

REVIEW PLAN

UPPER BARATARIA, LOUISIANA

FEASIBILITY STUDY

**US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT**

March 2019

REVIEW PLAN

March 2019

Project Name: Upper Barataria, Louisiana Feasibility Study (covering parts of Assumption, Ascension, St James, Lafourche, St John the Baptist, Jefferson, and St. Charles Parishes, LA)

P2 Number: 396697

Decision Document Type: Integrated Feasibility Report and Environmental Impact Statement

Project Type: Coastal Storm Risk Management (CSRM)

District: New Orleans District

District Contact:

Major Subordinate Command (MSC): Mississippi Valley Division (MVD) Vicksburg, MS

MSC Contact:

Review Management Organization (RMO): Coastal Storm Risk Management Planning Center of Expertise (CSRM PCX)

RMO Contact:

Key Review Plan Dates

<u>Date of RMO Endorsement of Review Plan:</u>	29 Jan 2019
<u>Date of MSC Approval of Review Plan:</u>	8 Mar 2019 (Sched)
<u>Date of IEPR Exclusion Approval:</u>	N/A
<u>Has the Review Plan changed since PCX Endorsement?</u>	Yes
<u>Date of Last Review Plan Revision:</u>	20 Feb 2019
<u>Date of Review Plan Web Posting:</u>	Pending
<u>Date of Congressional Notifications:</u>	Pending

Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>	<u>Complete</u>
FCSA Signature Date:	Oct 2018	9 Oct 2018	Yes
Alternatives Milestone:	Jan 24 2019	Jan 24 2019	Yes
Tentatively Selected Plan:	Oct 2 2019	Pending	No
Release Draft Report to Public:	Dec 3 2019	Pending	No
Agency Decision Milestone	Mar 27 2020	Pending	No
Final Report Transmittal:	Mar 19 2021	Pending	No
Chief's Report or Director's Report:	July 12 2021	Pending	No

Project Fact Sheet
March 2019

Project Name: Upper Barataria, Louisiana Feasibility Study

Location: Ascension, Assumption, Jefferson, Lafourche, St Charles, St. James, and St. John the Baptist Parishes, LA

Authority: The Resolution dated May 6, 1998 of the Committee on Transportation and Infrastructure of the U.S. House of Representatives authorizes a study that will investigate alternatives that may include structural and non-structural measures to address flood risk from tidal surges, coastal storm surges, and heavy rainfall in the area between Bayou Lafourche and the Mississippi River System, from Donaldsonville to the Gulf of Mexico (the “Study”). Notwithstanding Section 105(a) of the Water Resources Development Act of 1986 (33 U.S.C. 2215(a)), which specifies the cost-sharing requirements generally applicable to feasibility studies, Title IV, Division B of the Bipartisan Budget Act of 2018, Public Law 115-123, enacted February 9, 2018 (“BBA 2018”), authorizes the Government to conduct the Study at full Federal expense to the extent that appropriations provided under the Investigations heading of the BBA 2018 are available and used for such purpose.

Non-Federal Sponsor: Coastal Protection and Restoration Authority Board of Louisiana (CPRAB). A Feasibility Cost Share Agreement was signed on 9 Oct 2018.

Type of Study: Feasibility Study

SMART Planning Status: This is a 3x3x3 compliant Study (WRRDA 2014); the Study will be compliant with USACE DCW Memorandum issued 3 May 2018.

Study Area: The Study Area includes communities in the following seven southeast Louisiana parishes: Ascension, Assumption, Jefferson, Lafourche, St Charles, St. James, and St. John the Baptist Parishes. The Study Area is bounded on the north and east by the Mississippi River and Tributaries Project, Mississippi River Levee, on the west by Bayou Lafourche, and on the south Study Area extends slightly past U.S. Highway 90. See Figure 1. The Study Area is part of the larger Barataria Basin watershed covering approximately 760 square miles and characterized by low, flat terrain with numerous navigation channels, drainage canals, and natural bayous that drain into Lake Salvador and eventually the Gulf of Mexico. Areas of development located within the Study Area are mostly unleveed or have inadequate levee systems, are dependent on gravity drainage and are subject to the effects of interior rainfall flooding and riverine flooding. The southern half of the Study Area is also subject to tidal flooding due to hurricanes and other storms. The Study Area is mostly wetland and agricultural lands with numerous communities located adjacent to major highways and adjacent to the Mississippi River and Bayou Lafourche. Before construction of the Mississippi River levees, the area was subjected to rainfall, tidal, and hurricane flooding from the Mississippi River resulting in structural, agricultural, and environmental damages. Flood damages are aggravated by

the long duration of the high stages due to conveyance constrictions. The Barataria Basin is a diverse ecosystem inhabited by a variety of species of birds, mammals, reptiles, amphibians, as well as fresh, brackish, and saltwater fish.

Problem Statement and Study Goals and Objectives: This Study will investigate alternatives that may include structural and non-structural measures to address flood risk from tidal surges, coastal storm surges, and heavy rainfall in the area between Bayou Lafourche and the Mississippi River System, from Donaldsonville to just past U.S. Highway 90 in the basin. Structural measures to regulate Upper Barataria Basin stages and storage to facilitate structure damage reduction may consist of a combination of levees and floodwalls, conveyance channels, flood gates, tidal exchange structures, t-walls, and pumping stations. Nonstructural measures to address flood damages could include structure elevations, buy-outs and relocations, dry/wet flood-proofing, or localized levees/floodwalls.

The Study Area has been declared a federal disaster area nine times in the past 30 years due to flood damages from storms. The Study will evaluate measures to reduce the risk of flooding for residential and commercial structures, major transportation routes, and many other commercially and culturally significant places and activities vital to the economy of the region and nation. Saltwater intrusion associated with frequent storm surge also impacts the diverse ecologically important fresh water habitat within the Study Area. Aquaculture, commercial fishing, crawfish farming, fishing, hunting, and tourism industries are significantly impacted by frequent storm surge events. Flooding in the estuary, subjects the habitat to changes in water salinity. The economic impacts of frequent flooding affects fisheries, processors, suppliers, grocers, and restaurants at the regional and national level. The majority of the Study Area is vulnerable to heavy rainfall, tidal surges, and coastal storm surges also coincident with heavy rainfall. Sea level rise and subsidence are expected to increase the risk of flooding.

Federal Interest: A Federal Interest Determination (FID) was completed under a previous USACE feasibility study effort entitled “Donaldsonville, Louisiana to the Gulf of Mexico Flood Control- Mississippi River and Tributaries Feasibility Study” (Donaldsonville study). Assessments completed under that effort identified alternatives that ranged from \$214M to over \$1.3B. None of the alternatives evaluated under the Donaldsonville study were economically justified. However, the Study Area has grown in population and complexity since completion of the Donaldsonville study and it is expected that unique alternatives not evaluated under that effort could support the Federal Interest and be justifiable.

Risk Identification: Potential risks to be considered during the Study include the ability to effectively model storm surge and rainfall flooding in the Study Area given the size and complexity of the Study Area. Another risk is using an outdated 2012 structure inventory for the Study that may not accurately represent the currently existing number of residential, industrial, commercial and other types of structures and their conditions, as well as the population growth that has occurred in the Study Area.

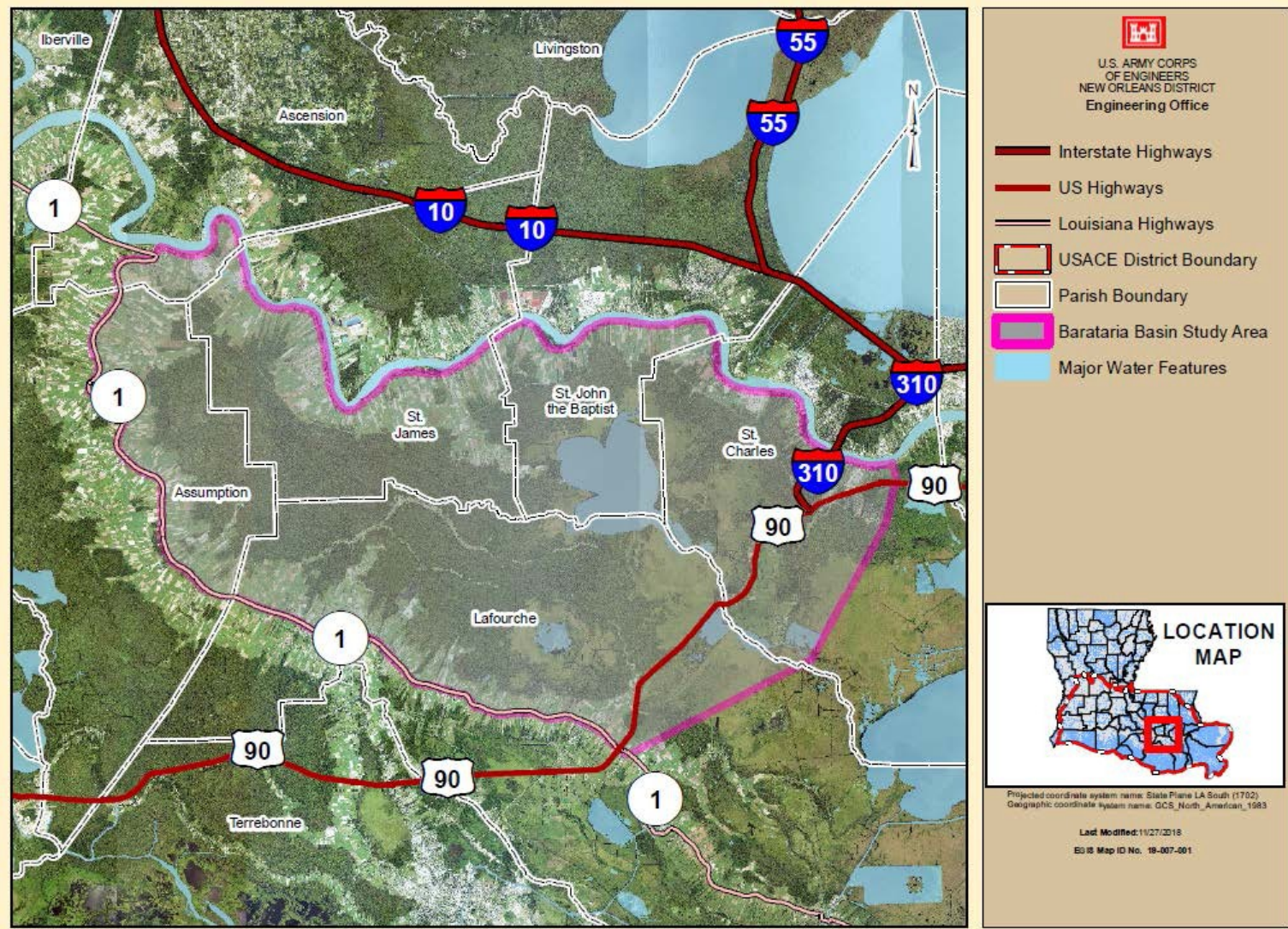


Figure 1: Upper Barataria, Louisiana Study Area

1. FACTORS AFFECTING THE LEVELS OF REVIEW

Scope of Review.

- Will the study likely be challenging? Yes. The Study Area is large and has complex hydrology. The ability to effectively model the Barataria Basin will be challenging. However, it is anticipated that a recently updated USACE certified model will support the damage assessments to be performed in the Study.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. The biggest Study risk is the active construction of coastal storm damage levee features being undertaken by local parishes and levee districts. Because this Study will also evaluate and possibly recommend the implementation of similar project features, there is a chance that the existing conditions in the Study Area could undermine the damages/benefits assessments, thereby impacting the Federal Interest Determination.
- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Life safety risks are inherent in coastal areas where tropical systems can damage structures and cause flooding. This is a Coastal Storm Risk Management (CSRM) study which will evaluate alternatives that can reduce damages to structures and alleviate storm-related flooding in the Study Area, and therefore life safety will be a significant Study issue. The potential for the recommendation to have a residual risk component also exists and that risk could increase over time as sea level rises.
- 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? Unlikely, although the Study Area is very large (approximately 760 square miles) and covers parts of seven parishes within the Barataria Basin so there is always the chance for dispute about the recommendation depending on its location and composition. However, the public generally supports measures to address flooding in the Study Area.
- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? Unlikely. The purposes, goals, and objectives of this Study were previously evaluated through the Donaldsonville, Louisiana to the Gulf of Mexico Flood Control- Mississippi River and Tributaries Feasibility Study conducted from 2002 to 2012, and there was no significant public dispute as to the economic or environmental cost or benefit associated with that prior study.

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? No, none of these conditions are expected to exist in any of the alternatives to be evaluated in the Study.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? Yes. Given the proximity to the coast of the Study Area, there will be a need for resiliency and robustness in the design of the project features to be recommended. Construction sequencing and scheduling are not expected to be out of the ordinary at this time.
- Is the estimated total cost of the project greater than \$200 million? Potentially, but the cost of the project will depend on the outcome of the Study and the plan recommended for implementation in the Final Integrated Feasibility Report and EIS.
- Will an Environmental Impact Statement be prepared as part of the study? Yes.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? Potentially, but this will depend on the outcome of the Study and the plan recommended for implementation in the Final Integrated Feasibility Report and EIS.
- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? No.
- 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? No.

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

Agency Technical Review (ATR). ATR is performed by a qualified team of senior highly experienced experts in the type of work being reviewed who are from outside the home district that are 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. If significant life safety issues are involved in a study or project a Safety Assurance Review (SAR) shall be conducted during ATR.

Independent External Peer Review (IEPR). Type I IEPR may be required for decision documents under certain circumstances. 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. A risk-informed decision is made as to whether Type I IEPR is appropriate.

Cost Engineering Review. All decision documents shall be coordinated with the Cost Engineering Mandatory 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 USACE 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. EC 1165-2-217 and ER 1105-2-100, Appendix H provide guidance on Civil Works 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

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Planning Model Review	No unapproved models are proposed	N/A	N/A	N/A	N/A
Report Synopsis	District Quality Control	2 Jan 19	31 Jan 19	\$5,000	No

Draft Integrated Feasibility Report and Environmental Impact Statement (EIS)	Agency Technical Review	3 Dec 19	10 Jan 20	\$50,000	No
Draft Integrated Feasibility Report and EIS	Type I IEPR	3 Dec 19	1 Mar 20	\$125,000	No
Draft Integrated Feasibility Report and EIS	Policy and Legal Review	3 Dec 19	10 Jan 20	N/A	No
Final Integrated Feasibility Report and EIS	District Quality Control	9 Jan 21	14 Jan 21	\$15,000	No
Final Integrated Feasibility Report and EIS	Agency Technical Review	20 Jan 21	8 Feb 21	\$30,000	No
Final Integrated Feasibility Report and EIS	Policy and Legal Review	5 Mar 21	5 May 21	N/A	No

NOTE: This Table may also be used to identify future review work in follow-on phases of a project. This may include products prepared during the pre-construction engineering and design phase or products prepared as part of planning for the Operations and Maintenance phase of a project.

a. DISTRICT QUALITY CONTROL

The home district shall manage and document DQC and will appoint a qualified senior staff member who has no production role in the Study as the DQC Lead. The DQC Lead will ensure that a formal DQC review is performed by all members who have been assigned to the DQC Review Team. The DQC Review Lead ensures coordination and interaction of team members, completeness of reviews, quality of review comments, and comment closeout and DQC Certification. The DQC of products and reports will also cover any necessary National Environmental Policy Act (NEPA) documents and other environmental compliance products (see EC 1165-2-217, sections 8.1 and 8.1.1). DQC efforts will include the necessary expertise to address compliance with current USACE policy and procedures. The DQC Lead shall prepare a DQC Plan and provide it to the RMO and MSC prior to starting DQC reviews. Table 2 identifies the required expertise for the DQC Review 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	Reviewer shall be a senior water resources planner with experience in water resource management studies.
Economics	A senior economist with at least 10 years of USACE economics experience (Senior Environmental Specialist) in Water Resource Management Projects and application of the HEC-FDA model, assessing other social effects (OSE) associated with CSRM projects, and justification of flood risk in accordance with current USACE policy.
Environmental Resources	Team member shall be a subject matter expert on the application and documentation of the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), applicable rules and regulations governing hazardous, toxic, and radioactive waste, and all other areas of environmental compliance required for this Study. Experience shall include knowledge of CSRM studies, and cultural resources, especially in a coastal environment.
Real Estate	Team member shall be experienced in Federal civil works real estate laws, policies and guidance as they pertain to coastal structures. The reviewer will be a senior real estate (RE) professional selected from the Nationally approved RE ATR list.
Civil Engineering	Responsible for reviewing site features and utilities to ensure minimal impacts to the flood protection system. The reviewer shall be a senior specialist and have substantial experience in coastal environments.
Hydrology and Hydraulics Engineering	The H&H reviewer shall be proficient with HEC-RAS and ADCIRC models, floodplain delineation, risk and uncertainty analysis, and associated technical concepts for coastal environments. The reviewer shall be a senior specialist and have substantial experience in coastal environments.

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 Integrated Feasibility Report (including all Appendices thereto). The DQC certification will be signed by the lead author of the product, the product reviewer(s), the DQC Review Lead, the supervisor of the author, and the PM. 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, on page 19 (see Figure F).

Interim Quality Control Checks will occur on the Integrated Feasibility Study (including all Appendices thereto), and other required NEPA and environmental compliance products/documents at the following check points:

Existing Conditions DQC. The purpose of the 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.

Focused Array DQC. 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.

Draft Integrated Feasibility Report/TSP DQC. The review will cover all plan formulation issues being presented in the Draft Integrated Feasibility Report (including all Appendices thereto), 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 DrChecks and the Memorandum-for-Record (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 reviewers 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 Draft Integrated Feasibility Report.

Final Integrated Feasibility Report DQC. Similar to the Draft Integrated Feasibility Report DQC, the review will cover all issues being presented in the Final Integrated Feasibility Report (including all Appendices thereto), and 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.

Documentation of completed DQC should be provided to the MSC, RMO, and ATR Team leader 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 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 water resource management studies. Experience in flood risk management and/or coastal storm damage risk management feasibility studies is required.
Economics	The Economics reviewer should have 10 – 20 years USACE economics experience in water resource management projects and application of the HEC-FDA model, assessing other social effects (OSE) associated with flood risk reduction projects, and justification of flood risk in accordance with current USACE policy.
Environmental Resources	Team member shall be a subject matter expert on the application and documentation of the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), applicable rules and regulations governing hazardous, toxic, and radioactive waste, and all other areas of environmental compliance required for this study. Experience shall include knowledge of CSRMs studies, and cultural resources, especially in a coastal environment.
Cost Engineering	Cost MCX approved reviewer with experience preparing cost estimates for coastal storm damage and/or flood risk management features. Team member shall be familiar with cost estimating for similar projects using MCACES or MII.

	The Cost Engineering panel member should have 15 years demonstrated experience.
Real Estate	The senior team member shall be experienced in Federal civil works real estate laws, policies, and guidance as they pertain to coastal structures. RE ATR reviewed will be a senior RE professional selected from the nationally approved RE ATR list.
Geotechnical Engineering	Responsible for reviewing the geotechnical design and existing soil conditions and ensure that the project meets USACE standards. The senior reviewer shall have experience with designs in coastal settings.
Civil Engineering	Responsible for reviewing site features and utilities to ensure minimal impacts to the flood protection system. The senior reviewer shall have experience in coastal environments.
Hydrology and Hydraulics Engineering	The senior H&H reviewer shall be proficient with HEC-RAS and ADCIRC models, floodplain delineation, risk and uncertainty analysis, and associated technical concepts for coastal environments.
Climate Preparedness and Resilience CoP Reviewer	An experienced member from the Climate Preparedness and Resilience Community of Practice (CoP) will participate in the ATR review

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. 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 Integrated Feasibility Report, 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.

Recommended Best Planning Practice: All members of the ATR team should use the four part comment structure (see EC 1165-2-217, Section 9(k)(1)).

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Type I IEPR.

The 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 Study.

Decision on Type I IEPR. Based on a risk-informed decision process, Type I IEPR will be required for this decision document. If the Recommended Plan contained in the Final approved Integrated Feasibility Report is implemented, the Project will likely involve risk to human life and is estimated to cost over \$200M, both which are mandatory triggers. Since the decision document is a Final Integrated Feasibility Report for a project with risk to human life, the Type I IEPR will also include a Safety Assurance Review. Due to life safety concerns, it is anticipated the Safety Assurance Review will continue through the implementation phase. This requirement will be further assessed as part of the Review Plan for the implementation phase.

Products to Undergo Type I IEPR. The draft Integrated Feasibility 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
Economics	The panel member shall be a professional with experience directly related to water resource economic evaluation or review. Member shall be familiar with USACE CSRМ analysis and benefit calculations, including use of standard USACE computer programs and shall have experience with the National Economic Development analysis procedures, particularly as they relate to CSRМ.
Environmental	The Panel Member shall have at minimum a Master’s Degree in ecology or biology. Panelist shall have particular knowledge of fisheries biology, CSRМ projects, and should be familiar with all NEPA and environmental compliance requirements. Panel Member shall have experience in wetland ecology of the Gulf Coast.
Hydrology and Hydraulic Engineer	The panel member shall be a registered professional engineer with experience in hydrology and hydraulic engineering with an emphasis on large public works projects and CSRМ features, designs, and structures. This individual shall be familiar with standard USACE hydrologic and hydraulic computer models and have

	experience with both computer simulation and physical modeling of large river systems.
Civil Design	The panel member shall be a registered professional engineer in civil engineering and have demonstrated experience in performing cost engineering/construction management for all phases of CSRM or related projects. Team member shall be familiar with several USACE coastal flood risk management projects across the U.S. Panel member shall be familiar with construction industry and practices used in CSRM and standard hurricane structure design.

Documentation of Type I IEPR. The OEO will submit a final Review Report no later than 60 days after the end of the draft Integrated Feasibility Report public comment period. USACE shall consider all recommendations in the OEO Review Report and prepare a written response for all recommendations. The Final Integrated Feasibility Report will summarize the OEO Review Report and the USACE response to the OEO Review Report and those documents will be posted on the internet when developed.

(ii) Type II IEPR.

The second kind of IEPR is Type II IEPR Safety Assurance Review (SAR). The SAR is managed outside of the USACE and is conducted on design and construction features 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 Recommended Plan is identified.

Products to Undergo Type II IEPR. TBD.

Required Type II IEPR Panel Expertise. TBD.

Recommended Best Planning Practice: Begin coordination with the RMO very early in the study to allow adequate time for scoping and contracting for the Type I IEPR.

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
HEC-FDA 1.4.2	The Hydrologic Engineering Center’s Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans to aid in the selection of a recommended plan to manage flood risk.	Certified
HEC-FIA	To estimate damages, HEC-FIA 2.2 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
IWR-Plan	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 for any mitigation alternatives that may be needed.	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 projects proposed for funding under the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). The model was certified for Regional use in the Gulf Coast of Louisiana and Texas via a CECW-P memo, dated 7 November 2017. The models will be used if mitigation features for wetland impacts are required.	Approved for Use

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
AdCIRC	Model simulates winds, storm surge, waves, tides, riverine inflows. The model has 2.5 to 5 million nodes define bathymetry, friction, canopy, and other attributes and can be coupled with SWAN or STWAVE wave models. AdCIRC was validated with past storms: Katrina, Rita, Gustav, Ike and Isaac, generally matches observed peak water levels to within 0.5 m. AdCIRC has been used extensively in project area for post-Katrina HSDRRS surge hazard analysis.	Community of Practice (CoP) Preferred
HEC-RAS	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.	CoP Preferred

Recommended Best Planning Practice: Hold an early coordination call (prior to the Alternatives Milestone) with the appropriate Planning Center(s) of Expertise to discuss model applications and any review needs for approval or certification of the planning models to be employed.

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 1 of this Review Plan. The makeup of the Policy Review team will be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

- 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 the PDT and conduct legal sufficiency reviews of the draft and final Integrated Feasibility Report, as well as other Study and NEPA documents and deliverables. Members of the Office of Counsel may participate from the District, MSC and HQUSACE levels. The MSC Chief of Planning and Policy will coordinate membership and participation with the Office of Counsel Chiefs. The home district Office of Counsel is responsible for the assessment by District Counsel on the scope of legal reviews. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.

- 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, opinion, certification or similar document may be used to document the input from the Office of Counsel.

- Each participating USACE Office of Counsel will determine how to document legal review input.

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
	MVN-PD-P	Planning Branch Chief	
	MVN-PDS-C	Lead Environmental	
	MVN-PD-F	Plan Formulator	
	MVN-PM	Sr. Project Manager	
	MVN-ED-FS	Geotechnical	
	MVN-REE	Real Estate	
	MVN-ED-SC	Cost Engineering	
	MVN-ED-H	H&H	
	MVN-PDS-C	Environmental	
	MVN-ED-H	H&H Branch Chief	
	MVN-ED-H	H&H	
	CPRA	Study Lead	
	MVN-PD-E	Economics	
	MVN-PD-PFR	Lead Plan Formulator	
	CPRA	Study Lead	
	MVN-ED-T	Civil Design	
	CPRA	Study Support	
	CPRA	Study Support	
	MVN-OC	Office of Counsel	
	MVN-PM	Project Manager	

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Phone Number
	MVN-PD	DQC Lead	
	MVP-PD-F	Planning	
	MVN-PDE	Economics	
		Environmental Resources/NEPA	
	MVN-REE	Real Estate	
		Civil Design	
		Hydrology/Hydraulics	

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
		ATR Lead	---

TBD		Planning	---
TBD		Economics	---
TBD		Environmental Resources/NEPA	---
TBD		Real Estate	---
TBD		Civil Design	---
TBD		Hydrology/Hydraulics	---
TBD		Geotechnical Engineering	---
TBD		Civil Engineering	---
TBD		Cost Engineering	---

POLICY REVIEW TEAM			
Name	Office	Position	Phone Number
	MVD	Review Manager	
		Climate Change	
	OWPR	Plan Formulation	
	HQ	Economics	
	HQ	Environmental	
	MVD	Cultural Resources	
	MVD	Hydrology/Hydraulics	
	MVM	Levee Safety/Geotech	
	MVD	Structural	
	MVD	Real Estate	

VERTICAL TEAM			
Name	Office	Position	Phone Number
	RB-T	Sr. Structural Engineer	
	PSD-DST	Chief	
	RB-W	H&H/Civil Engineering	
	PSD-DST	MVN FRM PM	
	PD	MR&T Env PM	
	PSD-DST	Deputy, Lower DST	
	CEMVD-PD-L	Review Manager	
	CECW-PC	Planning	
	MVD-OC	Asst. Division Counsel	
	RB-T	Deputy Chief	
	CWID	Supplemental PM	
	CWID	Chief	
	CEMVD-PD-L	Chief, Planning & Eco-PCX	

ATTACHMENT 2: Review Plan Revision List

Revision Date	Description of Change	Page / Section Number