

**REVIEW PLAN**  
**March 2019**

**Project Name:** South Central Coast, Louisiana

**P2 Number:** 332135

**Decision Document Type:** Integrated Feasibility/NEPA Decision Document

**Project Type:** Coastal Storm Risk Management and Flood Risk Management Feasibility Study

**District:** New Orleans (MVN)

**District Contacts:**

[REDACTED]

[REDACTED]

[REDACTED]

**Major Subordinate Command (MSC):** Mississippi Valley Division

**MSC Contact:**

[REDACTED]

**Review Management Organization (RMO):** Coastal Storm Risk Management PCX

**RMO Contact:**

[REDACTED]

## Key Review Plan Dates

**Date of RMO Endorsement of Review Plan:** *3/07/2019*  
**Date of MSC Approval of Review Plan:** *3/29/2019 (milestone schedule)*  
**Date of IEPR Exclusion Approval:** *N/A*  
**Has the Review Plan changed since PCX Endorsement?** *No*  
**Date of Last Review Plan Revision:** *N/A*  
**Date of Review Plan Web Posting:** *Pending/TBD*  
**Date of Congressional Notifications:** *Pending/TBD*

## Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>	<u>Complete</u>
<b>FCSA Execution:</b>	<b>10/09/2018</b>	<b>10/09/2018</b>	<b>Yes</b>
<b>Alternatives Milestone:</b>	<b>1/31/2019</b>	<b>1/31/2019</b>	<b>Yes</b>
<b>Tentatively Selected Plan:</b>	10/09/2019	TBD	No
<b>Release Draft Report to Public:</b>	12/02/2019	TBD	No
<b>Agency Decision Milestone:</b>	04/10/2020	TBD	No
<b>Final Report Transmittal:</b>	04/21/2021	TBD	No
<b>Chief's Report or Director's Report:</b>	10/08/2021	TBD	No

## Project Fact Sheet

**Project Name:** South Central Coast, Louisiana

**Location:** The study area covers south central Louisiana including Iberia, St. Martin, and St. Mary parishes. Communities of concern include Breaux Bridge, St. Martinville, New Iberia, Jeanerette, Delcambre, Loreauville, Morgan City, Franklin, Patterson, Baldwin, Berwick. Additionally, the federally-recognized Tribal Nation of the Chitimacha is at risk from flooding.

**Authority:** H.R. Docket 2767, 20 Sep 2006, Southeast Coastal Louisiana, LA.

*“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, that, in accordance with section 110 of the River and Harbor Act of 1962, the Secretary of the Army is requested to survey the coast of Louisiana in Iberia, St. Martin, and St. Mary parishes with a view to determine the feasibility of providing hurricane protection and storm damage reduction and related purposes.”*

Southeast Coastal Louisiana, LA was renamed South Central Coast Louisiana, LA to avoid confusion with the Southeast Louisiana urban flood control project covering Jefferson, Orleans, and St. Tammany Parishes.

Bipartisan Budget Act of 2018 (Public Law 115-123), Division B, Subdivision 1, Title IV, [Corps of Engineers—Civil, Department of the Army, Investigations](#).

**Sponsor:** Coastal Protection and Restoration Authority Board of Louisiana

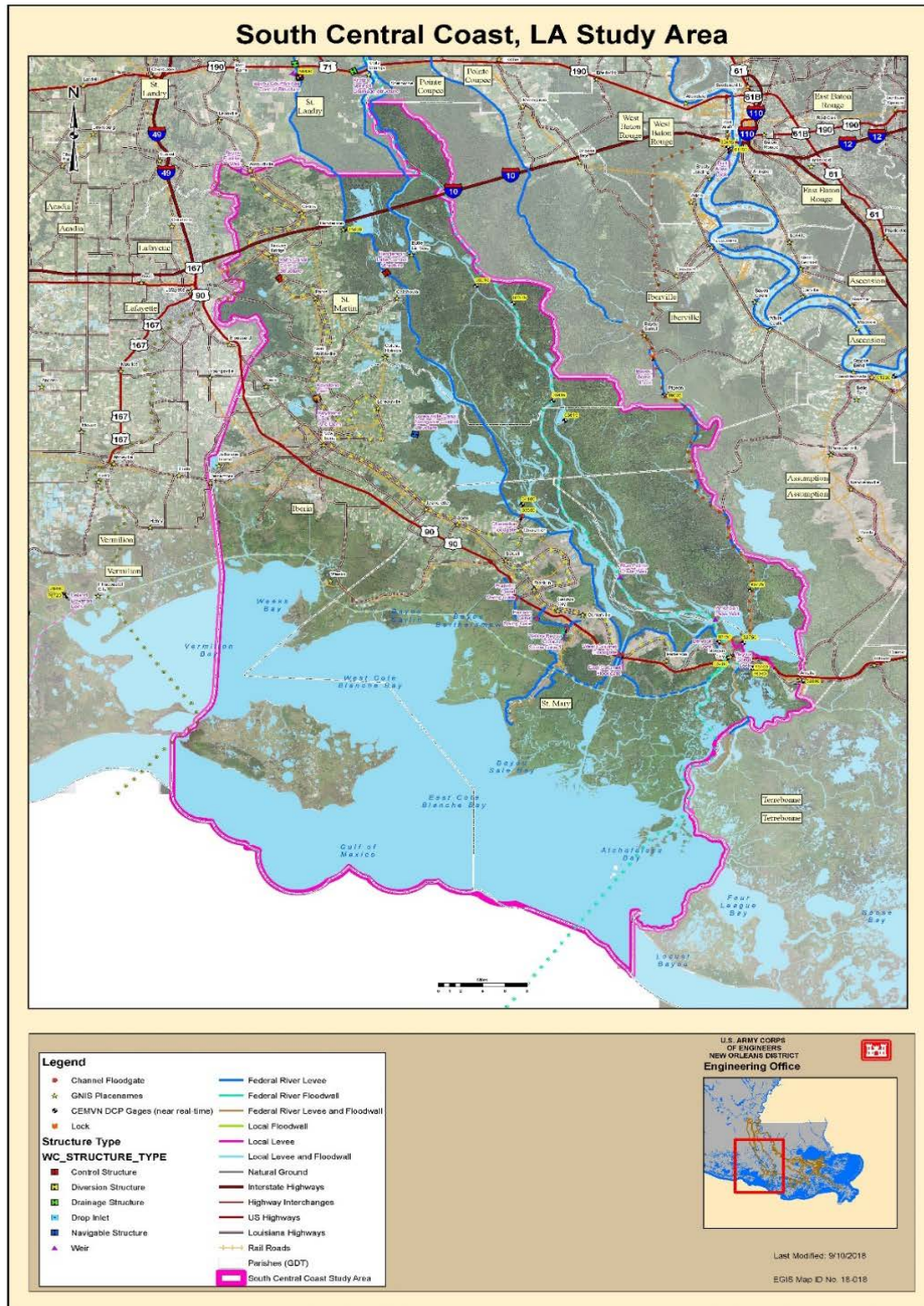
**Type of Study:** This is a Coastal Storm Risk Management (CSRМ) and Flood Risk Management (FRM) Feasibility Study.

**SMART Planning Status:** This is a 3x3x3 compliant study, WRRDA 2014. Study will be compliant with USACE Director of Civil Works Memorandum issued 3 May 2018 and Policy Guidance on Implementation of Supplemental Appropriations in the Bipartisan Budget Act of 2018 issued on 9 Aug 2018.

**Project Area:** The study area (Figure 1 page 4) is comprised of ecosystems having national significance as demonstrated by the presence of Bayou Teche National Wildlife Refuge and the State of Louisiana Marsh Island Wildlife Refuge and the Attakapas and Atchafalaya Delta Wildlife Management Areas and the Federal authorizations and implementation of the USACE Mississippi River and Tributaries project, the USACE Atchafalaya Basin Floodway System, the multi-Federal agency Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) program, and by the USACE Louisiana Coastal Area program.

The Atchafalaya Basin is unique because it has a growing delta system. Designated by Congress in 2006 as a National Heritage Area, the Atchafalaya Basin has significant cultural, historic, scenic and recreational resources. It is the Nation’s largest alluvial bottomland and swamp, providing habitat for 24 Federal- and state-listed threatened or endangered species, or species of concern such as Louisiana black bear, brown pelicans, and bald eagles. The actively growing

delta provides a rare opportunity for scientific study of active delta building processes. About 22 million pounds of crawfish are commercially harvested annually from the basin.



**Figure 1: South Central Coast Louisiana Feasibility Study Areas**

**Problem Statement:** Hurricanes riverine, rainfall, and tropical storms pose a significant risk to the communities, ecosystems, and industries of the Louisiana gulf coast. Approximately 177,000 people reside within the study area. The area has suffered from disasters and will continue to

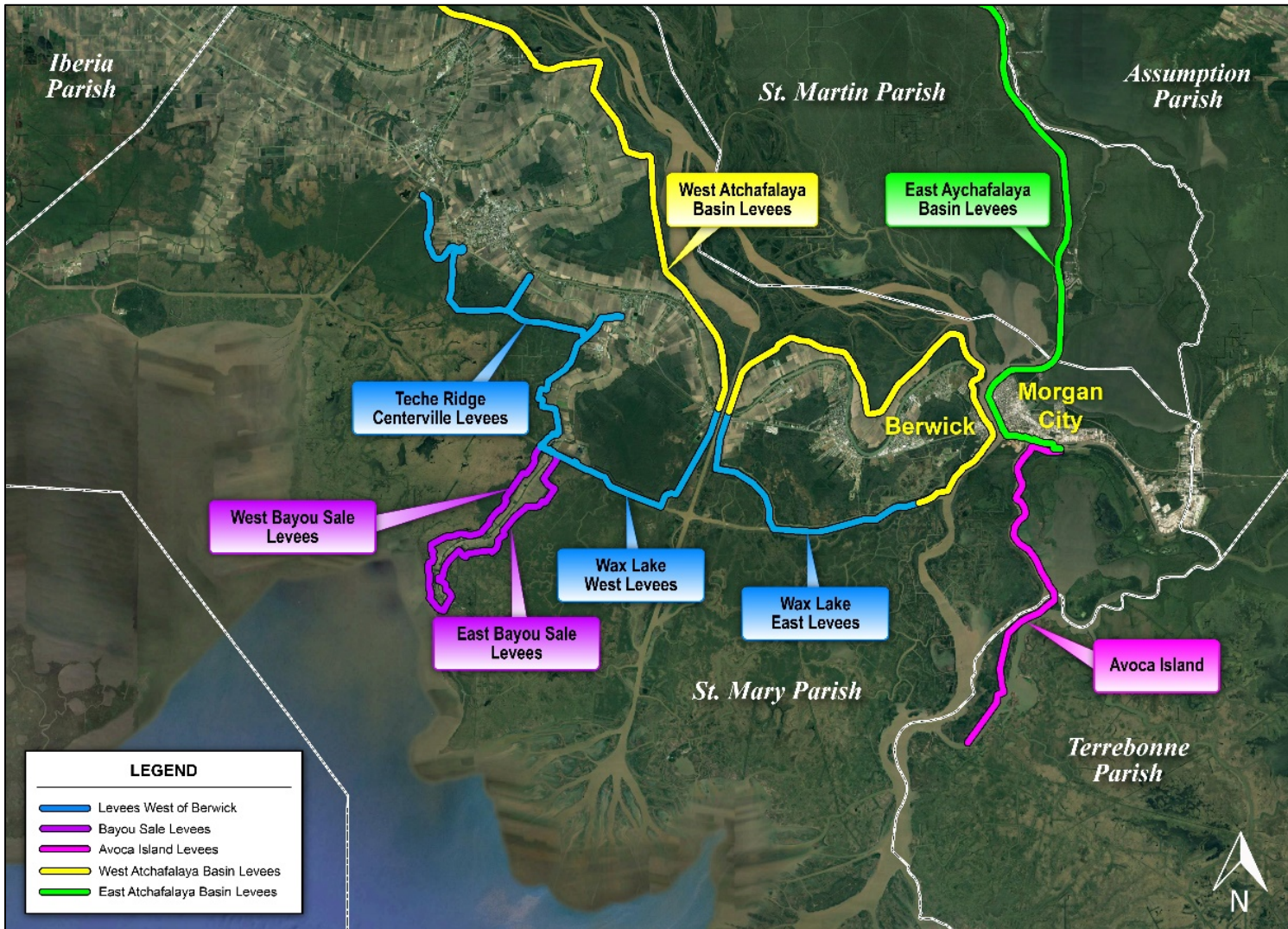
suffer from natural disasters without some form of FRM solution. Repeated storm events including Hurricanes Andrew, Rita, Gustav, and Ike which made landfall affecting the entire study area, resulted in losses of life, wildlife and property, and repeated mandatory evacuation costs. Emergency declarations have been declared in 22 of the last 30 years, due to coastal storm or riverine flooding damages. This area is also vulnerable to coastal land loss and degradation reducing the natural resiliency of the area to storm surge and flood attenuation. From 1932 to 2010, the area experienced a net loss of approximately 22,500 acres of wetlands. Continued wetlands losses impact migratory species, the ecological nurseries of the Gulf of Mexico, and various commercial and recreational activities.

**Federal Interest:** The area includes many industries with national significance including the carbon black manufacturing plants of Cabot Corporation, Columbian Chemicals, and Degussa Engineered Carbons. These plants are among the largest carbon black producers in the U.S. The area is a hub for ship building and fabricating the oil and gas services and extraction industries vital to the U.S. economy. The Strategic Petroleum Reserve maintains storage facilities immediately north and west of the study area with transfer and processing infrastructure traversing the area. Numerous federal lands and water resources investment programs are active in the study area. Congress, in Section 906 (e) and (f) of the Water Resources Development Act of 1986, enacted legislation that designated fish and wildlife enhancement within the Lower Atchafalaya Basin Floodway as having national significance.

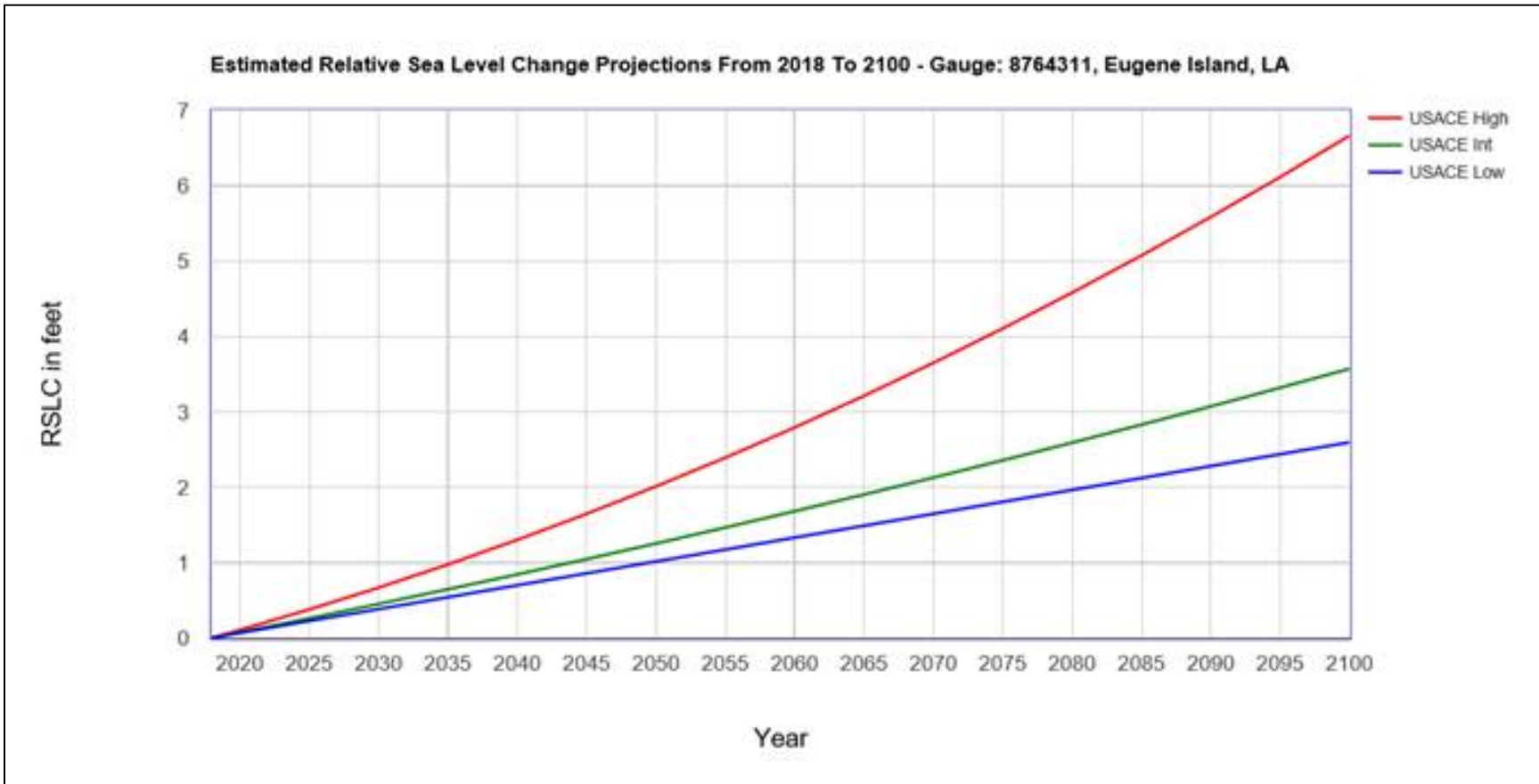
**Risk Identification:** South Central Coast Louisiana Feasibility Study residents are currently at risk from coastal storms. The project area consists of approximately 75,263 structures above the ground surface valued at \$18.6 billion. Residential and non-residential structures are raised on average 1 to 2 feet.

Current Federal projects are largely constructed on the eastern edge of the study area as illustrated in Figure 2. The existing Atchafalaya Basin Floodway System was authorized to address riverine flooding from the Atchafalaya River Basin and not designed to address coastal storm surge occurring from tropical storm events.

The study area suffers from the highest Relative Sea Level Rise in the country (Figure 3, Relative Sea Level Rise Projections within Project Area). Sea level rise at moderate- and high-level projections would result in loss of Marsh Island, further loss of barrier islands like Rabbit and Duck Key, and loss of marsh habitat in the project area. Loss of remaining barrier islands and marsh habitat would allow storm surge and damages to occur farther up into the human settlements within St. Martin, St. Mary and Iberia Parishes. Impacts of storm events could increase with the increasing relative sea level rise.



**Figure 2: Existing Flood Risk Management Infrastructure**



**Figure 3: Relative Sea Level Rise Projections within Study Area**

## 1. FACTORS AFFECTING THE LEVELS OF REVIEW

**Scope of Review.** *The PDT has determined DQC, ATR, and Type I IEPR will be required on the decision document. This determination was based on the potential to affect life safety for the 177,000 people within the study area, limited data collection and new investigations during the study, the potential for a recommended plan resulting in modification to existing civil works projects, a total project cost estimated to be over \$200 million, and it is unknown, but likely, that environmental justice communities exist within the study area.*

- Will the study likely be challenging? *Yes, project scope includes potential levee raises around city centers, new levee or 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 will be required for the recommended alternative and has initiated coordination with the PCX-CSR for their endorsement of the Review Plan and getting in IEPR contracting queue.*

Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. *Project risks may include but are not limited to the following:*

*Data collection and analysis related to engineering design, including surveys, and soil borings, is limited. There is risk that assumptions made during the study phase will prove to be incorrect resulting in increased project costs.*

*Sponsor has limited ability to accept plans not in compliance with proposed project in 2017 LA State Master Plan (<http://coastal.la.gov/our-plan/2017-coastal-master-plan/>). This constraint will limit the acceptability of potential measures and alternatives.*

*Given that data collection and analysis related to environmental existing conditions, including surveys, and cultural resource locations, endangered species locations, etc, is limited there is risk that, if the report is approved, assumptions made during the study phase will prove to be incorrect and increase project costs.*

*Given regional challenges with finding affordable mitigation banks and opportunities on similar projects, mitigation costs may be highly variable. Study phase estimates may be incorrect and increase project costs.*

*Given regional challenges with finding borrow sources and opportunities on similar projects, borrow costs may be highly variable. Study phase estimates may be incorrect and increase project costs.*

*The project schedule has limited contingency. Assigned project staff may change over the study development and result in increased time and cost to completion.*

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? *South Central Coast Louisiana Feasibility Study area is*



*largely not protected from coastal storm surge damage. Therefore, the PDT has determined a Type I IEPR that includes a Safety Assurance Review is required. 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 the project likely involve significant public dispute as to the project's size, nature, or effects? *There will likely be controversy from local authorities, communities, and tribal governments regarding the final selected plan. No opposition was identified in the first round of public and tribal engagements. PDT identified a low risk of public dispute, Controversy and dispute appear typical for CSRM and FRM USACE studies in the region.*
- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? *Project features and recommended alternative will seek to avoid and reduce impacts to the extent practicable. The project should have minimally significant dispute concerning the economic cost. There may be public disputes as to the environmental impacts. However, although local mitigation credits are limited resulting in a project implementation risk to construction schedule to identify mitigation lands, wetland impacts will be mitigated.*
- 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, storm surge and environmental models. Additionally, all project designs, measures, and features are anticipated to be common and routine techniques.*
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? *The selected plan should include adequate factors of safety that provide resiliency and robustness. The project is not anticipated to have unique and innovative construction sequencing or overlapping design construction schedule.*
- Is the estimated total cost of the project greater than \$200 million? *The PDT anticipates the project costs to be over \$200 million based on other similar projects in the region with a similar scope, authority, problems and opportunities.*
- Will an Environmental Impact Statement (EIS) be prepared as part of the study? *The level of NEPA documentation has not been determined. However, it is likely an Environmental Impact Statement will be prepared. Determination of 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 negligible 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 impacts.*
- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? *The PDT anticipates possible short term, minor impacts to natural resources. The PDT will avoid, minimize and mitigate resources impacted as necessary. There should be no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures.*
- 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? *The project should not have more than negligible adverse impacts to any listed species or critical habitats. Projects features will be screened to avoid and reduce impacts to endangered species and critical habitats.*

## 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 (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. DQC will be completed in accordance with MVN SOP dated 14-Nov-2018.

**Agency Technical Review.** ATR is 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. If significant life safety issues are involved in with the recommended alternative a safety assurance review will be conducted. The RMO will coordinate with the Flood Risk Management and Ecosystem Restoration PCXs as appropriate, including the Risk Management Center (RMC).

**Independent External Peer Review.** Type I IEPR is expected to be required for the resulting decision documents. 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 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 outlines project products, type of review, schedule and cost. The specific expertise required for the teams is identified in later subsections covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information. This table will be updated at each IPR and SMART Planning Milestone meeting and presented to the Vertical Team and following feasibility completion for future phases of the project to include design, construction, and operation and maintenance.

**Table 1: Levels of Review \***

<b>Products To Undergo Review</b>	<b>Review Level</b>	<b>Start Date</b>	<b>End Date</b>	<b>Cost</b>	<b>Complete</b>
Planning Model Review	Model Review (see EC 1105-2-412)	<a href="#"><u>N/A</u></a>	<a href="#"><u>N/A</u></a>	<a href="#"><u>N/A</u></a>	No
Draft Feasibility Report and EIS	District Quality Control (DQC)	<a href="#"><u>03/18/2019</u></a>	<a href="#"><u>11/01/2019</u></a>	<a href="#"><u>\$50,000</u></a>	No
Draft Feasibility Report and EIS	Agency Technical Review	<a href="#"><u>11/08/2019</u></a>	<a href="#"><u>01/15/2020</u></a>	<a href="#"><u>\$60,000</u></a>	No
Draft Feasibility Report and EIS	Type I IEPR	<a href="#"><u>11/08/2019</u></a>	<a href="#"><u>02/14/2020</u></a>	<a href="#"><u>\$75,000</u></a>	No
Draft Feasibility Report and EIS	Policy and Legal Review	<a href="#"><u>11/15/2019</u></a>	<a href="#"><u>01/15/2020</u></a>		No
Final Feasibility Report and EIS	District Quality Control	<a href="#"><u>03/27/2020</u></a>	<a href="#"><u>04/27/2020</u></a>	<a href="#"><u>\$25,000</u></a>	No
Final Feasibility Report and EIS	Agency Technical Review	<a href="#"><u>05/30/2020</u></a>	<a href="#"><u>06/30/2020</u></a>	<a href="#"><u>\$30,000</u></a>	No
Final Feasibility Report and EIS	Policy and Legal Review	<a href="#"><u>07/15/2020</u></a>	<a href="#"><u>10/15/2020</u></a>	<a href="#"><u>\$15,000</u></a>	No

\*The schedule in Table 1 reflects the Project Delivery Team’s intense early finish schedule and does not necessarily align with the milestone schedule as shown on page 2.

## 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**

<b>DQC Team Disciplines</b>	<b>Expertise Required</b>
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).
Plan Formulation	A senior water resources planner with experience in large river, Coastal FRM, and nonstructural projects.
Economics	A senior economist with 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, complex regional investigations. Should have extensive experience in analyzing FRM projects in accordance with ER 1105-2-100. Experience with non-structural analysis preferred.
Environmental Resources/NEPA	Senior Environmental Specialist with experience in Coastal 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. This includes experience with Tribal coordination.
Hydrology /Hydraulic Engineering	Senior H&H Engineer with experience with 2-dimensional models.
General Engineering	Senior engineer with experience in Coastal FRM projects.
Cost Engineering	The Cost Engineer should have 15 years demonstrated experience or combined equivalent of education and experience assessing Coastal FRM projects. Member should be a Professional Engineer with at least a Bachelor's degree, and should be from academia, a public agency, or an Architect-Engineer or Consulting Firm. Professional certification, such as DoD Tri-Service Cost Certification, or other cost certification is required.
Real Estate	Senior real estate specialist experienced in Federal lands and MOUs, and LA state laws on estate acquisition in coastal areas.
Office of Counsel (OC)	Senior OC should have experience in review of Federal CSR and FRM projects in coastal LA and LA state laws on estate acquisition in coastal areas.

**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. EC 1165-2-217 provides an example DQC Certification statement.

Documentation of 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 of conclusions should be provided in an accompanying narrative to allow the reviewer/checker to assure their validity.

Documentation of interim Quality Control Checks and resolution will occur via an Memorandum for the Record (MFR) development and circulation with vertical team.

Interim Quality Control Checks will include the following team members Plan Formulation, Environmental/National Environmental Policy Act (NEPA), Economics, Project Management, OC, Real Estate and Engineering.

Interim Quality Control Checks will occur at the following check points:

- Existing Conditions DQC. 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.
- Focused Array DQC. The review will consider measures, screening criteria, and the initial and focused array of alternatives. It will 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 Report/TSP DQC. The review will cover all plan formulation 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 DrChecks. 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. 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.
- 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 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 delays the start of other reviews (see EC 1165-2-217, section 9).

**Recommended Best Planning Practice: Use DrChecks software to document DQC. Attach a DrChecks report to the DQC Certification to help illustrate the thoroughness of the DQC.**

See Section E. Policy and Legal Review (2)

## **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**

<b>ATR Team Disciplines</b>	<b>Expertise Required</b>
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).
Plan Formulation	A senior water resources planner with experience in Coastal 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 FRM projects in accordance with ER 1105-2-100. Preferred experience includes certifying economic models, performing analysis on non-structural alternatives, and a background in both riverine and coastal FRM economics.
Environmental Resources/NEPA	Senior Environmental Specialist with experience in Coastal 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.
Hydraulic & Hydrology Engineering	Senior H&H Engineer with experience with 2-dimensional models.
General Engineering	Senior Engineer with experience in Coastal FRM projects.
Cost Engineering	The Cost Engineer should have 15 years' experience or combined equivalent of education and experience coastal FRM projects.

	Member should be a Professional Engineer with at least a Bachelor's degree, and should be from academia, a public agency, or an Architect-Engineer or Consulting Firm. Professional certification, such as DoD Tri-Service Cost Certification, or other cost certification is required. Understanding and experience in USACE processes, contracting acquisition procedures, estimating software (MCACES) and cost regulations (such as ER1110-1-1300, ER1110-2-1302, ETL1110-2-573) is required. Should have direct cost engineering design or construction management experience centered on coastal FRM projects.
Structural Engineering	Structural Engineering Senior Structural Engineer with experience in Coastal FRM projects.
Real Estate	Senior Real Estate Specialist with experience in Federal lands and MOUs.
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice will participate in the ATR review. The reviewer should be familiar with sea level rise analysis. At this time it is unknown if inland hydrology climate change will be a study consideration.
Risk and Uncertainty	A subject matter expert in multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty. The risk reviewer should have knowledge and experience in accordance with ER 1105-2-101.

**Documentation of ATR.** DrChecks will be used to document all ATR comments, responses and resolutions; subject to the additional requirements noted in Section E. Policy and Legal Review (2). 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 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.

**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**

**1. 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.** *A Type I IEPR will be required.*



**Products to Undergo Type I IEPR.** The full draft report and draft EIS 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 economics reviewer should be experienced in economic evaluation of FRM projects. Experience with HEC-FDA and HEC-FIA is required.
Environmental	The environmental reviewer should have 10 years of experience in Coastal FRM projects. This includes experience in NEPA, coastal zone management, essential fish habitat and endangered species compliance.
Engineering	A senior environmental engineer with experience in Coastal FRM projects.

**Documentation of Type I IEPR.** The Outside Eligible Organization 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.

**2. Type II IEPR.** Type II IEPR is managed outside of the USACE and conducted on studies generally in the design phase. Type II IEPR is focused on Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction for hurricane, storm and FRM 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 regular schedule.

**Decision on Type II IEPR.** *A decision 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. The models shown in Table 5 may be used to develop the decision document.

**Table 5: Planning Models**

<b>Model Name and Version</b>	<b>Brief Model Description and How It Will Be Used in the Study</b>	<b>Certification/Approval</b>
IWR Planning Suite II	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 WVA Marsh Models (Swamp, Fresh/Intermediate Marsh, Brackish Marsh, and Saline Marsh, Bottomland Hardwood) 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. This PDT will use the WVA to determine potential impacts under USACE civil works projects and mitigation. The model was approved for Regional use in the Gulf Coast of Louisiana and Texas via a CECW-P memo, dated 7 November 2017.	Certified
HEC-FDA 1.4.2	The model uses a point-based structure inventory to estimate damages. 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- FIA 2.2	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. Can be used to estimate life loss.	Certified
HEC-LIFE-SIM 1.0.1	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.

The models shown in Table 6 may be used to develop the decision document.

**Table 6: Engineering Models**

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
MCACES MII Version 3.0	MCACES is a cost estimation model. This model will be used to estimate costs for the feasibility study.	Approved for Use
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.	Approved for Use
HEC-RAS-1 and 2D	Developed and maintained by the Hydrologic Engineering Center. 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.	Approved for Use
AdCIRC SL15	Simulates winds, storm surge, waves, tides, riverine inflows. The model has 2.5 to 5 million nodes to 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. It has been used extensively for post-Katrina HSDRRS surge hazard analysis.	Approved for Use

**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).

**1. 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 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.

**2. 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 and will contain, as necessary, an assertion of attorney work product privileged or attorney/client privileged communication. In other cases, a separate legal memorandum, containing the same assertions of privilege, 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.
- Attorneys from the Office of Counsel will document comments in a manner that protects attorney client privilege. Dr. Checks will not be the method for documentation. Issues raised in Dr. Checks and resolution of those issues will be shared and, if necessary, resolved with the Office of Counsel via communications outside of Dr. Checks.

**ATTACHMENT 1: TEAM ROSTERS**

<b>PROJECT DELIVERY TEAM</b>				
<b>Name</b>	<b>Office</b>	<b>Position</b>	<b>Phone Number</b>	<b>Email</b>
[REDACTED]	[REDACTED]	Project Management	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Project Management	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Plan Formulation	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Environmental/NEPA	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	H&H & Climate	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	H&H & Climate	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Office of Counsel	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	GIS Support	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	General Engineering	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Engineering Technical Lead	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	HTRW	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Cost Engineer	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Public Affairs	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Public Affairs	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Tribal Liaison	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Cultural/Tribal/SHPO	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Real Estate	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Economist	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Economist	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Economist	[REDACTED]	[REDACTED]

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Email
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED] members have confirmed in writing they have the qualifications required in accordance with Table 2 of this Review Plan.

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
TBD	ATR Lead	TBD	TBD
TBD	Plan Formulation	TBD	TBD
TBD	Environmental/NEPA	TBD	TBD
TBD	Cost Engineering	TBD	TBD
TBD	Real Estate	TBD	TBD
TBD	General Engineering Design	TBD	TBD
TBD	Economist	TBD	TBD
TBD	Cultural Resources	TBD	TBD
TBD	Hydraulic & Hydrology	TBD	TBD
TBD	Structural Engineering	TBD	TBD
TBD	Climate Preparedness and Resilience CoP Reviewer	TBD	TBD
TBD	Risk and Uncertainty	TBD	TBD

<b>VERTICAL TEAM</b>			
<b>Name</b>	<b>Office</b>	<b>Position</b>	<b>Phone Number</b>
[REDACTED]	[REDACTED]	Planning	[REDACTED]
[REDACTED]	[REDACTED]	Environmental, Planning	[REDACTED]
[REDACTED]	[REDACTED]	Economist	[REDACTED]
[REDACTED]	[REDACTED]	Deputy, Planning	[REDACTED]
[REDACTED]	[REDACTED]	Chief, Planning & Ecosystem	[REDACTED]

<b>POLICY REVIEW TEAM</b>				
<b>Name</b>	<b>Office</b>	<b>Position</b>	<b>Phone Number</b>	<b>Email</b>
[REDACTED]	[REDACTED]	Planning	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Climate Change	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Environmental, Planning Manager	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Senior Economist	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Cultural Resources	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Geotechnical	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Structural	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Real Estate	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Counsel	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Hydraulics & Hydrology	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Review Manager	[REDACTED]	[REDACTED]