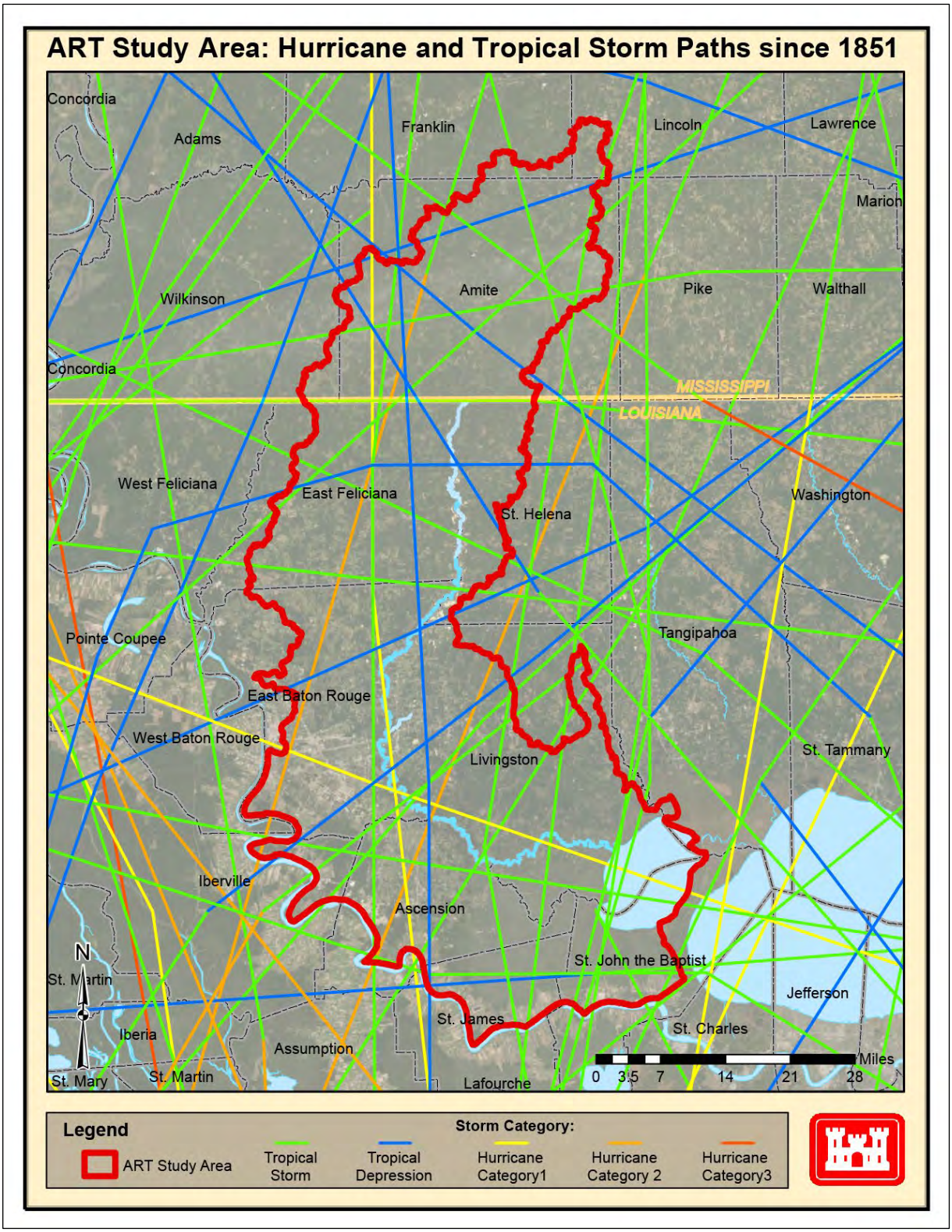

Figure 2-1. Hurricane and Tropical Storm Paths Since 1851

Table 2-1. Top Tropical Storms by Amount Paid by FEMA in the Study Area

Event	Month & Year	Number of Paid Claims	Total Amount Paid (millions)
2016 Louisiana Floods	August 2016	20,641	$1,689.2
Tropical Storm Lee	September 2011	9,725	$377.6
Hurricane Ike	September 2008	45,374	$2,074.1
Hurricane Gustav	September 2008	4,396	$88.9
Hurricane Rita	September 2005	8,921	$348.7
Hurricane Andrew	August 1992	5,242	$128.9
Hurricane Ida	September 2021	21,637	$1,112.0
Hurricane Zeta	October 2020	1,041	$17.3
Tropical Storm Nicholas	September 2021	254	$5.6

Source: Federal Emergency Management Agency (FEMA)

Note 1: Total amount paid is at price level at time of the event.
Note 2: Claims and amount paid are for entire event, which may include areas outside of the study area.

Table 2-2. FEMA Flood Claims in the Study Area by Parish/County from January 1978 through September 2023

Parish/County	Total Number of Claims	Number of Paid Claims	Total Payments (millions)
Ascension	6,005	5,141	$285.7
East Baton Rouge	18,958	15,792	$948.5
East Feliciana	14	12	$0.6
Iberville	544	439	$7.3
Livingston	10,270	8,829	$477.2
St. Helena	51	36	$1.7
St. James	206	144	$3.4
St. John the Baptist	8,725	7,209	$483.4
Total	44,773	37,602	$2,207.8

Source: Federal Emergency Management Agency (FEMA)

Opportunities

Opportunities to address the identified problems include:

- Risk Reduction to life, land, property, and infrastructure from flooding.
- Work with local communities to manage flood risk by leveraging the following efforts:
    - enhance public education and awareness of floodplain management;
    - improve flood warnings for preparation and evacuation;
    - recommend future modifications to the roadway systems to maintain emergency response vehicles access during hurricane and tropical storm events.
- Increase the resiliency of the vitally important I-10/I-12 transportation corridor
- Prevent degradation to fish and wildlife habitat by:
    - improving water quality;
    - increasing habitat or slowing down the trend of habitat quality reduction;
    - encouraging best management practices for land use management.
- Afford access to recreation (boating, bike trails, camping, swimming, and sightseeing facilities)

2.2 PLANNING GOAL AND OBJECTIVES

The primary goal is to reduce the severity of flood risk, damages and risk to human life along the ART to residents, businesses, and critical infrastructure. The federal objective of water and related land resources project planning is to contribute to NED consistent with protecting the Nation’s environment, pursuant to national environmental statutes, applicable executive

orders, and other federal planning requirements. Planning objectives represent desired positive changes to future conditions. All of the objectives focus on alternatives within the study area and within the 50-year period of analysis from 2026 to 2076. The planning objectives are:

- reduce risk to human life from flooding;
- reduce flood damages from rainfall in the ARB to industrial, commercial, and agricultural facilities and residential and nonresidential structures;
- reduce interruption to the nation's transportation corridors, particularly the I-10/I-12 infrastructure;
- reduce risks to critical infrastructure (e.g. medical centers, schools, transportation etc.).

2.3 PLANNING CONSTRAINTS AND CONSIDERATIONS

A planning constraint is a restriction that limits plan formulation or that formulation must work around. It is a statement of things the alternative plans avoid. One planning constraint was identified in this study:

- Avoid promoting development within the floodplain (in accordance with E.O. 11988) to the maximum extent practicable, which contributes to increased life safety risk.

Additionally, several planning considerations identified for plan formulation that would not require the removal of an alternative plan, but need to be assessed as part of the plan formulation process:

- Avoid or minimize negative impacts to:
  - threatened and endangered (T&E) species and protected species;
  - critical habitat, e.g., T&E;
  - water quality;
  - cultural, historic, and Tribal-trust resources;
  - recreation use in the ARB.
- Recognition/awareness that reaches of the Amite and Comite Rivers are Scenic Rivers, which may require legislative changes to implement alternatives.
- Consistency with local floodplain management plans by not inducing flooding in other areas.

2.4 PUBLIC SCOPING

Early NEPA coordination with the NFS, stakeholders, Federal and State agencies, and Federally-Recognized Tribes was performed prior to the notice of intent (NOI) and afterward through public meetings, social media, and the CEMVN website. USACE hosted general scoping meetings within 90 days of the start of the study, per Water Resources Reform and Development Act (WRRDA) 2014. As part of the early coordination, general scoping was initiated prior to the NEPA NOI, in conformity with 40 CFR 1500-1508. A public website page with the study information and request for feedback was established in mid-December 2018.

The collaborative stakeholders associated with this study are USACE, ARB Commission (ARBC), CPRA, and the following parishes: Livingston, Ascension, St. Helena, East Feliciana, East Baton Rouge, Iberville, St. John the Baptist, and St. James. Resource agencies associated with this study include the U.S. Fish and Wildlife Service (FWS), U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), and LDWF. Additionally, in partial fulfillment of USACE's responsibilities under E.O. 13175, early NEPA coordination was initiated with the following Tribes: Alabama-Coushatta Tribe of Texas (ACTT), Chickasaw Nation, Chitimacha Tribe of Louisiana (CTL), Choctaw Nation of Oklahoma (CNO), Coushatta Tribe of Louisiana (CT), Jena Band of Choctaw Indians (JBCI), Mississippi Band of Choctaw Indians (MBCI), Muscogee (Creek) Nation (MCN), Seminole Nation of Oklahoma (SNO), Seminole Tribe of Florida (STF), and Tunica-Biloxi Tribe of Louisiana (TBTL) on December 4, 2018.

A NEPA stakeholder meeting was conducted by USACE on December 3, 2018 at the USGS Baton Rouge, Louisiana office that included an option to participate by video conference. A subsequent reconnaissance meeting was conducted on December 10, 2018 with the NFS, and resource agencies at the at CPRA's Baton Rouge, Louisiana office which also included an option to participate by video conference. Federally-Recognized Tribes were invited, but were unable to attend. However, a follow up meeting was held on January 7, 2019, during which the MBCI participated. Additionally, a public scoping meeting was conducted on January 10, 2019, at CEMVN with Facebook live streaming, where feedback was requested as well. Feedback from the public scoping meeting resulted in the identification of three additional measures.

In accordance with NEPA, a NOI to prepare an EIS was published in the Federal Register (Volume 84, No. 63) on April 2, 2019. The scoping period ended on July 8, 2019. Three public scoping meetings were conducted within the study area on April 24 and 25, 2019 with Facebook live streaming. Comments were accepted via written correspondence and emails. Approximately 80 non–USACE people attended the meetings in person and the Facebook live streaming had over 6,000 views. Scoping identified four areas of concern: flooding, dredging opportunities, levee opportunities, and nature-based engineering. People are concerned about inducement of flooding into other area and proposed further investigation in alternative formulation and specific areas of concern. Feedback from the public scoping meeting resulted in the identification of one additional measure, which was proposed by the Healthy Gulf Collaborative, regarding conversion of sand and gravel mines to bottomland hardwoods habitat for flood control.

A meeting was conducted on June 18, 2019, with collaborative stakeholders, the NFS, resource agencies, and Federally-Recognized Tribes to present the preliminary final array of alternatives and the screening rationale of the alternatives that were screened. As a result, three agencies, (FWS, LDEQ, and LDWF) requested an evaluation of river restoration, which resulted in the addition of another alternative, restoration of river meanders.

The scoping report can be found on the project website: https://www.mvn.usace.army.mil/Amite-River-and-Tributaries/. It is called Appendix C-2 EIS Final Scoping Report and is found under the 2019 Draft Report and Appendices header. The

scoping report has copies of all written feedback received prior to the additional resources approval in 2022.

After the additional resources were approved to reassess the dry dam and further evaluate nonstructural alternatives, EJ outreach meetings were conducted on February 28, 2023, and March 1, 2023, to inform and engage residents about the flood risk reduction measures. Outreach efforts focused on civic and faith-based organizations that serve residents in areas of EJ concern, including local churches, libraries, non-profits, and community centers. Initial and follow-up calls were made to 29 churches, four community centers, three non-profits, and three academic institutions. Of those contacted, six churches, two community centers, two non-profits, and two academic institutions agreed to disseminate our one-page summary of the outreach effort to the residents they serve.

Table 2-3 shows the typical NEPA reporting requirements and where they are located in the SSDIFR/EA.

Table 2-3. NEPA Information in the SSDIFR/EA

NEPA Sections		Location in this Document
Cover Sheet		Cover Page
Abstract		Cover Page
Table of Contents		Table of Contents
Purpose of and Need for Action		Section 2
Alternatives Including Proposed Action		Section 4
Affected Environment		Section 3
Environmental Consequences		Section 5
List of Preparers		Section 10
Public Involvement		Section 9
Environmental Laws and Regulations		Section 8
Mitigation		Section 7
List of Report Recipients		Section 9
Index		Listed in References
Appendices		Listed in the Table of Contents

Section 3
Inventory and Forecast Conditions

3.1 ENVIRONMENTAL SETTINGS

Land Use

The Pre-Contact settlement of the ARB extends as far back as the Paleoindian period (11,500-8000 B.C.), although few sites of this age have been identified within the study area. However, archaeological evidence supports that during the period from 8000 B.C. to 800 B.C., the region was well inhabited by Native American peoples who often settled along ridges overlooking streams with gravel outcroppings. It is noteworthy to mention that during the subsequent Pre-Contact period, from approximately 800 B.C. and leading up until the time of Native American-European contact, settlement strategies shift away from the uplands of the ARB towards alluvial valleys, giving rise to some of the earliest agricultural-based settlements in the region. Upon the arrival of Europeans to the ARB, there were multiple groups of Native Americans occupying the ARB. The effects of contact between these cultures are understudied at the present time and can be refined as additional investigations are conducted in the future. European Settlements from the 1800s in the ARB primarily consisted of farming, fishing, hunting, and trapping communities near the Prairie Terraces and natural levees, often at or near floodplains. More densely populated communities began to form in response to the need for government administration and trade centers, resulting in the slow degradation of nearly 100 percent of the natural forested landscape. Road and rail networks further contributed to urbanization near high-ground water routes, and the establishment of multiple universities, a large petrochemical industry, and the Second World War prompted continuous population growth into the 1900s (GEC, Inc., 2015).

As of 2015, the study area predominantly consisted of undeveloped acreage. About 28 percent of the land was developed for commercial, residential, agricultural, recreation, and industrial purposes. The remaining 72 percent of the land was comprised of wetlands, new-growth forest, barren land, and other undeveloped land. Refer to Appendix D-2 for the land use classification table and map of the study area.

Climate, Weather Patterns, and Climate Change

The 2014 USACE Climate and Resiliency Policy Statement states the “USACE shall continue to consider potential climate change impacts when undertaking long-term planning, setting priorities, and making decisions affecting its resources, programs, policies, and operations.” The ART Study evaluates the feasibility of nonstructural flood risk measures from 2026 to 2076. The most significant impact on coastal wetlands resulting from climate change is sea level change (SLC).

Climate in the region is humid subtropical, being heavily influenced by the movements of warm moist air off of the Gulf of Mexico. Average monthly temperatures vary from approximately 51.2 °F in January to 82.0 °F in July. Winter nighttime lows below freezing are common, as are summer daytime highs in the mid-90s. See Appendix D-2, Table D:1-2 for the monthly temperature normals recorded from the Baton Rouge Metro Airport, LA monitoring station by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC).

Normal annual precipitation for the ARB is 60.5 inches, although for the period 1980 through 1991, rainfall averaged 64 inches a year. The ARB experienced drought conditions (-2 or less on the Palmer Drought Severity Index) during the modern era years of 1952, 1963, 1981, 1999, and 2000. Southerly, maritime winds prevail for much of the year, resulting in the potential for highly variable rainfall over the ARB. Daily variations are frequently measured in inches. Even for a 30-year averaging period, annual precipitation at various weather stations throughout the ARB ranged from 56 to 67 inches. The wettest month is December, with an average monthly normal rainfall of 6.14 inches. October is the driest month, averaging 3.50 inches of rainfall.

High cumulative rainfall events (e.g., 6 inches or more in less than 72 hours) over large areas of the ARB are caused under two typical scenarios: slow moving cold fronts encountering warm moist coastal air in late winter or early spring; and slow-moving tropical storms in summer or early fall. High short-term localized rainfall intensities (e.g., over one inch in an hour) can occur under these two scenarios and are also experienced in a third scenario—heavy summer-time thunderstorms. Severe riverine flooding in the lower ARB has occurred under extreme examples of all three scenarios, with minor localized flood events typically occurring at least once per year in small, poorly drained catchments. Record floods often result when significant rainfall events occur in the context of above-average seasonal rainfall patterns, which sustain high soil moisture saturation and floodplain water levels. In addition to rainfall-riverine flood events, the lower ARB is also subject to wind-driven coastal flooding associated with slow-moving tropical storms. Prolonged, heavy, southerly winds cause high water levels along the southeastern Louisiana coast (e.g., Breton and Mississippi Sounds), causing back-step rises in Lakes Borgne, Pontchartrain, and Maurepas. Lake Maurepas levels above 3 feet mean sea level (MSL) typically impact the lower ARB at least once per year. Tropical storms have pushed levels above 6 feet MSL. Increasing levels of relative sea level change (RSLC) are also associated with climate change (See Section 3.1.4).

Current projections of storm frequencies from the CPRA Coastal Master Plan Report (2017) anticipates increased frequencies for hurricanes and decreased frequencies for tropical storms. See Table 3-1a for the average annual number of North Atlantic Basin tropical storms and major hurricanes (CPRA 2017). https://coastal.la.gov/our-plan/2023-coastal-master-plan/

Table 3-1a. North Atlantic Basin Tropical Storms and Major Hurricanes based on the Plausible Range of Future Tropical Storm Frequency

	1981-2010 Average	Projected Average for 2015-2065	Range of Frequency change (2015-2065)
All tropical storms	12.1	8.8 to 12.6	-28%
Major Hurricanes	2.7	3.1 to 8.6	+13% and +83%

See Appendix D-1, Table D1-2 for the temperature normals from Baton Rouge Metro Airport.

Flood Events

The August 2016 Flood Preliminary Report for ARB (Jacobsen, B.J. 2017) provides findings on prior flooding, as well as the 2016 Flood Event. See Appendix D-2, Section 1.1.3 for Table D:1-3, which presents the top 10 pre-2016 crests based on USGS gauges for the Amite River at Denham Springs and Comite River at Joor Road (with peak stage data as far back as 1921 and 1943, respectively) and the peak discharge for five of the Amite River floods at Denham Springs. Three significant pre-2016 flood events are:

- The April 1983 Flood. A slow-moving system produced 6 to 13 inches of rain over a broad portion of the ARB, with high totals in the Upland Hills. This flood established the pre-2016 record flood for the lower Amite River and backwater in associated tributaries in the Middle and Lower Prairie zones. It was the second highest flood recorded on the Comite River at Joor Road. About 5,300 homes and 200 businesses were flooded and an estimated $172 million of damages incurred (1983 dollars). Flood damages in the Comite River Sub-basin were estimated to be $48 million.
- Hurricane Juan in October 1985. Hurricane Juan became stalled along the Louisiana coast for several days, producing extremely high wind-driven water levels in Lake Maurepas, reportedly above 6 feet NAVD 88, and 6-day rainfall totals of five to eleven inches throughout the ARB. Record flooding occurred in the Coastal Wetlands and Margins. Upstream portions of the ARB were largely unaffected.
- Tropical Storm Allison in June 2001. Tropical Storm Allison stalled over the region, with 7-day measured rainfall totals of 19.66 inches in Baton Rouge; 14.07 inches in Denham Springs; and 23.29 inches in Ascension Parish. The seven-day rainfall totals in parts of the lower ARB were considered a 0.01 AEP precipitation event. Due to a significant drought and very low soil moisture conditions present prior to the event, flood conditions in the upper and middle ARB were not as extreme.

The top tropical storms by amount paid by FEMA in the study area are presented in Table 2-1.

The August 2016 flood over southeast and south-central Louisiana was caused by a slow-moving low-pressure system that had its origins as an Atlantic tropical wave. Beginning on Monday, August 8, 2016, the low traversed east-to-west across northern Florida and lower

Alabama/Mississippi and approached the ARB late on Thursday, 11 August 2016. The low was not considered an area of interest for development by the National Hurricane Center. The U.S. National Weather Service (NWS) issued a flash flood watch for the region on Tuesday, August 9. Flash flood and river flood warnings were issued beginning Wednesday, August 10 and continued through the event. The majority of the ARB received in excess of 10 inches, with a large portion of the northern half of the ARB experiencing over 15 inches. Parts of the Middle Prairie zone in northern East Baton Rouge and northwestern Livingston Parishes had over 20 inches of rainfall.

A report commissioned by Louisiana Economic Development (2016) estimates damages under lost economic activity, property damages to residences, autos and businesses, and damage to government infrastructure. Operations at approximately 19,900 Louisiana businesses were disrupted by the flooding event, impacting approximately 278,500 workers (14 percent of the Louisiana workforce). Table 3-1b provides a summary of damages by category (Terrell 2016).

Table 3-1b. Summary of Damages by Category

Damages Category	Loss in Millions
Residential Housing Structures	$3,844.2
Residential Housing Contents	$1,279.8
Automobiles	$378.8
Agriculture	$110.2
Business Structures	$595.6
Business Equipment	$262.8
Business Inventories	$1,425.5
Business Interruption Loss	$836.4
Total $8,733.3	

Sea Level Change

ER 1100-2-8162 (USACE 2019) provides guidance for incorporating direct and indirect physical effects of projected future SLC across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects. Potential relative sea level change must be considered in every USACE coastal activity as far inland as the extent of estimated tidal influence.

Research by climate science experts predict continued or accelerated climate change for the 21st century and possibly beyond, which would cause a continued or accelerated rise in global MSL. The resulting local RSLC will likely impact USACE coastal project and system performance. As a result, managing, planning, engineering, designing, operating, and maintaining for SLC must consider how sensitive and adaptable natural and managed

ecosystems and human and engineered systems are to climate change and other related global changes. Planning studies and engineering designs over the project life cycle, for both existing and proposed projects, will consider alternatives that are formulated and evaluated for the entire range of possible future rates of SLC, represented here by three scenarios of “low,” “intermediate,” and “high” SLC. These alternatives will include nonstructural alternatives. In compliance with USACE policy (ER 1100-2-8162), the performance of all projects under all three SLC scenarios will be analyzed for the final array of alternatives in the final report.

Using USACE-predicted future water levels under the SLC scenarios, those water levels were converted into RSLC rates, incorporating sea level rise (SLR) effects measured at the gauges and land loss experienced in the extended project area for each project. No operations and maintenance activities were planned for any of the projects in relation to future elevation changes. Long-term sustainability (percent land left at the end of the period of analysis) was used to analyze the impact that different SLC scenarios had on the project areas.

3.2 RELEVANT RESOURCES

This section contains a description of relevant resources in the study area that could be impacted by the proposed project. The significant resources described are those recognized by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Significance based on institutional recognition means that the importance of an environmental resource is acknowledged in the laws, adopted plans, and other policy statements of public agencies, Tribes, or private groups. Significance based on public recognition means that some segment of the general public recognizes the importance of an environmental resource. Significance based on technical recognition means that the importance of an environmental resource is based on scientific or technical knowledge or judgment of critical resource characteristics. Table 3-2 provides summary information of the institutional, technical, and public importance of these resources.

Table 3-2. Relevant Resources in the Study Area

Resource	Institutionally Important	Technically Important	Publicly Important
Cultural and Historic Resources	National Historic Preservation Act (NHPA), as amended, and Section 106 and 110 of the NHPA; the Native American Graves Protection and Repatriation Act of 1990; the Archeological Resources Protection Act of 1979; and USACE's Tribal Consultation Policy (2012).	Federal, State, and Tribal stakeholders document and protect cultural resources including archaeological sites, districts, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and/or sites of religious and cultural significance based on their association or linkage to past events, to historically important persons, to design and construction values, and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Recreation Resources	Federal Water Project Recreation Act of 1965 as amended, and Land and Water Conservation Fund Act of 1965 as amended	Provide high economic value of the local, state, and national economies.	Public makes high demands on recreational areas. There is a high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.
Aesthetics	USACE ER 1105-2-100, and National Environmental Policy Act of 1969, the Coastal Barrier Resources Act of 1990, Louisiana's National and Scenic Rivers Act of 1988, and the National and Local Scenic Byway Program.	Visual accessibility to unique combinations of geological, botanical, and cultural features that may be an asset to a study area. State and Federal agencies recognize the value of beaches and shore dunes.	Environmental organizations and the public support the preservation of natural pleasing vistas.
Wetlands	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., E.O. 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.

Resource	Institutionally Important	Technically Important	Publicly Important
Uplands	Food Security Act of 1985, as amended; the Farmland Protection Policy Act of 1981; and the Fish and Wildlife Coordination Act of 1958, as amended.	They provide habitat for both open and forest-dwelling wildlife, and the provision or potential for provision of forest products and human and livestock food products.	The high value the public places on their present value or potential for future economic value.
Aquatic Resources/ Fisheries	Fish and Wildlife Coordination Act of 1958, as amended; Clean Water Act of 1977, as amended; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968.	They are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of the various freshwater and marine habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Soils and Water Bottoms	Fish and Wildlife Coordination Act, Marine Protection, Research, and Sanctuaries Act of 1990	State and Federal agencies recognize the value of water bottoms for the production of benthic organisms.	Environmental organizations and the public support the preservation of water quality and fishery resources.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened, Endangered, and Protected Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, FWS, NMFS, NRCS, EPA, LDWF, and Louisiana Department of Natural Resources cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.
Prime and Unique Farmland	Farmland Protection Policy Act	State and Federal agencies recognize the value of farmland for the production of food, feed and forage.	Public places a high value on food and feed production.
Air Quality	Clean Air Act of 1963, Louisiana Environmental Quality Act of 1983.	State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Water Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and Louisiana State & Local Coastal Resources Act of 1978.	USACE, FWS, NMFS, NRCS, EPA, and State DNR and wildlife/fishery offices recognize value of fisheries and good water quality and the national and state standards established to assess water quality.	Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water.

Resource	Institutionally Important	Technically Important	Publicly Important
Environmental Justice	Executive Order 12898 of 1994 (E.O. 12898) and the Department of Defense's Strategy on Environmental Justice of 1995	State and Federal agencies recognize social and economic welfare of minority and low-income populations	Public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of Federal laws, regulations, policies, and actions.
Socioeconomics	USACE ER 1105-2-100, and National Environmental Policy Act of 1969	When an environmental document is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental document will discuss all of these effects on the human environment.	Government programs, policies and projects can cause potentially significant changes in many features of the socioeconomic environment.

Resources not impacted in this study include Navigation, Noise and Vibration, and Essential Fish Habitat.

Natural Environment

3.2.1.1 Wetland Resources

Bottomland hardwood forests (BLH) in the study area are dominated by water oak, nuttall oak, green ash, red maple, and pignut hickory. Swamps in the Lower ARB are dominated by bald cypress and water tupelo, which have regenerated following extensive logging of virgin forest more than 70 years ago. The Louisiana swamps generally lack a mature canopy, as was present in the forests before logging occurred, and have lower productivity where isolated from riverine influences (Shaffer et al., 2003). Economically important natural resources associated with these swamps include fisheries of crawfish, blue catfish, and channel catfish, as well as logging. The classification of wetlands habitat from the U.S. Fish and Wildlife National Wetlands Inventory (https://www.fws.gov/wetlands/) is located in Appendix C-1.

3.2.1.2 Upland Resources

Forested Wetlands (From LDWF Natural Communities of Louisiana)

Hardwood Slope Forest

These forests mostly occur on slopes, or sometimes on stream and river terraces that are only rarely subject to flooding. This natural community occurs along slopes rising out of the floodplains in the Upper ARB and is dominated by hardwood trees with a sparse herbaceous layer. The hardwood slope forest community historically occupied approximately 100,000 to 500,000 acres and an estimated 25 to 50 percent of this acreage remains. Habitat conversion to pine plantations or residential uses, invasive and exotic species (including

Chinese tallow (*Triadica sebifera*), Chinese privet (*Ligustrum sinense*), and cogon grass (*Imperata cylindrica*)) construction of roads, utilities and pipelines, and use of off-road vehicles currently threatens the long-term viability of these forests.

Small Stream Forest

Small stream forests are relatively narrow wetland forests occurring along small rivers and large creeks in central, western, southeastern, and northern Louisiana. They are seasonally flooded for brief periods. The percentage of sand, silt, calcareous clay, acidic clay, and organic material in the soil is highly variable (depending on local geology) and has a significant effect on species composition. Soils are typically classified as silt-loams. At times, the community is quite similar in species composition to hardwood slope forests (beech-magnolia forests). These forested wetlands are critical components of the landscape filtering surface and subsurface flows, improving water quality, and storing sediment and nutrients (Rummer 2004). See Appendix D-1, Table D:2-3 for a vegetative species list for this natural community.

Nuisance Species (from LDWF Waterbody Management Plan 2017)

Common salvinia and water hyacinth have been the main source of access and habitat issues and complaints over the past several years. Common salvinia is scattered throughout the ARB and is constantly being restocked by draining swamps and bayous. Within the river system, the desire to own/sell waterfront property has led to the construction of numerous man-made canals over the past four decades. These canals are typically 50 to 200 feet wide, dead-end offshoots of the main river channel. The canals are lined with houses, camps, boat slips, docks, and an occasional boat ramp. The canal systems are rarely designed so that river water can flow through unimpeded (i.e. horseshoe in shape, etc.). Consequently, these dead-end canals have no inherent “flushing” mechanism to remove floating vegetation. Invariably, some form of aquatic vegetation makes its way into these canals each year and remains stranded due to the stagnant water conditions and thrives. When the suspect vegetation in these canals reaches unacceptable levels, shoreline property owners call LDWF to complain.

Estimates of vegetation coverage are:

Problematic Species:

- Common Salvinia (*Salvinia minima)* – 25 acres
- Water Hyacinth (*Eichhornia crassipes)* – 15 acres
- Duckweed (*Lemna spp.)* – 15 acres
- Duck Lettuce (*Ottelia alismoides*) – 50 acres
- Crested Floating Heart (*Nymphoides cristata*) – 6 acres

Beneficial Species:

- Yellow Water Lily (*Nymphaea mexicana)* – 100 acres
- Coontail (*Ceratophyllum demersum)* – 100 acres

3.2.1.3 Aquatic Resources and Fisheries

For a list of fish species in the study area, see Appendix D-2, Table D:2-4 (LDWF Amite River Waterbody Management Plan).

The Alabama Hickorynut (*Obovaria unicolor*) is an at-risk species, a 1.2 - 2 inch-long freshwater mussel, with round or elliptical shape. The outer shell (periostracum) is smooth and brown to yellow-brown, with rays. This species is a long-term brooder that is gravid from June through August of the following year. Like other freshwater mussels, the Alabama Hickorynut releases its larvae (glochidia) into the water column, where they parasitize a fish (glochial host) in order to transform into a juvenile mussel. Once the glochidia are ready, they release from the host to find a suitable substrate. Suitable glochidial host fishes for this species include the naked sand darter (*Ammocrypta beani*), southern sand darter (*Ammocrypta meridiana*), Johnny darter (*Etheostoma nigrum*), Gulf darter (*Etheostoma swaini*), blackbanded darter (*Percina nigrofasciata*), dusky darter (*Percina sciera*), and redspot darter (*Etheostoma artesiae*).

The Alabama Hickorynut inhabits sand and gravel substrates in moderate currents in large streams. However, the presence of moderate gradient pool and riffle habitats in a variety of stream and river sizes may contain this species. In Louisiana, the Alabama Hickorynut is known to occur in the Pearl and Amite River systems. Habitat modification and destruction due to siltation (i.e. from flooding events) and impoundment threaten this species. It is also negatively affected by the pollution of streams and rivers.

The rare Broadstripe topminnow *(Fundulus euryzonus)* is endemic to the Amite and Tangipahoa River Basins. The Broadstripe topminnow is listed as Vulnerable at the global and national level and Imperiled at the state level. This fish prefers smaller channel widths, with riparian vegetation canopy; features of upstream reaches of rivers. Current and historical mining operations in the ARB have led to channelization, which changes the upstream reaches of the river to behave more like downstream reaches by widening the channel and increasing water flow; thus, diminishing suitable habitat for the topminnow.

3.2.1.4 Wildlife

The study-area wetland and non-wetland forests provide valuable habitat for a variety of migratory game and non-game birds, mammals, amphibians, and reptiles. For a listing of associated species, see Appendix D-2, Table D:2-5 through Table D:2-8.

The coastal marshes and forested wetlands of the Lake Pontchartrain Basin have been identified by the North American Waterfowl Management Plan (NAWMP), Gulf Coast Joint Venture (GCJV): Mississippi River Coastal Wetlands Initiative as a key waterfowl wintering area. The Gulf Coast is the terminus of the Central and Mississippi Flyways and is therefore one of the most important waterfowl areas in North America, providing both wintering and migration habitat for significant numbers of the continental duck and goose populations that use both flyways.

The Mississippi River Coastal Wetlands Initiative area is dominated by coastal marsh, forested swamps, and seasonally flooded bottomland hardwoods that provide habitat for several species of wintering waterfowl. Wood ducks are the primary waterfowl species in forested wetlands, while other ducks, and use those forested habitats to a lesser degree. Other game birds are present in or adjacent to the study area including rails (Family: *Rallidae*). Non-game bird species also utilize the study area marshes, including various species of gulls and terns. Birds of prey in the study area include resident and transient hawks. Some neo-tropical migrants, currently experiencing population decline, are dependent on large forested areas to successfully reproduce. Also present are cuckoos, swifts, hummingbirds, woodpeckers, and the belted kingfisher (*Megaceryle alcyon*). See Appendix D-2, Table D2-5 for a list of bird species in the study area.

3.2.1.5 Threatened, Endangered, and Protected Species

Factors regarding the existing conditions for threatened and endangered species in the study area principally stem from the alteration, degradation, and loss of habitats; and human disturbance. The continued high rate of commercial development throughout the study area continues to reduce available wetland habitat to threatened and endangered species. This creates increased intra- and interspecific competition for rapidly depleting resources between not only the various threatened and endangered species, but also other more numerous fauna.

On November 15, 2023 CEMVN obtained a draft Coordination Act Report (CAR) from the FWS that provides a list of threatened and endangered species that may occur in the proposed project location, and/or may be affected by the proposed project. Table D:2-9 in Appendix D-2 a summary of findings from the draft CAR .

West Indian Manatee

Federally listed as a threatened species, *Trichechus manatus* (West Indian manatees) occasionally enter Lakes Pontchartrain and Maurepas and associated coastal waters and streams during the summer months (i.e., June through September). Manatee occurrences appear to be increasing, and they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals. All contract personnel associated with the project should be informed of the potential presence of manatees and the need to avoid collisions with manatees, which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. All construction personnel are responsible for observing water-related activities for the presence of manatee(s). Temporary signs should be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel movement zones (i.e., work area), and at least one sign should be placed where it is visible to the vessel operator. Siltation barriers, if used, should be made of material in which manatees could not become entangled, and should be properly

secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions should be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, should be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area on its own accord, special operating conditions are no longer necessary, but careful observations would be resumed. Any manatee sighting should be immediately reported to the Service's Lafayette, Louisiana Field Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821).

Public data on manatee sightings have provided benefits for conservation efforts, according to Hieb et al. (2017). Ongoing manatee population growth, future climate change, or other large-scale environmental perturbations are likely to continue altering the timing, duration, and location of manatee visits to the northern Gulf of Mexico. Although publicly sourced data and citizen-science efforts have inherent biases, on a decadal timescale these datasets could provide comprehensive information on manatee habitat use than is possible by direct observations.

Gulf Sturgeon

Acipenser oxyrhynchus desotoi (the Gulf sturgeon), federally listed as a threatened species, is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf Coast between the Mississippi River and the Suwannee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain Basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than 2 years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations, such as those caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

On March 19, 2003, the FWS and the National Marine Fisheries Service (NMFS) published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. The proposed project; however, does not occur within, nor would it impact designated Gulf sturgeon critical habitat.

USACE is responsible for determining whether the selected alternative is likely (or not likely) to adversely affect any listed species and/or critical habitat, and for requesting the FWS' concurrence with that determination. If USACE determines, and the FWS concurs, that the selected alternative is likely to adversely affect listed species and/or critical habitat, a request for formal consultation in accordance with Section 7 of the Endangered Species Act (ESA) should be submitted to the FWS. That request should also include USACE's rationale supporting their determination.

Inflated Heelsplitter Mussel

Federally listed as a threatened species, the Alabama heelsplitter mussel (*Potamilus inflatus*) was historically found in Louisiana in the Amite, Tangipahoa, and Pearl Rivers. Many life history aspects of the species are poorly understood but are likely similar to that of other members of the Unionidae family. Although the primary host fish for the species is not certain, investigation by K. Roe et al. (1997) indicates that the freshwater drum (*Aplodinotus grunniens)* is a suitable glochidial host for the species.

Based on the most recent survey data, the currently known range for the Alabama heelsplitter in Louisiana occurs only in the lower third of the Amite River, along the East Baton Rouge/Livingston Parish line from Spiller's Creek, which is in the vicinity of Denham Springs, downstream to the vicinity of Port Vincent. Because it has not been used widely for past or present gravel mining operations, the lower third of the Amite River (between Louisiana Highway 37 and Louisiana Highway 42) is more typical of a coastal plain river, being characterized by a silt substratum, less channelization, and slower water flow, all of which are characteristic of Heelsplitter habitat. This freshwater mussel is typically found in soft, stable substrates such as sand, mud, silt, and sandy gravel, in slow to moderate currents. Heelsplitter mussels are usually found in depositional pools below sand point bars and in shallow pools between sandbars and riverbanks.

Major threats to this species in Louisiana are the loss of habitat resulting from sand and gravel dredging and channel modifications for flood control, as shown by the apparent removal of the species in the extensively modified upper portions of the Amite River.

Northern Long-Eared Bat

The northern long-eared bat (*Myotis septentrionalis*), federally listed as an endangered species, is a medium sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches and is distinguished by its long ears. Its fur color can range from medium to dark brown on the back and tawny to pale brown on the underside. The northern long-eared bat can be found in much of the eastern and north central United States and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. In Louisiana, there have been confirmed reports of sightings in West Feliciana, Winn, and Grant parishes, although they can possibly be found in other parishes in the state. Some individuals were documented during mist net and bridge surveys on the Winn District of the Kisatchie National Forest and observed under bridges on the Winn District in Grant Parish.

Northern long-eared bats can be found in mixed pine/hardwood forest with intermittent streams. Northern long-eared bats roost alone or in small colonies underneath bark or in cavities or crevices of both live trees and snags (dead trees). During the winter, northern long-eared bats can be found hibernating in caves and abandoned mines, although none have been documented using caves in Louisiana. Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges to feed on moths, flies, leafhoppers, caddis flies and beetles, which they catch using echolocation. This bat can also feed by gleaning motionless insects from vegetation and water surfaces.

The most prominent threat to this species is white-nose syndrome, a disease known to cause high mortality in bats that hibernate in caves. Other sources of mortality for northern long-eared bats are wind energy development, habitat destruction or disturbance, climate change and contaminants. If implementation of the proposed action has the potential to directly or indirectly affect the northern long-eared bat or its habitat, further consultation with this office will be necessary.

The USACE is responsible for determining whether the selected alternative is likely (or not likely) to adversely affect any listed species and/or critical habitat, and for requesting the Service's concurrence with that determination. If the USACE determines, and the Service concurs, that the selected alternative is likely to adversely affect listed species and/or critical habitat, a request for formal consultation in accordance with Section 7 of the Endangered Species Act should be submitted to the Service. That request should also include the USACE's rationale supporting their determination.

Protected Species

Bald Eagle

The project-area forested wetlands provide nesting habitat for *Haliaeetus leucocephalus* (the bald eagle), which was officially removed from the List of Endangered and Threatened Species on August 8, 2007. There is one active bald eagle nest that is known to exist within the proposed project area; however, other nests may be present that are not currently listed in the database maintained by LDWF.

Bald eagles' nest in Louisiana from October through mid-May. They typically nest in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water in the southeastern parishes. Areas with high numbers of nests include the north shore of Lake Pontchartrain and the Lake Salvador area. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

Breeding bald eagles occupy "territories" that they will typically defend against intrusion by other eagles and that they likely return to each year. A territory may include one or more alternate nests that are built and maintained by the eagles, but which may not be used for nesting in a given year. Potential nest trees within a nesting territory may, therefore, provide important alternative bald eagle nest sites. Bald eagles are vulnerable to disturbance during courtship, nest building, egg laying, incubation, and brooding. Disturbance during this critical period may lead to nest abandonment, cracked and chilled eggs, and exposure of small young to the elements. Human activity near a nest late in the nesting cycle may also cause flightless birds to jump from the nest tree, thus reducing their chance of survival.

Colonial Nesting Birds

In accordance with the Migratory Bird Treaty Act and draft CAR from FWS (dated November 15, 2023, see Appendix D-1 Agency Coordination), the study area includes habitats that are commonly inhabited by colonial nesting waterbirds, which include herons, egrets, night-

herons, ibis, and roseate spoonbills. Recommendations to address compliance with the Migratory Bird Treaty Act is included in Section 8.5.

3.2.1.6 Geology, Soils and Water Bottoms, and Prime Farmland

The study area can be roughly divided into three regions with distinctive landforms, topographies, and associated floodplain characteristics. For a map of the geographic and physiographic setting, see Appendix D-2, Figure D:2-2.

1. The High Terraces includes the Mississippi counties, East Feliciana Parish, St. Helena Parish, and northern East Baton Rouge Parish. The area, with sediment dated to the Pleistocene era, consists of narrow floodplains with rolling hills at elevations typically ranging from approximately 80 to 500 feet above MSL.

2. The Intermediate and Prairie Terraces includes most of East Baton Rouge and Livingston Parishes and upland portions of Iberville and Ascension Parishes. This landscape transitions from rural hilly older Plio-Pleistocene Terraces to flatter, mid-elevation (approximately 20 to 80 feet MSL) recent Intermediate and Prairie Pleistocene Terraces.

3. The Recent Alluvial Floodplain includes lower Livingston Parish, the remainder of Iberville and Ascension Parishes, as well as St. James Parish. This area is dominated by expansive, low-lying (approximately 1 to 5 feet MSL), alluvial floodplains filled during the recent Holocene.

Soils and Water Bottoms

Soil textures present in the study area are found in Appendix D-2, Section 2.11.

Prime and Unique Farmland

The Farmland Protection Policy Act of 1981 (FPPA) was enacted to minimize the extent that Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses, and to assure that Federal programs are administered in a manner that, to the extent practicable, would be compatible with the State, local government, and private programs and policies to protect farmland.

Under this policy, soil associations are used to classify areas according to their ability to support different types of land uses, including urban development, agriculture, and silviculture. The USDA Natural Resource Conservation Service (NRCS) designates areas with particular soil characteristics as either “Farmland of Unique Importance,” “Prime Farmland,” “Prime Farmland if Irrigated,” or variations on these designations. Prime farmland, as defined by the FPPA, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Farmland of unique importance is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of

prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, drought-prone, and less productive, and cannot be easily cultivated as compared to prime farmland (NRCS 2016).

No unique farmlands are located within the study area, but approximately 503,703 acres of prime farmlands are located within the study area. For land classification and acreage of prime and unique farmlands in the study area, see Appendix D-2, Section 2.11.

3.2.1.7 Water Quality

The dominant bodies of water in the ARB are the Amite River, Blind River, and Comite River. Numerous rivers and streams cross through the ARB and its hydrology is greatly affected in the lower basin because the elevation is around sea level, plus or minus a foot.

Water quality in the main channels of the ARB is influenced by non-point source agricultural runoff and by residential and commercial point sources. Water quality in the Upper ARB; however, is often quite different because of hydrological modifications from the sand and gravel mines and berms. Louisiana Department of Environmental Quality has a general permit for the Louisiana Pollutant Discharge Elimination System, which requires that "impoundments of process or mine dewatering wastewater must be surrounded by a levee of sufficient size and construction to prevent a discharge of pollutants into waters of the state." The berms must have a height of 2 feet freeboard.

Nineteen water bodies in the Amite watershed are listed as impaired for one or more designated uses in the 2016 Integrated Report of Water Quality in Louisiana. (See Appendix D-2, Table D:2-11 for the Final 2016 Integrated Report of Water Quality in Louisiana).

Most of the segments are impaired for fish and wildlife propagation and swimming. In the Amite watershed, the top five suspected causes of impairment are 1) dissolved oxygen, 2) nitrate/nitrite (nitrite plus nitrate as N), 3) fecal coliform, 4) phosphorus (Total), and 5) turbidity.

3.2.1.8 Air Quality

The U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards for six principal pollutants, called “criteria” pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air, but forms in the atmosphere when three atoms of oxygen (03) are combined by a chemical reaction between oxides of nitrogen and volatile organic compounds in the presence of sunlight. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of nitrogen and volatile organic compounds, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air. The Clean Air Act General Conformity Rule (58 FR 63214, November 30, 1993, Final Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans) dictates that a conformity review be performed when a federal action generates air

pollutants in a region that has been designated a non-attainment or maintenance area for one or more National Ambient Air Quality Standards. A conformity assessment would require quantifying the direct and indirect emissions of criteria pollutants caused by the Federal action to determine whether the proposed action conforms to Clean Air Act requirements and any state implementation plan.

The general conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution. It is called a conformity rule because Federal agencies are required to demonstrate that their actions "conform with" (i.e., do not undermine) the approved State Implementation Plan for their geographic area. The purpose of conformity is to (1) ensure Federal activities do not interfere with the air quality budgets in the state implementation plans; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the National Ambient Air Quality Standards.

The ART Study Area includes several parishes in Louisiana and several counties in southwest Mississippi. Four of the Louisiana parishes are located in the Baton Rouge metropolitan area, which has been designated by the EPA as a maintenance area for ozone under the 8-hour standard effective December 27, 2016. This classification is the result of area-wide air quality modeling studies, and the information is readily available from the LDEQ, Office of Environmental Assessment and Environmental Services.

Federal activities proposed in the ozone-maintenance area may be subject to the state's general conformity regulations as stated under LAC 33:III.14.A, Determining Conformity of General Federal Actions to State or Federal Implementation Plans. A general conformity applicability determination is made by estimating the total of direct and indirect volatile organic compound (VOC) and nitrogen oxide (NOX) emissions caused by the construction of the project. Prescribed de minimis levels of 100 tons per year per pollutant are applicable in Ascension Parish. Projects that would result in discharges below the de minimis level are exempt from further consultation and development of mitigation plans for reducing emissions.

Human Environment

Cultural and Historical Resources

Federal regulations require USACE, as an agency responsible for funds appropriated by Congress, to identify if properties are historic (listed or eligible for listing in the National Register of Historic Places (NRHP)); to assess the effects the work will have on historic properties; to seek ways to avoid, minimize, or mitigate any adverse effects to historic properties; and to evaluate the proposed action's potential for significant impacts to the human and natural environment. The consideration of impacts to historic and cultural resources is mandated under Section 101(b)(4) of the NEPA as implemented by 40 CFR, Parts 1501-1508. Additionally, Section 106 of the National Historic Preservation Act (NHPA), as amended (54 U.S.C. § 300101 et seq.), requires Federal agencies to take into account their effects on historic properties (i.e., historic and cultural resources) and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Section 106 lays out four (4) basic steps that must be carried out sequentially (i.e., "Standard" Section 106): 1) establish the

undertaking; 2) identify and evaluate historic properties; 3) assess effects to historic properties; and 4) resolve any adverse effects (avoid, minimize, or mitigate). An agency cannot assess the effects of the undertaking on historic properties until it has identified and evaluated historic properties within the Area of Potential Effects (APE). The Federal agency must consult with the appropriate State Historic Preservation Officer(s) (SHPO), Tribal Historic Preservation Officer/s (THPO) and/or tribal officials, state and local governments, NFS/applicants, and other Consulting Parties in identifying historic properties, assessing effects, and resolving adverse effects, and provide for public involvement. Additionally, it is the policy of the Federal government to consult with Indian Tribal Governments on a Government-to-Government basis as required in E.O. 13175 (U.S. President 2000).

Existing Conditions

The cultural prehistory and history of southeast Louisiana and southwest Mississippi is shared with much of the southeast. The generalized Pre-Contact cultural chronology for the region according to Rees (2010:12) is divided into five primary archaeological components, or "periods," as follows: Paleoindian (11,500-8000 B.C.), Archaic (8000-800 B.C.), Woodland (800 B.C.-1200 A.D.), Mississippian (1200-1700 A.D.), and Historic (1700 A.D.-present). Regionally, these periods have been further divided into sub-periods based on material culture, settlement patterns, subsistence practices, and sociopolitical organization. Specific sub-periods identified within the study area include Poverty Point, Tchefuncte, Marksville, Baytown, Troyville, Coles Creek, Plaquemine, and Mississippian. Post-Contact Period (*ca*. 1650 A.D.-present) cultural affiliations within the study area follow the thematic approach set forth in the Louisiana Division of Archaeology's (LDOA) State of Louisiana Site Record Form (August 29, 2018) and are divided into the following temporal groups: *Historic Exploration* (1541-1803 A.D.), *Antebellum Louisiana* (1803-1860 A.D.), *War and Aftermath* (1860-1890 A.D.), *Industrial and Modern* (1890-1945 A.D.), and *Post-WWII* (1945 A.D.-present).

Archaeological Sites

Table 3-3. Historic Properties within the Study Area.

County/Parish	Building	Site	Structure	District	NHL	Archaeological Sites
Mississippi:						
Amite	18	1	—	—	—	29
Franklin	3	—	2	—	—	—
Lincoln	14	—	—	1	—	—
Wilkinson	11	3	—	2	—	1
Louisiana:						
Ascension	17	1	—	1	—	78
East Baton Rouge	67	7	2	13	2	20
East Feliciana	28	1	—	2	1	104

Iberville	21	—	1	1	—	22
Livingston	13	—	—	1	—	87
St. Helena	3	—	—	—	—	72
St. James	19	—	1	2	1	41
St. John the Baptist	14	1	—	2	1	14

Based on a review of the LDOA, *Louisiana Cultural Resources Map* (web-resource), the Mississippi Department of Archives and History (MDAH) Historic Resources Inventory Map (web-resource), and pertinent site and survey reports regarding previous investigations, CEMVN determined that approximately 468 archaeological sites (Table 3-3) are recorded within the current study area that collectively span the entire spectrum of Pre-Contact and Post-Contact archaeological components referenced above; encompassing some 10,000 years or more. It is also important to stress that many of the known sites in the study area have occupation spans encompassing more than one of the aforementioned cultural/ temporal periods, attesting to the long-ranging cultural importance of the region. Presently, no comprehensive systematic archaeological survey has been conducted throughout the entire study area and the distribution of recorded archaeological sites is largely indicative of project-specific federal and state compliance activities (e.g., linear surveys of roads, pipelines, and power line rights-of-way). Therefore, in addition to considering the known sites within the region, project alternatives must also be assessed for archaeological site potential.

Archaeological Site Potential

Louisiana's Comprehensive Archaeological Plan (Girard, et al. 2018) and research conducted by Earth Search, Inc. (Lee et al. 2009) for the *Proposed Amite River and Tributaries, Bayou Manchac Water Shed Feasibility Study, Ascension, East Baton Rouge & Iberville Parishes, Louisiana*, can be used for baseline planning purposes. To a great extent, the unique geomorphology and ecology of the study area has influenced site type and location. To examine how the physical landscape impacts the archaeological record, the LDOA divides the study area into a series of regions that follow the ecoregions classification of the Western Ecology Division of the U.S. Environmental Protection Agency (Daigle et al. 2006). There are six Regions at Level III, three of which fall within the present study area (Southern Coastal Plain, Mississippi Valley Loess Plain and Mississippi Alluvial Plain). All three Level III Regions are then further divided into sub-regions (Level IV: Southern Rolling Plains, Baton Rouge Terrace, Gulf Coast Flatwoods, Inland Swamps, and Southern Holocene Meander Belts). Girard, et al. (2018: 24-31) define how the unique environmental, biological, and physiological characteristics of each region influenced cultural development in order to provide context to the distribution of where sites are likely or unlikely to occur. Complimentary to Girard, et al.'s (2018) ecosystem-based model (above), Lee et al. recommend:

> *It is essential that investigations be conducted in the fullest consideration and effective integration of available knowledge of landscape dynamics. In doing so,*

surveys can be designed to provide adequate assessment of all areas, but with greater attention and effort focused on areas that would have been relatively more favorable for prehistoric occupation. Of greater importance, it avoids the expenditure of resources in areas where existing knowledge of geomorphic processes and landscape evolution indicates with confidence that prehistoric activities were precluded or where subsequent natural processes have destroyed the evidence…Geomorphologic data, previous archaeological investigations, and previously recorded sites will constitute the primary data sets utilized in the predictive model. Landform type, elevation, and soils will also be utilized to construct the predictive model. These data will be integrated to determine high probability areas within the riverine and upland portions of the project area.

Geospatial modeling of cultural landscapes for predictive scientific research is an important and rapidly developing approach in archaeology. Depending on the scale of the final array of project alternatives, it may be advantageous to develop a geospatial predictive model based upon the work of Girard, et al. (2018) and Lee et al. (2009) that incorporates the accumulated environmental and archaeological information specified above as a means to forecast the probability of significant archaeological sites occurring in any particular location that can further be used to guide efficient identification and evaluation strategies.

U.S. Civil War

The study area is also the setting of at least 11 terrestrial and naval Civil War battles ranging from small skirmishes to major decisive battles. The NPS's American Battlefield Protection Program (ABPP; 54 U.S.C. 380101-380103), Civil War Sites Advisory Commission (Public Law 101-628) has assigned Preservation Priorities ((http://npshistory.com/publications/battlefield/cwsac/report.pdf) to five individual battlefields located within the Study Area: Magnolia Cemetery (East Baton Rouge: Priority IV.1), Donaldsonville 1862 (Ascension Parish; Priority IV.2), Donaldsonville 1863 (Ascension Parish; Priority IV.2), Cox's Plantation (Ascension Parish; Priority IV.1), and Port Hudson (East Baton Rouge Parish and East Feliciana Parish: Priority I.1).

Louisiana Scenic Rivers Act

The LDWF is the lead state agency in the State Scenic River Program. Archaeological resources within scenic river corridors are protected by law under the Louisiana Scenic Rivers Act of 1988 (LSRA). The current Study Area includes the following Louisiana Natural and Scenic Rivers: the Amite River, Comite River, Blind River, and Bayou Manchac. In addition to the extra protections afforded to cultural resources under the LSRA, Bayou Manchac from the Amite River to the Mississippi River is designated as a "Historic and Scenic River," which requires that "full consideration shall be given to the detrimental effect of any proposed action upon the historic and scenic character thereof, as well as the benefits of the prosed use."

Next Steps

No determination of effect under the NHPA pursuant to 36 CFR 800.4(d) is being made at this time. As an alternate to the “Standard Section 106” process described above, in partial fulfillment of its Section 106 responsibilities, CEMVN has initiated consultation to negotiate a Programmatic Agreement (PA) that sets out the measures CEMVN will implement to resolve adverse effects through avoidance, minimization, and/or mitigation (36 CFR § 800.14(b)). A PA is appropriate when the undertaking is complex; the undertaking will adversely affect a significant historic property; the extent of effects is unknown; there is public controversy; and/or the parties involved overwhelmingly prefer it. The goal of this Section 106 consultation is to provide a framework for addressing this undertaking and establish protocols for continuing consultation with SHPO(s), Federally-Recognized Tribal governments, and other stakeholders. The PA would identify Consulting Parties, define applicability, establish review timeframes, stipulate roles and responsibilities of stakeholders, include procedures for consultation with Federally-Recognized Tribes, consider the views of the SHPO/THPO(s) and any other Consulting Parties, afford for public participation, develop programmatic allowances to exempt certain actions from Section 106 review, outline a standard review process, determine an appropriate level of field investigation to identify and evaluate historic and determine the potential to affect historic properties and/or sites of religious and cultural significance, streamline the assessment and resolution of adverse effects to historic properties through avoidance, minimization, and programmatic treatment approaches for mitigation, establish reporting frequency and schedule, provide provisions for post-review unexpected discoveries and unmarked burials, and incorporate the procedures for amendments, duration, termination, dispute resolution, and implementation. The PA would then govern CEMVN’s subsequent NHPA compliance efforts. Following the execution of a PA, the Chief of Engineers may then proceed with making a final decision on the project and issuing a Finding of No Significant Impact (FONSI) in compliance with NHPA and NEPA.

3.2.1.9 Aesthetics

The majority of the study area is within the ARB, which constitutes a mosaic of forest, pine plantations, pasture, and cropland. The primary land-use in the area is agriculture. The Amite River flows South from the Mississippi Valley Loess Plains Ecoregion and into the Mississippi Alluvial Ecoregion. The dominant natural vegetation in the northeast consists of upland forests dominated by oak, hickory, and both loblolly and shortleaf pine. The dominant natural vegetation in the northwest consists of forests characterized by beech, southern magnolia, and American holly. The dominant natural vegetation in the south consists of inland swamps and ridges (according to the State of Louisiana Eco-Region Map, ref. "Louisiana Speaks" and “USGS Eco-Region Map,” Daigle, J.J., Griffith, G.E. Omernik, J.M., Faulker, P.L., McCulloh, R.P., Handley, L.R., Smith, L.M., and Chapman, S.S., 2006, Ecoregions of Louisiana color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,000,00).”

From an aesthetic perspective, the inland swamps in the south have a fairly dense canopy constituted by bald cypress and water tupelo trees. The majority of the bald cypress are rarely the mature and majestic specimens as they once were due to logging operations in the early 1900s. The heavily shaded swamp understory is composed primarily of red maple

and green ash. The ground is hard bottom. The tranquil swamps are perennially wet and the water is clear. These swamp areas are often difficult to access and are generally viewed into from roadway edges, waterways, and natural ridges. The ridges are small rises in the inland swamp and are typically occupied by Water Oak, Diamond Oak, Sweetgum, Ash, Wax Myrtle, Black Willow, Chinese Tallow, and Privet. The ridges provide a dryer and slightly more accessible setting in contrast to the surrounding darkness and wetness of the inland swamps for hunters, nature observers, bird watchers, and ecologists.

Numerous efforts have been made to protect and promote visual resources within the ARB that are known for their unique culture and natural identity. One of these efforts, made by the Louisiana Department of Culture, Recreation & Tourism, is for marketing scenic byways thru rural landscape and culturally significant communities. There is a Scenic Byway bordering the study area on the south and east, which includes the Great River Road. This is but one segment to an overall scenic byway that stretches on multiple thoroughfares from Canada to the Gulf of Mexico. It is state and federally designated and has an “All American Road” status, making it significant in culture, history, recreation, archeology, aesthetics, and tourism.

In 1970, the Louisiana Legislature created the Louisiana Natural and Scenic Rivers System. The System was developed for the purpose of preserving, protecting, developing, reclaiming, and enhancing the wilderness qualities, scenic beauties, and ecological regimes of certain free-flowing Louisiana streams. These rivers, streams and bayous, and segments thereof, are located throughout the state and offer a unique opportunity for individuals and communities to become involved in the protection, conservation and preservation of two of Louisiana's greatest natural resources: its wilderness and its water. Within the study area, there are four designated Louisiana Natural and Scenic Rivers (RS 56:1857). The Amite River from the Louisiana-Mississippi state line to La. Hwy. 37 in East Feliciana Parish; the Blind River from its origin in St. James Parish to its entrance into Lake Maurepas; the Comite River from the Wilson-Clinton Hwy. in East Feliciana Parish to the entrance of White Bayou in East Baton Rouge Parish; and Bayou Manchac from the Amite River to the Mississippi River is designated as a Louisiana Historic and Scenic River (RS 56:1856).

“The general purpose of the Louisiana Scenic Rivers Act as it applies to the Amite River is to protect this section of river from channel modifications, protect water quality and habitats, and preserve recreational and scenic aspects of this river. Many of the Amite River reaches upstream and downstream of Grangeville have experienced significant mining activity and are neither natural nor scenic.” (ERDC/GSL TR-07-26, 2007, Page 12) Since 2007, LDWF has made efforts to halt in-stream mining and relocate mining sites further off the channel. While not pristine, the river remains natural and scenic in many of those reaches.

3.2.1.10 Recreation

Opportunities for both consumptive and non-consumptive recreational activities in the study area are centered on natural resources. Consumptive recreational activities in the area include hunting and fishing. Non-consumptive recreational activities include hiking,

canoeing, boating, biking, ATV riding, camping, outdoor photography, wildlife observation, and environmental education/interpretation.

The following public recreation areas, both within and near the study area, provide high quality recreational opportunities: Homochitto National Forest, Caston Creek Wildlife Management Area (WMA), Maurepas Swamp WMA, Waddill Outdoor Education Center, and multiple county-wide park and recreation systems. Table 3-4 highlights the extensive network of recreation resources within the study area currently established at the public level.

Table 3.4. Recreational Resources within the Study Area

Public Area	Size (acres)	Parish / County	Managing Agency	Recreation		Boat Launch	Recreational Highlights
				Consumptive	Non-consumptive		
National Forest							
Homochito National Forest	191,846	Amite, Franklin, Lincoln, Wilkinson	United States Department of Agriculture Forest Service	fishing, hunting	Horseback riding, hiking, picnicking, mountain biking, birding, photography, camping, shooting range	Yes	This National Forest is just outside the project area border to the northwest and includes 5.5 mile Bushy Creek Horse Trail, Clear Springs Recreation Area, Okhissa Lake Recreation Area with boat ramps, Woodman Springs Shooting Range
State Wildlife Refuge							
Caston Creek WMA	28,286	Amite, Franklin	Mississippi Department of Wildlife, Fisheries& Parks	Fishing, hunting	Horseback riding, hiking, picnicking, mountain biking, birding, photography, camping	No	This WMA is just outside the project area border to the northwest and within Homochito National Forest. It offers scenic horseback trails as well as various hiking and biking trails for the avid outdoorsmen or the novice adventurer.
Maurepas Swamp WMA	124,567	Ascension, Livingston, St. James, St. John the Baptist	Louisiana Department of Wildlife and Fisheries	fishing, hunting, trapping	Boating, camping, birding, wildlife viewing	No	Bald eagles and osprey nest in and around the WMA. Numerous species of neotropical migrant birds use this coastal forest habitat during fall and spring migrations. Resident birds, including wood ducks, black-bellied whistling ducks, egrets, and herons can be found on the WMA year-round.
Waddill Outdoor Education Center	237	East Baton Rouge	Louisiana Department of Wildlife and Fisheries	fishing,	Nature trails, birding, shooting range, archery range, picnic facilities	No	Accessible via North Flannery Road or by boat from the Comite River. LDWF initiated a Summer Day Camp for children ages 12 to 16 in the summer of 2011. The camp is free and open for 5 days allowing participants to receive official boater and hunter education certifications. The camp also offers a fish identification class, fishing and canoeing, skeet shooting, and other outdoor related activities.
Parish/County Park System							
Ascension Parish Parks	N/A	Ascension	Ascension	N/A	Ballfields, courts, playgrounds, leisure paths, swimming pools, picnic areas	Yes	The parish has 13 parks within the study area in communities including St. Amant, Gonzales, Prairieville, and Geismar

Recreation and Park Commission for the Parish of East Baton Rouge (BREC)	N/A	East Baton Rouge	BREC	N/A	Horseback riding, hiking, picnicking, mountain biking, birding, photography, camping, shooting range	Yes	BREC has more than 180 parks including a unique mix of facilities, which mirror the history and rich natural resources in the region; including a state-of-the-art observatory, a swamp nature center and conservation areas, a performing arts theatre, an equestrian park, an art gallery, an arboretum, an accredited zoo, seven golf courses and an extreme sports park with a 30,000-foot concrete skate park, rock-climbing wall, BMX track, and velodrome.
Livingston Parish Parks	N/A	Livingston	Livingston	N/A	Ball field, courts, pools, leisure paths, picnic areas	No	The parish has parks within the study area in communities including Greenwell Springs, Walker, Parks and Recreation of Denham Springs (PARDS), and Livingston Parks and Recreation (LPR).
St. James Parish Parks	N/A	St. James	St. James Parish Parks and Recreation	N/A	Ball fields, courts, playgrounds, leisure paths, swimming pools	No	The parish has 4 parks within the study area including Gramercy Park, Lutcher Park, Paulina Park, and Romeville Park,
St. John Parish Parks	N/A	St. John the Baptist	St. John the Baptist	N/A	Ball fields, courts, playgrounds, leisure paths, swimming pools, picnic areas	No	The parish has 8 parks within the study area: Ezekiel Jackson, Regala, Belle Pointe, Emily C. Watkins, Greenwood, Cambridge, Stephanie Wilking, and Hwy. 51 Park

According to the United States Department of the Interior National Park Service Land & Water Conservation Fund (L&WCF), 100 recreation projects within the study area have been supported since 1965. Section 6(f)(3) of the L&WCF Act assures that once an area has been funded with L&WCF assistance, it is continually maintained in public recreation use unless National Park Service (NPS) approves substitution property of reasonably equivalent usefulness and location and of at least equal fair market value. Table 3-5 illustrates funding from the L&WCF within the study area.

Table 3-5. L&WCF Grant Funding within the Project Area

Grants	Parish/County	Amount
2	Amite	$73,181.00
1	Wilkinson	$20,000.00
20	Ascension	$1,542,343.00
51	East Baton Rouge	$2,694,127.00
2	Iberville	$349,295.00
19	Livingston	$2,208,956.00
4	St. James	$367,093.00

1	St. John the Baptist	$128,027.00
100	**Total**	**$7,383,022.00**

Source: https://lwcf.tplgis.org/mappast/

3.2.1.11 Environmental Justice

An Environmental Justice (EJ) analysis focuses on the potential for disproportionately high and adverse impacts to minority and low-income populations during the construction and normal operation of the Federal action, in this case, the proposed flood risk-reduction system alternatives: the Non-Structural plan. The EJ assessment identifies environmental and demographic indicators for the project alternatives, using the NHGIS Tool which is a U.S. Census data mapping tool providing similar demographic data as EJSCREEN. Low-income and minority data are the criteria used to identify areas of EJ concern. EJSCREEN and CEQ's Climate and Economic Justice Screening Tool (CEJST) area also used to identify areas of EJ concern.

If an alternative impact is appreciably more severe or greater in magnitude on areas of EJ concern (minority or low-income populations) than the adverse effect suffered by the non-minority or non-low-income populations after taking offsetting benefits into account, then there may be a disproportionate finding. Avoidance or mitigation are then required. The following subsections provide information on the low-income and minority population in Ascension, East Baton Rouge, East Feliciana, Iberville, Livingston, St. Helena, St. James, and St. John the Baptist Parishes in Louisiana and the Mississippi Counties of Amite, Franklin, Lincoln, and Wilkinson.

Methodology

EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income regarding the development, implementation and enforcement of environmental laws, regulations, and policies, with no group bearing a disproportionate burden of environmental harm, and risks. Executive Order (EO) 12898 directs federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Areas of EJ concern are identified to help inform planners as to the location of those areas needing a particular focus and attention when determining the impacts of the federal action, as described in EO 12898. Federal agencies should assess the effects of their projects on communities with Environmental Justice concerns in accordance with EO 12898: Environmental Justice, 1994 and EO 14008, Tackling the Climate Crisis at Home and Abroad, 2021. For USACE, compliance with these Executive Orders is mandatory pursuant to Section 112(b)(1) of WRDA 2020 (Public Law 116-260). ("In the formulation of water development resources projects, the Secretary shall comply with any existing Executive Order regarding environmental justice . . . to address any disproportionate and adverse human health or environmental effects on minority communities, low-income communities, and Indian Tribes."). For purposes of consistency with EO 12898, Federal Actions to

Address Environmental Justice in Minority Populations and Low-Income Populations, the terms “minority populations” and low-income populations” are used in this document.

For a detailed description of the methodology used to identify low-income and minority areas that comprise the areas of EJ concern and the focus of the EJ analysis, refer to the EJ Appendix D-4.

Existing Conditions

Justice40 Initiative

The Council on Environmental Quality (CEQ) developed the Climate and Economic Justice Screening Tool (CEJST) to assist in identifying economically-disadvantaged communities. The CEJST utilizes several burdens that qualify a census tract as disadvantaged. Burden categories in CEJST include housing, health, climate change, energy, legacy pollution, transportation, water/wastewater infrastructure, and workplace development. In order for a tract to be considered disadvantaged, it must be at or above the 90th percentile in one or more burdens and be at or above the 65th percentile for low income. Detailed methodology can be found on the CEJST website.

Out of 146 census tracts in the ART study area, 57 are historically burdened by a CEJST burden category. These identified communities would be impacted disproportionately by inundation events as they may not have the resources to recover from the impacts or be able to properly mitigate prior to the event. Refer to Appendix G, Economic and Social Considerations, Section 7.2.6 for more information on Justice40.

For the EJ assessment, two different geographies are presented and both identify areas of EJ concern, based upon minority and low-income criteria. The first presents data for Parishes and Counties which gives a broad-brush overview of the study area’s minority and low-income demographics. Twelve parishes and counties in Louisiana and Mississippi, respectively comprise the ART study area, including Ascension, East Baton Rouge, East Feliciana, Iberville, Livingston, St. Helena, St. James and St. John the Baptist Parishes in Louisiana and in Mississippi, Amite, Franklin, Lincoln and Wilkinson Counties. Table D4-1 in Appendix D-4 shows the racial composition for the Louisiana parishes and Mississippi counties, respectively in the study area. Seven of the twelve parishes or counties in the study area including East Baton Rouge, East Feliciana, Iberville, St. Helena, St. James and St. John the Baptist Parishes as well as Wilkinson County, MS, meet or exceed the minority thresholds and are identified as EJ areas of concern. The minority threshold for Louisiana is 48.5 percent and for Mississippi is 50 percent.

For more information on minority populations, refer to the EJ Appendix D-4.

Six of the 12 Parishes/Counties in the study area, including Iberville and St. Helena Parishes in Louisiana and Amite, Franklin, Lincoln and Wilkinson Counties in Mississippi exceed the poverty threshold of individuals living below poverty relative to each State’s poverty percentage, 18.8 percent and 19.4 percent respectively (Appendix D-4, Table D4-3). These

six parishes/counties are identified as areas of EJ concern based upon meeting the poverty criteria.

The Parishes and Counties exceeding the minority OR poverty thresholds are identified as areas of EJ concern from a large-scale perspective. In total, 10 of the 12 parishes/counties in the study area meet or exceed the minority OR poverty criteria and are identified as areas of EJ concern.

For more information on low-income populations, refer to Appendix D-4.

However, the second geographic approach provides a more zoomed in geographic scale, at the Census Block Group level, which shows the areas of EJ concern based upon minority and poverty thresholds being exceeded--at this smaller geographic scale. A more zoomed in perspective provides an opportunity to identify impacts from the proposed action to smaller communities. U.S. Census Block Groups are much smaller geographic areas compared to parishes or counties. Census Block Groups are smaller geographic areas made up of Census Blocks (the smallest geographic area for which U.S. Census data is available).

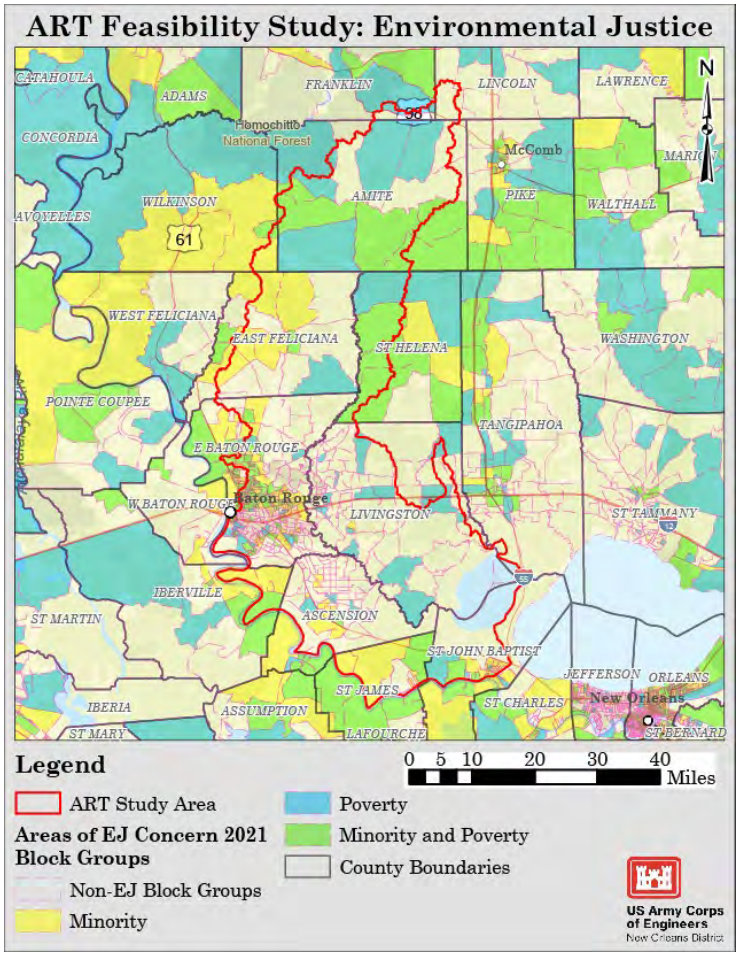

Figure 3-1. Areas of EJ Concern, ART Study Area

Polygon shapefiles shown on the maps in the EJ sections of the main report and attribute data used in the EJ analysis are from Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

A closer look at the study area reveals pockets of neighborhoods with EJ concerns located in Census Block Groups within the parishes and counties. The colored polygons in Figure 3-1 depict the U.S. Census Block Groups in the study area that are identified as areas of EJ concern because they meet or exceed the criteria for minority (yellow), low-income or poverty (blue) or both low-income and minority (green) criteria.

Just under 800,00 people live in the ATR study area, defined as the population in Louisiana and Mississippi block groups within or intersecting the ATR study area. The vast majority are in Louisiana. Just over 380,000 of the ART study area population live in areas of EJ concern.

About 150,000 residents live in EJ areas identified as meeting both minority and poverty criteria, roughly 160,000 are in EJ areas identified as meeting just the minority threshold while the remainder, about 73,000 people, live in EJ areas identified using the poverty criteria.

The Census Block Groups shown on Figure 3-1 represent the areas of EJ concern in the ART study area and are the focus of the EJ impacts assessment which will identify adverse and beneficial effects from the federal action, described in Chapter 5.

EJSCREEN uses environmental and demographic indicators to help identify EJ areas of concern. If an EJ area's exposure to the environmental indicators is above the 80th percentile in the state or the nation and the Federal action exacerbates any of those environmental risks, a potential disproportionate impact may occur. The EJ Environmental Indexes are presented in Table D4-4 in Appendix D-4. Five of the indexes are at or above the 80th percentile as compared to Louisiana or the USA and include Particulate Matter, Ozone, Air Toxics Cancer Risk, Toxic Releases to Air, and Wastewater Discharge

EJ outreach meetings

Meetings took place for the Amite River and Tributaries Feasibility Report Environmental Impact Statement on February 28, 2023, and March 1, 2023 to inform and engage residents about the flood risk reduction measures, which included the Nonstructural Plan.

Outreach efforts focused on civic and faith-based organizations that serve residents in areas of EJ concern, including local churches, libraries, non-profits, and community center. Initial and follow-up calls were made to 29 churches, four community center, three non-profits, and three academic institutions. Of those contacted, six churches, two community centers and two non-profits agreed to disseminate our one-page project summary to the residents they serve. More information on the EJ meetings is provided in Appendix D-4.

3.2.1.12 Socioeconomics

Table 3-6, 3-7, and 3-8 display the population, number of households, and the employment (number of jobs) for each of the parishes and counties for the years 2000, 2010, and 2017 as well as projections for the years 2025 and 2045. The 2000 and 2010 population, number of households, and employment is based on estimates from the 2010 U.S. Census and the projections were developed by Moody's Analytics (ECCA) Forecast, which has projections to the year 2045.

Table 3-6 Historical and Projected Population by Parish/County

Parish/County	2000	2010	2017	2025	2045
Ascension	76,627	107,215	122,948	136,988	161,973
East Baton Rouge	412,852	440,171	446,268	441,495	415,720
East Feliciana	21,360	20,267	19,412	18,140	15,910
Iberville	33,320	33,387	33,027	31,166	27,428
Livingston	91,814	128,026	138,228	150,306	166,260
St. Helena	10,525	11,203	10,363	9,681	8,592
St. James	21,201	22,006	21,790	22,599	23,727
St. John the Baptist	43,248	45,621	44,078	45,713	47,995
Amite	13,599	13,131	12,447	11,992	11,680
Franklin	8,448	8,118	7,765	7,517	7,476
Lincoln	33,166	34,869	34,347	35,400	36,479
Wilkinson	10,312	9,878	8,804	8,335	7,823
Total	776,472	873,893	899,477	919,332	931,063

Sources: 2000, 2010, 2017 from U.S. Census Bureau; 2025, 2045 from Moody's Analytics (ECCA) Forecast

Table 3-7. Projected Households by Parish/County

Parish/County	2000	2010	2017	2025	2045
Ascension	26,995	38,050	44,890	51,815	66,244
East Baton Rouge	156,740	172,440	179,910	184,008	186,082
East Feliciana	6,694	6,996	6,922	6,752	6,411
Iberville	10,697	11,075	11,229	11,137	10,643
Livingston	32,997	46,297	52,184	57,891	69,149
St. Helena	3,890	4,323	4,116	3,995	3,810
St. James	7,002	7,691	7,945	8,561	9,727
St. John the Baptist	14,381	15,875	16,005	17,249	19,602
Amite	5,261	5,349	5,213	5,149	5,252
Franklin	3,205	3,214	3,118	3,138	3,272
Lincoln	12,563	13,313	13,682	14,272	15,446
Wilkinson	3,584	3,452	3,236	3,097	3,065
Total	284,008	328,074	348,450	367,063	398,703

Sources: 2000, 2010 from U.S. Census Bureau; 2017, 2025, 2045 from Moody's Analytics (ECCA) Forecast

Table 3-8. Projected Employment by Parish/County

Parish/County	2000	2010	2017	2025	2045
Ascension	36,431	49,414	59,670	65,803	82,614
East Baton Rouge	197,789	205,112	227,301	222,833	222,810
East Feliciana	7,811	7,427	7,866	7,321	6,820
Iberville	11,745	12,622	13,661	12,892	12,054
Livingston	42,326	56,675	66,010	70,000	82,219
St. Helena	3,830	4,097	4,171	3,868	3,649
St. James	8,102	8,949	8,940	9,257	10,448
St. John the Baptist	18,702	19,252	18,794	19,479	21,968
Amite	5,274	4,385	4,206	4,023	4,082
Franklin	3,234	2,866	2,721	2,650	2,747
Lincoln	13,981	12,940	13,614	13,749	14,784
Wilkinson	3,239	2,968	2,610	2,404	2,343
Total	352,463	386,704	429,564	434,280	466,538

Sources: 2000, 2010 from U.S. Bureau of Labor Statistics; 2017, 2025, 2045 from Moody's Analytics (ECCA) Forecast

Table 3-9 shows the per capita personal income levels for the 12 parishes and counties for the years 2000, 2010, 2017, and 2025, with projections provided by Moody's Analytics Forecast.

Table 3-9. Per Capita Income ($) by Parish/County

Parish/County	2000	2010	2017	2025
Ascension	24,052	39,416	47,628	60,180
East Baton Rouge	27,228	39,651	48,120	60,048
East Feliciana	20,049	33,122	39,908	53,331
Iberville	18,681	32,342	38,960	50,288
Livingston	21,521	32,621	39,883	51,341
St. Helena	16,821	34,136	41,273	55,046
St. James	18,722	38,421	45,219	60,576
St. John the Baptist	20,002	33,894	41,505	57,423
Amite	17,923	25,620	32,225	41,711
Franklin	15,844	27,175	33,133	42,441
Lincoln	20,257	30,468	36,895	44,607
Wilkinson	14,667	24,322	28,745	37,916

Sources: 2000, 2010 from U.S. Census Bureau; 2017, 2025 from Moody's Analytics (ECCA) Forecast

3.2.1.13 Other Social Effects

In accordance with the USACE Institute for Water Resources (IWR) handbook in Applying OSE in Alternatives Analysis (USACE, 2013), the CEMVN identified six themes to describe the social impact in the study area. The six social factors include:

- Social Vulnerability & Resiliency
- Health & Safety
- Economic Vitality
- Social Connectedness
- Participation
- Environmental Justice – Justice 40 Initiative

3.3 FUTURE WITHOUT PROJECT CONDITIONS

NEPA requires that, in analyzing alternatives to a proposed action, a federal agency must consider an alternative of "no action." The future-without-project (FWOP) conditions apply to when the proposed action would not be implemented and the predicted additional environmental gains (e.g. flood risk reduction) would not be achieved. The FWOP conditions would include lower tax revenues as property values decline due to higher risk of damage from flooding events over time. Higher risk of damage from flooding could manifest itself in higher premiums for flood insurance under FEMA's National Flood Insurance Program.

Higher premiums are expected to increase the cost of property ownership and result in correspondingly lower market values.

Without implementation of the proposed action, other federal, state, local, and private restoration efforts may still occur within or near the proposed project area. Section 1.5 of the SSDIFR/EA discusses ongoing programs and potential projects in the study area for floodplain related activities. None of the proposed projects are currently in construction and if they were implemented, would have only localized flood risk reduction within the study area. The projects/programs would have the potential to reduce the number of eligible structures for the nonstructural portion of the TSP.

Section 1.5.1 details current projects in and around study area. The Comite River Diversion, which is currently under construction, will be located approximately 20 river miles upstream of the confluence of the Comite and Amite Rivers (Figure 1-1). The project will divert water from the Comite River west to the Mississippi River, between the cities of Zachary and Baker, providing urban flood damage risk reduction.

Section 4
Formulation of Alternatives

Plan formulation supports the USACE water resources development mission. A systematic and repeatable planning approach is used to ensure that sound decisions are made. The Principles and Guidelines describe the process for Federal water resource studies. It requires formulating alternative plans that contribute to Federal objectives. Alternative plans are a set of one or more management measures functioning together to address one or more planning objectives. A management measure is a feature or activity that can be implemented at a specific geographic site to address one or more planning objectives.

The initial plan formulation strategy was to focus on regional solutions (e.g., dams, detention basin, and diversion) followed by formulation based on economics damage centers (e.g., where the greatest consequences are) minimizing life loss, and/or more local protection. These measures/alternatives were developed based on previous reports and studies, NFS information, stakeholder/public input, new hydrology and hydraulics, geotechnical assessments, and professional judgment. This section also describes the plan formulation process to identify the TSP, which includes development of cost estimates and economic analysis.

4.1 MANAGEMENT MEASURES AND SCREENING

The ARB primarily has flooding from two different sources. The upper basin flooding is caused from headwater flooding from rainfall events. The lower basin flooding is caused by a combination of drainage from headwaters and backwater flooding from tides, wind setup as well as flooding from tropical coastal storm events. Thirty-four nonstructural and structural management measures of a variety of scales were identified for evaluation to reduce the risk of flood damages within the ARB (Table 4-1). The measures were evaluated by the screening process based on the planning objectives, constraints, as well as the opportunities and problems of the study/project area.

Nineteen measures were carried forward to develop the alternative plans. Section 2 of Appendix F provides a description of the evaluation.

Table 4-1. Management Measures

Measure ID	Description
RW-1	Dredging of Outfall @ Amite River
RW-2	Dredging of Lower Amite River
RW-3	Dredging of Upper Amite River
RW-4	Dredging of Bayou Manchac
RW-5	Bridge Restrictions/ Improvements for I-12
RW-6	Amite River Channel Bank Gapping
RW-7	Storage Area at Spanish Lake, Ascension/Iberville Parish
RW-8	Hwy 22 and Port Vincent Bridge Drainage Improvements
RW-9	Upper Amite Bridge Restrictions/ Improvements
RW-10	Bayou Conway Pump to Mississippi River
RW-11	Diversion Gravity Fed (Manchac)
RW-12	Diversion Pump Station (Manchac)
RW-13	Diversion Gravity Fed (Union)
RW-14	Diversion Pump Station (Union) with conveyance channel
RW-15	Diversion Gravity Fed (Romeville)
RW-16	Diversion Pump Station (Romeville) with conveyance channel
RW-17	Modifications to Comite Diversion
RW-18	Dredging of Outfall @ Blind River
RW-19	Dredging of Lower Blind River
RW-20	Dredging of Colyell Creek
RW-21	Amite River Diversion Channel Bank Gapping
RW-22	Dredging of Lake Maurepas
HW-1	0.01 AEP Dry Dams-Upper Amite Tributaries
HW-2	Small Dry Dams on Amite River -Upper Amite
HW-3	Reservoirs along Bayou Manchac
HW-4	Flood Gate at Blind River Hwy 61
HW-5	Dry Retention Ponds- Lower Amite
HW-6	Closures at Tidal Passes
HW-7	University Lakes as Reservoir
UL-1	Large Scale Dam -Upper Amite (i.e. Darlington 0.04 AEP)
NS-1	Flood warning/Monitoring systems
UL-2	Dredging of Amite River Tributaries
NS-2	Nonstructural Improvements for high frequency events
FS-1	Ring Levees around Critical Facilities

Note: Shaded cells are measures that were not carried forward during the screening process.

4.2 DEVELOPMENT OF INITIAL ARRAY OF ALTERNATIVE AND SCREENING

Fifteen alternatives were assembled through the plan formulation process, which include alternatives for no action and nonstructural (Table 4-2). The alternative plans were initially identified using one or more of the 19 management measures that were carried forward after the screening evaluation. Two additional alternatives were identified through public scoping, as discussed in Section 2.4.

The alternatives comprised of the FRM concepts are:

- Remove Water (RW) = removing water more quickly out of the ARB
- Hold Water (HW) = during heavy rainfall events, water would be held back from flowing down the ARB until water levels drop to reduce the flood risk
- Nonstructural (NS) = does not modify or restrict the natural flood
- Upper and Lower Basin (UL) = alternative that likely results in reduced flood risk for the entire ARB.
- Focused Structural (FS) = measures to protect critical facilities.

Most alternatives assessed had very little reduction in flood risk and limited benefits. The less frequent AEP events (25 years and up) cause the majority of flooding issues in the ARB. The rainfall events, combined with a steep hydraulic gradient from the headlands of the basin to the flat middle and lower basins (Figure 4-1), provide for a significant backwater effect at the lower end of the system at Lake Maurepas. Once the water accumulates and backs up, it can no longer exit the basin and the basin begins to fill. This unique hydrology was evaluated with numerous measures and alternatives that resulted in primarily shifting water from one place to another within the damage areas while not reducing the backwater effect and thus not allowing water to drain from the basin. In essence, other alternatives could not get to the core of the issues because they were not removing water from the hydraulic budget. Because water backs up into the watershed, water surface elevations did not lower in specific areas or overall. This, in turn, did not allow for significant lowering of water surface elevation in damage areas. The parishes in the study area have a combined population of about 900,000 with more than half of the population living in East Baton Rouge Parish. The study area has over 260,000 structures and of those, about 80 percent are in the central portion of the ARB, north of Bayou Manchac. Many of the alternatives, such as channel improvements and diversions, were located where there were not many structures, so there were limited benefits. The remaining alternatives that were not screened, were those that provided storage of water to attenuate flooding downstream in heavily developed areas. Those alternatives are the focused array of alternatives.

In compliance with the Water Resources Development Act of 2016 (WRDA, 2016) Section 1184, engineering with nature was considered. Alternatives 14 and 15 are nature-based features; however, they were screened due to limited flood risk reduction benefits as discussed in Appendix F.

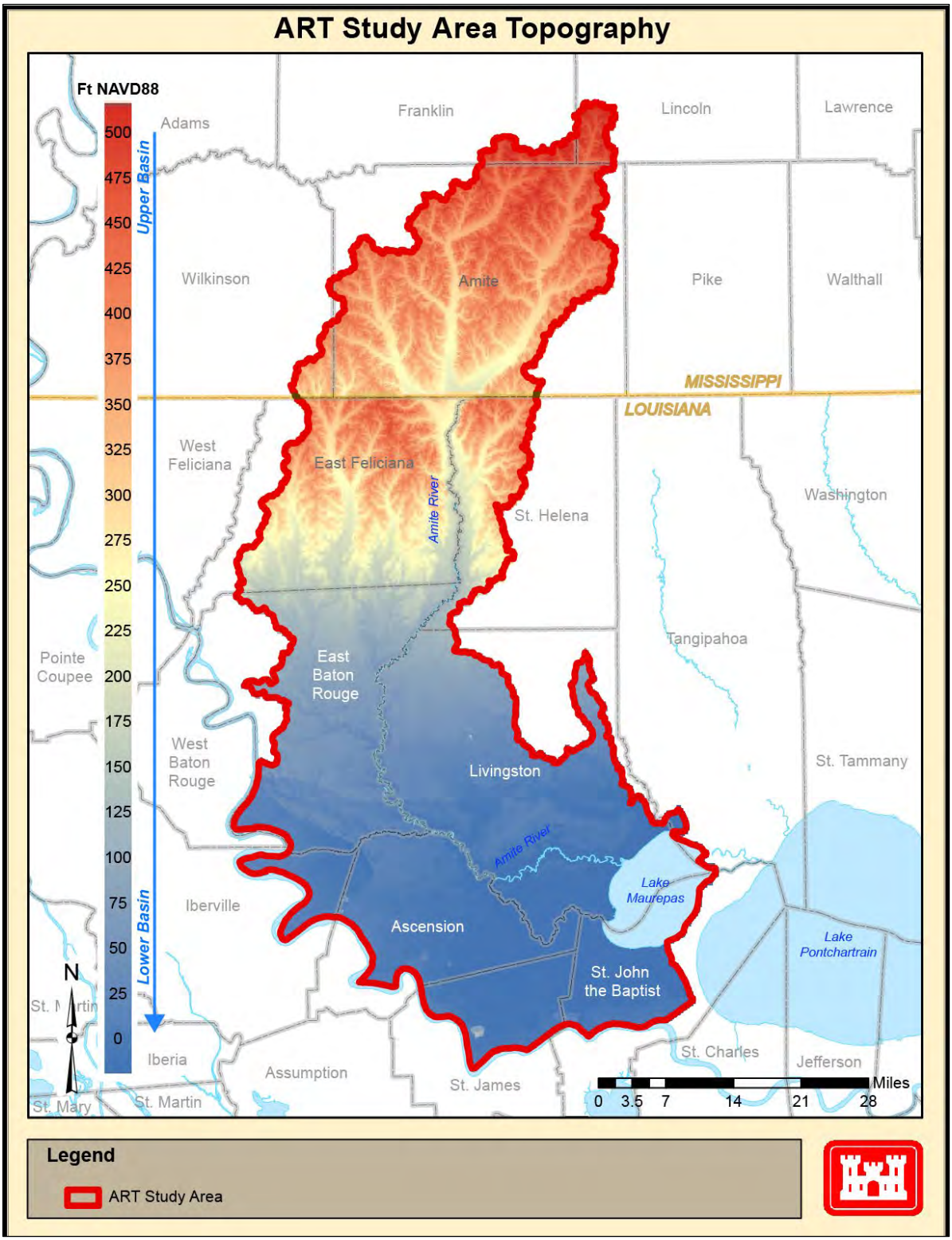

Figure 4-1. ARB Topographic Digital Elevation Model (Source: Louisiana Oil Spill Coordinators Office 2001)

Table 4-2. Alternatives

Alt ID	Measures Included	Alternative Description
Alt 1	No Action	No action would be taken under this plan. Damages would continue into the future.
Alt 2	RW-1+RW-2	Dredging of the Amite River outfall (RW-1) and in the lower reaches of the Amite River (RW-2)
Alt 3	RW-6	Lower Amite River Channel Bank Gapping (RW-6)
Alt 4	RW-8	Hwy 22 and Port Vincent Bridge drainage improvements (RW-8)
Alt 5	HW-3+ RW-4	Dredging (RW-4) and storage along Bayou Manchac in multiple small reservoirs (HW-3)
Alt 6	RW-7+NS-2+FS-1	Flood gate at Airline Hwy, Pump to MS River, open flood gates at Turtle and Alligator Bayous (RW-7) with the addition of nonstructural measures (NS-2) and ring levees for residential communities and critical infrastructure (FS-1)
Alt 7	RW-5+RW-9	Reduction of flow restrictions from bridges at I-12 (RW-5) and above I-12 (RW-9)
Alt 8	RW-3	Dredging of the Upper and Central Amite Basin, above I-12 (RW-3)
Alt 9	HW-7	University Lakes as reservoirs (HW-7)
Alt 10	HW-1	0.01 AEP Dry Dams along tributaries (HW-1)
Alt 11	HW-2	Small dry dams on the Amite River (HW-2)
Alt 12	UL-1	Large scale 0.04 AEP dam (UL-1) (wet or dry)
Alt 13	NS-1+ NS-2	Nonstructural (NS-1 and NS-2) (0.04 and .02 AEP floodplains)
Alt 14	None	Conversion of sand and gravel mines in the Amite Riverine to bottomland hardwood forest and swamp forest
Alt 15	None	Restoration of River Meanders

Note: Shaded cells are alternatives that were not carried forward during the screening process.

4.3 FOCUSED ARRAY OF ALTERNATIVES

The focused array of alternatives, which is the same alternatives as previously identified in the final array in the publicly released 2019 DIFR/EIS, are presented in Table 4-3. Descriptions of the alternatives are presented in the Plan Formulation Appendix F and designs are presented in Engineering Appendix B.

Table 4-3. Focused Array of Alternatives

Alt ID	Management Measures	Alternative Description
Alt 1	No Action	No action would be taken under this plan. Damages would continue into the future.
Alt 10	HW-1	0.01 AEP Dry Dams along tributaries (HW-1)
Alt 12	UL-1	Large scale 0.04 AEP dam (UL-1) (wet and dry)
Alt 13	NS-1+ NS-2	Nonstructural (NS-1 and NS-2) (0.04 and .02 AEP floodplains)

Three alternatives were screened due to negative net benefits: the nonstructural plan for a 0.02 AEP floodplain, large scale 0.04 AEP wet Darlington Dam and the three 0.01 AEP dry dams on the Darlington, Lilley, and Bluff Creeks (Appendix F). The remaining alternatives were, Alternative 10 for an 0.01 AEP dry dam on Sandy Creek, Alternative 12 .04 AEP dry Darlington Dam and Alternative 13 nonstructural for 0.4 AEP. The alternative carried forward and chosen to be the TSP based on the 2019 economic evaluation was Alternative 12, an 0.04 AEP dry Darlington Dam since it had the highest net economic benefits.

2019 TSP Public, Policy and Technical Reviews and Additional Detailed Evaluation

In the TSP of the publicly released 2019 DIFR/EIS, a $2.3 billion dry dam and nonstructural measures to address residual risk was identified. This plan, while preliminarily determined to be feasible, revealed technical and policy concerns that were raised during its public, policy and technical reviews.

Per ER 1105-2-100, acceptability is the workability and viability of the alternative plan with respect to acceptance by Federal and non-Federal entities and the public and compatibility with existing laws, regulations, and public policies. Two primary dimensions to acceptability are implementability and satisfaction. Implementability means that the alternative is feasible from technical, environmental, economic, financial, political, legal, institutional, and social perspectives. If it is not feasible due to any of these factors, then it cannot be implemented, and therefore is not acceptable. An infeasible plan should not be carried forward for further consideration. However, just because a plan is not the preferred plan of a NFS does not make it infeasible or unacceptable ipso facto. The non-Federal partner's willingness or unwillingness to sign a Project Cooperation Agreement should not be the test of whether a plan is acceptable or not. The second dimension to acceptability is the satisfaction that a particular plan brings to government entities and the public. Obviously, the extent to which a plan is welcome or satisfactory is a qualitative judgement. Nevertheless, discussions as to the degree of support (or lack thereof) enjoyed by particular alternatives from a community, state Department of Natural Resources, Ducks Unlimited, or other national or regional organizations, for example, are additional pieces of information that can help planners evaluate whether to carry forward or screen out alternative plans.

4.3.1.1 Implementability

Implementability means that the alternative is feasible from technical, environmental, economic, financial, political, legal, institutional, and social perspectives. If it is not feasible due to any of these factors, then it cannot be implemented, and therefore is not acceptable. The level of the dam design, due in part to a lack of soil data, was insufficient to ensure constructability. Constructing the dam would introduce significant incremental risk to the communities downstream. A semi quantitative risk analysis was not conducted to identify how severe the incremental risk would be.

For a dam to be effective to reduce flood risk, it needs to be located in the upper Amite River watershed, an area where sand and gravel mining is extensive. There is a high likelihood that there would be presence of these high porosity soils throughout the upper Amite River area which would result in weaker soil strengths that require a much larger dam base and

section. Without the increased level of design evaluation, the available information regarding the embankment (settlement, seepage, abutments) and structures (spillway and controlled outlet) were insufficient to inform the dam safety process and constructability. In consideration of the technical and policy concerns raised during public, policy and technical review and in accordance with USACE policies ER 1110-2-1302 Civil Works Cost estimating, the overall contingency for dam increased from 30 percent used for the 2019 DIFR-EIS to be around 110-130 percent.. This level of increase in cost contingency would also be applied to the other dam alternative (Alternative 10) of the 0.01 AEP dry dam on Sandy Creek.

As a result, a USACE policy compliant, technically implementable, and constructable dam design and cost, including addressing incremental life risk, would likely exceed the benefits resulting in no federal interest. Because of the previously outlined social impacts and acceptability, the cost will not be reevaluated. The best available Geotech data was used to screen the dam from a technical standpoint and economic standpoint.

4.3.1.2 Social Impacts and Acceptability

Again, the two components of acceptability are implementability and satisfaction. In light of the acceptability policy criteria outlined previously, there are substantial social impacts that would have resulted from the dam and more specifically the unsupportable EJ impacts that would occur. In February 2021, the Governor of Louisiana expressed concerns regarding the potential impacts to EJ communities within the footprint of the Darlington Dry Dam. EJ is an institutionally important factor consistent with Executive Order 12898 of 1994 (EO. 12898) and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations and to those populations challenged with environmental hazards. The area where the Darlington Dam would be located is identified as an area of EJ concern based upon EPA's EJSCREEN 2020 data for minority and low-income residents and based upon two environmental indicators. There is the potential for high, adverse, disproportionate, direct impacts to historically disadvantaged communities from construction of the Darlington Dam. A disproportionately high and adverse effect means the adverse impact is appreciably more severe or greater in magnitude on minority or low-income populations than the adverse effect suffered by the non-minority or non-low-income populations after considering offsetting benefits. The high adverse impact is the relocation of households that currently are within the footprint of the proposed dam. The benefits of the dam would be flood risk reduction. A vast majority of structures benefiting (damages prevented) are located well south of the dam. The area of the dam footprint is feeling the high burden of the project (relocations) while only receiving a small share of the flood risk reduction benefits. The community would likely relocate to housing in an area outside of a floodplain. All structures within the footprint of the proposed dam would have been acquired. This concern was critical to the Governor and his concerns were expressed to the CEMVN Commander in a letter.

Additionally, there was significant public dispute as to the nature or effects of the dam project (See Appendix D-4). East Feliciana and St. Helena Parishes, Louisiana, and Amite

County, Mississippi, have passed public resolutions against USACE construction of the dam due to concerns about community impacts to the parishes. Finally, there is significant public dispute as to the economic or environmental costs or benefits of the dam project. St. Helena and East Feliciana Parishes also have concerns regarding the loss of tax base due to large land acquisitions.

The misalignment between the Darlington Dam and USACE EJ policies and initiatives along with the lack of support and satisfaction from both state and local governments and a sector of the public gives rise to the dam alternative not being acceptable. Based on acceptability criteria, the Darlington Dam alternative is screened as an alternative.

4.3.1.3 Conclusion

Based on the concerns and available information the Dry Dam alternative does not meet USACE tolerable risk guidelines due to economic risk/cost effectiveness, potential societal life risk, and environmental acceptability. For these reasons the Dry Dam alternative (including Alternative 10: Sandy Creek Dry Dam) has been removed from further consideration consistent with USACE policy of acceptability and implementability in accordance with ER 1105-2-100.

4.4 FINAL ARRAY OF ALTERNATIVES PLAN DEVELOPMENT

With removal of the Dry Dam alternative from further consideration, the next highest NED alternative and likely the only economically justified one is the 0.04 AEP nonstructural plan. To further assess the 0.04 AEP nonstructural only plan, three plans were developed as well as revisions to existing conditions to account for projects that alter the hydrology as described in Section 1.5 of the SSDIFR/EA and H&H models for inclusion of residual risk from storm surge downstream boundary conditions (See Appendix H). The first developed plan identified was the Nonstructural NED Plan using a new USACE method of aggregation and an additional two alternatives that increased OSE benefits for SV areas. Plan 1 is the no action alternative.

All nonstructural plans employed the USACE “logical aggregation method” which according to USACE Planning Bulletin 2019-03, nonstructural analyses are to be conducted using the method. Rather than the individual structure, selected groups of structures known as “aggregates” are the unit of analysis and each such aggregate is a separable element that must be incrementally justified. Aggregates were arranged based on several factors (See Appendix G: Economic and Social Consideration). Since the study area is subject to riverine, rainfall, and residual flood damages associated with hurricanes and coastal storm flood events, aggregates were primarily grouped according to the source (type of flood event) of the flooding. Using this method, 57 floodplain aggregates (groups of structures) were identified. An assessment of all structures located in the 0.1, 0.04, and 0.2 AEP floodplains was performed. The net benefits of each aggregate were analyzed based on the damages they would incur at the 0.1, 0.04, and 0.2 AEP. For evaluation purposes, the cost of raising and flood proofing was used to determine the cost of the nonstructural plans.

Acquisition and buyouts were not carried forward to the final array for assessment of nonstructural plans using the USACE logical aggregation method. The USACE team completed an economic analysis to assess the cost of acquisition and relocation of structures based on the eligible structures in Plan 4. The estimate of the cost of acquiring structures was computed once model execution was completed. Acquisition costs are based on the cost of acquiring the parcel of land, the structure(s) built on the land, an architectural survey, and miscellaneous costs associated with the acquisition process. The depreciated replacement value of the structure (excluding any contents) was used to represent the cost of the structure, which was previously described as being sourced from RS Means square foot cost data. The acquisition cost was the cost of performing an architectural survey, which is associated with cultural resources concerns. Finally, the cost of demolition, deed changes, legal fees, and re-grading the surface were estimated and included as miscellaneous costs. These miscellaneous costs associated with acquisition were sourced from the 2010 USACE Cedar Rapids, Iowa Feasibility Report. The prices derived from the 2010 report were price indexed to 2023 price levels. Acquisition costs by structure were summed to yield an estimate of total structure acquisition cost.

Relocation costs were based on the cost of relocating a tenant residential occupant, as required per Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (URA), that has been removed from the acquired parcel. Relocation costs include purchasing a suitably located piece of property commensurate with the acquired parcel and the costs associated with the URA. Costs associated with URA include assisting the occupant with moving costs and incidentals for residential structures and moving costs, searching expenses, and re-establishing costs for non-residential structures. The URA costs amount to $53,800 per residential structure and $269,000 per non-residential structure. Relocation costs by structure were summed to yield an estimate of total structure relocation cost. The total acquisition and relocation costs were added together and applied on a per structure basis to estimate a cost of acquisition and relocation. The acquisition and relocation first costs is $2,216,403,800 versus the elevation and floodproofing measures of $1,657,970,000.

Additionally, since the interior of the study area is most often receiving damages resulting from widespread, low-level flooding; no individual reaches were identified during the logical aggregation method for relocation and buyouts.

Plan 2: Nonstructural NED Plan Identification

The initial Nonstructural NED plan was identified to be the plan strictly for the study purpose of rainfall flood risk (See Appendix G). When adding an increment of residual risk for storm surge, the HEC-FDA economic model uses aggregations based on the rainfall WSE only and calculates the flood damages based on the predominate condition since the relative WSE at a given probability changes, the expected annual damage changes (Table 4-4 and Figure 4-2). The predominant condition WSE takes the higher of the WSEs generated by two hydrologic boundary condition scenarios: one condition accounts for basin-wide extreme rainfall events with normal highwater downstream boundary condition, and a secondary condition that has negligible basin rainfall with storm surge downstream boundary

conditions. The details of these models will be available in the H&H Appendix H. Eight flooding events were used (0.5, 0.2, 0.1, 0.04, and 0.02, 0.01 and 0.002) for the HEC-FDA analysis the assignment of stages relative to the probabilities change.

Table 4-4. Nonstructural Aggregation Plans

	Rainfall Risk Only Plan (Average Elevation of 4 feet)	**Nonstructural NED PLAN: Rainfall Risk and inclusion of benefits from reduced damages from residual risk of coastal storm surge (Average Elevation of 6 feet)**
Structures Eligible	1,777	3,177

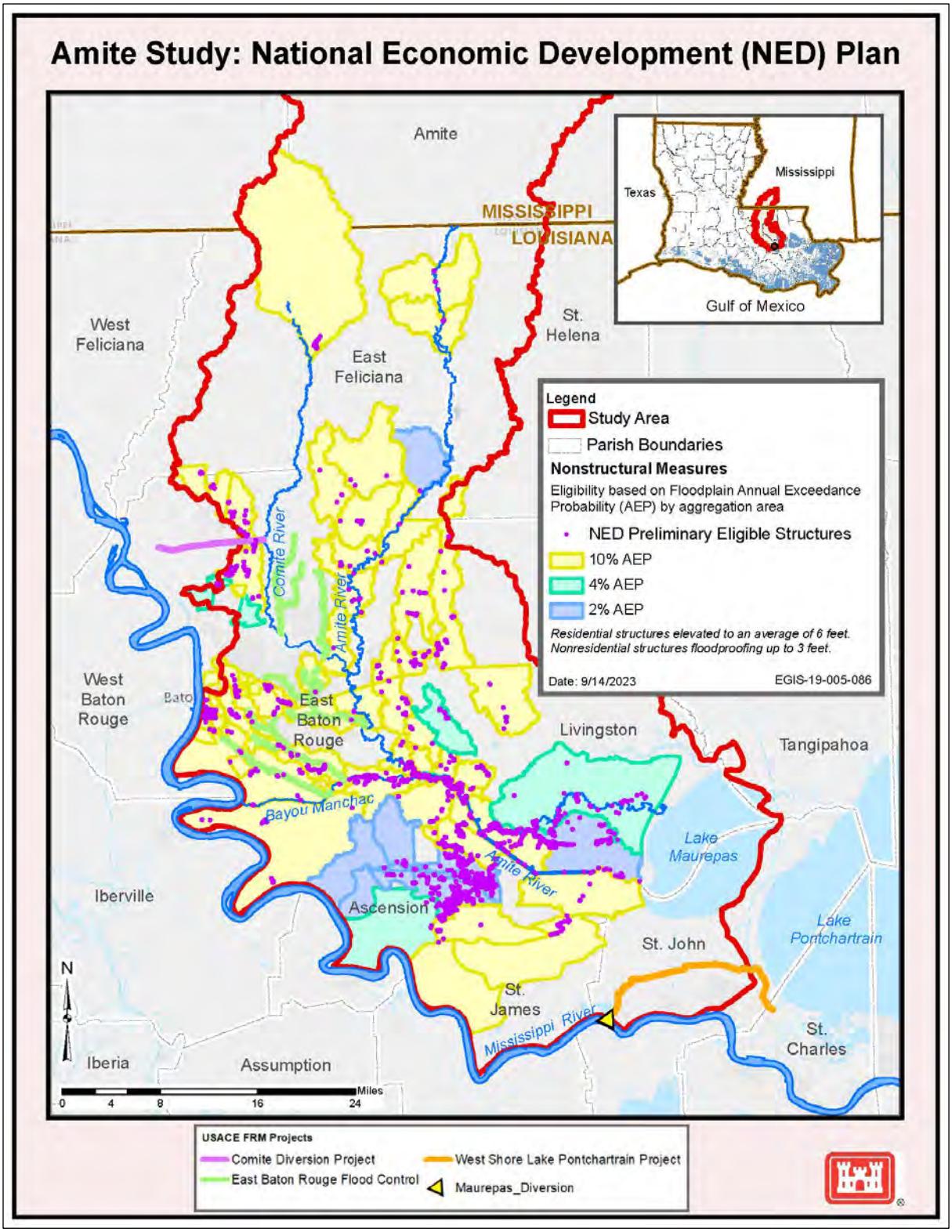

Figure 4-2. Nonstructural NED Plan

Total Benefits Plan Development

Two additional plans were identified to increase benefits in the OSE account, which is one of the four account USACE uses to identify benefits of plans in accordance with the USACE 2014 PRG. This comprehensive assessment of the four accounts is used to identify the Total Benefits Plan. Expanding the NED plan to include SV areas, increased the OSE benefits account.

The primary database used to represent social vulnerability data was the CDC's Social Vulnerability Index (CDC-SVI). CDC-SVI data included representation for socioeconomic status, age, disabilities, language, minority status, housing, and transportation (Figure 4-3). Areas in the 90th percentile or higher were flagged as having high social vulnerability. The aggregates used to identify the NED Plan were further subdivided into 19 SV sub aggregates allowing the team to evaluate impacts and formulate alternatives specific to areas experiencing high social vulnerability. Eligibility for incremental total benefits plans relied on a comparison of the benefits at the 10 percent, 5 percent, and 2 percent AEP floodplain aggregations and parametric construction costs at the sub aggregate level. Plan 3 and Plan 4 include all structures eligible within Plan 2 and they expand eligibility to include additional structures in areas experiencing social vulnerability. See Appendix G: Economic and Social Consideration for additional information regarding the process used.

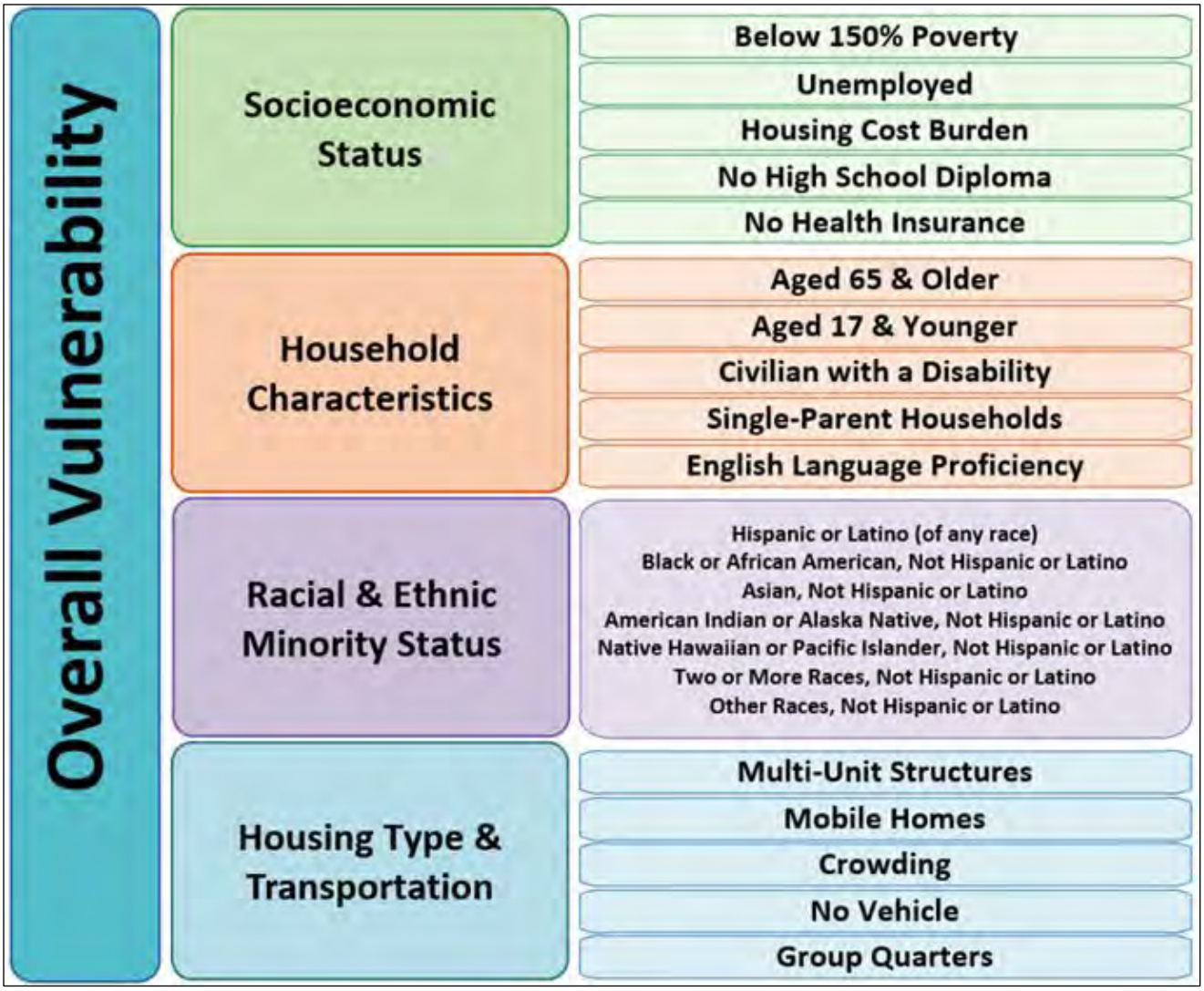

Figure 4-3. CDC's Social Vulnerability Index

Plan 3: Nonstructural NED Plan + OSE Increment 1

Plan 3 expanded eligibility to include all structures within SV sub aggregates that had positive net benefits when to compared to the parametric constructions.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Plan 4 expanded eligibility to include all structures within SV sub aggregates at the next highest floodplain aggregation even if the sub aggregation did not have positive net benefits (Figure 4-4).

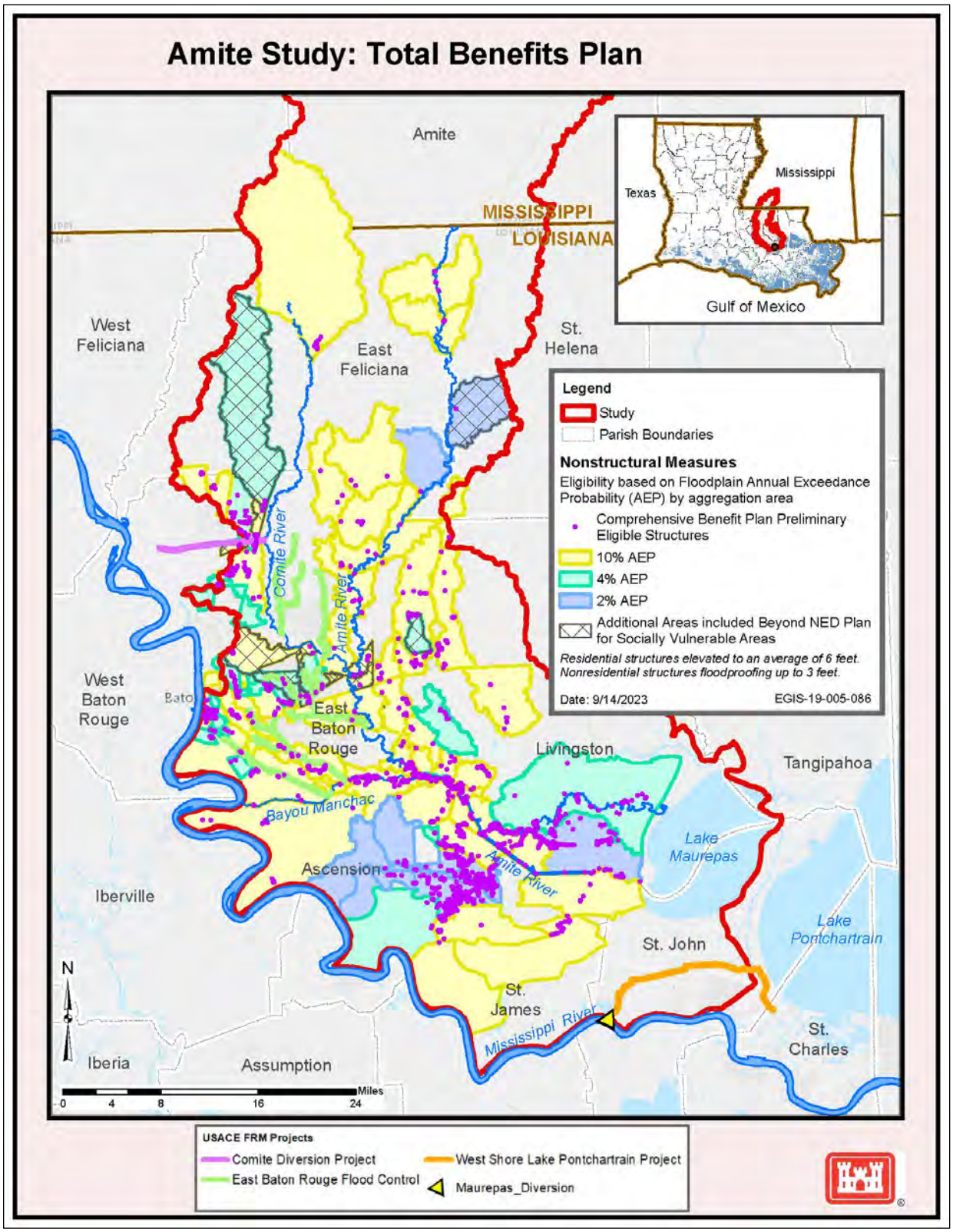

Figure 4-4. Plan 4: Nonstructural Plan + OSE Increment 2

Section 5
Evaluate Alternative Plans

5.1 ENVIRONMENTAL CONSEQUENCES

In accordance with NEPA, this chapter includes the scientific and analytic basis for comparison of the considered alternatives identified in Section 4 – Formulation of Alternatives. The discussion includes the alternatives' impacts on those resources identified in Section 3, Inventory and Forecast Conditions, including direct, indirect, and cumulative effects; the relationship between short-term uses and long-term productivity; and any irreversible or irretrievable commitments of resources involved should one of the alternatives be implemented.

The extent and significance of environmental impacts to the TSP include risk and uncertainty that will be further considered during feasibility-level design and analysis. Risk and uncertainties on the TSP's impacts for wetland resources (Section 5.3.1.9), Cultural and Historic Resources (Section 5.3.1.9), Environmental Justice (Section 5.3.1.12), and Socioeconomics (Section 5.3.1.13) are addressed in the SSDIFR/EA .

5.2 CUMULATIVE EFFECTS ANALYSIS

The Council on Environmental Quality (CEQ) Regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR §1508.7).

Cumulative effects are not caused by a single project but include the effects of a particular project in conjunction with other projects (past, present and future) on the particular resource. Cumulative effects are studied to enable the public, decision-makers and project proponents to consider the "big picture" effects of a given project on the community and the environment. The role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional and local significance (CEQ, 1997).

The CEQ issued a manual entitled "Cumulative Effects under the National Environmental Policy Act" (CEQ, 1997). This manual presents an 11-step procedure for addressing cumulative impact analysis. The cumulative effects analysis concentrates on whether the actions proposed for this study, combined with the impacts of other projects, would result in a significant cumulative impact, and if so, whether this study's contribution to this impact would be cumulatively considerable.

5.3 SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY EACH ALTERNATIVE

This chapter describes the environmental consequences associated with implementing the final array of alternatives described in Section 4.

This chapter compares the effects of the proposed final array of alternative plans:

- Plan 1: No Action Alternative
- Plan 2: Nonstructural NED Plan
- Plan 3: Nonstructural NED Plan + OSE Increment 1
- Plan 4: Nonstructural NED Plan + OSE Increment 2

5.3.1 Relevant Resources Affected

This section describes the direct, indirect, and cumulative effects of the No Action Alternative, the Nonstructural NED Plan, and the OSE Plans.

Initially, a wide selection of resources were considered and several were determined not to be affected by the project. This was due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Wetlands, Uplands, aquatic resources/fisheries, prime and unique farmland, and essential fish habitat would not be affected by the proposed project. Table 5-1 provides a list of resources in the project area and anticipated impact(s) from implementation of the proposed action.

Table 5-1. Relevant Resources Impacts in and near the Project Area

Relevant Resource	Negative Impact	Positive Impact	Not Impacted
Wetland Resources	Temporary and permanent for No Action		Nonstructural TSP
Upland Resources	Temporary and permanent No Action		Nonstructural TSP
Aquatic Resources/Fisheries			No Action Alternative and nonstructural
Wildlife			No Action Alternative and Nonstructural TSP
Threatened, Endangered, and Protected Species			No Action Alternative and Nonstructural TSP
Geology, Soils, and Prime and Unique Farmland			No Action Alternative and Nonstructural TSP
Water Quality			No Action Alternative and Nonstructural TSP
Air Quality			None for No Action Alternative and Nonstructural TSP
Cultural	Potential Adverse Effect for Nonstructural	Potential positive indirect impacts towards preserving at-risk unique architectural and design characteristics that the communities and historic districts in the 0.04 AEP floodplain strive to maintain and enhance.	No Action Alternative
Recreation		Potential	No Action Alternative and Nonstructural TSP
Aesthetics		potential for Nonstructural	No Action Alternative and Nonstructural TSP
Socioeconomic Resources		Potential for Nonstructural with Acquisitions	
Environmental Justice	Adverse Impact for No Action;	Permanent for reduced flood risk for structural and nonstructural measures	
HTRW			No Action Alternativeand Nonstructural TSP

While there may be marginal effects to land-use from each of the alternatives, no major changes to land-use are expected from any of the projects being considered. Wetland and Upland resources would potentially have temporary negative impacts due to SLR, continued habitat degradation and anthropogenic development.

5.3.1.1 Wildlife

Impacts of Considered Alternatives

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: Without implementation of the proposed action (TSP), habitat loss would likely continue at the present rate, resulting in a reduction of habitat diversity and availability for resident terrestrial wildlife (See Appendix C-1).

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: Elevating structures in the floodplain could potentially provide shelter to wildlife species from predators; however, given the limited number of structures elevated, this impact would be low to negligible in extent.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: Elevating structures in the floodplain could potentially provide shelter to wildlife species from predators; however, given the limited number of structures elevated, this impact would be low to negligible in extent.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: Elevating structures in the floodplain could potentially provide shelter to wildlife species from predators; however, given the limited number of structures elevated, this impact would be low to negligible in extent.

5.3.1.2 Threatened, Endangered, and Protected Species

Impacts of Considered Alternatives

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: With the No Action alternative, no direct impacts to endangered species or their critical habitat would occur. Existing conditions would persist and listed threatened, endangered, or protected species would likely continue to be subject to institutional recognition and further regulations and federal management. Other listed species could also be adversely impacted by the continued habitat loss and degradation, including the inflated heelsplitter mussel.

Table 5-2. Threatened (T), Endangered (E), & Protected (P) Species in Study Area

Scientific name	Common name and status (T, E, or P)	Listing	Found in Study Area	Determination of Effects
Potamilus inflatus	Alabama Heelsplitter Mussel (T)	Federal	Yes	No effect
Acipenser oxyrhynchus desotoi	Atlantic Sturgeon (T)	Federal	Yes	No effect
Trichechus manatus	West Indian Manatee (TT)	Federal	Yes	No effect
Myotis septentrionalis	Northern long-eared bat (E)	Federal	Yes	No effect
Haliaeetus leucocephalus	Bald Eagle (P)	State	Yes	No effect

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: This alternative would not result in impacts to threatened, endangered, and protected species.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: This alternative would not result in impacts to threatened, endangered, and protected species.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: This alternative would not result in impacts to threatened, endangered, and protected species.

5.3.1.6 Geology, Soils and Water Bottoms, and Prime Farmland

Impacts of Considered Alternatives

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: This alternative would not have an effect on prime farmland. Soil and water bottoms could continue to experience both anthropogenic and natural impacts within the ARB, including the sand and gravel operations and erosional forces that alter the river channel.

Cumulatively, the soils and water bottoms would continue to experience periodic shifts during rainfall events.

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: Structures elevated or purchased in the floodplain could contain but not affect prime farmland, soils, or water bottoms.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: Structures elevated or purchased in the floodplain could contain but not affect prime farmland, soils, or water bottoms.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: Structures elevated or purchased in the floodplain could contain but not affect prime farmland, soils, or water bottoms.

5.3.1.7 Water Quality

Impacts of Considered Alternatives

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: Without implementation of the proposed action, no direct impacts to water quality would occur. Indirect impacts as a result of not implementing the proposed action would be the continued degradation of water quality as the area continues to erode as a result of flood events and human development in the ARB.

Plane 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: This alternative would not directly impact water quality. When combined with other past, present, and reasonably foreseeable future projects in the ARB, this alternative would not impact water quality.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: This alternative would not directly impact water quality. When combined with other past, present, and reasonably foreseeable future projects in the ARB, this alternative would not impact water quality.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: This alternative would not directly impact water quality. When combined with other past, present, and reasonably foreseeable future projects in the ARB, this alternative would not impact water quality.

Direct, Indirect, and Cumulative Impacts: This alternative would not directly impact water quality. When combined with other past, present, and reasonably foreseeable future projects in the ARB, this alternative would not impact water quality.

5.3.1.9 Cultural and Historic Resources

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative impacts: Impacts to cultural and historic resources within the study area have resulted from both natural processes, (e.g., flooding and erosion) and human activities (e.g., development, commercial gravel mining, recreational use, and vandalism). Riverine environments are dynamic and impacts to cultural and historic resources would continue at the current trend because of natural processes and anthropogenic modifications to the landscape. The No Action Alternative would have no immediate impact on archaeological resources. Artificial and natural processes would likely continue to erode and deteriorate known archaeological resources, while exposing previously undocumented sites and/or artifacts. The No Action Alternative would also have no immediate impact on historic buildings, structures, and other infrastructure. However, the built-environment would not remain static over time and would continue to evolve. Adverse impacts that are expected to occur to some built-environment resources include non-compatible modifications, deterioration due to neglect and abandonment, and damage from flooding or other natural disasters. Other historic buildings, structures, and infrastructure will likely be maintained and/or restored in manners consistent with the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties (48 FR 44716-42; September 29, 1983). Further, the number of potentially NRHP-eligible built-environment properties will increase over time as resources continue to age and gather historical significance. No change would occur in the management condition of cultural and historic resources; Federal actions or undertakings would continue to be reviewed in accordance with Section 106 of the NHPA.

Plan 2: Nonstructural NED Plan

Direct:

A review of Plan 2 indicates that the considered action includes ground disturbing activities (e.g., access, staging, foundation work and hardening, demolition, site cleanup, and other associated site work) within the project footprint that may directly affect archeological resources in a manner that may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Plan 2 also has potential for significant direct impacts to historic built-environment resources (e.g., residential, commercial, and public structures). These structures may possess unique architectural and design characteristics that many property-owners strive to maintain and enhance. The considered action includes direct modifications (i.e., elevation, flood proofing, retrofit) to potential built-environment historic properties that may diminish the integrity of the property's design, materials, and/or workmanship, but also have potential to cause other types of direct effects to the integrity of the property's location, setting, feeling, or association.

USACE anticipates that many potential direct adverse effects to archaeological resources can be avoided or minimized by confining Nonstructural work to substantially within the existing building/structure footprint through work restrictions designed to avoid impacts to archaeological resources developed in consultation with SHPO, Federally-Recognized Tribes,

and other Consulting Parties that will be incorporated into the PA. USACE also anticipates that many potential direct adverse effects to built-environment resources may be avoided or minimized through a "design review" process developed in consultation with SHPO, Federally-Recognized Tribes, and other Consulting Parties that will be included within the PA in which USACE will seek ways to revise the scope of the project to substantially conform to the SOI *Standards*, and/or avoid or minimize adverse effects for NRHP-listed or eligible historic properties and/or properties of religious or cultural significance to Federally-Recognized Tribes, or TCP(s). The Nonstructural treatment selected should whenever possible, utilize design principles and practices that retain or minimize changes to the building's historic features, integrity, and character. Should the proposal have a direct adverse effect on a NRHP-eligible cultural resource that cannot be avoided or minimized, USACE would work toward a resolution of adverse effects with SHPO, Federally-Recognized Tribes, and other Consulting Parties following the procedures negotiated in the PA. Any additional conditions or requirements would be documented at that time.

Indirect:

In addition to individual historic properties where Nonstructural measures are implemented, Plan 2 also has the potential for indirect impacts to known and undocumented built-environment resources in the larger context of the surrounding viewshed that the building(s) occupy, or are adjacent to, through the successive introduction of new visual elements and/or modifications to the viewshed and overall visual landscape of known and previously undocumented (e.g., individual/contributing NRHP-eligible structures, local and NRHP-listed or eligible NRHDs), that may diminish the integrity of these property's location, setting, and feeling. The arrangement of structures within their community represents a distinct pattern of cultural development that should be valued and preserved. The type, scale, location, and pattern of historic properties define the overall character of a neighborhood. A Nonstructural design proposal for a single property, regardless of if the individual structure is historic or not, must also consider its relationship to historic properties within the neighborhood and/or historic district in which it is located. The treatment of an individual property's site features, design, materials, and/or workmanship, can play a critical role in avoiding or minimizing the potentially disruptive indirect visual impacts that Nonstructural measures can have on a surrounding neighborhood, historic district, or other types of built-environment resources.

Although Plan 2 has the potential to indirectly impact multiple historic properties, one of the most significant outcomes of this effort would be to reduce risk to historic structures from future flood events so they maintain their character in relation to other historic buildings within each neighborhood or historic district, thus protecting the architectural qualities of each neighborhood or historic district as a whole. Therefore, Plan 2 may have positive indirect impacts towards preserving at-risk unique architectural and design characteristics that the communities and historic districts in the 0.04 AEP floodplain strive to maintain and enhance.

USACE anticipates that many of the potential indirect adverse effects to built-environment resources will be localized and could be avoided or minimized through the design review process that will be included within the PA (see above). The Nonstructural measures represent a framework in which a range of potential flood risk reduction actions are required to be

considered, each with a unique range of planning considerations and constraints, including neighborhood context. Where possible, by integrating both traditional and innovative Nonstructural design approaches it is still possible to reinforce a historic building's physical relationship to its site, neighboring buildings, the street on which it is located, as well as the neighborhood or historic district it may be located within or adjacent to, in a sensitive manner to produce the best individualized approach for a given historic building, neighborhood, and/or historic district. These approaches can reduce the damaging visual effects of altering historic properties in a manner that maintains or complements their individual character and setting. Appropriate techniques to avoid or minimize potential indirect negative visual effects could include considering ways to revise the scope of the project to substantially conform to the SOI *Standards*; limiting elevation heights; shifting specific project elements away from the historic property to lessen the adverse effect (e.g., buffering); aesthetic camouflaging treatments; and/or use of sympathetic infill panels and landscaping features to visually shield project elements from historic properties within the surrounding viewshed. Potential adverse impacts to NRHP-eligible historic buildings, structures, NRHD(s), or other built environment resources that cannot be avoided or minimized would be mitigated as appropriate following the procedures negotiated in the PA in consultation with SHPO, Federally-Recognized Tribes, and other Consulting Parties, as appropriate. Any additional conditions or requirements would be documented at that time.

Cumulative:

Cumulative impacts to cultural resources would be the additive combination of the direct and indirect impacts of Plan 2 and other Federal, state, local, and private, flood risk projects existing and/or authorized for construction along the Amite River Basin (see: Table 1-1a in the Relevant Prior Reports and Studies Section). Activities associated with this alternate action have the potential to directly and/or indirectly effect existing and previously undocumented cultural resources within the project footprints, surrounding viewsheds, and communities they occur in.

Potential negative impacts of Plan 2 may include direct, indirect, and cumulative effects to properties included in or eligible for inclusion in the NRHP and cultural resources significant at the state, local, and national level and/or of significance to Federally-Recognized Tribes that may be listed or eligible for the NRHP; including archaeological sites, historic structures, local and NRHDs, and other built-environment resources. Conversely, Plan 2 may have long-term positive net impacts to cultural resources within communities in the 0.04 AEP floodplain. USACE acknowledges that the implementation of Plan 2 may result in modifications to historic buildings or other built-environment resources potentially not meeting the SOI *Standards*. However, the overarching goal of this effort is to reduce risk from future flood events within the Amite River Basin, thus; potentially protecting the architectural qualities of communities within the 0.04 AEP floodplain as a whole. Therefore, Plan 2 may also result in net positive cumulative impacts towards preserving nonrenewable at-risk unique architectural and design characteristics that the communities and historic districts strive to maintain and enhance. Otherwise, damage to, or widespread loss of, cultural resources could lead to the loss of connection to place; causing a net loss of cultural diversity within the 0.04 AEP floodplain and its surrounding communities. This is important because the cultural resources within many

portions of the 0.04 AEP floodplain are understudied and/or not duplicated or replaced at other locations. Because most cultural resources are nonrenewable this would constitute a significant cumulative impact.

The assessment of direct, indirect, and cumulative impacts for Plan 2 may require a comprehensive inventory and NRHP evaluation of built-environment resources inclusive of each site where nonstructural measures are proposed in addition to the larger surrounding viewshed that would need to be completed in PED; it is recommended that inventory work for each site should be conducted no more than five (5) years in advance of construction. Potential adverse impacts to archaeological sites, historic buildings, structures, NRHD(s), or other built-environment resources listed or eligible for the NRHP that cannot be avoided or minimized would be mitigated following the procedures negotiated in the PA in consultation with SHPO, Federally-Recognized Tribes, and other Consulting Parties, as appropriate. Any additional conditions or requirements would be documented at that time.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts:

The direct, indirect, and cumulative impacts to cultural resources for the considered action would be proportionally similar to the impacts specified for Plan 2 described above.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts:

The direct, indirect, and cumulative impacts to cultural resources for the considered action would be proportionally similar to the impacts specified for Plan 2 described above.

5.3.1.10 Aesthetics

Plan 1: No Action Alternative

Direct and Indirect Impacts: The harmonious natural landscape combination of rivers and creeks slowly meandering southward is contrasted by unnaturally straight roadways and spoil banks, cutting through the mosaic of forest, pine plantations, pasture, and cropland. Visual resources would continue to evolve from existing conditions as a result of both land use trends and natural processes over the course of time. Waterways would continue to swell to capacity and overflow into nearby areas seasonally. Communities near these waterways would continue to experience high water events seasonally due to stormwater inputs from development adding to, and at times exceeding, the pre-development capacity.

Cumulative Impacts: Cumulative impacts to visual resources would be the additive combination of impacts by this and other Federal, State, local, and private flood risk reduction efforts, including but not limited to the CRD and the EPR Flood Control Project.

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: Elevating and floodproofing homes would not impact viewsheds into any surrounding areas.. In areas where there is public access from a street or roadway, these nonstructural elements would not change the viewshed. Houses being raised are currently present; their elevation would change, but the site is still occupied either way..

Plan 3: Nonstructural NED Plan + OSE Increment 1

The direct, indirect, and cumulative impacts to aesthetics for the considered action would be proportionally similar to the impacts specified for Plan 2 described above.

Plan 4: Nonstructural NED Plan + OSE Increment 2

The direct, indirect, and cumulative impacts to aesthetics resources for the considered action would be proportionally similar to the impacts specified for Plan 2 described above.

5.3.1.11 Recreation

Alternative 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: Without intervention, communities within the study area would continue to be at risk from high water events induced by stormwater inputs. Recreational resources would continue to be influenced by existing conditions as a result of both land use trends and natural processes over the course of time.

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts: The nonstructural features could have no impact to recreational resources, depending on the methods used.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: The nonstructural features could have no impact to recreational resources, depending on the methods used.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: The nonstructural features could have no impact to recreational resources, depending on the methods used.

5.3.1.12 Environmental Justice

Alternative 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: The no action alternative would not provide flood risk reduction to the residents living within the study area. There would be no direct impact on minority and/or low-income population groups under this alternative. However, because this alternative fails to provide flood risk reduction, the actual and perceived risks to minority

and/or low-income population groups under this alternative would be higher than under the alternatives.

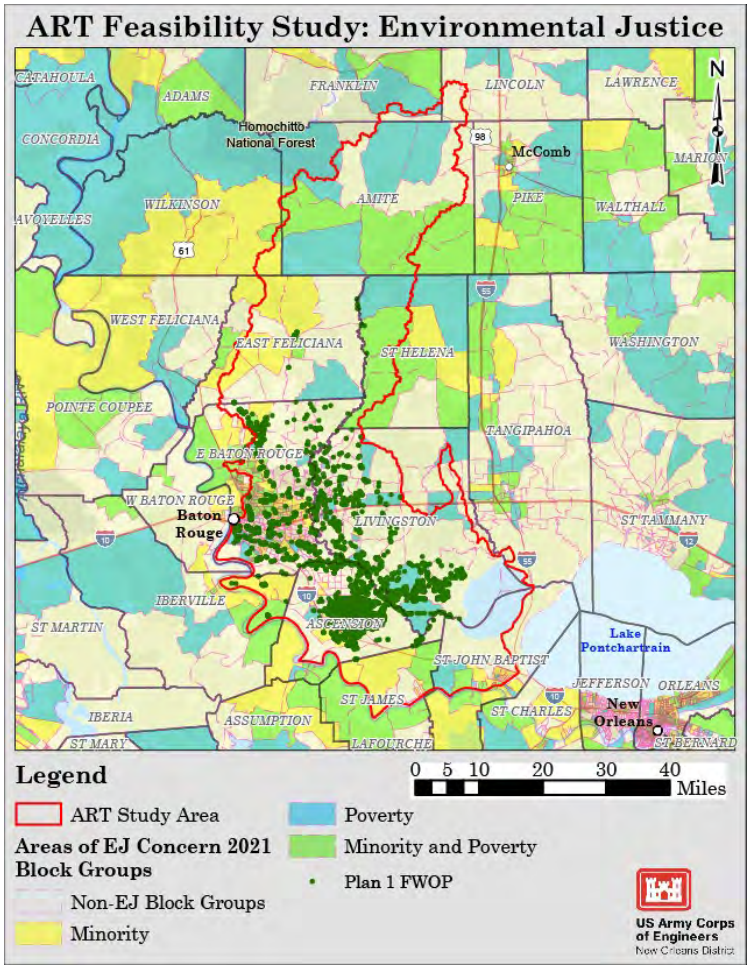

Figure 5-1: Plan 1, Future Without-Project Condition, Structures at Risk for Flooding

Polygon shapefiles shown on the maps in the EJ sections of the main report and attribute data used in the EJ analysis are from Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

Figure 5-1 shows the structures in the ART study area at risk for flooding under the no action plan, and which are in areas of EJ concern. Of the 14,309 structures identified in the future without-project condition that are at risk for flooding, 5,269 are in areas of EJ concern or about 37 percent of structures. In this case, at risk for flooding means there is a risk for flooding at the first-floor elevation of the structure.

Indirect impacts under the no action alternative include a higher potential for permanent displacement of minority and/or low-income population groups as compared to the with-project alternatives as residents relocate to areas with higher levels of flood protection.

Cumulative impacts under the no action alternative include the potential for a steady decline in minority and/or low-income population groups and other groups as residents move to areas with lower flood risks, as well as continued financial and emotional strain placed on these groups as they prepare for and recover from flood events. Other Federal, State, local, and private flood risk reduction efforts, including but not limited to, the CRD and the EBR Flood Control Project, would also influence these populations.

Plan 2: Nonstructural NED Plan

Direct Impacts: The voluntary nonstructural plan involving structure elevation may directly impact EJ communities and these impacts are not disproportionate. All residents, regardless of race and income, will have the choice of elevation. Direct impacts include temporary disruption of use of homes during elevation. At this time, there are 3,117 structures (the vast majority are residential structures) located in the 0.1, 0.04, and 0.2 AEP floodplains and it is uncertain who may participate in the non-structural plan. All structures within these floodplains are in economically justified reaches and would be flood-proofed or elevated; therefore, all residents within the reaches, irrespective of race, ethnicity, or income, would be able to choose to participate in the plan.

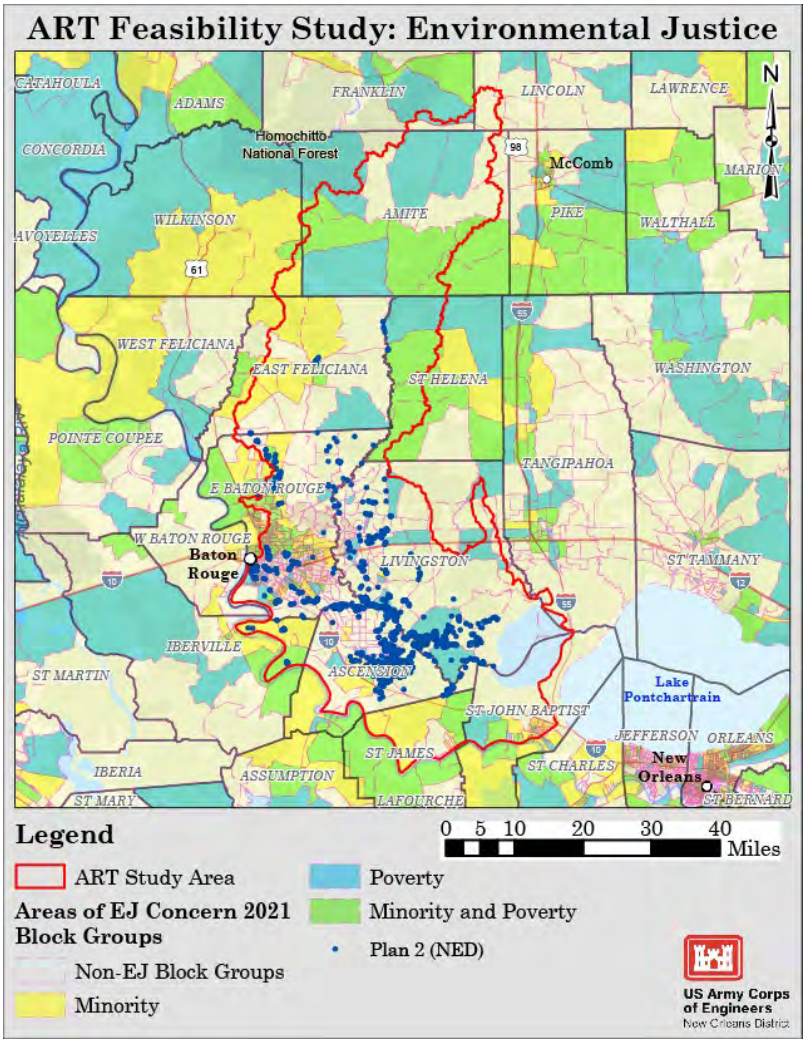

Figure 5-2: Plan 2, NED, Eligible Structures and Areas of EJ Concern

Polygon shapefiles shown on the maps in the EJ sections of the main report and attribute data used in the EJ analysis are from Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

Figure 5-2 shows the location of 3,117 structures eligible for elevation or floodproofing (blue dots). Of the 3,117 structures eligible for home elevation or non-residential floodproofing, 1,163 are in areas of EJ concern or about 37 percent of total eligible structures. Homeowners living in areas of EJ concern would be eligible to participate in the elevation program which is a direct positive benefit to those choosing to participate. The 1,163 eligible structures in areas of EJ concern under Plan 2 represent about 22 percent of the structures in areas of EJ concern that are at risk for flooding under the future without-project condition (1,163/5,269).

The nonstructural measures may provide those choosing home elevation in this low-density area of minority and low-income populations with flood risk reduction. Despite existing base

floor elevations differing among individual structures, elevations would provide the same level of risk reduction benefits per structure at year 2076 (end of the period of analysis). Homeowners would be responsible for costs associated with repairs to ensure a structurally-sound home prior to elevation and would be responsible for temporary relocation costs during elevation. All other costs of elevating structures, including the cost to elevate the structure, would not be borne by any single individual or the community; rather, these costs would be part of the proposed project costs.

Indirect Impacts: The out-of-pocket costs to elevate a structure are the responsibility of the eligible homeowner. These costs could be an adverse impact if the homeowner is living at or below the poverty level. Mitigation strategies to increase participation and to bridge the financial gap to participation are discussed at the end of this section, below, with the heading "Mitigation of Potential Direct Impacts".

Beneficial indirect impacts include reducing flood risk of the residents and businesses that choose to participate in the program and improving the ability to recover much more quickly after a storm event. Other positive social effects and comprehensive benefits are discussed in more detail in Section 1.1.4 of the Economic Appendix.

Cumulative Impacts: Positive cumulative impacts to minority and/or low-income populations associated with providing risk reduction are expected to occur as a result of the lower flood risk in the area under this alternative. Additionally, other Federal, State and local flood risk reduction projects will provide positive cumulative impacts by reducing flood risk to low-income and minority communities. Housing within floodplains that are elevated will have a lower flood risk from storm events. For those living in structures in floodplains that choose not to elevate, flood risk from future storm events will continue.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts:

Plan 3 beneficial impacts are similar to Plan 2 and include flood risk reduction but to 3,189 structures or 72 more structures than are in the NED Plan 1. The additional 72 structures included in Plan 3 are all residential located in SV areas as defined by the CDC.

About 1,200 structures are in areas of EJ concern or about 38 percent of the eligible structures that comprise Plan 3. Figure 5-3 shows the location of the eligible structures under Plan 3 with the dark blue dots representing NED Plan 2 carried forward into Plan 3 and light blue dots as the additional SV structures or about 72. Direct impacts for homeowner who chose to participate in the elevation program include a lower flood risk since their structure would be elevated to the 100-year storm elevation or to a maximum of 13 feet. The ground surface would still be at risk for flooding which includes street flooding and any potential flooding of property remaining at grade, such as automobiles. Businesses in areas of EJ concern, if they decide to participate in the program, would be floodproofed which would result in a lower flood risk. After a flood event, these participating businesses would likely be able to reopen and offer their services to residents in EJ areas of concern much more quickly than if they choose not to participate in the floodproofing program.

Indirect impacts for eligible participants in Plan 3 include OSE and comprehensive benefits such as over-arching social themes including social vulnerability & resiliency, health & safety, economic vitality and social connectedness. Impacts to these social themes are prevalent in flood risk management projects and Plan 3 improves these social themes by offering a housing elevation program or business floodproofing option. Both eligible homes and businesses, could be elevated or floodproofed which adds to the areas resiliency to recover after a disaster. Out of 191 Louisiana Census Tracts within the ART study area, there were 46 Tracts that were identified as experiencing social vulnerability and include 72 additional structures that are not in Plan 2 and are shown in Figure 5-3 as light blue dots.

Potential adverse indirect impacts from Plan 3 are similar to those discussed for the NED Plan 2 and include the possibility that low-income homeowners may not be able to afford the out-of-pocket costs to have their home elevated.

Additionally, areas of EJ concern may benefit from regional economic development spurred by the implementation of the NS Plan. An increase in jobs, labor income, value-added and sales are economic impacts that EJ areas could experience to varying degrees. These project-related economic impacts are considered regional impacts. For more information on regional economic development, see Section 6 in the Economic Appendix.

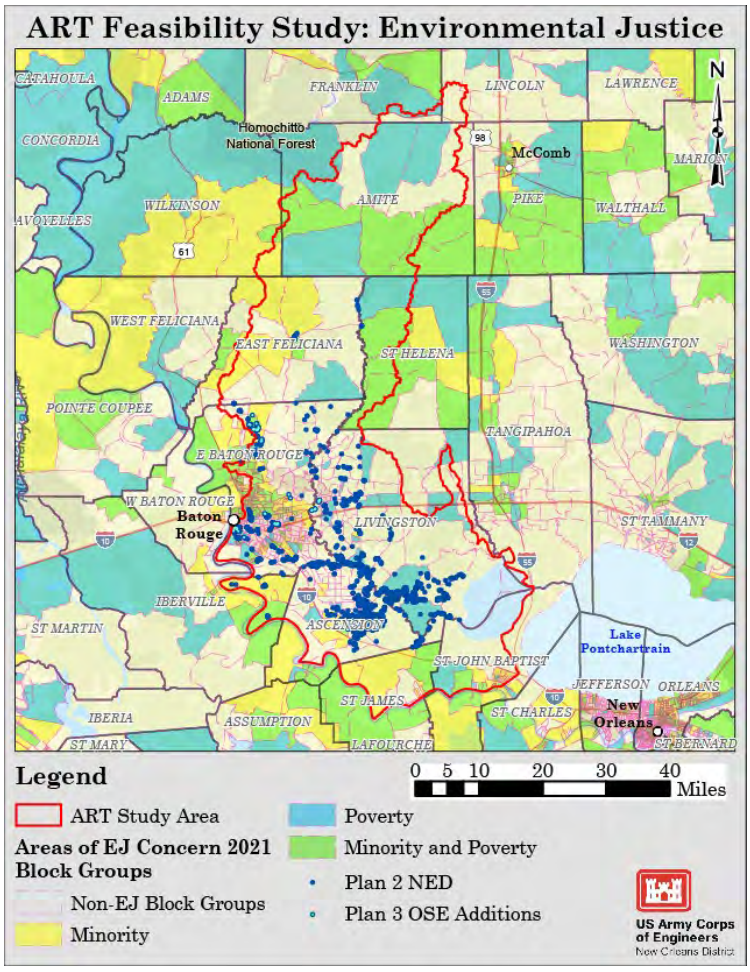

Figure 5-3: Plan 3, NED/OSE1, Eligible Structures and Areas of EJ Concern

Polygon shapefiles shown on the maps in the EJ sections of the main report and attribute data used in the EJ analysis are from Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts:

Plan 4 is similar to Plan 3 except Plan 4 includes 109 more eligible residential structures that are in SV areas that are not in Plan 3. A total of 3,298 structures are eligible under Plan 4 and about 40 percent of these structures (1,322) are in areas of EJ concern. Figure 5-3 shows the location of Plan 4 eligible structures and structures in areas of EJ concern with the dark blue dots representing the OSE Plan 3 eligible structures and the light blue dots representing the additional 109 structures added that are added from SV areas. Positive direct benefits will accrue to residents and businesses in areas of EJ concern who chose to participate in the plan and include a lower flood risk.

Adverse indirect impacts include the homeowner having to pay for temporary housing and costs associated with preparing their home for elevation. Some homeowners, particularly those who are low-income, may not be able to afford the out-of-pocket costs and ultimately prevent them from participating in the elevation plan. Mitigation of these potential financial reasons of not being able afford costs to volunteer for elevation are discussed in the section below, Mitigation of Potential Direct Impacts.

Positive indirect impacts also accrue to areas of EJ Concern by reducing social vulnerability and OSE, as is described for Plan 3. These affects are similar to Plan 3 but slightly larger since more structures would be eligible for elevation and floodproofing, based in part on Social Vulnerability.

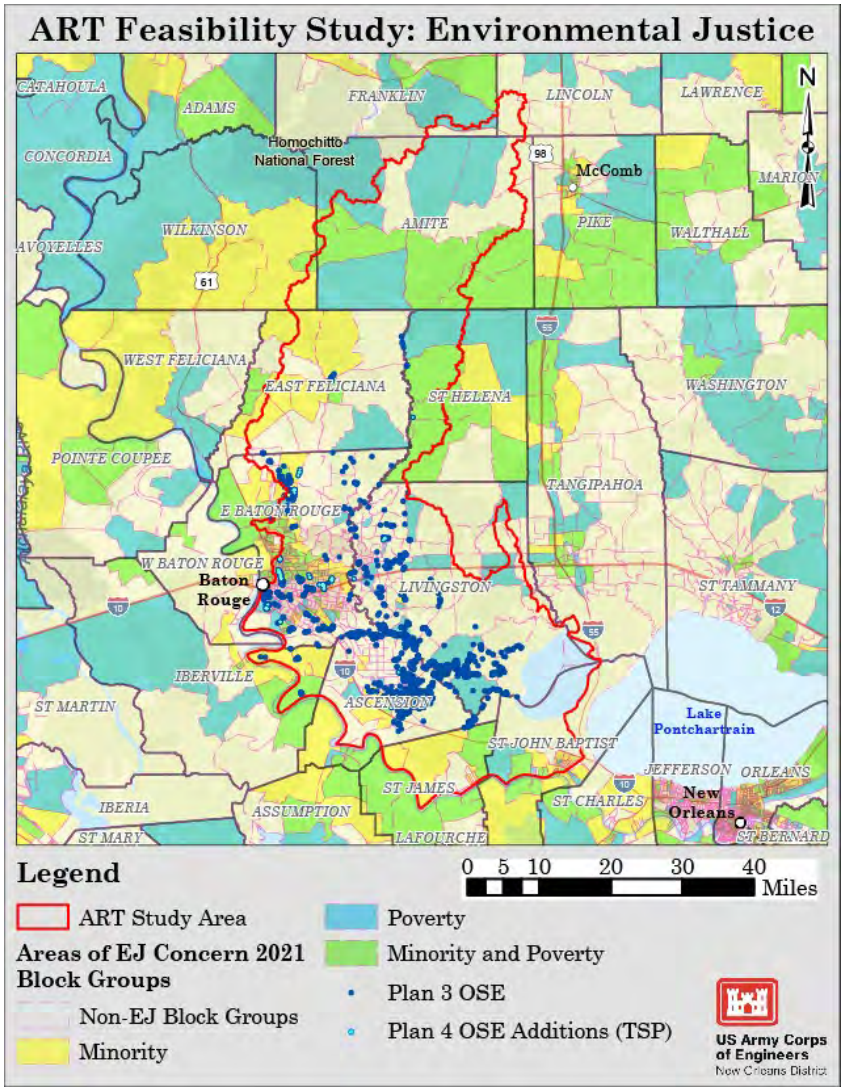

Figure 5-4: Plan 4, NED/OSE2 Eligible Structures and Areas of EJ Concern

Polygon shapefiles shown on the maps in the EJ sections of the main report and attribute data used in the EJ analysis are from Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

5.3.1.2.1 Justice 40

The Federal Government has made it a goal that 40 percent of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. This goal has been designated the Justice 40 Initiative. There are nine census tracks in the study area that have been identified as disadvantaged communities according to the Justice 40 criteria. Each of these communities qualify due to their low-income designation and the economic loss to building value resulting from natural hazards each year. Additionally, categories shared by some but not all these communities

include barriers to transportation, unemployment, percent of adults with less than a high school diploma, high rates of heart disease, and projected flood risk. The factors considered included Social Vulnerability & Resiliency, Health & Safety, Economic Vitality, and Social Connectedness.

Approximately 40% of eligible structures in each of the three plans (Plans 2, 3 and 4) are in disadvantaged communities. For more information on the Justice40 Initiative, refer to Section 6.4.4.

5.3.1.2.2 Mitigation of Potential Indirect Impacts:

For those residents in areas of EJ concern who may not be able to participate in the elevation program because of financial reasons and who are low-income, there may be opportunities of other federal, state and local authorities to assist and bridge the financial gap to increase participation.

To increase participation rates for the TSP, for homeowners who cannot afford the cost associated with the nonstructural plan (where SV and or income criteria may be developed), the following items may be considered, but may require additional Congressional authority:

- Allowances, such as those referenced in the WRDA 2022, Section 8154, to provide temporary relocation assistance to voluntary homeowner participants in nonstructural projects.
- Future agreements developed with a NFS may include that no cost share be requested directly of the property owner.
- Develop an assistance program to help connect preliminary eligible homeowners to other programs to meet some of the USACE secondary eligibility criteria such as repair condition of the structure. An example would be State of Louisiana Partial Action Plan No.1 for the Utilization of Community Development Block Grant Funds in Response to Hurricane Isaac administered through the Louisiana Office of Community Development/ Disaster Recovery Unit.

5.3.1.2.3 Other Benefits to Areas of EJ Concern: Clustering Based on Socially Vulnerable Communities

During implementation of the NS Plan, a clustering methodology would identify populations in areas of social vulnerability using Center for Disease Control and Prevention (CDC) Socially Vulnerable Index (SVI) most recent data. For this effort US percentile ranking may be chosen over Louisiana percentile ranking to ensure that all census tracts with potential SVI are captured. Detailed documentation of the SVI percentile ranking, and data dictionary can be found on the CDC's website. A vast majority of the CDC's SV areas are also areas of EJ concern, as identified in the SSDIFR/EA.

According to CDC's SVI documentation, census tracts at the 90th percentile or higher indicate high vulnerability. SVI includes four themes: Socioeconomic Status; Household Characteristics; Racial & Ethnic Minority Status; and Housing Type/Transportation (Figure 1-2). To capture all SV, census tracts with 90th percentile or higher in any of the four

themes may be classified as highly vulnerable which are areas where the population is exposed to high levels of environmental stressors and are low-income who reside in disadvantage communities as identified by CEQ's Climate and Economic Justice Screening Tool using the most recent race demographic statistics from the U.S. Census Bureau. This approach would rank environmental and demographic data as the main factor in determining which eligible properties should be prioritized. Homeowners in disadvantaged communities or those living at or below the poverty level would be given priority.

5.3.1.13 Socioeconomics

Plan 1: No Action Alternative

Direct, Indirect, and Cumulative Impacts: The no action alternative would maintain the current without-project condition of the study area. There are no expected cumulative impacts due to the Comite River Diversion and East Baton Rouge Flood Control projects or other Federal, State, local, or private flood risk reduction efforts. Cumulative impacts to socioeconomic resources would be the additive combination of impacts by this study and other studies, including, but not limited to the two aforementioned projects.

Plan 2: Nonstructural NED Plan

Direct, Indirect, and Cumulative Impacts:

The non-structural alternative would rely upon the voluntary participation of residents of the 3,117 structures within the 0.02 AEP floodplain to have their structures flood-proofed, or elevated. The voluntary nature of this alternative makes it impossible to determine which residents would participate without surveys. With the construction of this project, there will be a small, direct impacts to employment in the construction industry during duration of construction. There are no expected cumulative socioeconomic impacts due to this alternative; socioeconomic impacts due to this alternative are independent of the socioeconomic impacts of the CRD and EBR Flood Control projects or other Federal, State, local, or private flood risk reduction efforts.

Plan 3: Nonstructural NED Plan + OSE Increment 1

Direct, Indirect, and Cumulative Impacts: The non-structural alternative would rely upon the voluntary participation of residents of the 3,189 structures within the 0.02 AEP floodplain to have their structures flood-proofed, or elevated. The voluntary nature of this alternative makes it impossible to determine which residents would participate without surveys. With the construction of this project, there will be a small, direct impacts to employment in the construction industry during duration of construction. There are no expected cumulative socioeconomic impacts due to this alternative; socioeconomic impacts due to this alternative are independent of the socioeconomic impacts of the CRD and EBR Flood Control projects or other Federal, State, local, or private flood risk reduction efforts.

Plan 4: Nonstructural NED Plan + OSE Increment 2

Direct, Indirect, and Cumulative Impacts: The non-structural alternative would rely upon the voluntary participation of residents of the 3,298 structures within the 0.02 AEP floodplain to have their structures flood-proofed, or elevated. The voluntary nature of this alternative makes it impossible to determine which residents would participate without surveys. With the construction of this project, there will be a small, direct impacts to employment in the construction industry during duration of construction. There are no expected cumulative socioeconomic impacts due to this alternative; socioeconomic impacts due to this alternative are independent of the socioeconomic impacts of the CRD and EBR Flood Control projects or other Federal, State, local, or private flood risk reduction efforts.

Section 6
Evaluation and Comparison of Final Array of Alternative Plans

The USACE evaluated measures described in Section 4 and screened them based on their ability to meet the project objectives, avoid constraints, and to maximize benefits provided over the 50-year period of analysis from 2026 - 2076. Plans were developed with incrementally justified measures in accordance with ER 1105-2-100 and WRDA 1986. Three plans, in addition to no action, were progressed for further evaluation in selecting the TSP which included:

Plan 2: Nonstructural NED Plan- Floodproofing or elevation of 3,117 structures located in the 0.1 (46 aggregates), 0.2 (5 aggregates) or 0.4 (6 aggregates) floodplain to 0.01 AEP BFE. Plan 2 would include the elevation of 2,748 residential structures and floodproofing of 369 nonresidential structures.

Plan 3: Nonstructural NED Plan + OSE Increment 1- Floodproofing or elevation of 3,189 structures located in the 0.1 (54 aggregates), 0.2 (8 aggregates) or 0.4 (6 aggregates) floodplain to 0.01 AEP BFE. Plan 3 would include the elevation of 2,815 residential structures and floodproofing of 374 nonresidential structures.

Plan 4: Nonstructural NED Plan + OSE Increment 2- Floodproofing or elevation of 3,298 structures located in the 0.1 (59 aggregates), 0.2 (13 aggregates) or 0.4 (7 aggregates) floodplain to 0.01 AEP BFE. Plan 4 would include the elevation of 2,918 residential structures and floodproofing of 380 nonresidential structures.

Risk Reduction- The term 0.01 AEP level of risk reduction, refers to a level of reduced risk of rainfall, riverine or storm surge driven flooding that the project has a 1 percent chance of experiencing each year. Different combinations of size, intensity and track of rainfall and coastal storm could result in a 0.01 probability of a surge and/or rainfall event.

The measures in the Final Array of Alternative Plans were evaluated for economics (Section 6.1) and then to the planning objectives (Section 6.2) and the formulation criteria (Section 6.3) as given and defined in the Principles and Guidelines (P&G) Section VI.1.6.2(c). They were subsequentially compared to the four Federal accounts (Section 6.4) that are used to assess the effects of the final array of alternatives. This evaluation and screening informs the decision in selecting the TSP.

6.1 ECONOMIC EVALUATION OF FINAL ARRAY OF ALTERNATIVE PLANS

The following assumptions were applied when evaluating floodproofing and elevations of structures within the 0.1, 0.04, and 0.02 AEP floodplains:

- Elevation of residential structures to predicted 2076, 0.01 AEP BFE to a maximum of 13 feet above ground level*.
- Dry Floodproofing of non-residential structures for flood depths not greater than 3 feet above the adjacent ground.

*Raising structures greater than 13 feet above ground level introduces damage risk from winds during tropical events as a new condition. This height generally serves as a differentiator for insurance rates for wind/hail coverage as well and is therefore used as the upper limit for elevating structures. If the BFE elevation is greater than 13 feet above ground level, the structure would still be eligible for elevation up to that height with the residual risk present. It is estimated more than 99 percent of the structures' BFE, based on 2076 hydrology, is below 13 feet.

As shown on Table 6-1, Plan 2 has the greatest annual net benefits and was identified as the preliminary NED plan.

Table 6-1. Economic Analysis of Final Array of Alternatives

Costs	Plan 2: NED Plan	Plan 3: NED + OSE Increment 1	Plan 4: NED + OSE Increment 2
Total Project Costs			
First Cost	$1.47 through 1.56 B	$1.51 through 1.60 B	$1.56 through 1.66 B
Interest During Construction	$5.0 through 5.3 M	$5.1 through 5.4 M	$5.3 through 5.6 M
Total Investment Cost	$1.47 through 1.57 B	$1.52 through 1.61 B	$1.57 through 1.66 B
Estimated Annual Costs			
Annualized Project Costs	$54.6 through 58.0 M	$56.1 through 59.6 M	$58.2 through 61.8 M
Annual OMRR&R	TBD	TBD	TBD
Total Annual Costs	$54.6 through 58.0 M	$56.1 through 59.6 M	$ 8.2 through 61.8 M
Average Annual Benefits			
Total Annual Benefits	$59.8 M	$60.6 M	$61.4 M
Net Annual Benefits	$5.1 through 1.8 M	$4.4 M through 942 K	$3.4 M through (178) K
Benefit to Cost Ratio	1.09 through 1.03	1.08 through 1.02	1.06 through 0.997

Table 6-2. Nonstructural Plans Floodplain Aggregation by Reach

Floodplain AEP	Plan 2: NED Plan	Plan 3: NED + OSE Increment 1	Plan 4: NED + OSE Increment 2
0.1	46	54	59
0.04	5	8	13
0.02	6	6	7

6.2 EVALUATION OF STUDY PLANNING OBJECTIVES

Plans 1 through 4 were compared to the study objectives, presented, and discussed in Section 2.2 of the SSDIFR/EA, to validate the selection of the TSP based on net benefit calculations (Table 6-3).

Objective 1 (reduce the risk to human life from flooding) and Objective 2 (reduce flood damages from rainfall in the ARB to industrial, commercial, and agricultural facilities and residential and nonresidential structures) were evaluated through the performance analysis described in Section 6.1 of the SSDIFR/EA. The analysis quantitively measured the reductions in WSEs which informed the subsequent economic analysis to determine the change in the number and frequency of flooded structures compared to the No Action Alternative. Public infrastructure such as hospitals are included in the nonstructural analysis. All the Final Array of Alternatives decreased the risk to public health and safety by reducing the number of structures impacted by flooding and reducing the annual flood damages when compared with the No Action Alternative. The No Action Alternative does not decrease the risk to public safety. Specifically, regarding life safety risk reduction for all nonstructural plans it is a minor positive impact because of structure elevation. Life safety risk reduction is specific to residents who shelter in place and during events not requiring evacuation.

Objective 3 is to reduce interruption to the nation’s transportation corridors, particularly the I-10/I-12 infrastructure. Transportation corridors include one or more routes that connect centers of economic activity. Transportation corridors provide transportation and other logistics services that promote trade among the cities and countries along the corridor. Interstate 10 and Interstate 12 are the major transportation corridor within the study area. Objective 3 did not end up being a distinguishing factor in the Final Array of Alternatives.

Objective 4 is to reduce risks to critical infrastructure (e.g. medical centers, schools, transportation etc.). Objective 4 did not end up being a distinguishing factor in the Final Array of Alternatives between nonstructural plans; however, some critical infrastructure are preliminary eligible as part of the nonstructural plans vs. the no action.

Table 6-3. Final Array Evaluation to Study Objectives

Alternative	Reduce flood damages from rainfall events	Reduce risk to human life from flooding	Reduce interruption to the nation's transportation corridors	Reduce risks to critical infrastructure (e.g. medical centers, schools, transportation etc.);
Plan 1: No Action	Low	Low	Low	Low
Plan2: Nonstructural NED Plan	Medium	Medium	Low	Low
Plan 3: NED + OSE Increment 1	Medium	Medium	Low	Low
Plan 4: NED + OSE Increment 2	Medium	Medium	Low	Low

High-Signifies the metric was met considerably.

Medium-Signifies the metric was met moderately.

Low-Signifies the metric was minimally met if all.

6.3 PRINCIPLE AND GUIDANCE CRITERIA EVALUATION

The four formulation criteria suggested by the P&G (completeness, effectiveness, efficiency, and acceptability) were also used to aide in the selection of the TSP. Descriptions of the P&G criteria are below. Table 6-4 presents the P&G criteria evaluation.

- *Acceptability* is the workability and viability of the alternative plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies (P&G Section VI.1.6.2(c)(4). Acceptability means a measure or plan is technically, environmentally, economically, and socially feasible. Measures or plans that are clearly not feasible should be dropped from consideration.
- *Completeness* is a determination of whether or not the plan includes all elements necessary to achieve the objectives of the plan. It is an indication of the degree that the outputs of the plan are dependent upon the actions of others.
- *Effectiveness* is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities (P&G Section VI.1.6.2(c)(2)). Alternative plans that clearly make little or no contribution to the planning objectives should be dropped from consideration.
- *Efficiency* is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment (P&G Section VI.1.6.2(c)(3)). Benefits can be both monetary and non-monetary. Alternative plans that provided little benefit relative to cost should be dropped from consideration.

Table 6-4. Final Array Evaluation to P&G Criteria

Alternative	Acceptability	Completeness	Effectiveness	Efficiency
Plan 1: No Action	Partially. Viable and in accordance with state and local entities and with existing laws. Provides no solution to the identified problems.	No. Does not meet objectives to reduce flood risk.	No. The alternative does not alleviate the problems identified and does not meet the objectives of the project.	Yes. No money is expended, no benefits are gained, problems are not alleviated, and objectives are not met. No flooding risk would be reduced.
Plan 2: Nonstructural NED Plan	Yes. Viable and in accordance with state and local existing laws.	Yes. The alternative includes all features needed to produce the stated effects.	Partially. The alternative alleviates some of the flood risk. It does not achieve Objective 3 of the study.	Yes. Is the most cost-effective means of providing a reduction of damages to eligible structures.
Plan 3: NED + OSE Increment 1	Yes. Viable and in accordance with state and local existing laws.	Yes. The alternative includes all features needed to produce the stated effects.	Partially. The alternative alleviates some of the flood risk. It does not achieve Objective 3 of the study.	Partially. It is cost effective but does have a slightly lower net benefits and increased cost but provides some potential to reduce flooding for SV areas.
Plan 4: Plan 4: NED + OSE Increment 2	Yes. Viable and in accordance with state and local existing laws.	Yes. The alternative includes all features needed to produce the stated effects.	Partially. The alternative alleviates some of the flood risk. It does not achieve Objective 3 of the study.	Partially. It is cost effective but does have a lower net benefits and increased cost but provides the highest potential to reduce flooding for SV areas.

6.4 COMPARISON OF ALTERNATIVES TO SYSTEM OF ACCOUNTS-FLOOD RISK MANAGEMENT SYSTEM

Plan formulation has been conducted with a focus on achieving the federal objective of water and related land resources project planning, which is to contribute to NED consistent with protecting the Nation's environment, pursuant to national environmental statues, applicable EOs, and other Federal planning requirements. Plan formulation considers all effects, beneficial or adverse, to each of the four evaluation accounts identified in the USACE 2014 PRG which are NED, Environmental Quality (EQ), Regional Economic Development (RED), and OSE. Table 6-5 compares the four Federal accounts against the three nonstructural alternatives in the final array. This is a summary of the highest-ranking alternatives by account.

Table 6-5. P&G Four Federal Accounts Assessment

Four Accounts	Plan 2: NED Plan	Plan 3: NED + OSE Increment 1	Plan 4: NED + OSE Increment 2
National Economic Development (NED)	Avg. Annual Benefits $ 59.8 M Avg. Annual Costs $54.6 through 58.0 M Net Annual Benefits $5.1 through 1.8 M BCR- 1.09 through 1.03	Avg. Annual Benefits $60.6 M Avg. Annual Costs $56.1 through 59.6 M Net Annual Benefits $4.4 M through 942 K BCR- 1.08 through 1.02	Avg. Annual Benefits $61.4 M Avg. Annual Costs $58.0 through 61.6 M Net Annual Benefits $3.4 M through (178) K BCR- 1.06 through 0.997
Environmental Quality (EQ)	No significant impacts to the environment.	No significant impacts to the environment.	No significant impacts to the environment.
Regional Economic Development (RED)	Value Added: $1,391,463,000 FTE Jobs: 14,521	Value Added: $1,429,854,000 FTE Jobs: 14,925	Value Added: $1,478,086,040 FTE Jobs: 14,429
OSE	Overall minor positive benefits associated with the NED nonstructural plan. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes. For a detailed explanation of OSE criteria, reference table 6-7.	Both Minor & Moderate positive benefits are associated with Plan 2. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes. For a detailed explanation of OSE criteria, reference table 6-7.	Both Minor & Moderate positive benefits are associated with Plan 2. These benefits are realized via the Social Vulnerability & Resiliency, Health & Life Safety, Economic Vitality, Social Connectedness, Participation, and Environmental Justice as it relates to Justice 40 themes. For a detailed explanation of OSE criteria, reference table 6-7.

Ranges are 10-18% PED costs

FY 24 Interest 2.75% and 2024 Price Level

Cost Share 35% NFS and 65% Federal

6.4.1 NED ACCOUNT COMPARISON

The intent of comparing alternative flood risk reduction plans in terms of NED account was to identify the beneficial and adverse effects that the plans may have on the national economy. Beneficial effects are increases in the economic value of the national output of goods and services attributable to a plan. Increases in NED were expressed as the plans' economic benefits, and the adverse NED effects were the investment opportunities lost by committing funds to the implementation of a plan. The factors considered included structure and content damage, and emergency costs.

6.4.2 EQ ACCOUNT COMPARISON

The EQ account is an assessment of favorable or unfavorable ecological, aesthetic, and cultural or natural resources changes. Environmental Impacts of the TSP are described in detail in Section 5. The analysis was conducted with the participation of agencies, local governments, and stakeholders through an on-going and engaging series of scoping meetings, public input meetings, agency and stakeholder meetings, and on-site meetings, and will continue through the PED study phase and coordination of the project through State and Agency reviews. The EQ account was another means of evaluating the plans to assist in making recommendations. The factors considered included habitat change and threatened & endangered species risk.

6.4.3 RED ACCOUNT COMPARISON

The RED account addresses the impacts that the USACE expenditures associated with the implementation of the nonstructural plans will have on the levels of income, output, and employment throughout the region. This RED analysis employs input-output economic analysis, which measures the interdependence among industries and workers in an economy. This analysis uses a matrix representation of a regional economy to predict the effect that changes in one industry will have on other industries. The greater the interdependence among industry sectors, the larger the multiplier effect on the economy. Changes to government spending drive the input-output model to project new levels of sales (output), value added Gross Regional Product (GRP), employment, and income for each industry.

RECONS Version 2 was the specific input-output model used to estimate the regional economic development impacts of the TSP Plan. The USACE Institute for Water Resources, Louis Berger, and Michigan State University developed the regional economic impact modeling tool, RECONS (Regional Economic System), that provides estimates of jobs and other economic measures such as labor income, value added, and sales that are supported by USACE programs, projects, and activities. This modeling tool automates calculations and generates estimates of jobs, labor income, value added, and sales using IMPLAN®'s multipliers and ratios, customized impact areas for USACE project locations, and customized spending profiles for USACE projects, business lines, and work activities. RECONS allows the USACE to evaluate the regional economic impact and contribution associated with USACE expenditures, activities, and infrastructure. Table 6-6 summarizes RED impacts from RECONs. Additional information can also be found in Appendix G: Economic and Social Consideration. The factors include the total expenditure, value added (gross regional product), and full-time equivalent jobs.

Table 6-6. RED Impacts from RECONS

Plan	Expenditures	Gross Regional Product	Full-time Equivalent Jobs
1: No action	$0	$0	0

2: NED Plan	$1,560,788,000	$1,391,463,000	14,521
3: NED + OSE Increment 1	$1,603,850,000	$1,429,854,000	14,925
4: NED + OSE Increment 2	$1,657,950,000	$1,478,086,000	15,429

6.4.4 OTHER SOCIAL EFFECTS

The OSE account includes impacts to over-arching social themes including social vulnerability & resiliency, health & safety, economic vitality, social connectedness, participation, and environmental justice as it relates to the justice 40 initiative. Impacts to these social themes are prevalent in flood risk management projects and are evaluated and discussed in the OSE account (Table 6-7).

Evaluation of the outcomes of the various alternatives on SV populations using the Center for Disease Control, Agency for Toxic Substances and Disease Registry's Social Vulnerability and US. Census Bureau statistics, United States Geological Survey Food Atlas, and the Council on Environmental Quality's Climate and Economic Justice Screening Tool. Additionally, the life safety risk to the study area utilizing submergence criteria from the LifeSim technical manual was evaluated.

Table 6-7. Summary of OSE Benefit Themes

OSE Theme	Indicator	Plan 2: NED Plan	Plan 3: NED + OSE Increment 1	Plan 4: NED + OSE Increment 2
Social Vulnerability & Resiliency	Structures included in SV Areas	+	++	++
Health & Safety	Life Safety	+	+	+
	Critical Infrastructure	+	+	+
	Food Insecurity	+	++	++
Economic Vitality	Employment Activity	+	+	+
Social Connectedness	Civic Infrastructure	+	+	+
Participation	Public Involvement	*Evaluated Post-Draft Report Outreach*		
Environmental Justice	Structures included in Areas of EJ concern	+	++	++

Legend:
+: Minor Positive Benefits
++: Moderate Positive Benefits
+++: Significant Positive Benefits

Social Vulnerability & Resiliency:

Plan 2 provides minor benefits to individuals experiencing social vulnerability in the study area. Under this plan, $6.4 Million, 11.07 percent of total benefits are provided to these identified areas. Plan 3, NED + OSE Increment 1 provides moderate benefits to individuals experiencing social vulnerability within the ART study area. This plan was formulated with specific considerations of Social Vulnerability. Under this plan, incremental benefits in communities experiencing social vulnerability were increased to $7.2 Million, or 12.8 percent of overall benefits. Plan 4, NED + OSE Increment 2 provides moderate benefits to communities experiencing social vulnerability, increasing the total benefits to these identified areas to $7.9 Million, for an overall 14 percent of total benefits of the plan. Additional information on the incorporation of social vulnerability into the final array and their impacts can be found in the Economic & Social Consideration Appendix, Appendix G, in sections 1.2.2, 7.2.1, and 7.3.1.

Health & Safety

Life Safety:
Life safety concerns were addressed for the ART study via a simplified method utilizing the submergence criteria established by the Risk Management Center's (RMC) LifeSim technical manual. This approach does not include warning and evacuation and assumes that all residents within the structures are trapped in the structure at the time the max depth arrives.

All proposed nonstructural plans do not mitigate life safety risk on roadways; however, mitigation of proposed elevations and floodproofing does reduce the number of structures experiencing high hazard conditions according to the submergence criteria thresholds in the LifeSim technical manual. The decreased life safety concern is consistent among all of the plans in the final array. Reference Appendix G, section 7.3.3 for additional information relating to life safety.

Critical Infrastructure:

Critical infrastructure was assessed by surveying the physical critical infrastructure that is mitigated under the final array. Under each of the plans, there are 5 facilities that will be wet floodproofed. This mitigation will allow these services and their assistance to return to operation sooner than under the existing flood conditions. See Appendix G, section 7.3.3 for additional information relating to critical infrastructure.

Food Insecurity:

Food Insecurity impacts were determined through the USGS Food Access Atlas, where tracts are identified as experiencing food insecurity if they are both low income and have low access to fresh grocers. Plan 2 mitigates 14 total grocery stores, two of which are included in areas experiencing food insecurity. Plan 3 includes mitigation of 15 grocery stores in total, with the additional grocer not being in an area that experiences food insecurity. Plan 4 presents the same level of mitigation for areas experiencing food insecurity as Plan 3. Reference Appendix G, section 7.3.3 for additional information related to food insecurity.

Economic Vitality

Economic vitality was assessed via employment by industry and the number of commercial structures mitigated under each of the plans. Plan 2 floodproofs 369 commercial structures, Plan 3 floodproofs 374 commercial structures, and Plan 4 floodproofs 380 commercial structures. The difference between the 3 plans is insignificant when compared. The mitigation of these structures will decrease the duration of employment and consumption pauses.

Social Connectedness

Impacts to social connectedness was measured via inclusion of civic infrastructure in each of the plans. Civic infrastructure includes community centers and places of worship. Each of the plans in the final array mitigates eight physically located facilities, three of them being community centers and five of them being places of worship.

Environmental Justice – Justice 40 Initiative

Environmental Justice as it relates to the Justice 40 initiative according to Executive Order 14008, was evaluated by determining how many structures are included in the plans within areas of Environmental Justice concern according to the Council on Environmental Quality's Climate and Economic Justice Screening Tool. Plan 2 included 1,262, or 40 percent of total structures in areas of Environmental Justice Concern. Plan 3 included an additional 22 structures in areas of Environmental Justice Concern for a total of 1,284, or 40 percent of the total eligible structures in the plan. Of the increase in total structures from Plan 2, 31 percent of the increased structures are in areas of Environmental Justice concern. Plan 4 included an additional 172 structures in areas of Environmental Justice Concern for a total of 1,324, or 40 percent of the total eligible structures in the plan. Of the increase in total structures from Plan 2, 36 percent of the increased structures are in areas of Environmental Justice concern (Table 6-8).

Table 6-8. Disadvantaged Communities (Justice 40)

	***Plan 2**: NED Plan*	***Plan 3**: NED + OSE Increment 1*	***Plan 4**: NED + OSE Increment 2*
Structures Included	1,262	1,284	1,324
% of Benefits to Disadvantaged Communities	40%	40%	40%

6.5 IDENTIFYING THE TSP

The CEMVN is presently pursuing a policy exception for the following USACE Policy: ER 1105-2-100 2-3(f)(1) stating: "The National Economic Development (NED)Plan. For all project purposes except ecosystem restoration, the alternative plan that reasonably maximizes net economic benefits consistent with protecting the Nation's environment, the NED plan, shall be selected. The Assistant Secretary of the Army for Civil Works (ASA (CW)) may grant an exception when there are overriding reasons for selecting another plan based upon comprehensive benefits or other Federal, State, local and international concerns."

Currently, the TSP is the Plan 4: Nonstructural Plan with additive for OSE for positive and negative benefits because it provides flood risk reduction in terms of national economic development along with the added benefit of flood risk reduction to vulnerable and disadvantaged communities, maximizing the OSE account (Table 6-9). While this plan is not the NED Plan, it provides the best level of comprehensive benefits for flood risk reduction to the ARB study area and is the Total Benefits Plan for this study. If the policy exception is not granted, the TSP will default to Plan 2: Nonstructural NED Plan. As part of feasibility level design activities, the costs and benefits will continue to be refined and will be updated within the final report.

Table 6-9. Summary of Costs and Benefits of the TSP (Plan 4: Total Benefits Plan) and the NED Plan

Item	NED Plan	TSP: Plan 4
Total Annual Benefits:	$59.8 M	$61.4 M
Damage Category: Structure, Contents, Vehicles, and Debris Removal		
Total First Costs	$1.47 through 1.56 B	$1.56 through 1.66 B
Interest During Construction	$5.0 through 5.3 M	$5.3 through 5.6 M
Annual Operation & Maintenance Costs	TBD	TBD
Total Annual Costs	$54.6 through 58.0 M	$58.0 through 61.6 M
B/C Ratio	1.09 through 1.03	1.06 through 0.997
Expected Annual Net Benefits	$5.1 through 1.8 M	$3.4 M through (178) K

Ranges are 10-18% PED costs
FY 24 Interest 2.75% and 2024 Price Level
Cost Share 35% NFS and 65% Federal

Section 7
Tentatively Selected Plan

The federal TSP is Plan 4, the Total Benefits Plan, which includes nonstructural elevation, dry floodproofing, and wet floodproofing measures on a total of 3,298 structures, located in the 0.1 (59 aggregates), 0.2 (13 aggregates), or 0.4 (7 aggregates) AEP floodplain to 0.01 AEP BFE in the ARB study area. Flood risk and residual risk from coastal storm surge were estimated to be reduced to:

- 2,918 residential structures,
- 380 nonresidential structures.

The reduction in damages would be achieved by elevating residential structures up to 13 feet above ground surface and floodproofing up to 3 feet above ground surface. During implementation, each structure would be individually surveyed. Participation in the TSP is 100 percent voluntary.

This plan is estimated to have an annual cost of $58 through $61.6 million (total project cost of 1.56 through 1.66 Billion including interest during construction), a BCR range of 1.06 through 0.997, and net benefits range of $3.4 million through -$178 K at the current Federal discount rate (FDR) of 2.75 percent and 2024 Price Level.

No significant flood risks associated with the ARB and its tributaries were identified within Mississippi; therefore, no structures have been identified as eligible as part of this plan.

7.1 NATIONAL ECONOMIC DEVELOPMENT PLAN

The intent of comparing alternative flood risk reduction plans in terms of NED is to identify the beneficial and adverse effects that the plans may have on the national economy. Beneficial effects were considered to be increases in the economic value of the national output of goods and services attributable to a plan. Increases in NED were expressed as the plans' economic benefits, and the adverse NED effects were the investment opportunities lost by committing funds to the implementation of a plan. The NED plan reasonably maximizes net benefits. The NED costs and benefits for the final array are described in Table 6-1. The NED Plan includes floodproofing or elevation of 3,117 structures located in the 0.1 (46 aggregates), 0.2 (5 aggregates) or 0.4 (6 aggregates) floodplain to 0.01 AEP BFE.

Flood and costal storm risk were estimated to be reduced to:

- 2,748 residential structures,
- 369 nonresidential structures.

The CEMVN is presently pursuing a policy exception for the following USACE Policy: ER 1105-2-100 2-3(f)(1) stating: "The National Economic Development (NED)Plan. For all

project purposes except ecosystem restoration, the alternative plan that reasonably maximizes net economic benefits consistent with protecting the Nation's environment, the NED plan, shall be selected. The ASA CW may grant an exception when there are overriding reasons for selecting another plan based upon comprehensive benefits or other Federal, State, local and international concerns." If the policy exception is not granted, the Recommended Plan will default to Plan 2: Nonstructural NED Plan.

7.2 IMPLEMENTING THE PLAN

Subject to project authorization, appropriation and availability of funding, full environmental compliance, and execution of a binding agreement with the NFS, construction is currently scheduled to begin in 2026 (Appendix I: Implementation Plan). The schedule assumes that implementation of the Nonstructural Plan will occur over an approximate 10-year period with approximately 500 structures to be elevated and/or floodproofed a year after an 18-month PED phase. The project requires construction authorization and the appropriation of construction funds. A continuous funding stream is needed to complete this project within the anticipated timeline, which requires continuing appropriations from Congress and the State of Louisiana to fund the detailed design phase and fully fund construction contracts.

In order to be preliminarily eligible for inclusion in the Plan, the following criteria must be met:

1. The structure must have a first-floor elevation at or below the applicable floodplain (which may be a 0.1, 0.04, 0.02 AEP year floodplain depending on the location of the structure), based on hydrologic conditions predicted to occur in 2026 (the beginning of the 50-year period of analysis) at a specific location.
2. The elevation or floodproofing measures proposed for the structure must be economically justified based on an aggregation or sub aggregation level that are anticipated to be avoided over the 50-year period of analysis (years 2026-2076) unless they have been identified eligible based on SV criteria and included in the next highest aggregation regardless of economic justification.
3. The structure must have a permanent foundation and be permanently immobilized and affixed or anchored to the ground, as required by applicable law, and must be legally classified as immoveable real property under state law. Notwithstanding the provisions of La. R.S. 9:1149.6, a manufactured, modular, or mobile homeowner and any subsequent owner of an immobilized manufactured, modular, or mobile home, may not de-immobilize the manufactured, modular, or mobile home in the future, by detachment, removal, act of de-immobilization, or any other method. Manufactured, modular, and mobile homes that do not meet these requirements are not eligible for elevation. This criterion only applies to residential uses of manufactured, modular, and mobile homes.

Once construction funds are appropriated for this project, the LADOTD, as the NFS, and the Department of the Army will enter into a project partnership agreement (PPA). After the signing of a PPA, the NFS will acquire the necessary land, easements and rights of way to construct the project. Because project features cannot be advertised for construction until

the appropriate real estate interests have been acquired, obtaining the necessary real estate in a timely fashion is critical to meeting the project schedule. At the completion of construction, or functional portions thereof, the NFS would be fully responsible for OMRR&R, as the functional portions of the project are completed.

The following work tasks were assumed for cost estimation purposes. No USACE Federal funds will be used to restore, replace, or repair a structure or bring a structure into compliance with applicable building and other codes. All work will require the issuance of state and local government permits prior to the commencement of any onsite construction. Elements of structure work that are deemed to be potentially eligible costs include, but are not limited to: design costs; costs of obtaining all required permits (i.e., zoning or land use approvals, environmental permits or required certifications, historic preservation approvals and Section 106 NHPA consultation in accordance with the PA; including any required mitigation measures, building permits, etc.): costs for title searches and the review of title documents; survey and inspection costs.

Elevation of Residential Structures

No additions to the habitable spaces of a structure (including but not limited to, outbuildings, detached garages, sheds, etc.) will be permitted in the performance of the elevation work. Elements of structure elevation work that are potentially eligible project costs include the following tasks:

- Raising the roof and extending the walls of a side structure attached to the main structure (i.e., garage);
- Raising mechanical equipment (e.g., air conditioner, furnace, water heater, electrical panel, fuel storage, valves, or meters);
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- Meeting access requirements of applicable building and other codes (e.g., stairs with landings, guardrails) and/or the Americans with Disabilities Act;
- Creating large vent openings in the foundation and walls to meet requirements for floodwater entry and exit;
- Special access improvements (e.g., elevators, lifts, ramps, etc.) when a satisfactory written medical opinion is provided by a medical doctor who is active, in good standing and licensed by the State of Louisiana, stating that special handicapped access is required for a handicapped or mobility challenged property owner and/or the property owner's family member and/or other person currently residing in the structure, and/or by a tenant currently occupying the structure. Multiple access points may also be eligible where necessary to meet state and/or local building and other code requirements;
- Removal of any trees and other vegetation which restrict the elevation work;
- Debris removal (all demolition debris (hazardous and non-hazardous) shall be removed and taken to an approved landfill;

- Site grading and site restoration including grading landscaping to it preconstruction condition but it cannot adversely affect drainage of adjacent properties;
- Temporary site protection measures during the elevation work such as temporary construction fencing;
- Allowable relocation assistance funds for displaced tenants who are unable to occupy the structure during the elevation process in accordance with the URA and Real Property Acquisition Policies for Federal and Federally Assisted Programs of 1970, Public Law 91-646, 84 Stat. 1984 (42 U.S.C. 4601), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987, Title IV of Public Law 100-17, 101 Stat. 246-256. Relocation assistance for tenants who cannot live in the structure during the elevation process, may include, among other thing, advisory services, eligible reasonable out-of-pocket expenses incurred during temporary displacement (e.g., moving and storage of household goods required to be removed during construction, temporary quarters, meals, etc.);
- If additional work is required as a condition of building permit issuance, and if such work is not listed as eligible herein, the property owner will be required to fund and conduct such additional work. In no event shall the structure be elevated if USACE determines that the structure is not physically sound and/or capable of being raised safely.

Dry Floodproofing of Nonresidential Structures

Elements of structure work that are deemed to be potentially eligible dry floodproofing costs include, the following tasks:

- Installation of backflow valves;
- Closures on doors, windows, stairwells and vents-- temporary or permanent;
- Rearranging or protecting damageable real property components--e.g., relocate or raise utilities;
- Sump pumps and sub-drains;
- Water resistant material; water resistant window coverings, doors and jambs; waterproof adhesives; sealants and compounds, and floor drains;
- Plastic sheeting around the walls;
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- Removal of any trees that restrict the dry floodproofing of a structure;
- Temporary site protection measures during site work.

Wet Floodproofing of Nonresidential Structures

Elements of structure work that are deemed to be potentially eligible wet floodproofing costs include the following tasks:

- Wet floodproofing of the structure;
- Engineered flood vents;

- Flood-resistant construction materials such as rigid foam board wall insulation or cement board and molding within the interior of the building,
- Elevation and wet floodproofing of electric outlets,
- Concrete floor treatment and interior wall and floor sealer/stains;
- Exterior paint coatings;
- Sand/water blasting or other manual removal of rusted coatings and application of epoxy coatings;
- Elevation and wet floodproofing of mechanical and electrical equipment;
- Connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- Removal of any trees which restrict the elevation of a structure;
- Temporary site protection measures during site work.

7.2.1 REAL ESTATE

The TSP consists of implementing nonstructural measures to reduce the risk of damages from flooding to residential and non-residential structures in the study area. The TSP involves elevations of residential structures and flood proofing of nonresidential structures.

The TSP is presently Plan 4: Nonstructural Plan with additive for OSE for positive and negative benefits because it provides flood risk reduction in terms of national economic development along with the added benefit of flood risk reduction to vulnerable and disadvantaged communities, maximizing the OSE account. While this plan is not the NED Plan, it provides the best level of comprehensive flood risk reduction to the ARB study area and is the Total Benefit Plan for this study. If the policy exception is not granted, the TSP will default to Plan 2: Nonstructural NED Plan.

Plan 4: Nonstructural Plan with additive for OSE for positive and negative net benefits

A total of approximately 3,298 structures in the study area met the requirement of having a First Floor Elevation (FFE) at or below the applicable floodplain. The estimated total cost for Real Estate for Plan 4 is $111.8 M. These costs include administrative costs associated with implementation of the plan and temporary residential relocations of tenants during structure elevation. Real estate tasks associated with elevating (approximately 2,918 structures) and floodproofing (approximately 380 structures) could include such items as obtaining rights-of-entry, title work, preparation, execution, and recordation of the estates and any needed curative documents, appraisals or value estimates, residential relocation costs for tenants, and subsequent inspections to ensure the work was performed in accordance with the Project Partnership Agreement (PPA).

Plan 2: Nonstructural NED Plan

The initial Nonstructural NED plan involves the floodproofing or elevation of 3,117 structures located in the floodplain. The estimated total cost for Real Estate for Plan 2, if a waiver is not obtained, is $105.6 M This plan would involve elevating approximately 2,748 structures and floodproofing approximately 369 structures.

In both plans, floodproofing non-residential structures and elevating residential structures will be offered to property owners on a voluntary basis and implemented only with the property owner's consent.

Property owners who have preliminarily eligible structures that wish to participate in the floodproofing measures will be required to apply for the program and provide a right-of-entry to their property.

The proposed legal mechanism to undertake the residential elevation or non-residential floodproofing measures would be through the use of a non-standard permanent Restrictive Easement that would outline the elevation or floodproofing treatment, identify restrictions owners must take or abstain from to ensure the long-term performance of elevation and floodproofing measures, and contain restrictions and covenants that would run with the land. The restrictive easements will be recorded in local land records to run with the land.

The proposed nonstandard Restrictive Easement will be executed between the property owner and the NFS. If a property owner elects not to have the nonstructural treatment performed on their structure and an agreement is not obtained, eminent domain will not be pursued.

7.2.2 OPERATIONS, MAINTENANCE, REPAIR, REHABILITATION, AND REPLACEMENT

There are no NFS OMRR&R obligations for the completed nonstructural work other than the performance of monitoring and periodic inspections. The required inspection and monitoring of the completed nonstructural work shall be detailed in the Final OMRR&R Manual issued by USACE to the NFS. These OMRR&R obligations shall commence upon the issuance of a Notice of Construction Completion (NCC) by USACE. In accordance with the requirements of the Final OMRR&R Manual, the NFS shall conduct periodic inspections at specified intervals and provide written certifications to USACE that the structures and lands have been inspected and document whether or not any violations have been found. Nonstructural Inspection/Implementation Checklist will be developed as part of the OMRR&R Manual.

Inspections by the NFS of elevated structures will determine among other things, that no part of the structure located below the level of the lowest habitable finished floor has been converted to living area for human habitation, or otherwise altered in any manner which would impede the movement of waters beneath the structure; that the area below the predicted 2076 100-year BFE is being used solely for the parking of vehicles, limited storage, or access to the structure and not for human habitation; that mechanical, electrical or plumbing devices have not been installed below the BFE; that the property is in compliance with all applicable floodplain ordinances and regulations. There may be exceptions to this based on individual structure but is to be documented and with reference to associated approval. USACE shall have the right, but not the obligation, to perform its own inspections of the elevated and flood proofed structures pursuant to the project. For all structure types (residential and nonresidential) OMRR&R costs are expected to be '*de minimus*.' Costs for these efforts have not yet been calculated but will be included in the final report.

Beginning at the time of issuance of the NCC, the property owner shall be responsible for all costs and risk associated with maintaining, repairing, rehabilitating and replacing the completed floodproofing measures on the property.

7.2.3 COST SHARING REQUIREMENTS

A NFS must support all phases of the project. Feasibility study costs are typically shared 50 percent Federal and 50 percent non-Federal, but this study is 100 percent federally funded. For nonstructural features, design and implementation phases are cost-shared, with the NFS providing 35 percent of the total project costs. Once a project has been implemented, OMRR&R of the project is a 100 percent non-Federal responsibility.

Total project first costs of the TSP at FY 24 price levels are approximately $1.56 through 1.66 B. The total fully funded cost of the project, with escalation through the mid-point of construction, is approximately $1.92 through 2.04 B (Table 7-1). As part of feasibility level design activities, the costs will continue to be refined and will be updated within the final report.

Table 7-1. Project First and Total Apportionments

Project First Costs	
Construction	$ 915.1 M
PED	$ 91.5 M through $164.7 M
Construction Management	$ 91.5 M
Real Estate	$ 89.4 M
Contingency	$ 374 M through $ 397 M
Total Project First Cost (constant dollar basis) Apportionment	**$ 1.56 through 1.66 B**
Federal Share (65%)	$ 1.01 through $1.08 B
Non-Federal Share (35%)	$ 550 through 580 M
Total Project Cost (Fully Funded)	**$1.92 through 2.04 B**
Federal Share (65%)	$ 1.25 through $1.33 B
Non-Federal Share (35%)	$ 671 through 714 M

Ranges are 10-18% PED costs
FY 24 Interest 2.75% and 2024 Price Level

7.2.4 FEDERAL RESPONSIBILITIES FOR THE SELECTED PLAN

The Federal Government will be responsible for PED and construction of the project in accordance with the applicable provisions of Public Law 99-662 (WRDA of 1986), as amended. The Government, subject to congressional authorization, the availability of funds, and the execution of a binding agreement with the NFS in accordance with Section 221 of

the Flood Control Act of 1970, as amended, and using those funds provided by the NFS, shall expeditiously construct the project, applying those procedures usually applied to Federal projects, pursuant to Federal laws, regulations, and policies.

7.2.5 NON-FEDERAL RESPONSIBILITIES FOR THE SELECTED PLAN

Federal implementation of the project for nonstructural flood risk management includes, but is not limited to, the following required items of local cooperation to be undertaken by the non-Federal sponsor in accordance with applicable Federal laws, regulations, and policies:

a. Provide 35 percent of construction costs, as further specified below:
    1. Provide, during design, 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;
    2. Provide all lands, easements, rights-of-way, and placement areas and perform all relocations determined by the Federal government to be required for the project;
    3. Provide, during construction, any additional contribution necessary to make its total contribution equal to at least 35 percent of construction costs;
b. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of flood risk reduction the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;
c. Inform affected interests, at least yearly, of the extent of risk reduction afforded by the flood risk management features; participate in and comply with applicable Federal floodplain management and flood insurance programs; prepare a floodplain management plan for the project to be implemented not later than one year after completion of construction of the project; and publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with the project;
d. Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof at no cost to the Federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal laws and regulations and any specific directions prescribed by the Federal government;
e. Give the Federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose;
f. Hold and save the Federal government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the project, except for damages due to the fault or negligence of the Federal government or its contractors;

g. Perform, or ensure performance of, any investigations for hazardous, toxic, and radioactive wastes (HTRW) that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the Federal government determines to be necessary for construction, operation, and maintenance of the project;
h. Agree, as between the Federal government and the non-Federal sponsor, to be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, operation, and maintenance of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the Federal government;
i. Agree, as between the Federal government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law; and
j. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, (42 U.S.C. 4630 and 4655) and the Uniform Regulations contained in 49 C.F.R Part 24, in acquiring real property interests necessary for construction, operation, and maintenance of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

7.2.6 RISK AND UNCERTAINTY

Risk and uncertainty are intrinsic in water resources planning and design. Risk is a measure of the probability and consequence of uncertain future events. It is the chance of an undesirable outcome. Uncertainty refers to the likelihood an outcome results from a lack of knowledge about critical elements or processes contributing to risk or natural variability in the same elements or processes. Throughout the planning process, the PDT identified risk and uncertainty using collaboration with the NFS and stakeholders and in accordance with USACE policies related to risk such as USACE ER 1105-2-100. Risk informed decisions were made regarding the reliability of estimated benefits and the costs of alternative plans.

Measures were developed to manage risk by expanding on and referencing successful similar completed projects along the Louisiana coast, as well as nationwide. Experience from previous projects helped in the identification of possible risks and decrease uncertainty in plan formulation. No measure or alternative in the TSP is burdened by significant risk or uncertainty regarding its eventual success. Significant risks were avoided by using proper design, appropriate selection, and correct seasonal timing of applications. Risks were also

managed through extensive coordination with other agencies and experts. This subsection described various categories of risk and uncertainties pertinent to the study. See Section 4 for information regarding how the PDT incorporated risk-informed decision making into the planning process.

For nonstructural measures, the level of risk reduction is variable, as every structure in the aggregation has a unique ground surface elevation and structural attributes such as foundation height, value, and condition. Each of these factors led to each individual structure, in the project area, having a different level of risk reduction relative to its neighbors and other structures in the inventory. The result is that the TSP does not have a single level of risk reduction, but rather 3,298 different levels. The level of risk reduction can be summarized by how many structures see risk reduction for each of the eight flood frequencies ran through HEC-FDA, see Appendix G Economics and Social Vulnerability for additional discussion on the risk reduction.

7.2.6.1 Costs and Level of Design

USACE decision documents recognize cost risk and uncertainty surrounding implementation. All cost estimates will carry a degree of uncertainty. The estimated total project first cost for the TSP is $1.56 through 1.66 B at a Class 4 level of technical information which represents preliminary design.

The currently known major uncertainty drivers for costs are the following:

- Owner Participation Rate;
- Scope Maturity;
- Availability of Floodproof Contractors.

The major contributor to the resulting total project contingency for the Schedule feature was:

- Contract Acquisition;
- PED and S&A Cost;
- Temporary Relocation of Residents.

Engineering design factors that carry uncertainty include:

- Final construction design;
- Modeling analysis and assumptions;
- Existing or future projects cause unexpected effects on the TSP.

As the project moves into the next phases, USACE will focus risk management and mitigation on the primary cost and other significant risk drivers to the extent within USACE control. However, there still exists the potential for other unanticipated and uncontrollable changes in environmental or economic conditions that could further increase the total project first cost beyond the current estimate and/or necessitate changes in the project’s design.

Because natural systems are complex and consist of an intricate web of variables that influence the existence and condition of other variables within the system, all projects (e.g., flood risk management, restoration, etc.) contain inherent uncertainties. The effects of tropical storms, increased SLR, and climate change on each project's performance are uncertain and are addressed through future projections based on existing information.

7.2.6.2 Environmental Factors

The PDT has identified the following environmental factors that inherently carry uncertainty and could impact the accrual of benefits within the 50-year period of analysis. These environmental risks to implementation would be managed by gathering data and making changes to the project, if necessary.

- Potential climate change issues, such as SLR, in addition to regional subsidence rates are significant scientific uncertainties. These issues have been incorporated in the alternative evaluation process. SLR is discussed further in Section 7.2.6.2.1.
- Future climate change trajectories or projections affect habitat conditions (e.g., subsidence, SLR, flood events, drought, growing season lengths, etc.).
- River conditions could change.

7.2.6.3 Participation Rate

An analysis will be performed, as part of feasibility level design and included within the final report to determine a triangular distribution regarding what participation rate could be expected within the Amite study area. It is likely that this uncertainty distribution will be around 25 percent, 50 percent, and 75 percent sensitivities to provide the range of net benefits that non-participation would expect to yield. The economics team will rely on the best practice guides provided by the National Nonstructural Committee to assist with this effort.

7.2.6.4 Sea Level Rise

To evaluate potential future changes in project performance due to relative sea level change, ER 1100-2-8162 requires planning studies and engineering designs to be formulated and evaluated considering all possible rates of SLC: low, intermediate, and high. The ER directs to the USACE Sea Level Change Curve Calculator online tool to develop the three rates. For the high-subsidence area of coastal Louisiana, the Sea-Level Calculator for Non-NOAA Long-Term Tide Gauges was used specifically. After comparing and evaluating the rates determined by the calculator, the PDT determined that the 'intermediate' rate of sea level rise SLR should be used in this study for future conditions model runs in the analysis of alternatives. This topic is discussed further in Section 6.3 of Appendix H: Hydrologic & Hydraulics.

In recognition of the uncertainty presented by SLR, the TSP is based on the 2076, 0.01 AEP BFE predominate condition WSE, which uses the higher of the WSEs created by riverine flooding due to extreme precipitation or storm surge flooding. This results in an increase structure elevation heights and likely floodproofing for many of the structures, that

will help ensure adaptation capacity. CEMVN will continue to monitor local conditions and determine if the intermediate scenario of sea level change is reasonably representative of observed conditions. If observed conditions significantly exceeding the intermediate projection are identified during design or construction, reevaluation of the TSP plan will be required.

7.2.6.5 Residual Risk and Damages

The TSP will greatly reduce, but not eliminate all future flood risk damages and residual risk would remain in the study area. Additionally, the structures eligible for inclusion in the nonstructural plans were based only on rainfall flood risk. This leaves a large number of structures, approximately 50 percent of the structures with residual flood risk within the study area (See Appendix G Table G:5-3), not included in the TSP that would have been if the plan formulation used coastal hydraulic conditions in addition to rainfall to develop alternatives. This would require additional authorization and is outside of the study purpose.

The residual risk, along with the potential consequences, will be communicated to the NFS and will become a requirement of any communication and evacuation plan when this plan is implemented.

7.2.6.6 Potential Induced Flooding

No potential induced flooding is anticipated with nonstructural plans.

Section 8
Environmental Laws and Regulations

8.1 EXECUTIVE ORDER (E.O.) 11988 FLOODPLAIN MANAGEMENT

Executive Order 11988 directs Federal agencies to reduce flood loss risk; minimize flood impacts on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by flood plains. Agencies must consider alternatives to avoid adverse and incompatible development in the flood plain. If the only practical alternative requires action in the flood plain, agencies must design or modify their action to minimize adverse impacts. The proposed action is in compliance with E.O. 11988 because it would only include non-structural measures and not result in development of the floodplain.

8.2 EXECUTIVE ORDER 11990 PROTECTION OF WETLANDS

The purpose of Executive Order (E.O.) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. If impacts to wetlands are determined, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments. The proposed action would not result in impacts to wetlands and therefore is in compliance with E.O. 11990.

8.3 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act (CZMA) requires that “each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs.” Coordination with Louisiana Department of Natural Resources regarding consistency with the CZMA is in progress and would be complete before finalization of the FONSI.

8.4 ENDANGERED SPECIES ACT OF 1973

The Endangered Species Act (ESA) is designed to protect and recover threatened and endangered (T&E) species of fish, wildlife and plants. No plants were identified as being threatened or endangered in the project area. If a manatee(s) is sighted within 100 yards of the project area, moving equipment must be kept at least 50 feet away from the manatee or shut down. There would be restrictions on vessel operation, restrictions on the use of siltation barriers, and mandatory signage designed to avoid any harm to manatees in the project area as stated in the draft FWCAR. Based on review of existing data and in coordination with the FWS guidelines, the CEMVN finds that there would be no effect on threatened and endangered species with implementation of this project.

8.5 MIGRATORY BIRD TREATY ACT

The project area is known to support colonial nesting wading/water birds (e.g., herons, egrets, ibis, night-herons and roseate spoonbills) and shorebirds (terns and gulls). Based on review of existing data, and with the use of FWS guidelines, the CEMVN finds that implementation of the proposed actions would have no effect on colonial nesting water/wading birds or shorebirds. FWS and USACE biologists would survey the proposed project area before project implementation to confirm no nesting activity as suitable habitat and the potential for nesting exist within the project area. If active nesting exists within 1,000 feet (water birds) or 1,300 feet (shorebirds) of construction activities then USACE, in coordination with FWS, would develop specific measures to avoid potential adverse impacts to those species. A detailed nesting prevention plan may be necessary in order to deter birds from nesting within the aforementioned buffer zones in order to avoid potential adverse impacts. If a nesting prevention plan is necessary, it would be prepared in coordination with FWS.

The bald eagle was removed from the List of Endangered and Threatened Species in August 2007, but continues to be protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act of 1918, as amended (MBTA). During nesting season, construction must take place outside of FWS/LDWF buffer zones. A USACE Biologist and a FWS Biologist would survey for nesting birds. This would be done prior to the start of project implementation.

8.6 FISH AND WILDLIFE COORDINATION ACT OF 1934

The Fish and Wildlife Coordination Act (FWCA) provides authority for the FWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development projects to first consult with the FWS, NMFS and State resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. Section 2(b) requires the FWS to produce a Coordination Act Report (FWCAR) that details existing fish and wildlife resources in a project area, potential impacts due to a proposed project and recommendations for a project. The FWS reviewed the proposed action project described in this SSDIFR/EA. The draft FWCAR is pending and can be found in Appendix D-1 . Responses to draft comments would be included in the final report.

1. If ring levees are proposed as part of the “non-structural” component of the TSP, the levee alignments should be located to avoid and minimize impacts to both herbaceous wetlands and forested communities (wet and non-wet) as much as possible. The acreage of wetlands and forested habitat enclosed within ring levees also should be minimized to the maximum extent practicable.

USACE RESPONSE: Ring levees are not a part of the proposed nonstructural TSP. Should this change in the future, USACE would re-coordinate with the FWS and avoid and minimize impacts to habitat to the maximum extent practicable.

2. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.

    a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the CPRA should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
    b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project area, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.

USACE RESPONSE: Concur. During project implementation a qualified biologist would be on site to ensure activities would not affect colonial wading birds during the nesting season. USACE would also be in compliance with the Bald and Golden Eagle Protection Act if activities are within 660 feet of a bald eagle nest.

3. If implementation of the proposed action has the potential to directly or indirectly affect Inflated heelsplitter mussel, Gulf sturgeon, West Indian Manatee, or the Northern long-eared bat, then consultation with this office should be initiated.

USACE RESPONSE: Concur. The nonstructural TSP would not effect Inflated heelsplitter mussel, Gulf sturgeon, West Indian manatee, or the Northern long- bat. Should this change in the future, USACE would re-coordinate with the FWS and avoid and minimize impacts to habitat to the maximum extent practicable.

4. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document, contact this office.

USACE RESPONSE: Concur. There is no in-water work anticipated with the proposed nonstructural TSP. Should this change in the future, USACE would re-coordinate with the FWS and avoid and minimize impacts to the maximum extent practicable.

5. The Service recommends that the USACE contact the Service for additional ESA section 7 consultation if: 1) the scope or location of the proposed project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated.

USACE RESPONSE: Concur.

The final SSIFR/EA will include responses to the final FWCAR.

8.7 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

A phase I environmental site assessment is required for all USACE civil works projects to facilitate early identification and appropriate consideration of potential hazardous, toxic, and radioactive waste (HTRW) problems. HTRW includes any material listed as a “Hazardous Substance” under CERCLA. Other regulated contaminants include those substances that are not included under CERCLA but pose a potential health or safety hazard. Examples include, but are not limited to, many industrial wastes, naturally occurring radioactive materials, many products and wastes associated with the oil and gas industry, herbicides, and pesticides. ER 1165-2-132 and Division Regulation 1165-2-9 established policies for conducting HTRW review for USACE civil works projects.

A preliminary HTRW phase 1 environmental site assessment was conducted for the current draft SSDIFR/EA, and no HTRW concerns were identified. The ART study area was surveyed via aerial photography and environmental database searches in the study area’s respective zip codes, and no HTRW concerns were identified. The proposed action would include an individual HTRW assessment per structure, should that structure go through the process of being elevated. If during the individual HTRW assessment, a recognized environmental condition (REC) is identified, it would be incumbent upon the property owner to address the REC in order to be considered a part of the program.

8.8 E.O. 12898 ENVIRONMENTAL JUSTICE

USACE is obligated under E.O. 12898 of 1994 and the Department of Defense’s Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or some other race or a combination of two or more races.

A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations are those whose income is the Census Bureau’s statistical poverty threshold for

a family of four. The Census Bureau defines a “poverty area” as a census tract or block numbering area with 20 percent or more of its residents below the poverty threshold level and an “extreme poverty area” as one with 40 percent or more below the poverty threshold level.

8.9 NATIONAL HISTORIC PRESERVATION ACT OF 1966

USACE is continuing to follow its NHPA Section 106 procedures described in Section 3 and 5 to develop a project-specific PA in furtherance of USACE’s Section 106 responsibilities for this Undertaking. Due to the unknowns associated with implementing the TSP, and the inability to determine effects on historic properties, CEMVN has decided to negotiate a PA in accordance 36 CFR 800.14(b). The PA would then govern USACE’s subsequent NHPA compliance efforts. Following the execution of the PA, USACE may proceed with issuing a FONSI in compliance with Section 106 and NEPA.

8.10 TRIBAL CONSULTATION

It is the policy of the Federal Government to consult with Federally-Recognized Tribal Governments on a Government-to-Government basis as required in E.O. 13175 (“Consultation and Coordination with Indian Tribal Governments;” U.S. President 2000). The requirement to conduct coordination and consultation with Federally-Recognized Tribes on and off of Tribal land finds its basis in the constitution, Supreme Court cases, and is clarified in later planning laws, such as the National Environmental Policy Act. When conducting a civil works planning activity (http://www.usace.army.mil/Missions/Civil-Works/Tribal-Nations/), USACE is directed to follow six principles when engaging with Tribal Governments. These principles emphasize Tribal sovereignty, the Federal Government’s trust responsibility, Government-to-Government consultation, early and pre-decisional consultation, recognition of Tribal self-reliance, focusing USACE on efforts at Tribal capacity building, and requiring USACE to protect natural and cultural resources during project development and implementation. Moreover, the USACE Planning and Guidance Notebook (ER 1105-2-100), including Smart Planning, gives guidance in Appendix B, Public Involvement, Collaboration and Coordination (B-8) and Appendix D, Environmental Evaluation and Compliance (D-3), reinforcing the same authorities and processes. The most explicit and accessible guidance regarding USACE and Tribal interaction can be found in USACE’s Tribal Consultation Policy (November 01, 2012).

In addition to consulting with Tribes under the NHPA as described above (NHPA 1966 Section), USACE is consulting in accordance with E.O. 13175, NEPA, and its 2012 Tribal Policy. The 2012 Tribal Consultation Policy directs that consultation should begin at the earliest planning stages before decisions are made and actions are taken (paragraph 3b); provides guidance that USACE should contact “[T]ribes whose aboriginal territories extend to the lands where an activity would occur…sufficiently early to allow a timely review of the proposed action" (paragraph 5.d.(1); and goes on to state that the USACE official interacting with Federally-Recognized Tribes should maintain open lines of communication through consultation with Tribes during the decision making process for matters that have the potential to significantly affect protected Tribal resources, Tribal rights (including treat rights),

and Indian lands (paragraph 6. d.). In sum, all of this guidance directs the agency to start early and to coordinate often.

USACE started the Tribal consultation process by inviting Tribes to participate in the early scoping process via letter on December 4, 2018, (also see Public Scoping Section 2.4). The letters were directed to the leadership of each of the Tribal governments whose aboriginal and historic territories or historic removal routes extended to the lands where the proposed activities would occur (i.e., the ACTT, CTL, CNO, CT, MBCI, JBCI, STF, SNO, and TBTL). Two responses were received that did not address the substance of the request. The MBCI participated in a scoping meeting and raised the issue of effects to pre-contact archaeological sites from any of the then-proposed alternatives. Next, on April 10, 2019, USACE provided an email distribution of the April 2, 2019, Notice of Intent to produce an EIS as well as the advertisement of public meetings for this project. No responses were received regarding this distribution. USACE also invited each of the Tribes to participate as a cooperating agency in the development of the EIS at a meeting on June 18, 2019. Only the MCN responded to this correspondence, indicating that the Tribe was choosing to consult under the NHPA, rather than participate as a cooperating agency. USACE intends to keep the lines of communication open throughout the study, relying on the Section 106 Process to capture significant Tribal concerns regarding historic properties, but remains open to the need to undertake Government-to-Government consultation, as necessary.

Section 9
Public Involvement

Project Delivery Team (PDT) meets every other Thursday with team members and the NFS to discuss progress and pitfalls of the study.

Early NEPA coordination with the NFS, stakeholders, Federal and State agencies, and Federally-Recognized Tribes was performed prior to the 2019 notice of intent (NOI) and afterward through public meetings, social media, and the CEMVN website. USACE hosted general scoping meetings within 90 days of the start of the study, per Water Resources Reform and Development Act (WRRDA) 2014. As part of the early coordination, general scoping was initiated prior to the NEPA NOI, in conformity with 40 CFR 1500-1508. A public website page with the study information and request for feedback was established in mid-December 2018.

The collaborative stakeholders associated with this study are USACE, ARB Commission (ARBC), CPRA, and the following parishes: Livingston, Ascension, St. Helena, East Feliciana, East Baton Rouge, Iberville, St. John the Baptist, and St. James. Resource agencies associated with this study include the U.S. Fish and Wildlife Service (FWS), U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), and the Louisiana Department of Wildlife and Fisheries (LDWF). Additionally, in partial fulfillment of USACE's responsibilities under E.O. 13175, early NEPA coordination was initiated with the following Tribes: Alabama-Coushatta Tribe of Texas (ACTT), Chickasaw Nation, Chitimacha Tribe of Louisiana (CTL), Choctaw Nation of Oklahoma (CNO), Coushatta Tribe of Louisiana (CT), Jena Band of Choctaw Indians (JBCI), Mississippi Band of Choctaw Indians (MBCI), Muscogee (Creek) Nation (MCN), Seminole Nation of Oklahoma (SNO), Seminole Tribe of Florida (STF), and Tunica-Biloxi Tribe of Louisiana (TBTL) on December 4, 2018.

A NEPA stakeholder meeting was conducted by USACE on December 3, 2018 at the USGS Baton Rouge, Louisiana office that included an option to participate by video conference. A subsequent reconnaissance meeting was conducted on December 10, 2018 with the NFS, and resource agencies at the at CPRA's Baton Rouge, Louisiana office which also included an option to participate by video conference. Federally-Recognized Tribes were invited, but were unable to attend. However, a follow up meeting was held on January 7, 2019, during which the MBCI participated. Additionally, a public scoping meeting was conducted on January 10, 2019, at CEMVN with Facebook live streaming, where feedback was requested as well. Feedback from the public scoping meeting resulted in the identification of three additional measures.

In accordance with NEPA, a NOI to prepare an EIS was published in the Federal Register (Volume 84, No. 63) on April 2, 2019. The scoping period ended on July 8, 2019. Three public scoping meetings were conducted within the study area on April 24 and 25, with Facebook live streaming. Comments were accepted via written correspondence and emails.

Approximately 80 non–USACE people attended the meetings in person and the Facebook live streaming had over 6,000 views. Scoping identified four areas of concern: flooding, dredging opportunities, levee opportunities, and nature-based engineering. People are concerned about inducement of flooding into other area and proposed further investigation in alternative formulation and specific areas of concern. Feedback from the public scoping meeting resulted in the identification of one additional measure, which was proposed by the Healthy Gulf Collaborative, regarding conversion of sand and gravel mines to bottomland hardwoods habitat for flood control.

A meeting was conducted on June 18, 2019, with collaborative stakeholders, the NFS, resource agencies, and Federally-Recognized Tribes to present the preliminary final array of alternatives and the screening rationale of the alternatives that were screened. As a result, three agencies, (FWS, Louisiana Department of Environmental Quality (LDEQ), and LDWF) requested an evaluation of river restoration, which resulted in the addition of another alternative, restoration of river meanders.

The scoping report was included in the 2019 DIFR/EIS, Environmental Appendix C-2, which has copies of all written feedback received prior to the additional resources approval in 2022. It can be found at https://www.mvn.usace.army.mil/Amite-River-and-Tributaries/.

After the additional resources were approved to reassess the dry dam and further evaluate nonstructural alternatives, EJ outreach meetings were conducted on February 28, 2023, and March 1, 2023, to inform and engage residents about the flood risk reduction measures. Outreach efforts focused on civic and faith-based organizations that serve residents in areas of EJ concern, including local churches, libraries, non-profits, and community centers. Initial and follow-up calls were made to 29 churches, four community centers, three non-profits, and three academic institutions. Of those contacted, six churches, two community centers, two non-profits, and two academic institutions agreed to disseminate our one-page summary of the outreach effort to the residents they serve.

A Public Notice of this SSDIFR/EA will be available for a 45-day comment period beginning December 15, 2023, and end on January 29, 2024 along with a redaction of the 2019 NOI.

Environmental Justice (EJ) Meetings took place for the Amite River and Tributaries Feasibility Report Environmental Impact Statement on February 28, 2023, and March 1, 2023 to inform and engage residents about the flood risk reduction measures, which included the Nonstructural Plan.

Outreach efforts focused on civic and faith-based organizations that serve residents in areas of EJ concern, including local churches, libraries, non-profits, and community center. Initial and follow-up calls were made to 29 churches, four community center, three non-profits, and three academic institutions. Of those contacted, six churches, two community centers and two non-profits agreed to disseminate our one-page project summary to the residents they serve. More information on the EJ meetings is provided in Appendix D-4.

A Public Notice of this draft SSDIFR/EA will be available for a 45-day comment period beginning December 15, 2023, and end on January 29, 2024.

Preparation of this SSDIFR/EA was coordinated with appropriate congressional, Federal, Tribal, State, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, will receive copies of the:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
Coastal Protection and Restoration Authority Board of Louisiana
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Louisiana Departments of Transportation and Development

Section 10
Conclusion

The recommendations contained herein reflect the information available at this time and current USACE policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to Congress as proposals for authorization and implementation funding. However, prior to transmittal to Congress, the non-federal sponsor, interested federal agencies, and the public will be advised of any significant modifications and will be afforded an opportunity to comment further.

10.1 USACE PLAN RECOMMENDATION

The TSP for this study includes a nonstructural plan for eligible properties within the study area. The TSP as detailed in the SSDIFR/EA has been identified by CEMVN for future recommendation for authorization as a Federal project, with such modifications thereof as in the discretion of the Commander, Headquarters, U.S. Army Corps of Engineers, may be advisable. The USACE recognizes that the NFS, supports the current identification of the TSP, but the NFS will also concurrently review the SSDIFR/EA.

The Draft Report for this study was first released for review in November 2019 and has since undergone additional analysis. This SSDIFR/EA includes additional concurrent ATR, public and policy reviews. The PDT, CEMVN management, and USACE vertical team representatives throughout the agency will consider comments provided during the public/concurrent review period prior to providing feedback to a USACE Headquarters Senior Leaders Panel. This panel will consider significant public, technical, legal, policy and IEPR comments on the TSP and other alternatives in conjunction with a decision to endorse the TSP and propose a way forward to complete feasibility-level design and the FIFR-EA.

The FIFR-EA is scheduled to be submitted in 2024 to USACE headquarters after which a Chief's Report will be developed. Once the Chief of Engineers approves and signs the Report, the Chief of Staff will sign the notification letters forwarding the Report to the chairpersons of the Senate Committee on Environmental and Public Works and the House of Representatives Committee on Transportation and Infrastructure. The signed Chief's Report will also be provided to the Office of the Assistant Secretary of the Army for Civil Works for review by the Administration.

The SSDIFR/EA fully describes flood risk to structures and life safety associated with riverine, rainfall, and residual risk to those structures caused by coastal storm flood events. The measures of the TSP were formulated to reduce the risk of rainfall flood damages to key infrastructure and structures. The TSP would greatly reduce, but not eliminate future damages and residual risk would remain. The residual risk, along with the potential

consequences, has been communicated to the Non-federal Sponsor and will become a requirement of any communication and evacuation plan.

10.2 PARTICIPATION IN NONSTRUCTURAL ALTERNATIVES.

To increase participation rates for the TSP, for homeowners who cannot afford the cost associated with the nonstructural plan (where SV and or income criteria may be developed), the following items may be considered, but may require additional Congressional authority:

- Allowances, such as those referenced in the WRDA 2022, Section 8154, to provide temporary relocation assistance to voluntary homeowner participants in nonstructural projects.
- Future agreements developed with a NFS may include that no cost share be requested directly of the property owner.
- Develop an assistance program to help connect preliminary eligible homeowners to other programs in order to meet some of the USACE secondary eligibility criteria such as repair condition of the structure. An example would be State of Louisiana Partial Action Plan No.1 for the Utilization of Community Development Block Grant Funds in Response to Hurricane Isaac administered through the Louisiana Office of Community Development/ Disaster Recovery Unit.

10.3 RECOMMENDED ACTION BY OTHERS

Additional recommendations that may be implemented by others that will further reduce the residual risks associated with flood damages were identified during the study.

10.3.1 CONTENT PROTECTION MEASURES OF WET FLOODPROOFED BUILDINGS

While wet floodproofing reduces structural damages, it does not reduce the risk and associated benefits to contents. The NFS, or individual owners, are encouraged to consider implementing content protection measures.

10.3.2 ADOPTION OF MORE STRINGENT LOCAL FLOODPLAIN REGULATIONS

Although communities within the study area cannot change the minimum National Flood Insurance Program (NFIP) standards. The NFS should work with the local governments to adopt local standards that achieve higher levels of flood risk reduction. Examples of potential actions may include replacing elevation requirements based on the 0.01 AEP to the 0.2 AEP level of risk reduction; implementing a zero-rise floodway; and adopting cumulative damages as the trigger for substantial damage determination.

10.3.3 ADOPTION OF MORE RESTRICTIVE PARISH AND MUNICIPAL BUILDING CODES, LAND USE AND ZONING REGULATIONS, AND OTHER DEVELOPMENTAL CONTROLS

Local governments within the floodplain should be encouraged to adopt, implement, and enforce stricter building and housing code requirements, land use and zoning regulations, and other developmental controls aimed at reducing flood risk and flood damage.

10.4 PATH FORWARD

This draft report available for public review beginning December 15, 2023. The official closing date for the receipt of comments is January 29, 2024, which is 45 days from the date on which the notice of availability of the SSDIFR/EA appears in the Federal Register during this review period. Comments may be mailed to the address listed below. Comments may also be emailed to the email address listed below.

U.S. Army Corps of Engineers
Attention: Chief, Environmental Branch
Environmental Branch
CEMVN–PDS, Room 136,
7400 Leake Avenue
New Orleans, LA 70118
Email: AmiteFS@usace.army.mil

Public meetings are tentatively scheduled for the week of January 15, 2024. The meetings dates and locations will be provided on the CEMVN project website at: www.mvn.usace.army.mil/Amite-River-and-Tributaries.

List of Preparers

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List of Acronyms and Abbreviations

AAHU	Average Annual Habitat Units
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ACTT	Alabama-Coushatta Tribe of Texas
AEP	Annual Exceedance Probability
APE	Area of Potential Effects
ARB	Amite River Basin
ARBC	Amite River Basin Commission
ART	Amite River and Tributaries East of the Mississippi River, Louisiana.
BCR	Benefit to Cost Ratio
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
BREC	Recreation and Park Commission for the Parish of East Baton Rouge
CDBG	Community Development Block Grant
CEMVN	USACE New Orleans District
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNO	Choctaw Nation of Oklahoma
CPRA	Coastal Protection and Restoration Authority
CRD	Comite River Diversion
CT	Coushatta Tribe of Louisiana
CTL	Chitimacha Tribe of Louisiana
CWA	Clean Water Act
DEA	Draft Environmental Assessment

DEIS	Draft Integrated Feasibility Report and Environmental Impact Statement
EA	Environmental Assessment
EBR	East Baton Rouge
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
EQ	Environmental Quality
ER	Engineer Regulation
ESA	Endangered Species Act
FDR	Federal Discount Rate
FEIS	Integrated Feasibility Report and Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1981
FRM	Flood Risk Management
FS	Focused Structural
FWCA	Fish and Wildlife Coordination Act
FWCAR	Coordination Act Report
FWS	Fish and Wildlife Services
FY	Fiscal Year
FWOP	Future With Out Project
GCJV	Gulf Coast Joint Venture
GOMESA	Gulf of Mexico Energy Security Act

GOSHEP	Louisiana Governor's Office of Homeland Security and Emergency Preparedness
H&H	Hydraulics and Hydrology
HMGP	Hazard Mitigation Grant Program
HTRW	Hazardous, Toxic, and Radioactive Waste
HW	Hold Water
IFR	Integrated Feasibility Report
JBCI	Jena Band of Choctaw Indians
LCA	LA Coastal Area
LDEQ	Louisiana Department of Environmental Quality
LDOA	Louisiana Division of Archaeology
LADOTD	Louisiana Department of Transportation and Development
LDWF	Louisiana Department of Wildlife and Fisheries
LPR	Livingston Parks and Recreation
LWCF	Land and Water Conservation Fund
LWFMP	Louisiana Statewide Comprehensive Water Based Floodplain Management Program
LWI	Louisiana Watershed Initiative
MBCI	Mississippi Band of Choctaw Indians
MBTA	Migratory Bird Treaty Act
MCACES MII	Micro-Computer Aided Cost Estimating System, 2nd Generation
MCN	Muscogee (Creek) Nation
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NAWMP	North American Waterfowl Management Plan
NBEM	National Bald Eagle Management
NCDC	National Climatic Data Center

NED	National Economic Development
NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NGVD	National Geographic Vertical Datum
NRHD	National Register Historic District
NHL	National Historic Landmarks
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOX	Nitrogen Oxide
NPS	National Park Service
NRC	National Research Council
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NS	Nonstructural
NSI	National Structure Inventory
NWI	National Wetlands Inventory
NWS	US National Weather Service
O&M	Operation and Maintenance
OCD	Office of Community of Development
OMRR&R	Operations, Maintenance, Repair, Rehabilitation, and Replacement
OSE	Other Social Effects
PA	Programmatic Agreement
PARDS	Parks and Recreation of Denham Springs

PDM	Pre-Disaster Mitigation Program
PDT	Professional Development Team
PED	Planning, Engineering and Design
PPA	Project Partnership Agreement
REC	Recognized Environmental Condition
RED	Regional Economic Development
ROD	Record of Decision
ROE	Right of Entry
RPDES	Regional Planning and Environment Division South
RSLC	Relative Sea Level Change
RW	Remove Water
SHPO	State Historic Preservation Officer
SLC	Sea Level Change
SLR	Sea Level Rise
SNO	Seminole Nation of Oklahoma
SSDIFR	Supplemental Second Draft Integrated Feasibility Report
STF	Seminole Tribe of Florida
SWPP	Stormwater Pollution Prevention Plan
T&E	Threatened and Endangered
TBTL	Tunica-Biloxi Tribe of Louisiana
THPO	Tribal Historic Preservation Officers
TSP	Tentatively Selected Plan
UL	Upper and Lower Basin
URA	Uniform Relocation Assistance Act
USACE	United States Army Corps of Engineers
USDA	US Department of Agriculture

USGS	United States Geological Survey
VOC	Volatile Organic Compound
WMA	Wildlife Management Area
WQC	Water Quality Certification
WRRDA	Water Resources Reform and Development Act
WVA	Wetland Value Assessment