

REVIEW PLAN

BIPARTISON BUDGET ACT OF 2018

**Amite River and Tributaries – East of the Mississippi River, LA
Feasibility Study**

Amite River Basin

**U.S. Army Corps of Engineers
New Orleans District**

MSC Approval Date: 28 March 2019

February 2020

REVIEW PLAN

February 26, 2020

Project Name: Amite River and Tributaries - East of the Mississippi River, LA

P2 Number: 464542

Decision Document Type: Feasibility Report

Project Type: Flood Risk Management

District: New Orleans District

District Contact: [REDACTED]

Major Subordinate Command (MSC): Mississippi Valley Division

MSC Contact: [REDACTED]

Review Management Organization (RMO): Flood Risk Management Planning Center of Expertise

RMO Contact: [REDACTED]

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: 12/14/2018

Date of MSC Approval of Review Plan: 3/28/2019

Date of IEPR Exclusion Approval: N/A

Has the Review Plan changed since PCX Endorsement? Yes (minor edits)

Date of Last Review Plan Revision: 2/26/2020

Date of Review Plan Web Posting: 3/28/2019

Date of Congressional Notifications: TBD

Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>	<u>Complete</u>
<u>Alternatives Milestone:</u>	Feb 7, 2019	Feb 7, 2019	Yes
<u>Tentatively Selected Plan:</u>	Oct 3, 2019	Sep 26, 2019	Yes
<u>Release Draft Report to Public:</u>	Dec 4, 2019	Nov 29, 2019	Yes
<u>Agency Decision Milestone:</u>	Apr 3, 2020	TBD	No
<u>Final Report Transmittal:</u>	Apr 14, 2021	TBD	No
<u>Chief's Report:</u>	Oct 1, 2021	TBD	No

Project Fact Sheet
December 6, 2018

Project Name: Amite River and Tributaries- East of the Mississippi River, LA

Location: The Amite River Basin covers portions of Amite, Lincoln, Franklin, and Wilkinson Counties in Mississippi as well as East Feliciana, St Helena, East Baton Rouge, Livingston, Ascension, and Iberville Parishes. Additionally, the study area includes St. James and St. John the Baptist Parishes. (Figure 1).

Authority: This study effort is being investigated due to the [Bipartisan Budget Act of 2018, H. R. 1892—13, Title IV, Corps of Engineers—Civil, Department of the Army, Investigations](#), where funds are being made available for the expenses related to the completion, or initiation and completion, of flood and storm damage 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.C. 5121 et seq.) in calendar years 2014, 2015, 2016, or 2017.

This study area is based on the August 2016 flood over southeast and southcentral Louisiana, and is 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."

The “existing project” was authorized in 1955 and construction was completed in 1964. Pursuant to the authorization, the Non-Federal sponsors for that project are responsible for the operation and maintenance (O&M) of that project.

Sponsor: Louisiana Department of Transportation and Development (If alternatives are developed in Mississippi, a non-federal sponsor(s) with authority to study the basin within Mississippi will be determined at a later date).

Type of Study: Flood Risk Management Feasibility Study

SMART Planning Status: This is a 3x3x3 compliant study (WRRDA 2014). Study will be compliant with USACE DCW Memorandum issued 3 May 2018 (DPM CW 2018-05).

Study Area: Amite River Basin and tributaries which includes portions of Southwest Mississippi and Southeast Louisiana. Additionally, the study area includes St. James and St. John the Baptist Parishes. See Study Area map on Page 4.

Problem Statement:

The Amite River and its tributaries can cause flood damages to industrial, commercial, agricultural facilities, and residential and nonresidential structures. The Amite River Basin 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 and wind setup. Critical infrastructure throughout the region, includes the I-10 and I-12 transportation systems, government facilities, and schools are expected to have increased risk of damage from rainfall events as a result of climate change.

Federal Interest: As recently as August 2016, the President issued disaster declarations for parishes in the Amite River Basin due to impacts from “The Great Flood of 2016”. The flood was responsible for 13 deaths (<http://ldh.la.gov/index.cfm/page/2553>) and the rescue of at least 19,000 people by the Louisiana National Guard

(https://www.army.mil/article/173589/national_guard_rescues_19000_in_flood_affected_areas).

The area experienced historic flooding to thousands of homes and businesses and impacts to the Nation's critical infrastructure by shutting down both the I-10 and I-12 transportation systems for days. Major urban centers in the basin saw significant flooding well outside of normal flood stages. The study will develop Flood Risk Management (FRM) alternatives to reduce the risks to public, commercial, and residential property, real estate, infrastructure, and human life; increase the reliability of a National transportation corridor (I-10-I-12) by providing alternatives that will potentially lessen damages from rainfall and wind/tide induced flooding; and enhance public education and awareness of flood risks.

Risk Identification:

Flooding in the Amite River Basin is a potential significant threat to human life as the study area contains a population of about 700,000. The project area consists of approximately 253,000 structures valued at \$73 billion. Residential and non-residential structures are raised on average 1-3 feet. Hurricanes, tropical storm events, and locally heavy rainfall pose a significant risk to the communities, ecosystems, and industries of the Amite River Basin. The project area is impacted by flooding within the upper basin from downwater flooding and the lower basin by a combination of downwater and backwater flooding (i.e. wind driven/ tides and rainfall).

The Future Without Project Conditions include increased flood risk due to rapid change in floodplain hydrology from development activities and changes in riverine geomorphology caused by stream bank erosion and channel degradation. Two current USACE construction projects, Comite River Diversion and the East Baton Rouge Flood Control, will impact the hydrology of the Amite River Basin. Additionally storms are expected to increase in frequency and intensity in southeast Louisiana due to climate change. This will result in higher and more frequent storm damages and higher average annual damages.

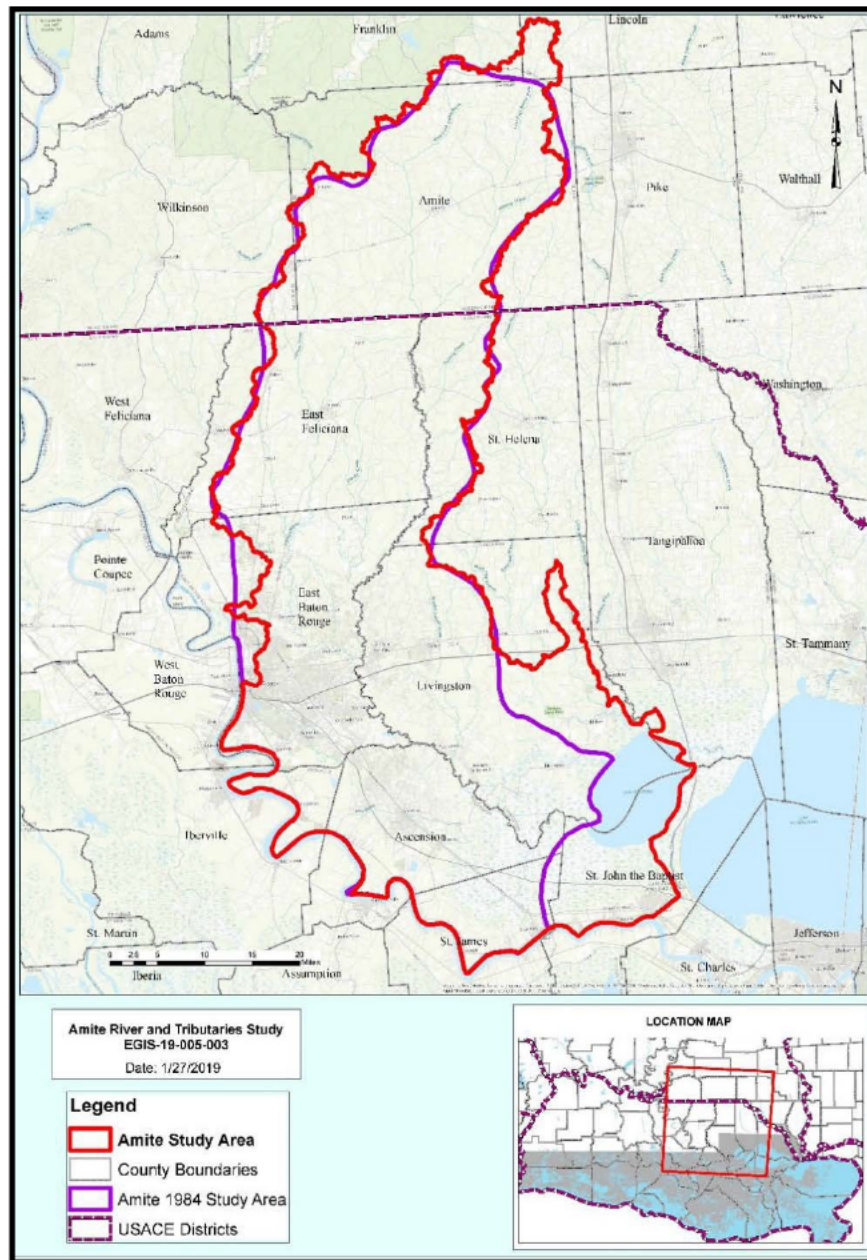


Figure 1: Amite River and Tributaries - Study Area Map

1. FACTORS AFFECTING THE LEVELS OF REVIEW

Scope of Review.

- Will the study likely be challenging? Yes due to the size of the study area and differing stakeholder viewpoints.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.

Existing Conditions Concerns – The study will require research to understand the scope of the O&M obligations of the existing FRM project (Amite River and Tributaries) and will consider whether the NFS have fulfilled those obligations. In addition, the study area contains two USACE projects that are in Pre-Construction Engineering and Design and the planned features may be changed/modified. The downstream conditions could change based on the final constructed projects.

Backwater Flooding Concerns – The lower portion of the study is very flat and can be influenced by other rivers, bays, and even tidal impacts well outside of the study area.

There are risks associated with finding publicly acceptable comprehensive solutions.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues?

The Amite River and tributaries has the potential to have significant threat to human life as the most recent flood in August 2016 resulted in 13 deaths and the rescue of at least 30,000 people, including 19,000 rescued by the U.S. Coast Guard and 11,000 rescued by others. Therefore, the PDT has determined a Type I IEPR that includes a Safety Assurance Review is required to assess significant life safety issues and factors that will be a part of plan formulation. Lives have been lost in past flood events. The area has ample warning times for flooding, which may limit justification of the project on life safety alone. Some of the proposed measures could include dry reservoirs which could involve life safety issues. Social justice and underserved communities may exist within the project area as well. Features layout and design will consider environmental, social well-being, and public safety.

- Has the Governor of an affected state requested a peer review by independent experts?

No

- Will it likely involve significant public dispute as to the project's size, nature, or effects?

Yes.

- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project?

Yes, the study will likely have significant dispute in regards to environmental costs and benefits since measures could impact areas designated as a scenic river and the benefits of the measures/alternatives could impact several parishes. The measures/alternatives could have benefits in one parish while requiring mitigation efforts in other parishes. The study has received local media coverage in light of the two Pre-Construction Engineering and Design projects in the study area. Downstream conditions could change based on the final constructed projects.

The PDT will be conducting NEPA scoping meetings and public review of draft documents through the planning process. In accordance with EC-1165-2-217, section 7.e.(4) and section 7.e.(13), reviewers will have access to public comments received whenever feasible and appropriate and will be made aware of public participation activities as they relate to the review schedule.

- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?

The PDT anticipates using approved planning, hydrology and hydraulics, cost engineering, climate change and environmental models. All project designs, measures, and features are anticipated to be common and routine techniques with the exception for the potential of a dam reservoir as being a measure. Also note there are two existing construction projects that are in PED as well as the existing FRM project that is the O&M phase that could have significant impacts on future without projects conditions.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule?

This is yet to be determined.

- Is the estimated total cost of the project greater than \$200 million?

Yes. Note: Coordination with Cost Engineering DX and Congressional authorization would be required for construction funding.

- Will an Environmental Impact Statement be prepared as part of the study?

The level of NEPA documentation has not been determined. However it is highly likely an Environmental Impact Statement will be prepared in part due to the cumulative effects of concurrent USACE construction projects and other local efforts within the study area. Determination of the appropriate NEPA decision document will occur following Alternative Milestone and prior to Tentatively Selected Plan.

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?

The PDT does not anticipate any adverse impacts on scarce or unique tribal, cultural, or historic resources. The PDT plans to implement a programmatic agreement with all interested parties to avoid, minimize, or mitigate any scarce or unique tribal, cultural, or historic resources.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures?

This is yet to be determined.

- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat?

This is yet to be determined.

2. REVIEW EXECUTION PLAN

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

District Quality Control. All decision documents will (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan.

Agency Technical Review. ATR will be performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC. Since there is potential for significant life safety issues in this study, a safety assurance review will be conducted during ATR.

Independent External Peer Review. Type I IEPR will be required for this decision document. This is the most independent level of review, and is applied in cases that meet criteria where the risk and magnitude of the project are such that a critical examination by a qualified team outside of USACE is warranted. In accordance with ER 1165-2-217, section 7.e.(11).c, IEPR reviewers will be selected by the RMO, contractor, or Outside Eligible Organization (OEO) as appropriate.

Cost Engineering Review. All decision documents shall be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX will assist in determining the expertise needed on the ATR and IEPR teams. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews typically occur as part of ATR.

Model Review and Approval/Certification. EC 1105-2-412 mandates the use of certified or approved models for all planning work to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions.

Policy and Legal Review. All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H provides guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. These reviews are not further detailed in this section of the Review Plan.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the teams are identified in later subsections covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information.

Table 1: Levels of Review

The table below outlines project products, type of review, schedule and cost. This table will be updated at each IPR and SMART Planning Milestone meeting and presented to the Vertical Team. After completion of the feasibility study, the table will be updated for future phases of the project to include design, construction, and operation and maintenance.

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Existing Conditions and Focused Array	District Quality Control	03/22/2019	04/05/2019	\$10,000	Yes
Draft Feasibility Report and EIS	District Quality Control	10/17/2019	10/31/2019	\$33,000	Yes
Draft Feasibility Report and EIS	Legal Sufficiency Review	10/31/2019	11/14/19	n/a	Yes
Draft Feasibility Report and EIS	Policy and Legal Review (One Policy Review Team)	11/29/2019	3/6/2020	n/a	No
Draft Feasibility Report and EIS	Agency Technical Review	11/29/2019	2/21/2020	\$60,000	Yes
Draft Feasibility Report and EIS	Type I IEPR	11/29/2019	4/15/2020	\$86,051	No
Final Feasibility Report and EIS	District Quality Control	11/12/2020	11/26/2020	\$36,000	No
Final Feasibility Report and EIS	Agency Technical Review	11/27/2020	01/15/2021	\$28,000	No
Final Feasibility Report and EIS	Legal Sufficiency Review (MVN)	2/12/2021	2/26/2021	n/a	No
Final Feasibility Report and EIS	Policy and Legal Review (MSC)	3/19/2021	4/1/2021	n/a	No

a. DISTRICT QUALITY CONTROL

The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). Table 2 identifies the required expertise for the DQC team.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in large river Flood Risk Management projects.
Economics	The Economics reviewer should have at least 10 years of USACE economics experience or a combination of education and experience. The reviewer should have a background in developing economic simulation models and analysis for large, and complex regional investigations.. Should have extensive experience in analyzing flood risk management projects in accordance with ER 1105-2-100, the Planning Guidance Notebook. Experience with non-structural analysis preferred. Experience with HEC-FDA, HEC-FIA and LIFE-SIM is preferred.
Environmental Resources	Senior Environmental Specialist with experience in FRM projects. This includes experience in coastal zone management, essential fish habitat and endangered species compliance.
Cultural Resources	Senior Cultural Resource Specialist with experience in Federal lands and programmatic agreements.
Hydrology/Hydraulic Engineering	Senior H&H Engineer with experience with 2-dimensional models and experience with climate change analysis.
General Engineering	Senior Engineer with dam project or diversion experience. Determination of appropriate engineering disciplines required for review (civil, geotechnical etc.) are dependent upon the measures chosen. The engineering disciplines will be identified following Alternative Milestone and prior to Tentatively Selected Plan.
Cost Engineering	The Cost Engineering panel member should have 15 years demonstrated experience or combined equivalent of education and experience assessing FRM projects. Member should be a Professional Engineer from an Accrediting Board for Engineering and Technology accredited institution with at least a Bachelor's degree. Professional certification, such as DoD Tri-Service Cost Certification, or other cost certification is required.
Structural Engineering	Senior Structural Engineer with experience in FRM projects.
Geotechnical Engineering	Senior Geotechnical Engineer with experience in foundation analysis and channel stability analysis.
Real Estate	Senior Real Estate Specialist with experience in Federal lands.

Documentation of DQC. Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in EC 1165-2-217 (see page 19, Figure F).

1. Documentation of Amite River and Tributaries FRM DQC and interim Quality Control Checks will be completed in accordance with the RPEDS SOP for DQC. Quality Control Checks will be performed by senior level staff, such as supervisors and team leaders, but not individuals who have produced the original work or who managed or reviewed documents produced by outside contractors. Quality Checks evaluate assumptions, loadings, design parameters, constraints, equations, model inputs, quantities, and references used to complete the design and/or analysis. They will be guided by a checklist that identifies appropriate considerations. Thorough annotation, conclusions should be provided in an accompanying narrative to allow the reviewer/checker to assure their validity.
2. Documentation of interim Quality Control Checks and resolution will occur via a Memorandum for Record (MFR) development and circulation with the vertical team.
3. Interim Quality Control Checks will include the following team members: Plan Formulation, Environmental, Economics, Project Management, OC, Engineering Division and Real Estate members.
4. Interim Quality Control Checks will occur on the Amite River and Tributaries FRM study at the following check points:
5. Existing Conditions DQC. This review will include plan formulation and environmental DQC team members, at a minimum. The purpose of this DQC is to review historic, existing, and future without project conditions, and problems, opportunities, goals and objectives. The review will cover scoping and preliminary analysis. The plan formulation reviewer will compare the risks and consequences identified in the RP, PMP, and risk register to ensure that risks and consequences are being considered, and if they need to be, revised appropriately and are being addressed.
6. Focused Array DQC. This review will include plan formulation, economics and environmental. The review will consider measures, screening criteria, and the initial and focused array of alternatives. It will also review model selections and incorporation of risk and uncertainty details among other actions identified. The reviewers will compare the risks and consequences identified in the RP, PMP, and risk register.
7. Draft Report/TSP DQC. This will include reviews by the PDT and OC, as well as the entire DQC team as identified in this Review Plan. The review will cover all plan formulation issues being presented in the draft report, including risk informed approaches as documented in the respective checklist. It will be conducted and stored in the DQC folders on the RPEDS SharePoint, and in Dr. Checks and the MFR produced will be in the form of a Review Report, complete with documentation and resolution of DQC comments for use by an ATR Team, as applicable, and a DQC certification form accompanied by the

complete set of checklists. The plan formulation reviewer will compare the risks and consequences identified in the RP, PMP, and risk register to ensure that risks and consequences are being considered, and if they need to be, revised appropriately and are being addressed. If a TSP risk assessment is identified in the RP and PMP, or if a risk buy-down plan is identified in the planning process, the plan formulation reviewer will assure it was conducted and addressed and documented correctly in the report.

8. Final Report DQC. Similar to the Draft Report DQC, the review will include the full gamut of considerations ranging from PDT and OC review to formal DrChecks comments made by the entire DQC Team. A Review Report will be prepared as the MFR for use by subsequent ATR and IEPR reviews, in conjunction with a completed set of checklists.
9. Documentation of completed DQC should be provided to the MSC, RMO and ATR Team lead prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews (see EC 1165-2-217, section 9).

b. AGENCY TECHNICAL REVIEW

The ATR will assess whether the analyses are technically correct and comply with guidance, and that documents explain the analyses and results in a clear manner. An RMO manages ATR. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h) (1)). Table 3 identifies the disciplines and required expertise for this ATR Team.

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may serve as a reviewer for a specific discipline (such as planning).
Planning	A senior water resources planner with experience in FRM projects.
Economics	The Economics reviewer should have 10 – 20 years USACE economics experience or a combination of education and experience. The Economics reviewer should have a background in developing economic simulation models and analysis for large, complex regional investigations.. Should have extensive experience in analyzing flood risk management projects in accordance with ER 1105-2-100, the Planning Guidance Notebook. Preferred experience includes performing analysis on non-structural alternatives, and a background in both riverine and coastal economics.

Environmental Resources	Senior Environmental Specialist with experience in FRM projects. This includes experience in NEPA, coastal zone management, essential fish habitat and endangered species compliance.
Cultural Resources	Senior Cultural Resource Specialist with experience in programmatic agreements.
Hydraulic and Hydrology	Senior H&H Engineer with experience with 2-dimensional models.
General Engineering	Senior Engineer with dam project or diversion experience. Determination of appropriate engineering disciplines required for review (civil, geotechnical etc.) are dependent upon the measures chosen. The engineering disciplines will be identified following Alternative Milestone and prior to Tentatively Selected Plan. Since it is known at this time that a structural engineer is required, that discipline has been added as a separate discipline.
Cost Engineering	The Cost Engineering panel member should have 15 years demonstrated experience or combined equivalent of education and experience assessing FRM projects. Should have direct cost engineering design or construction management experience centered around FRM. Active participation in related professional societies is encouraged.
Structural Engineering	Structural Engineer with experience in FRM projects.
Geotechnical Engineering	Senior Geotechnical Engineer with experience in FRM projects, foundation analysis, and channel stability analysis.
Real Estate	The Real Estate Plan reviewer should have 5-10 years real estate experience or equivalent education. Should have direct real estate experience on design or construction teams with knowledge of policies, guidance and procedures with ER 405-1-2, Real Estate Handbook.
Climate Preparedness and Resilience CoP Reviewer	Climate Preparedness and Resiliency Community of Practice certified member will participate in the ATR review.
Risk and Uncertainty	For decision documents involving hydrologic, hydraulic, and/or coastal related risk management measures, include a subject matter expert in multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty in accordance with ER 1105-2-101.

Documentation of ATR. DrChecks will be used to document all ATR comments, responses and resolutions. Comments should be limited to those needed to ensure product adequacy. All members of the ATR team should use the four part comment structure (see EC 1165-2-217, section 9(k)(1). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the EC 1165-2-217 issue resolution process. Concerns can be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review (see EC 1165-2-217, Section 9), for the draft and final reports, certifying that review

issues have been resolved or elevated. ATR may be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Type I IEPR.

Type I IEPR is managed outside of the USACE and conducted on studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study.

Decision on Type I IEPR. The flood hazard along the Amite River and Tributaries poses a significant threat to human life, as evidenced during flooding in August 2016 that resulted in 13 deaths and the rescue of at least 30,000 people by the Louisiana National Guard and others. Additionally, the project scope includes potential construction of storm water retention basins, channel modification, diversions levees, floodgates and pumping stations for flood risk reduction measures, as such public safety concerns, potential for controversy, and high level of complexity may occur in the project. The PDT anticipates a Type I IEPR with a safety assurance review component will be required for the recommended alternative and initiated coordination the PCX for their endorsement of the Review Plan and getting in IEPR contracting queue.

Products to Undergo Type I IEPR. The full draft report will undergo IEPR.

Required Type I IEPR Panel Expertise. Panels will consist of independent, recognized experts from outside of the USACE in disciplines representing a balance of areas of expertise suitable for the review being conducted. Table 4 lists the required panel expertise.

Table 4: Required Type I IEPR Panel Expertise

IEPR Panel Member Disciplines	Expertise Required
Plan Formulation/Economics	The review panel member must be from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum of 10 years demonstrated experience in economics and planning/ The Review Plan member should be familiar with the USACE six-step planning process, which is governed by ER 1105-2-100, Planning Guidance Notebook. In addition, the reviewer should have experience in economic evaluation of flood risk management projects and methods for evaluating flood damages and potential for life loss using tools such as HEC Flood Damage Reduction Analysis (HEC-FDA), and HEC Flood Impact Analysis (HEC-FIA) and/or HEC-LifeSim.

Environmental	The Review Panel member must be a scientist from academia, a public agency, a non-governmental entity, or an Architectural-Engineering or Consulting Firm. The Review Panel member must have at least 10 years' experience directly related to water resources environmental evaluation or review and the National Environmental Policy Act (NEPA) process and analysis, and have a biological or environmental background that is familiar with the project area and environmental impact analysis and mitigation. The Review Panel member must be familiar with habitat, fish and wildlife species that may be affected by the project alternative in the study area and region. Additionally, the Review Panel member must be familiar and have experience with Clean Water Act, Endangered Species Act (ESA), and Essential Fish Habitat.
Hydrology and Hydraulic Engineering	The Review Panel member must be a registered professional engineer from academia, a public agency whose mission includes flood risk management, or an Architect-Engineer or consulting firm, having a minimum of 10 years experience in hydrologic, hydraulic and sediment transport analyses and models, such as HEC River Analysis System (RAS). The reviewer should be familiar with application of detention/retention basins, geomorphology, climate change, and non-structural solutions involving flood warning systems and flood proofing.
Civil/Structural Engineering	The Review Panel member must be a registered professional engineer having a minimum of 10 years experience in civil engineering and design with at minimum a Bachelor's degree in engineering. The Review Panel member should be experienced in designing channel modifications, levee systems, earthwork, retention/detention facilities, such as dams and reservoirs; have working knowledge of construction; and capable of making professional determinations based on experience.
Geotechnical Engineering	The Review Panel member should be a registered professional engineer or geologist having a minimum of 10 years' experience in geotechnical engineering with a minimum Bachelor's degree. The Review Panel member should have familiarity and experience in working with geotechnical evaluations and geo-civil design for flood risk management projects to include foundation analysis and channel stability analysis.

Documentation of Type I IEPR. The Outside Eligible Organization (OEO) will submit a final Review Report no later than 60 days after the end of the draft report public comment period. USACE shall consider all recommendations in the Review Report and prepare a written response for all recommendations. The final decision document will summarize the Review Report and USACE response and will be posted on the internet.

(ii) Type II IEPR.

The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction for hurricane, storm and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. A Type II IEPR Panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, and periodically thereafter on a regular schedule.

Decision on Type II IEPR. *A decision on performing a Type II IEPR will be made once a plan is recommended.*

Products to Undergo Type II IEPR. TBD

Required Type II IEPR Panel Expertise. TBD

d. MODEL CERTIFICATION OR APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

Table 5: Planning Models. The following models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
IWR-Planning Suite II	The IWR-Plan was developed by the Institute of Water Resources as accounting software to compare habitat benefits Among alternatives. This model will be used to determine best buy alternatives and incremental cost analysis of alternatives.	Certified
Wetland Value Assessment (WVA)	The Wetlands Value Assessment (WVA) Marsh Models (Fresh/Intermediate Marsh, Brackish Marsh, and Saline Marsh) were initially developed as the primary means of measuring the wetland benefits of candidate	Approved for Use - The model was approved for Regional use in the Gulf Coast of Louisiana and

	projects proposed for funding under the Coastal Wetlands Planning, Protection and Restoration Act. This PDT will use the WVA for determining potential impacts under USACE civil works projects and mitigation.	Texas via a CECW-P memo, dated 7 November 2017. The WVA models for all non-marsh models (such as swamps) were approved on 12/6/18.
HEC-FDA 1.4.2	To estimate damages, HEC-FDA 1.4.2 uses a point-based structure inventory. Hydraulic stage data are used to determine the flood depths at each structure, and structure depth-damage curves are used to estimate damages.	Certified
HEC-LIFE-SIM 2.0	HEC-LifeSim is an agent based simulation system for estimating life loss with the fundamental intent to simulate population redistribution during an evacuation. Life loss is then determined by the hazard (e.g. flooding).	Enterprise Life Safety Model

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

Table 6: Engineering Models. These models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
Micro-Computer Aided Cost Engineering System (MCACES) MII Version 3.0	MCACES is a cost estimation model. This model will be used to estimate costs for the feasibility study.	Certified
HEC-RAS-1 and 2D 5.0.6	Developed and maintained by the Hydrologic Engineering Center (HEC). Project may use 1-D Steady Flow and 1-D Unsteady Flow. HEC-RAS 1-D is commonly used for: Water surface profiles over long reaches; Depth averaged velocities; Rainfall impact; Sediment transport. HEC-RAS 2D is commonly used for 2-D flow simulation over large domains such as: Rivers, Canals, Flood Plains, Estuaries, Rainfall Catchment Areas; large scale simulations with long durations. Both models have been used extensively in project area.	CoP Preferred

AdCIRC SL15	Model simulates winds, storm surge, waves, tides, riverine inflows. Previously approved AdCIRC runs are planned to be used. The AdCIRC model runs were done in 2011 for the West Shore Lake Pontchartrain project, with good resolution in Lake Maurepas. The results from those previously approved runs to get maximum water levels in Lake Maurepas for any frequency event at 50 year intervals. The AdCIRC model runs are only being used for tailwater inputs for the HEC-RAS-1 and 2D models as well as the Delft3D Flow models.	CoP Preferred
Delft3D Flow 4.02.03	Delft 3D is commonly used for 2-D flow simulation over large domains such as: Rivers, Canals, Flood Plains, Estuaries, Rainfall Catchment Areas; large scale simulations with long durations. Capable of modeling wind effects on hydraulics. Sediment transport. Coupled with SWAN for wave analysis. Due to the size of the study area (Mississippi through Lake Maurepas), this model may be used for large scale wind simulations.	CoP Allowed

e. POLICY AND LEGAL REVIEW

Policy and legal compliance reviews for draft and final planning decision documents are delegated to the MSC (see Director's Policy Memorandum 2018-05, paragraph 9).

(i) Policy Review.

The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The team is identified in Attachment 2 of this Review Plan. The Policy Review will be conducted by the MSC, with a team member assigned from Headquarters (HQUSACE).

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Review team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- In addition, teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

- In some cases legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.
- Each participating Office of Counsel will determine how to document legal review input.

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
[REDACTED]	MVN-PM-BC	Senior Project Manager	[REDACTED]
[REDACTED]	MVN-PM-B	Project Manager	[REDACTED]
[REDACTED]	MVN-PD-PFR	Lead Plan Formulator	[REDACTED]
[REDACTED]	MVN-PDF	Plan Formulator	[REDACTED]
[REDACTED]	MVN-PD-E	Lead Economics	[REDACTED]
[REDACTED]	MVN-PDE	Economics	[REDACTED]
[REDACTED]	MVN-PDS-C	Environmental	[REDACTED]
[REDACTED]	MVN-ED-L	Civil Engineering	[REDACTED]
[REDACTED]	MVN-ED-SC	Cost Engineering	[REDACTED]
[REDACTED]	MVN-ED-L	Engineering Lead	[REDACTED]
[REDACTED]	MVN-ED-SR	Study Engineer	[REDACTED]
[REDACTED]	MVN-ED-H	Geographer	[REDACTED]
[REDACTED]	MVN-REE	Real-estate	[REDACTED]
[REDACTED]	MVN-OC	Office of Counsel	[REDACTED]
[REDACTED]	MVN-ED-H	H&H	[REDACTED]
[REDACTED]	MVN-ED-H	H&H	[REDACTED]
[REDACTED]	MVN-PA	Public Affairs	[REDACTED]
[REDACTED]	MVP-PD-E	Economist	[REDACTED]
[REDACTED]	MVN-PDS-N	Archaeologist	[REDACTED]
[REDACTED]	MVN-PDN-NCR	Tribal Liaison	[REDACTED]
[REDACTED]	MVN-ED-F	Geotech Engineer	[REDACTED]
[REDACTED]	MVN-ED-T	Structural Engineer	[REDACTED]
[REDACTED]	MVN-ED-SR	Relocations	[REDACTED]

DISTRICT QUALITY CONTROL TEAM				
Name	Office	Position	Phone Number	Qualifications
[REDACTED]	CEMVN-PD	DQC Lead - Plan Formulator	[REDACTED]	DQC members have the qualifications as described in Table 2 of this Review Plan
[REDACTED]	CEMVP-PD	Planning - Water Resources Certified Planner	[REDACTED]	
[REDACTED]	CESAS-PM-P	Environmental Resources - NEPA Specialist	[REDACTED]	
[REDACTED]	CEMVN-ED-HC	Hydraulics and Hydrology - Engineer	[REDACTED]	
[REDACTED]	CEMVN-PDN-NCR	Cultural Resources - Supervisory Archeologist	[REDACTED]	
[REDACTED]	CEMVN-REE	Real Estate - Chief Appraisal & Planning Branch	[REDACTED]	
[REDACTED]	CEMVN-ED-LW	General Engineering- Engineering Design	[REDACTED]	
[REDACTED]	CEMVN-PDE	Economics - Economist	[REDACTED]	
[REDACTED]	CEMVN-EDS	Structural Engineering	[REDACTED]	
[REDACTED]	CEMVN-ED-F	Geotechnical Engineering	[REDACTED]	
[REDACTED]	CEMVN-ED-SC	Cost Engineering	[REDACTED]	

AGENCY TECHNICAL REVIEW TEAM				
Name	Office	Position	Phone Number	Qualifications
[REDACTED]	CENWD-PDC	ATR Lead/Plan Form	[REDACTED]	ATR Team members have the qualifications as described in Table 3 of this Review Plan.
[REDACTED]	CELRH-EC-DC	Gen Eng/Civil Design	[REDACTED]	
[REDACTED]	CESWG-ECH	Climate	[REDACTED]	
[REDACTED]	CENWO-PM-AC	Environmental	[REDACTED]	
[REDACTED]	CENWO-EDH-D	H&H/Flood Risk Analysis	[REDACTED]	
[REDACTED]	CENWW-ECE	Cost	[REDACTED]	
[REDACTED]	CELRH-DSPC-GS	Geotech	[REDACTED]	
[REDACTED]	CENWO-PM-AB	Econ	[REDACTED]	
[REDACTED]	CELRN-PMP	Cultural	[REDACTED]	
[REDACTED]	CENWK-RE	Real Estate	[REDACTED]	
[REDACTED]	CELRH-DSPC-GE	Structural	[REDACTED]	
[REDACTED]	CELRH-DSPC-TS	Construction	[REDACTED]	

VERTICAL TEAM			
Name	Office	Position	Phone Number
	CECW-PC	Planning	
	CEMVD-PD-L	Deputy, Planning	
	CEMVD-PD-L	Chief, Planning & Ecosystem PCX	
	CEMVD-PD-L	Project Manager	
	CEMVD-PD-L	Supervisory Civil Engineer	
	CEMVD-PD-L	Chief - Program Support Division	
	CEMVD-PD-C	Chief Civil Works Integratin/Programs Deputy	
	CEMVD-RB-W	Deputy, Watershed	
	CEMVD-PD-OD	TBD	
	CEMVD-PDC	Supplemental Program Manager	
	CEMVD-RB-T	Project Manager	

POLICY REVIEW TEAM			
Name	Office	Position	Phone Number
	CEMVD-PD-L	Review Manager	
	CECW-PC	Plan Formulation	
	CECW-PC	Economics	
	CECW-PC	Environmental	
	CEMVD-PD-L	Cultural Resources	
	CEMVD-RB-W	Hydraulics & Hydrology	
	CEMVD-RB-T	Geotechnical	
	CEMVD-RB-T	Structural	
	CEMVD-RB-T	Levee Safety	
	CEMVD-RB-T	Dam Safety	
	CESAJ-EN-WC	Climate Change	
	CEMVD-PD-SP	Real Estate	
	CEMVD-OC	Counsel	

* New 0193 Position being filled will assume this role

Location of Change/Revision	Description of Change/Revision	Date
Table 1, Levels of Review	Updated Complete column to “Yes” for Existing Conditions and Focused Array DQC	7/9/2019
Table 1, Levels of Review	Changed End Date for Legal Sufficiency Review for Draft Report and EIS from 11/28/2019 to 11/25/2019	7/9/2019
Table 1, Levels of Review	Changed Start Date for Policy and Legal Review of Draft Report and EIS from 11/28/2019 to 11/25/2019	7/9/2019
Table 1, Levels of Review	Changed Start Date for ATR of Draft Report and EIS from 11/28/2019 to 11/25/2019	7/9/2019
Table 1, Levels of Review	Changed Start Date for IEPR of Draft Report and EIS from 11/28/2019 to 11/25/2019	7/9/2019
Table 1, Levels of Review	Changed End Date for IEPR of Draft Report and EIS from 3/28/2020 to 2/24/2020	7/9/2019
Table 5, Planning Models	Changed Version number of HEC-Life-SIM from 1.0.1 to 2.0	7/9/2019
Attachment 1 – Team Rosters	Added [REDACTED] and [REDACTED] [REDACTED]	7/9/2019
Page 1 - Key Review Plan Dates	Changed date of last Review Plan Revision from 3/20/2019 to 7/9/2019	7/9/2019
Page 1 - Milestone Schedule	Actualized release of the draft report to 11/29/2019	2/26/2020
Table 1, Levels of Review	Updated Review dates and cost of IEPR	2/26/2020
Table 4, Required Type 1 IEPR Panel Expertise	Updated to be consistent with IEPR Planning Work Statement	2/26/2020
Attachment 1, Team Rosters	Updated PDT, DQC and ATR reviewers	2/26/2020