DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA, GA 30303-8801

CESAD-PDP 28 May 2019

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, Savannah District, 100 W. Oglethorpe Avenue, Savanah, Georgia 31401-3604

SUBJECT: Approval of the Review Plan for the Savannah River Below Augusta Restore Ecosystem Study, Georgia

1. References:

a. Memorandum, CEMVD-PD-L 21 December 2016, subject: Savannah River Below Augusta Restore Ecosystem, Georgia, Feasibility Study, Savannah District; National Ecosystem Restoration Planning Center of Expertise, Recommendation to Approve Review Plan, and Endorsement of Type I Independent External Peer Review Exclusion Request.

b. Memorandum, CECW-P, 7 June 2018, subject: Revised Delegation of Authority in Section 2034(a) (5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343).

c. Email, CESAS-PM-P, 10 May, 2019, subject: SRBA - Review Plan approval -- email request.

d. Memorandum, CESAS-PD, 22 December 2016, subject: Savannah River Below Augusta Restore Ecosystem Project; Request for Exclusion from Type I Independent External Peer Review (IEPR).

2. Savannah District (SAS) prepared and submitted for review and approval the review plan for the Savannah River Below Augusta Restore Ecosystem Study, Georgia, on 14 December 2016. The National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) provided SAS their endorsement of the Review Plan and concurrence with the Type I Independent External Peer Review Exclusion request on 21 December 2016. After suspension of the study in 2017, the study was resumed in March 2018. SAS updated the review plan, and the ECO-PCX concluded that their endorsement stands. The review plan does not include Type I Independent External Peer Review.

3. I approve the enclosed review plan and the request for exclusion from IEPR. The approved review plan is subject to change as circumstances require, consistent with study development under the project management business process. Subsequent revisions to this approved review plan due to significant changes in the study, study scope, or level of review will require new written approval from this office.

4. The point of contact for this action is [redacted], Interim Chief, Planning and Policy Division, at [redacted]

Encl
as

DIANA M. HOLLAND
Brigadier General, USA
Commanding

Savannah River Below Augusta
REVIEW PLAN
May 2019

Project Name: Savannah River Below Augusta (SRBA) Integrated Feasibility Report and Environmental Assessment, Georgia

P2 Number: *402909*

Decision Document Type: Integrated Feasibility Report and Environmental Assessment

Project Type: Single purpose Ecosystem Restoration Study

District: Savannah

District Contact: Plan Formulator (912) 652-5375

Major Subordinate Command (MSC): South Atlantic Division

MSC Contact: Senior Plan Formulator, (404) 562-5226

Review Management Organization (RMO): Ecosystem Restoration - Planning Center of Expertise (ECO-PCX)

RMO Contact: ECO-PCX SAD Account Manager, (651) 290-5259

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: *21 December 2016*

Date of MSC Approval of Review Plan: *TBD*

Date of IEPR Exclusion Approval: *TBD*

Has the Review Plan changed since PCX Endorsement? *Schedule was revised after study was suspended and resumed*

Date of Last Review Plan Revision: *none*

Date of Review Plan Web Posting: *TBD*

Date of Congressional Notifications: *(enter date the RIT notified Congress of IEPR decisions)*

Milestone Schedule

	Scheduled	Actual	Complete
Alternatives Milestone:	*22 May 2019*	*(enter date)*	*(Yes/No)*
Tentatively Selected Plan:	*23 Jan 2020*	*(enter date)*	*(Yes/No)*
Release Draft Report to Public:	*19 Mar 2020*	*(enter date)*	*(Yes/No)*
Agency Decision Milestone:	*06 Aug 2020*	*(enter date)*	*(Yes/No)*
Final Report Transmittal:	*19 Feb 2021*	*(enter date)*	*(Yes/No)*
Chief's Report:	*23 Aug 2021*	*(enter date)*	*(Yes/No)*

Project Fact Sheet
April 2019

Project Name: Savannah River Below Augusta Ecosystem Restoration, Georgia (GA)

Location: The study area includes the Savannah River and surrounding wetlands and riparian lands from the upper end of the Savannah arbor (River Mile [RM] 21.3) to Augusta, GA (RM 202.16), on both sides of the river, in Georgia and South Carolina.

Authority: The study is authorized under the US House of Representatives Committee on Public Works and Transportation Resolution dated 1 Aug 1990 and Section 1201 (29) of the Water Resources and Development Act of 2016.

Sponsor: The Savannah Riverkeeper (Augusta, GA)

Type of Study: Integrated Feasibility Report & Environmental Assessment

SMART Planning Status: The Savannah District (SAS) is currently seeking an exemption waiver to the 3-year study completion requirement because the study was previously suspended due to sponsor funding issues.

Project Area: The authorized navigation project for the Savannah River between Augusta and Savannah, Georgia is a channel 9 feet deep and 90 feet wide from the upper end of Savannah Harbor (mile 21.31) to the head of navigation at Augusta above the 13th Street bridge (mile 202.16) (Figure 1).

Figure 1. Savannah River Below Augusta Study Area

Problem Statement: Modifications have occurred to the Savannah River due to the construction of the navigation project from 1889 to 1976. One component of construction between 1959 and 1962 was the removal about 40 bends between river mile 31.4 river and river mile 183.5 to straighten the river for navigation safety purposes. During low flows, many of these bends are separated from the main river channel, resulting in aquatic habitat degradation. Reservoir construction in the Upper Savannah River modified the river's natural flow regime changing sediment load and water quality. River access to some tributary streams is cut off due to dredged material placement from channel modifications (deepening, widening, snagging, and construction of navigation cuts, pile dikes and other work) to provide the 9-foot depth. State and federal threatend and endangered species within the study area that may benefit from the restoration efforts include the shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus*), robust redhorse (*Moxostoma robustum*), wood stork (*Mycteria americana*) as well as three species of mussels: Savannah lilliput (*Toxolasma pullus),* Altamaha spinymussel (*Elliptio spinosa), barrel floater (Anodonta couperiana*). . Due to these changes, the following problems have occurred:

- The Savannah River was shortened a total of 30 river miles within the study area.
- Fish and wildlife habitat has been negatively impacted, particularly fish spawning and juvenile/nursery habitat.
- Cutoff bends were disconnected from the main river and this has led to disconnection of surface water and ground water. This has also led to conversion of wetland type.
- Straightening of the river has reduced residence time for nutrient uptake therefore reducing water quality primarily in Savannah Harbor.
- Bank stabilizing at cuts has reduced natural erosion and undercutting of the bank, thereby reducing river wildlife and fish habitat, and natural sediment dynamics.

Federal Interest: The Savannah River Below Augusta (SRBA) navigation project was authorized by the Rivers and Harbors Act of March 3, 1881. The Federal navigation project includes manmade cutoffs. This study will consider modifications to the Federal navigation project and cutoff river segments that may restore and benefit the ecosystem. Potential solutions have not yet been determined.

Risk Identification: The primary risks for this project are associated with normal project development: funding and schedule, real estate concerns, and constructability and design considerations. There is no threat to human life.

1. FACTORS AFFECTING THE LEVELS OF REVIEW

- **Scope of Review.** The Draft Report and supporting materials will undergo DQC and ATR. The reviews will require team members who are experienced in ecosystem restoration. DQC and ATR reviews will follow standard procedures and scope as described in EC 1165-2-217, and in accordance with guidance and best practices for each discipline/Community of Practice as described later in this document.

- Will the study likely be challenging? **No.**

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. **The risks are likely to occur with study funding. Dependent upon the nature of the comments, the potential exists for revisiting such things as the calculation of habitat units, the criteria and locations comparisons in the study.**

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? **No life safety issues are anticipated**.

- 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? **No.**

- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project? **No**.

- 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.**

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? **No.**

- Is the estimated total cost of the project greater than $200 million? **No. Costs are anticipated to be between $20 million and $140 million.**

- Will an Environmental Impact Statement be prepared as part of the study? **An EIS is not currently anticipated. The decision will be made upon completion of the Environmental Assessment.**

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? **No.**

- 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 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). 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. SAS has determined that this project does not meet any of the triggers that require a Type I IEPR and has requested an exemption from this requirement.

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 Compliance 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.

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. At this point in the study, no work in-kind products have been identified.

Table 1: Levels of Review

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Draft Feasibility Report and EA	District Quality Control	1/24/2020	2/7/2020*	$25,000	No
Draft Feasibility Report and EA	Legal Review	2/7/2020	2/28/2020	N/A	No
Draft Feasibility Report and EA	Agency Technical Review	3/19/2020	5/1/2020	$50,000	No
Draft Feasibility Report and EA	Type I IEPR	NA	NA	NA	NA
Final Feasibility Report and EA	District Quality Control	10/5/2020	10/26/2020*	$25,000	No
Final Feasibility Report and EA	Agency Technical Review	10/26/2020	11/16/2020*	$30,000	No
Final Feasibility Report and EA	Policy and Legal Review	9/15/2020	10/1/2020*	N/A	No

* Schedule includes review, response, and comment closure time.

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). The DQC Lead should 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 team.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience with ecosystem restoration experience
Economics	The reviewer shall have extensive knowledge of the principles and guidelines of economic analysis as it relates to cost effectiveness/incremental cost analysis models for ecosystem restoration within the Corps of Engineers.
Environmental Resources and Cultural Resources	The reviewer shall be an expert in the NEPA process and environmental laws. The reviewer shall have knowledge of the Section 106 NHPA compliance process.
Hydraulic and Hydrologic Engineering	Familiarity with running hydraulic models and their application to ecosystem restoration projects. Knowledge of how economists and biologists use hydraulic and hydrologic information in their assessments. Some experience with flood risk evaluation is preferable.
Geotechnical Engineering	Expertise in geotechnical considerations for riverine and wetland construction.
Cost Engineering	The cost engineer shall be an expert in MII with expertise in riverine and wetland construction.
Real Estate	The Real Estate reviewer should be an expert in the real estate planning process for cost shared and full federal civil works projects and acquisition of real estate interests for ecosystem restoration projects. The reviewer must have a full working knowledge of EC 405-1-12, Real Estate Planning and Acquisition Responsibilities for Civil Works Projects and Public Law 91-646. The reviewer must be able to identify areas of the Real Estate Plan that are not in compliance with the guidance set forth in EC 405-1-12 and will make recommendations for bringing the report into compliance. All estates suggested for use will be reviewed to assure they are sufficient to allow project construction and the real estate cost estimate will be validated as being adequate to allow for real estate acquisition.

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

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 ECO-PCX is the RMO for this study. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h)(1)). Table 3 identifies the disciplines and required expertise for this ATR Team.

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may serve as a reviewer for a specific discipline (such as planning).
Planning	A senior water resources planner with experience in ecosystem restoration. The reviewer shall be certified in Plan Formulation in the Planner Database
Economics/Risk and Uncertainty	The reviewer shall have extensive knowledge of the principles and guidelines of economic analysis as it relates to cost effectiveness/incremental cost analysis models for ecosystem restoration within the Corps of Engineers.
Environmental Resources	The reviewer shall be an expert in the NEPA process. The reviewer shall be certified in Ecosystem Restoration in the Planner Database.
Cultural Resources	The reviewer shall be a certified Agency Technical Reviewer for the Cultural Resources Sub Community of Practice with experience in prehistoric archaeology in the Southeastern U.S. The reviewer shall have knowledge of the Section 106 compliance process.

Hydraulic and Hydrologic Engineering	Senior Hydraulic Engineer familiar with running hydraulic models and their application to ecosystem restoration projects. Some experience with flood risk evaluation preferable.
Geotechnical Engineering	Senior Geotechnical Engineer with expertise in geotechnical considerations for riverine and wetland construction.
Cost Engineering	The cost engineer shall be an expert in MII with expertise in riverine and wetland construction. The Cost MCX will designate and approve this team member.
Real Estate	The Real Estate reviewer is to have expertise in the real estate planning process for cost shared and full federal civil works projects, relocations, report preparation and acquisition of real estate interests including ecosystem restoration projects. The reviewer must have a full working knowledge of EC 405-1-12, Real Estate Planning and Acquisition Responsibilities for Civil Works Projects and Public Law 91-646. The reviewer must be able to identify areas of the Real Estate Plan that are not in compliance with the guidance set forth in EC 405-1-12 and will make recommendations for bringing the report into compliance. All estates suggested for use will be reviewed to assure they are sufficient to allow project construction and the real estate cost estimate will be validated as being adequate to allow for real estate acquisition.
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice (CoP) will participate in the ATR review. This team member may also serve in another role on the ATR.

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

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Type I IEPR.

Decision on Type I IEPR.

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-217, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project 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. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-217.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

Decision on IEPR

Engineer Circular 1165-2-217 states that any of the factors below require IEPR:

The following mandatory triggers warrant a Type I IEPR. SAS reviewed those criteria and reached the following conclusions:

1. Significant threat to human life. Very low risk to human life has been determined at this time but will be confirmed under a risk analysis performed during the Pre-Construction Engineering and Design (PED phase). **Criterion not met.**
2. Total Project Cost> $200 M. It is anticipated that this total project cost will not exceed $200 M. **Criterion not met.**
3. A request by a State Governor of an affected state. There is no request by the Governor of an affected state for a peer review by independent experts. **Criterion not met.**
4. Where the Department of Civil Works (DCW) or the Chief of Engineers determines that the project study is controversial due to significant public dispute over either the size, nature, or effects of the project or the economic or environmental costs or benefits of the project. This project is not likely to involve significant public disputes as to size, nature, or effects of the project and is not likely to involve significant public disputes as to the economic or environmental costs and benefits of this project. **Criterion not met.**
5. There is significant public dispute as to size, nature, or effects of the project. **Criterion not met.**
6. There is significant public dispute as to the economic or environmental cost or benefit of the project. **Criterion not met.**
7. Cases where information is based on novel methods, presents complex challenges for interpretation, contains precedent-setting methods, or presents conclusions that are likely to change prevailing practices. The information in the decision document or anticipated project design is not likely to be based on novel methods, involve the use of 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 project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule. **Criterion not met.**

For the SRBA study, none of the triggers requiring a Type I IEPR are met. In addition, the study:

- Does not currently anticipate requiring an EIS; and
- The Chief of Engineers has not yet determined it is controversial; and
- It has no more than negligible adverse impacts on scare or unique tribal, cultural, or historic resources; and
- It has no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures; and
- It has, before implementation of mitigation measures, no 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.

In conclusion, the study would not significantly benefit from a Type I IEPR.

When a decision document does not trigger a mandatory Type I IEPR, a risk-informed recommendation will be developed. The process shall consider the consequences of non-performance on project economics, the environment, and social well-being (public safety and social justice), as well as indicate whether the product is likely to contain influential scientific information or be a highly influential scientific assessment, or involve other issues that provide a rationale for determining the appropriate level of review. The recommendation must make a case that the study is so limited in scope or impact that it would not significantly benefit from IEPR.

The SRBA study is so limited in impact that it would not significantly benefit from a Type I IEPR. The study does not include an Environmental Impact Statement; is not controversial; is anticipated to have no negligible adverse impacts on scarce or unique tribal, cultural, or historic resources; has no substantial adverse impacts on fish and wildlife species and their habitat before implementing mitigation measures; has, before implementation of mitigation measures, no more than a negligible adverse impact on a species listed as endangered or threatened species under the Endangered Species Act of 1973 or the designated critical habitat of such species; and has minimal life safety risk. The study is for an activity with ample experience within the USACE and industry to treat the activity as being routine. This is an ecosystem restoration study involving standardized methods and well established criteria to determine the alternatives. There is minimal risk of substantial non-performance related to project economics. With regard to impacts on the environment, a draft environmental assessment will be prepared in compliance with the National Environmental Policy Act. If the analysis supports the conclusion that environmental impacts are not significant, then a Finding of no Significant Impact (FONSI) will be generated and signed. Otherwise, and Environmental Impact Statement will be generated. Accordingly, analysis of environmental impacts does not involve a large degree of uncertainty or high risk for underestimation. Social justice considerations are being addressed through determination of low income eligibility determinations in accordance with Section 322 of the Water Resources Development Act of 1990. Given these considerations, the risk of non-performance with regard to matters pertaining to social well-being would be anticipated as minimal. This study does not involve novel, untested, or influential scientific information or methods. The analyses, while complex, are within the typical scope of similar studies. Methods and required data and analyses are well-established in USACE guidance. It is not expected that the project would benefit from IEPR.

The Savannah District has considered the criteria above and recommends excluding this study from Type I IEPR. The District will request that the Division Commander approve an IEPR exclusion request.

Products to Undergo Type I IEPR. Not-Applicable

Required Type I IEPR Panel Expertise. Not-Applicable
Documentation of Type I IEPR. Not-Applicable

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

Decision on Type II IEPR. This ecosystem restoration study does not meet the criteria to warrant a Type II 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 Status
Habitat Suitability Index Models	The habitat use information and Habitat Suitability Index (HSI) models presented in this RP are an aid for impact assessment and habitat management activities. Three specific species have been identified to evaluate; largemouth bass, snapping turtle, and shortnose sturgeon. Literature concerning a species' habitat requirements and preferences is reviewed and then synthesized into HSI models, which are scaled to produce an index between 0 (unsuitable habitat) and 1 (optimal habitat).	Approved
Wetland Value Assessment Bottomland Hardwoods Community Model for Civil Works (Version 21.2)	The WVA community models have been designed to function at a community level and therefore attempt to define an optimum combination of habitat conditions for all fish and wildlife species utilizing a given habitat type. Each model consists of 1) a list of variables that are considered important in characterizing fish and wildlife habitat, 2) a Suitability Index (SI) graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values, and 3) a mathematical formula that combines the Suitability Index for each variable into a single value for habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI. The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing fish and wildlife habitat. This model was developed to determine the suitability of bottomland hardwoods habitat in providing resting, foraging, and nesting habitat for a diverse assemblage of wildlife species.	Certified
IWR- Planning Suite 2.0.6.1	IWR PLAN was developed by the Institute for Water Resources, and is designed to assist with formulation and comparison of alternative plans. 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. IWR PLAN takes user defined solutions to planning problems and externally generated estimates of each solution's effects and can formulate all possible combinations of those solutions considering user defined relationships between solutions. IWR PLAN will then identify which combinations are the best financial investments through cost effectiveness and incremental cost analyses. Each combination of solutions is an alternative plan. If alternative plans have already been formulated outside IWR PLAN, the user can bypass the routine for building combinations and still use IWR PLAN to assist in identifying which plans are the best investments.	Certified

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
HEC-RAS 5.0.7 (River Analysis System)	The Hydrologic Engineering Center's River Analysis System (HEC-RAS) performs one and two-dimensional steady and unsteady flow river hydraulics calculations. The program is used for unsteady flow analysis to evaluate the Future Without-Project and Future With-Project conditions.	HH&C CoP Preferred Model

e. POLICY AND LEGAL COMPLIANCE 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 reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

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

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

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
[redacted]			

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Phone Number
[redacted]			

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
[redacted]			

VERTICAL TEAM			
Name	Office	Position	Phone Number
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

POLICY REVIEW TEAM			
Name	Office	Position	Phone Number
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]