

Review Plan
August 2024

1. Project Summary

Project Name: Charleston Tidal And Inland-Related Flood Risk Management Study

Location: Charleston, Charleston County, South Carolina

P2 Number: 496373

Decision and Environmental Compliance Document Type: Feasibility Report

Congressional Authorization Required: Yes

Project Purpose(s): Conduct a feasibility study for tidal- and inland-related flood risk management at Charleston, South Carolina

Non-Federal Sponsor: City of Charleston, South Carolina

Points of Public Contact for Questions/Comments on Review Plan:

District: Charleston District

District Contact: Project Manager

Major Subordinate Command (MSC): South Atlantic Division

MSC Contact: District Support Planner

Review Management Organization (RMO): National Planning Center for Coastal Storm Risk Management (PCX-CSRМ)

RMO Contact: Deputy Director

Key Review Plan Dates

Date of RMO Endorsement of Review Plan	Pending
Date of MSC Approval of Review Plan	Pending
Date of IEPR Exclusion Approval	N/A
Has the Review Plan changed since RMO Endorsement?	No
Date of Last Review Plan Revision	None
Date of Review Plan Web Posting	None

Milestone Schedule and Other Dates

	Scheduled	Actual
FCSA Execution	5 MAR 2024	5 MAR 2024
Alternatives Milestone	23 AUG 2024	23 AUG 2024
Tentatively Selected Plan	14 JAN 2028	Pending
Release Draft Report to Public, ATR and Policy and Legal Compliance Review Team	14 MAR 2028	Pending
Agency Decision Milestone	1 FEB 2029	Pending
Final Report Transmittal to Policy and Legal Compliance Review Team	24 MAY 2029	Pending
State & Agency Briefing	TBD	Pending

Chief's Report or Director's Report	28 AUG 2029	Pending
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2. References

Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 1 May 2021.

Engineer Circular 1105-2-412 – Planning – Assuring Quality of Planning Models, 31 March 2011.

Planning Bulletin 2013-02, Subject: Assuring Quality of Planning Models (EC 1105-2-412), 31 March 2013.

Office of Management and Budget, Final Information Quality Bulletin for Peer Review, Federal Register Vol. 70, No. 10, January 14, 2005, pp 2664-267

The online USACE Planning Community Toolbox provides more review reference information at: <https://planning.erdc.dren.mil/toolbox/current.cfm?Title=Peer%20Review&ThisPage=Peer&Side=No>.

3. Review Execution Plan

The general plan for executing all required independent reviews is outlined in the following two tables.

Table 1 lists each study product to be reviewed. The table provides the schedules and costs for the anticipated reviews. Teams also determine whether a site visit will be needed to support each review. The decisions about site visits are documented in the table. As the review plan is updated the team will note each review that has been completed.

Table 2 identifies the specific expertise and role required for the members of each review team. The table identifies the technical disciplines and expertise required for members of review teams. In most cases the team members will be senior professionals in their respective fields. In general, the technical disciplines identified for a District Quality Control (DQC) team will be needed for an Agency Technical Review (ATR) team. Each ATR team member will be certified to conduct ATR by their community of practice. If Independent External Peer Review (IEPR) is warranted, panel membership will reflect disciplines representing the areas of expertise applicable to the review being conducted. The table is set up to concisely identify common types of expertise that may be applicable to one or more of the reviews needed for a study.

Table 1: Schedule and Costs of Reviews

Product to undergo Review	Review Level	Site Visit	Start Date	End Date	Cost	Complete
FWOP Model ENG/ECON Results	Targeted ATR	No	December 2025	December 2025	\$5,000	No
FWP Model ENG/ECON Results	Targeted ATR	No	December 2026	December 2026	\$5,000	No
Draft Feasibility Report / EA or EIS	District Quality Control	No	February 2028	February 2028	\$40,000	No
Draft Feasibility Report / EA or EIS	Agency Technical Review	No	March 2028	April 2028	\$60,000	No
Draft Feasibility Report / EA or EIS	IEPR, Scoping (Corps costs)	N/A	October 2027	December 2027	\$25,000	No
Draft Feasibility Report / EA or EIS	IEPR, Contractor Review	N/A	March 2028	April 2028	\$200,000	No
Draft Feasibility Report / EA or EIS	Policy and Legal Review	Yes/No			n/a	No
Final Feasibility Report / EA or EIS	District Quality Control	N/A	May 2029	May 2029	\$40,000	No
Final Feasibility Report / EA or EIS	Agency Technical Review	N/A	May 2029	June 2029	\$60,000	No
Final Feasibility Report / EA or EIS	Policy and Legal Review	N/A	May 2029	June 2029	n/a	No

Table 2: Review Teams - Disciplines and Expertise

Discipline / Role	Expertise	DQC	ATR	IEPR
DQC Team Lead	Extensive experience preparing Civil Works decision documents and leading DQC. The lead may serve as a DQC reviewer for a specific discipline (planning, economics, environmental, etc.).	Yes	No	No
ATR Team Lead	Professional with extensive experience preparing Civil Works decision documents and conducting ATR. Skills to manage a virtual team through an ATR. The lead may serve on the ATR team for a specific discipline (such as planning, economics, or environmental work).	No	Yes	No

Discipline / Role	Expertise	DQC	ATR	IEPR
IEPR Manager	Planner with extensive knowledge of IEPR policy and procedures and contract management and oversight skills.	No	No	Yes
Planning	Skilled water resources planner knowledgeable in complex planning investigations and the application of SMART principle to problem solving.	Yes	Yes	Yes
Economics	A senior economist with experience applying G2CRM and HEC-FDA 2.0 (a life cycle model and an events based model) in an iterative application to estimate flood damages and to assess alternative performance in reduction of flood damage as well as quantification of multiple benefit categories.	Yes	Yes	Yes
Environmental Resources	The environmental reviewer should have expertise in evaluating the impacts associated with structural and non-structural storm surge measures as well as extensive knowledge of estuarine and coastal ecology. The reviewer should also be familiar with the environmental coordination and the National Environmental Policy Act (NEPA) requirements for FRM and CSRM studies.	Yes	Yes	Yes
Cultural Resources	Cultural resources reviewer should have expertise in evaluating the impacts associated with coastal storm risk management projects with some knowledge of both terrestrial and underwater archaeology. The reviewer should also be familiar with the environmental coordination, NEPA, and National Historic Preservation Act (NHPA) Section 106 requirements.	Yes	Yes	Yes
Hydrology	Engineer with experience applying hydrologic principles, including interior drainage, and technical tools to project planning, design, construction, and operation.	Yes	Yes	Yes
Hydraulic Engineering	A senior professional who has thorough knowledge of open channel dynamics, application of levees and flood walls, non-structural solutions and flood proofing, and computer modeling such as HEC-RAS. In addition, the reviewer should have expertise in reviewing sea level change and project performance requirements from ER 1105-2-101.	Yes	Yes	Yes
Cost Engineering	The cost engineering reviewer should have experience evaluating cost requirements for all types of measures that may be recommended in a FRM and CSRM study including nonstructural, structural, and natural and nature-based features (NNBFs) and experience with the following models: Crystal Ball, CEDEP, eProUCL Version 4.00.04, and MiniTab.	Yes	Yes	Yes
Coastal Engineering	Engineer will have experience with coastal storm risk management investigations and projects and climate change analyses. The coastal engineer should also be an	Yes	Yes	Yes

Discipline / Role	Expertise	DQC	ATR	IEPR
	expert in the field of coastal storm modeling, such as ADCIRC, Delft3D and HEC-RAS and G2CRM.			
Civil Engineering	The civil engineering reviewer should have expertise working on planning studies that include structural and nonstructural measures.	Yes	Yes	No
Structural Engineering	The civil engineering reviewer should have expertise working on planning studies that include structural and nonstructural measures.	Yes	Yes	Yes
Geotechnical Engineering	The geotechnical engineering reviewer will have an understanding of the behavior of soils, site characterization, material management, and slope stability.	Yes	Yes	Yes
Construction/ Operations	Extensive construction management experience and operations work. Role may be filled by two people in Districts with separate construction/operations divisions.	No	No	No
Real Estate	The real estate reviewer should have expertise in the real estate requirements of all measures that may be recommended for a FRM and CSRM project including nonstructural, structural, and NNBFs.	Yes	Yes	No
Climate Preparedness and Resilience	A member of the Climate Preparedness and Resiliency Community of Practice knowledgeable of inland and coastal hydrology climate change assessment policy and practice. DQC will be performed by a resource in South Atlantic Division with climate and resilience experience.	Yes	Yes	No
Risk and Uncertainty	For decision documents involving hydrologic, hydraulic, and/or coastal related risk management measures, include on the ATR team an expert on multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty.	No	Yes	No

4. Documentation of Reviews

Documentation of DQC. Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the base conditions (existing and future), draft and final report stages. Documentation of DQC will follow the District Quality Manual and the MSC Quality Management Plan. DrChecks will be used for documentation of DQC comments. An example DQC Certification statement is provided in ER 1165-2-217, Appendix D. Documentation of completed DQC, to include the DQC checklist, will be provided to the MSC, RMO and the ATR Team leader. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

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 will use the four-part comment structure (see ER 1165-2-217, Section 5). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the issue resolution process in ER 1165-2-217, Section 5.9. Unresolved concerns will be closed in DrChecks by noting the concern has been elevated. ATR documentation will include an assessment by the ATR team of the effectiveness of DQC. The ATR Lead will prepare a Statement of Technical Review (see ER 1165-2-217, Section 5.11, and Appendix D), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR will be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

Documentation of 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 final 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.

Documentation of Model Review. Planning models require compliance with EC 1105-2-412. Models developed by the Corps of Engineers are certified and models developed by others are approved. Certifications or approvals may be specific to a single study, a regional application or for nationwide application. Completion of a model review is documented in a memorandum from the Director of a Planning Center of Expertise and should accompany reporting packages for study decisions.

5. Supporting Information

Study or Project Background

Study Authority

The Tidal- And Inland-Related Flood Risk Management study was authorized by Congress in the Water Resources Development Act of 2020 (Public Law 116-260). The authority directs the Secretary of the Army, acting through the USACE, to develop a comprehensive plan to determine the feasibility of carrying out projects for flood damage reduction in the City of Charleston.

Study or Project Area

Charleston is the most populous city in the U.S. state of South Carolina, the county seat of Charleston County, and the principal city in the Charleston metropolitan area. The city lies just south of the

geographical midpoint of South Carolina's coastline on Charleston Harbor, an inlet of the Atlantic Ocean formed by the confluence of the Ashley, Cooper, and Wando rivers. Charleston had a population of 150,227 at the 2020 census. The population of the Charleston metropolitan area, comprising Berkeley, Charleston, and Dorchester counties, was estimated to be 849,417 in 2023. It ranks as the third-most populous metropolitan statistical area in the state, and the 71st-most populous in the United States.

Study or Project Area Map

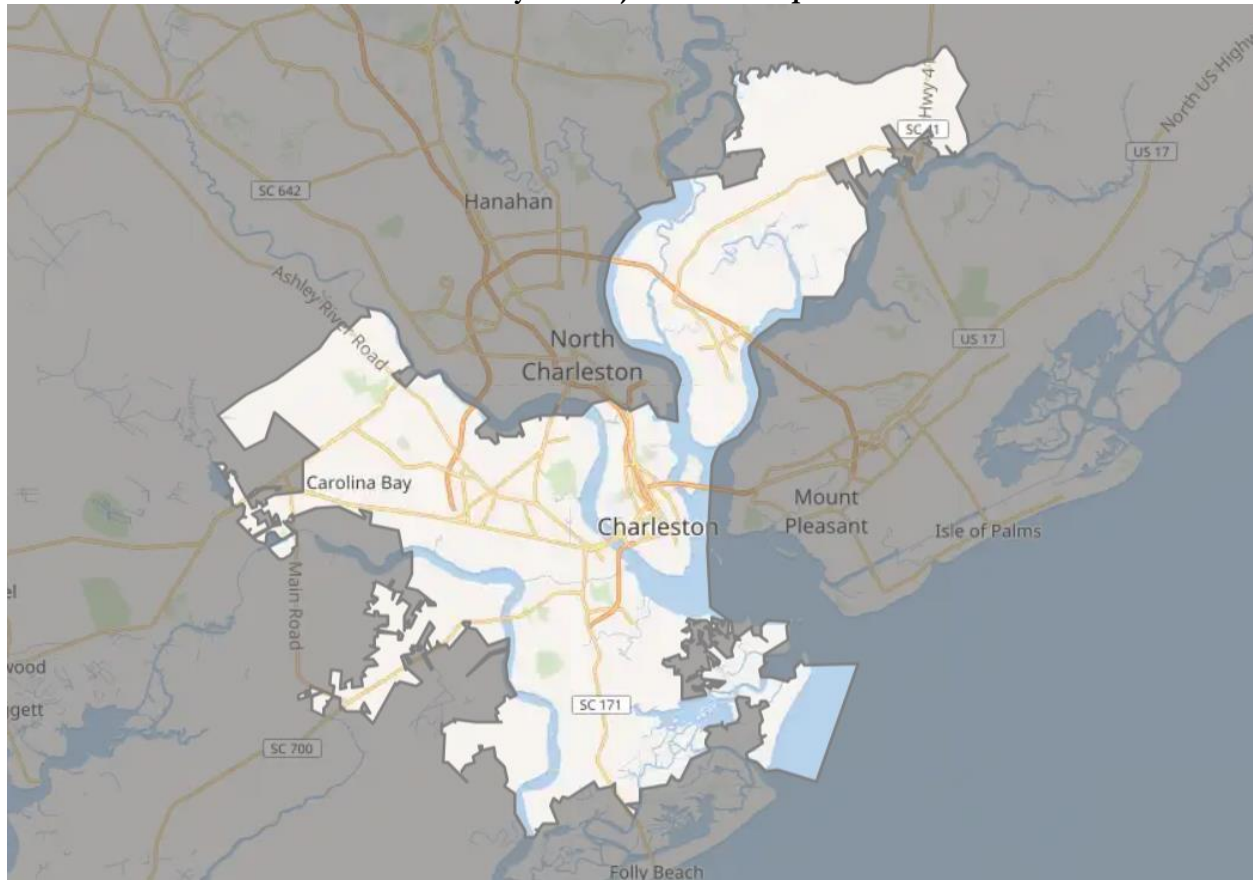


Figure 1 – Study Area Map.

Problem Statement

Low lying coastal communities including residential populations, commercial and tourism centers and a regional medical center are becoming increasingly vulnerable to inland and tidal flooding that, when combined with increasingly intense precipitation and relative sea level change can result in life safety risk and economic risks. High demand for residential and commercial developments drive continued growth of the built environment that replaces pervious surfaces with impervious surfaces, displace wetlands and constrain the capabilities of the built infrastructure and natural marshes and habitats to detain or convey water. Higher probability of widespread and longer duration inland and tidal flooding endangers the nationally significant historic and cultural assets within the study area.

Goals and Objectives

Goal: Minimize loss of human life and property due to the impairment and loss of protective features.

Objectives:

- Reduce risks to life and property in the City of Charleston associated with inland and tidal flooding hazards and compound flooding to business, communities, natural habitats and infrastructure through 2095
- Reduce costs and risks to national economic development associated with coastal hazards and compound flooding to business, residents, and infrastructure
- Improve the resilience of the local and regional economy to impacts from coastal hazards and compound flooding
- Maximize net social benefits and improve resilience of affected communities to impacts from coastal hazards and compound flooding, including
- Minimize disproportionate impacts to vulnerable communities

Future Without Project Conditions

The City of Charleston will face higher flood depths and longer duration floods from multiple hazards, including storm surge, relative sea level change, rising groundwater, increased precipitation, intensifying rain events and rapidly increasing and impactful tidal flooding. If this project does not occur, much of the existing residences and businesses in the 155 sq miles of City of Charleston will be exposed to monthly flooding in the next 50 years. FWOPC modeling will characterize the overall flood hazard of the multiple sources. Current available data estimates RLSC at 14” by 2050 and 2’-4’ by 2070 for the City’s coastal areas, which includes most of the shorelines on James Island, West Ashley, the Peninsula, Johns Island and Daniel Island / Cainhoy.

Types of Measures/Alternatives Being Considered

This study will develop distinctly different approaches to reduce multiple components of flood risk that can occur independently and in combination, which include storm surge, relative sea level change, rising groundwater, increased precipitation, intensifying rain events and rapidly increasing and impactful tidal flooding. An array of structural and nonstructural alternatives will be formulated for the inland and coastal flood risk management objectives. Alternatives may include measures such as detention or conveyance features, levees, floodwalls, nature-based solutions, structure elevating and revised building practices and standards. nature based solutions (NBS) to be evaluated may include wetlands protection and restoration through a variety of means such as beneficial use of dredged material, vegetation plantings, and shoreline stabilization. It is anticipated that compound flood hazard conditions will be addressed with layered measures to address flood from multiple hazards in combination.

Estimated Cost/Range of Costs

Costs of alternatives are unknown at this time but given the size of the area and problem complexity, costs are expected to be well over \$200 million for a comprehensive plan.

6. Models to be Used in the Study

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 following planning models may be used to develop the decision document:

Table 3: Planning Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
IWR-Planning Suite	This software assists with the formulation and comparison of alternative plans. While IWR-PLAN was initially developed to assist with environmental restoration and watershed planning studies, the program can be useful in planning studies addressing a wide variety of problems. IWR-PLAN can assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR-PLAN can assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are the best financial investments and displaying the effects of each on a range of decision variables.	Certified
HEC-FDA 2.0	The program integrates hydrologic engineering and economic analysis to formulate and evaluate plans using risk-based analysis methods. It will be used to evaluate /compare plans to aid in selecting a recommended plan. Assume surge alternative is in place for FWOP modeling of rainfall and tidal risk, add residual risk from surge to FWOP damages. Formulate alternatives for rainfall/tidal, recommend a plan.	Approved for one time use in CSRM studies
G2CRM 0.4.564	G2CRM is a Probabilistic Life Cycle Analysis (PLCA) model developed by ERDC that provides incorporation of quantified uncertainty in the driving forces, physical system, and system response. The model is designed for the evaluation of CSRM projects involving static	Certified

	protective measures. G2CRM is able to perform event-driven Monte Carlo simulation of environmental forcing (storms), estimate event-based damages, and protective system response, over the project life cycle. FWOP modeled using G2CRM to understand risk from surge only. Formulate alternatives for surge, model FWP, recommend a plan to address surge.	
Regional Economic System (RECONS 2.0)	RECONS (Regional Economic System) is a Corps corporate model specifically developed to assess the Regional Economic Development (RED) impacts of Corps civil works projects. This model will be used to support discussion of the RED benefits associated with project implementation. The RECONS model will estimate the impacts to the local economy, in terms of income, employment and tax revenues, resulting from project construction.	Certified
Northern Gulf of Mexico Brown and White Shrimp HSI	A Habitat Suitability Index (HSI) is defined as a numerical index that represents the capacity of a given habitat to support a selected fish or wildlife species. This index is an estimate or measure of habitat conditions in the study area divided by the optimum habitat conditions for the same evaluation species (Turner and Brody 1983). The HSI has a range of zero to one, with zero representing unsuitable habitat and one representing optimum habitat. This model does not consider or estimate population size, dynamics or recruitment; it only estimates suitable habitat. This brown and white shrimp HSI model is based on the juvenile life stage and uses food/cover (marsh type) and water quality (salinity and water temperature) conditions to estimate habitat suitability.	Pending. Single Use Approval process initiated with the ECO-PCX.

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. For example, HH&C models need to comply with the requirements of HH&C CoP Enterprise Standard 08101.

These engineering models may be used to develop the decision document:

Table 4: Engineering Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
ADvanced CIRCulation Model 56 (ADCIRC)	ADCIRC was developed to predict storm surge water level and help control the impact of storm damage. ADCIRC is a hydrodynamic modeling technology that conducts short- and long-term simulations of tide and storm surge elevations and velocities in deep-ocean, continental shelves, coastal seas, and small-scale estuarine systems. ADCIRC will be used to create probabilistic offshore boundary conditions by running a suite of representative synthetic storms. Synthetic storms will be derived from the SACS. Offshore boundary conditions. It will be used in the detailed RAS modeling framework to generate hazard curves (probabilistic total water levels) representative to project domain. The model will be used to estimate existing, FWOP, and FWP water depths to aid in calculating alternative economic benefits.	CoP Preferred
Steady State Spectral Wave 6.2.28 (STWAVE)	STWAVE allows coastal project engineers to numerically model wave generation and transformation over complex bathymetry, interaction of waves with currents and structures, and propagation of waves in entrances and harbors. The model will be used to estimate existing, FWOP, and FWP water depths to aid in calculating alternative economic benefits.	CoP Preferred
Delft3D 2021.3	Delft3D-FLOW is a two- and three-dimensional hydrodynamic model of unsteady flow, water quality and sediment transport, as well as tidal waves, morphology and ecology from tidal and precipitation inputs. The Delft3D model is considered a potential option for the water quality and wetland/vegetation modeling for environmental assessment. The Delft3D WAQ module includes salinity, dissolved oxygen (DO), nutrient dynamics, soil biogeochemistry, etc. It	Allowed, and being determined whether one time use approval will be required.

	can be run directly using Delft's flow module. The model will be used to estimate existing, FWOP, and FWP water depths to aid in calculating alternative economic benefits.	
HEC-RAS 2D, Version 5.0, 6.3	This software allows the user to perform one-dimensional steady flow, one and two-dimensional unsteady flow calculations, sediment transport/mobile bed computations, and water temperature/water quality modeling. The model will be used to estimate existing, FWOP, and FWP water depths to aid in calculating alternative economic benefits.	CoP Preferred
HEC-HMS 4.10	This software is designed to simulate the complete hydrologic processes of dendritic watershed systems. The software includes many traditional hydrologic analysis procedures such as event infiltration, unit hydrographs, and hydrologic routing. The model will be used to estimate existing, FWOP, and FWP water depths to aid in calculating alternative economic benefits.	CoP Preferred
Micro-Computer Aided Cost Estimating System Second Generation v. 4.4.4 (MII)	The MII software application is PC-based and is currently used by the Army Corps of Engineers and AE firms for the preparation of detailed construction cost estimates. The software is used for the preparation of programming estimates, current working estimates, bid opening IGEs and construction modification estimates. The software will be used to prepare a cost estimate for the construction of the alternatives to compare with economic benefits.	Allowed
Crystal Ball 11.1.2.4.900	The software is used to determine contingency based in a cost estimate. The contingency is based on cost and schedule risk and level of design.	Allowed

All civil works planning studies must document compliance with CECW-P memo (28 July 2023), Model Coordination for Civil Works Planning Studies, to coordinate models and confirm assigned modelers possess the requisite knowledge and experience to complete modeling tasks. A questionnaire for each model is attached in Appendix F.

7. Factors Affecting Level and Scope of Review

All planning products are subject to the conduct and completion of District Quality Control. Most planning products are subject to Agency Technical Review and a smaller sub-set of products may be subject to Independent External Peer Review and/or Safety Assurance Review. Information in this section helps in the scoping of reviews through the considerations of various potential risks.

Objectives of the Reviews

1. Ensure decision document quality and completeness.
2. Ensure decision document is compliant with federal laws and policies including but not limited to the National Environmental Policy Act, as well as USACE policies and plan formulation standards for coastal storm risk management feasibility studies.
3. Ensure sound assumptions, modeling and analyses methods, feasibility-level design, and plan formulation methods were utilized to develop the recommended measures/alternatives and appropriately documented in the decision document and supporting appendices.
4. Ensure external coordination with the non-Federal Sponsor, stakeholders, environmental resource agencies, and public throughout the study are appropriately documented in the decision document.

Assessing the Need for IEPR

Mandatory IEPR Triggers

- Has the Chief of Engineers determined the project is controversial? No
- Has the Governor of an affected state requested an IEPR? No
- Is the cost of the project more than \$200 million? Very Likely

Discretionary IEPR

- Has the head of another Federal agency requested an IEPR? No

Potential IEPR Exclusion

- Is the project cost greater than \$200 million? Very Likely; and
- Does the project have an Environmental Impact Statement (EIS)? Very Likely

IEPR Exclusion Condition A.

- Does the study include an EIS? Unknown
- Is the project controversial? Yes
- Does the project have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? Unknown
- Does the project have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? Unknown
- Does the project, before implementation of mitigation measures, have more than a negligible adverse impact on a species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.) or the critical habitat of such species designated under such Act? Unknown

IEPR Exclusion Condition B.

- Does the study include an EIS? Unknown; and
- Does the project involve only the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates within the same footprint and for the same purpose as an existing water resources project; Unknown or

- Is for an activity for which there is ample experience within USACE and the industry to treat the activity as being routine; Unknown and
- Does the project have minimal life safety risk? Unknown

IEPR Exclusion Condition C.

- Does the study include an EIS? Unknown; and
- Is the study being conducted under the general continuing authorities of the CAP? No

Assessing Other Risk Considerations

Drivers of the level of review include distinguishing between the ten sources of flooding (sea level rise, tidal, rainfall, and storm surge) as identified in WRDA 2022, Section 8106 and accounting for the performance of the City's storm water drainage system. Although the City is bounded by two rivers, riverine flooding from interior watersheds is not a driver of the flooding problem. Existing coastal and rainfall models will be used to analyze flooding issues.

- Will the study likely be challenging? If so, describe how? Yes, because the problem is complex and requires multiple models to produce model input and delineate specific flood hazards.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. Assumptions will be made about subsurface conditions which can vary greatly, especially in areas where fill has been placed for development. Inaccurate assumptions could result in cost increases when implementing the recommended plan. Also, assumptions about the long term effect of climate change and sea level rise will be described as recommended in guidance, but may not be applied to the recommended plan if the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? It is unlikely that the project will be justified by public health and safety, but public health and safety will be part of the study, i.e. the medical district is susceptible to catastrophic flooding and evacuation routes are subject to flooding and closure during high tide, hurricane or tropical storm events. The medical district on the Peninsula is the largest concentration of employment in the State. In addition, the medical district is home to the State's only burn trauma center, a Veteran hospital and a new \$500 million dollar Children hospital.
- 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? If so, how? Unknown at this time, however likelihood is low.
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? If so, how? Unknown at this time.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? If so, what are the anticipated impacts? Unknown at this time.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? If so, describe the impacts? Unknown at this time.
- 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? If so, what are the anticipated impacts? No.

8. Risk Informed Decisions on Level and Scope of Review

Targeted ATR. PDT anticipates that ENG/ECON outputs of FWOP may warrant Focused ATR to reduce study and schedule risk.

IEPR Decision. Very Likely.

Safety Assurance Review. Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction projects for hurricane, storm and flood risk management projects, or other projects where existing and potential hazards pose a significant threat to human life. In some cases, significant life safety considerations may be relevant to planning decisions. These cases may warrant the development of relevant charge questions for consideration during reviews such as ATR or IEPR. In addition, if the characteristics of the recommended plan warrant a Safety Assurance Review, a panel will be convened to review the design and construction activities on a regular schedule before construction begins and until construction activities are completed.

Decision on Safety Assurance Review. Decision will be made later.

9. Policy and Legal Compliance Review

Policy and legal compliance review of draft and final planning decision documents is delegated to the MSC (see EP 1105-2-61).

(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 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.

- 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.

10. Public Comment

This Review Plan will be posted on the District's website. Public comments on the scope of reviews, technical disciplines involved, schedules and other considerations may be submitted to the District for consideration. If the comments result in a change to the Review Plan, an updated plan will be posted on the District's website.

11. Documents Distributed Outside the Government

For information distributed for review to non-governmental organizations, the following disclaimer shall be placed on documents:

“This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy.”

Appendix A - Brief Description of Each Type of Review

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 and accompanying components will undergo DQC. This internal review covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan. The DQC team will read all reports and appendices. The review must evaluate the correct application of methods, validity of assumptions, adequacy of basic data, correctness of calculations (error-free), completeness of documentation, and compliance with guidance and standards. Districts are required to check all computations and graphics by having the reviewer place a highlight (e.g., place a “red dot”) on each annotation and/or number indicating concurrence with the correctness of the information shown.

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.

Independent External Peer Review. IEPR is 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. Certain criteria dictate mandatory performance of IEPR and other considerations may lead to a discretionary decision to perform IEPR. For this study, a risk-informed decision has been made that IEPR is appropriate. The information in Section 1 – Factors Affecting the Scope of Review – informed the decision to conduct IEPR.

Cost Engineering Review. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX assisted 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 occur as part of ATR.

Model Review and Approval/Certification. The use of certified or approved planning models for all planning work is required to ensure the models are technically and theoretically sound, compliant with policy, computationally accurate, and based on reasonable assumptions. Engineering models must comply with standards set by the appropriate Engineering Community of Practice.

Policy and Legal Compliance Review. 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.

Public Review. The District will post the Review Plan and approval memo on the District’s internet site. Public comment on the adequacy of the Review Plans will be accepted and considered. Additional public review will occur when the report and environmental compliance document(s) are released for public and agency comment.