DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION
1400 WALNUT STREET
VICKSBURG MS 39180-3262

CEMVD-PDM 7 March 2022

MEMORANDUM FOR Commander, Memphis District

SUBJECT: Approval of the Updated Review Plan for the Running Reelfoot Bayou, Tennessee Feasibility Study

1. References:

a. USACE, CEMVM-ZA memorandum (Request for Approval of the Review Plan for the Running Reelfoot Bayou, Tennessee Feasibility Study), 3 December 2021 (Encl 1)

b. USACE, CEMVD-PD memorandum (Running Reelfoot Bayou, Tennessee), 12 November 2021 (Encl 2)

c. ER 1165-2-217 (Review Policy for Civil Works), 1 May 2021

2. The enclosed updated Review Plan (RP) for the Running Reelfoot Bayou, Tennessee Feasibility Study has been prepared in accordance with ER 1165-2-217 and has been coordinated with our staff and the Mississippi Valley Division Ecosystem National Planning Center of Expertise who concurred with the RP.

3. We hereby approve this RP, which is subject to change as circumstances require, consistent with project development under the Project Delivery Business Process. Non-substantive changes to this RP do not require further approval. Substantive revisions to this RP or its execution will require new written approval from this office. The district should post the approved RP to its internal website with sensitive information removed.

4. My point of contact for this action is

Encls

EDWARD E. BELK, JR., P.E.
Director of Programs

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
167 NORTH MAIN STREET B-202
MEMPHIS, TN 38103-1894

CEMVM-ZA (1165-2-26d2) 03 December 2021

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, Mississippi Valley Division (CEMVD-PDM/B. CHEWNING), 1400 Walnut Street, Vicksburg, MS 39180

SUBJECT: Request for Approval of the Review Plan for the Running Reelfoot Bayou, Tennessee Feasibility Study

1. References:

a. Engineer Regulation (ER) 1165-2-217, Review Policy for Civil Works, dated 01 May 2021.

b. Civil Works Director's Policy Memorandum, CW 2019-01, subject: Policy and Legal Compliance Review, dated 09 January 2019.

c. Memorandum, CEMVD-PD (ECO-PCX), dated 12 November 2021 (Enclosure 1).

2. This memorandum transmits the Review Plan (Enclosure 2) for the Running Reelfoot Bayou, Tennessee Feasibility Study for your review and approval. The subject Review Plan and Review Plan Checklist (Enclosure 3) was prepared in accordance with ER 1165-2-217 (Reference 1a).

3. The Review Plan follows criteria in ER 1165-2-217 to assess risk of excluding the study from Type I Independent External Peer Review (IEPR). Based on the requirements outlined in ER 1165-2-217, the study does not meet any of the mandatory IEPR criteria.

4. The point of contact is

3 Encls
1. ECO-PCX Endorsement Memo
2. Review Plan
3. Review Plan Checklist

ZACHARY L. MILLER
COL, EN
Commanding

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSISSIPPI VALLEY DIVISION
1400 WALNUT STREET
VICKSBURG, MISSISSIPPI 39180-3262

CEMVD-PD (ECO-PCX) 12 November 2021

MEMORANDUM FOR Commander, Memphis District
ATTN: Mr. Troy Constance, CEMVN-PD

SUBJECT: Running Reelfoot Bayou, Tennessee

1. References

a. Engineer Regulation (ER) 1165-2-217 Review Policy for Civil Works, 01 May 2021.

b. Engineer Regulation 1110-2-12, Quality Management, 30 Sept 2006.

c. Independent External Peer Review Standard Operating Procedure, Aug 2016.

d. U.S. Army Corps of Engineers, Memorandum for Major Subordinate Commanders, 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), 23 May 2018.

e. Engineer Circular (EC) 1105-2-412 Assuring Quality of Planning Models, 31 Mar 2011.

f. Draft Review Plan, Running Reelfoot Bayou, Tennessee, 11 Nov 2021 (encl 1).

2. The enclosed Review Plan complies with all applicable policy and provides for adequate District Quality Control and Agency Technical Review for the plan formulation, engineering, and environmental analyses, and other aspects of plan development. The Ecosystem Restoration National Planning Center of Expertise (ECO-PCX) recommends the Mississippi Valley Division approve the Review Plan following the provisions of EC 1165-2-217 (Reference 1.a.).

3. The Review Plan uses criteria in EC 1165-2-217 to assess the risk of excluding the study from Type I Independent External Peer Review (IEPR). A risk assessment shows that the study does not meet any of the criteria for mandatory IEPR. The ECO-PCX concurs with the District's assessment and endorses the exclusion of the study from conducting IEPR.

4. Currently, the Project Delivery Team anticipates using up to ten planning models in the study. Additional coordination between the study team and the ECO-PCX is anticipated to determine the appropriate models to use. Six of the models are approved or certified for use. The other four models, if selected for use, will require review and certification. The team should consult with the ECO-PCX to seek model

approval or certification following the standards contained in EC 1105-2-412 (Reference 1.e.).

5. The ECO-PCX recommends approval of the Review Plan by the Major Subordinate Command. Upon approval, please provide the ECO-PCX with a copy of the Review Plan and the approval memorandum, and the link to where the plan is posted on the District website. If revisions are made to the plan due to changes in project scope or Corps policy, a revised Review Plan should be provided to the ECO-PCX for review. Non-substantive changes do not require further ECO-PCX review but should be documented in an updated Review Plan and provided to the ECO-PCX and other members of the vertical team. At a minimum the plan should be updated and presented at each SMART Planning milestone meeting.

6. Thank you for the opportunity to assist in the preparation of the Review Plan. If you have any questions about the plan or other aspects of review requirements, please contact Dr. Kat McCain, the ECO-PCX Account Manager for the Mississippi Valley Division. We look forward to continuing to work with the team as the study progresses.

Enclosure (1)

Gregory Miller
Operating Director,
Ecosystem Restoration National
Planning Center of Expertise

CF:
CEMVD-PDP (Young, Mallard, Holder, Lawton, Mickal)
CEMVM-PD-P (Ray)
CEMVN-PD-PER (Price)
CEMVN-PDC-UDC (Carpenter)
CEMVN-PDD-FRR (Davis)
CEIWR-GS (McCain)
CEMVP-RPEDN-PD-F (Richards)
CEMVP-PD-P (Runyon)

MVD PLANNING DECISION DOCUMENT REVIEW PLAN
February 2022

Project Name: Running Reelfoot Bayou, Tennessee
P2 Number: 459255

Decision Document Type: Feasibility Report with Integrated NEPA Review

Project Business Line: Ecosystem Restoration

District: Memphis District
District Contact:

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

MSC Contact:

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

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: 11/12/2021
Date of MSC Approval of Review Plan: PENDING **02/11/2022**
Date of IEPR Exclusion Approval: NA
Has the Review Plan changed since RMO Endorsement? Yes. Addendum attached.

Date of Last Review Plan Revision: 11 February 2022
Date of Review Plan Web Posting: PENDING
Date of Congressional Notifications: PENDING

Milestone Schedule

	Scheduled	Actual	Complete
FCSA Execution:	18 Jun 2021	18 Jun 2021	Yes
Alternatives Milestone:	19 Nov 2021	19 Nov 2021	Yes
Tentatively Selected Plan:	17 Jun 2022	*(enter date)*	No
Release Draft Report to Public:	19 Aug 2022	*(enter date)*	No
Agency Decision Milestone:	14 Dec 2022	*(enter date)*	No
Final Report Transmittal:	13 Dec 2023	*(enter date)*	No
S&A Briefing:	21 Feb 2024	*(enter date)*	No
Chief's Report:	31 May 2024	*(enter date)*	No

Project Fact Sheet
February 2022

Project Name: Running Reelfoot Bayou, Tennessee Feasibility Study

Location: Lake, Obion, and Dyer Counties, Tennessee (Figure 1).

Purpose of Review Plan. This Review Plan establishes policy and procedures for the comprehensive accountable review strategy for the Running Reelfoot Bayou Feasibility Study by providing a process for review of all products throughout the lifecycle of the Study. This Review Plan will ensure the quality and credibility of decisions of the Study.

Authority: Section 216 of the Flood Control Act of 1970, P.L. 91-66, December 31, 1970. "The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying structures or their operation, and for improving the quality of the environment in the overall public interest."

Section 203(e) of the Flood Control Act of 1954, P.L. 83-780, September 3, 1954. "The plan for flood control in the Reelfoot Lake Area, Tennessee and Kentucky, substantially in accordance with the recommendations of the Chief of Engineers in his report dated 17 June 1954, at an estimated cost of $748,100."

Sponsor: West Tennessee River Basin Authority

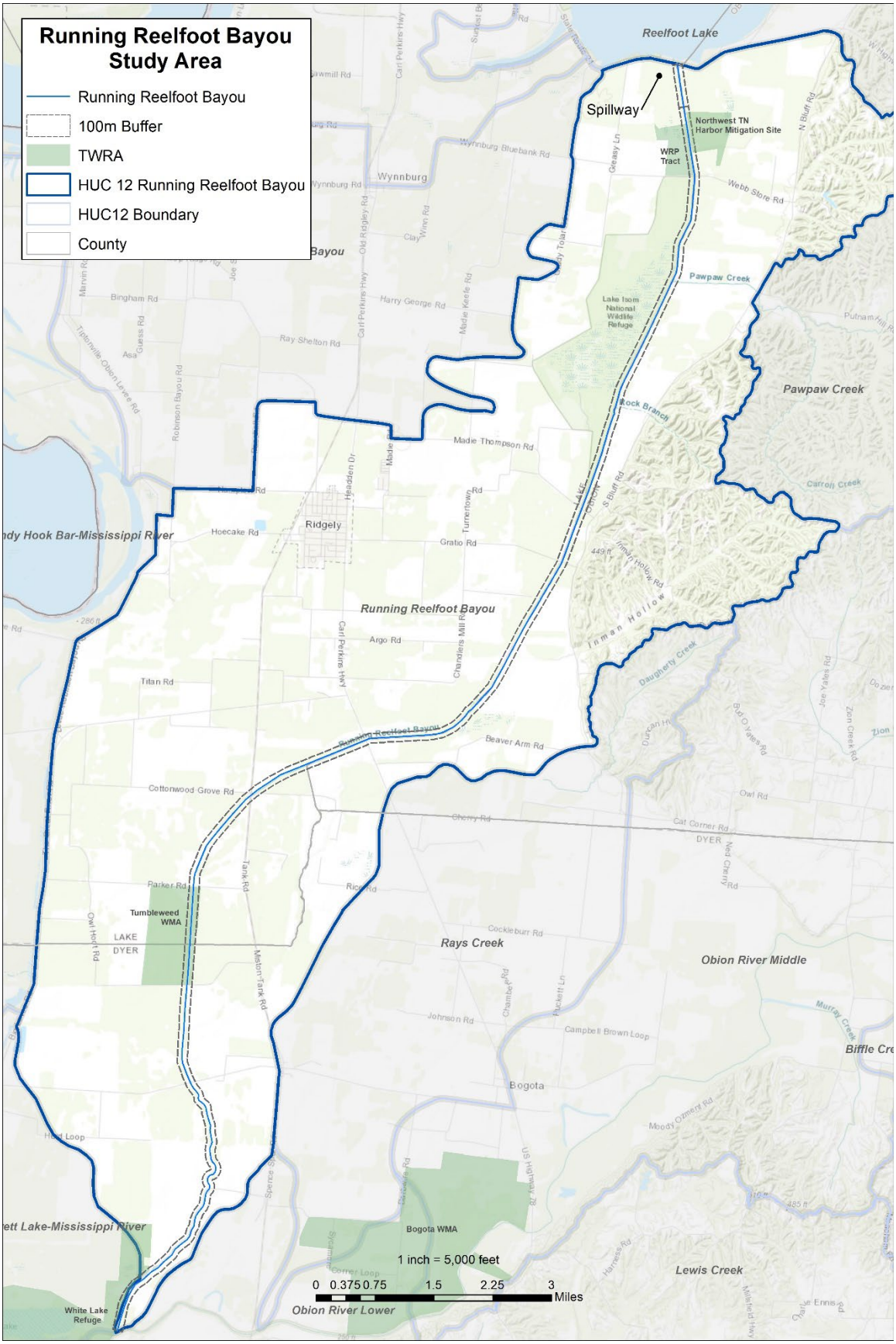
Type of Study: Feasibility Study with Integrated Environmental Compliance

SMART Planning Status: 3x3x3 Compliant

Project Area: Running Reelfoot Bayou (RRB) flows south from the main outlet of Reelfoot Lake, beginning in Lake County, Tennessee and flowing approximately 20 miles through Obion and Dyer Counties, Tennessee before terminating at the confluence of the Obion River. The RRB is the boundary between Lake and Obion Counties and crosses into Dyer County before it joins the Obion River. The study area boundary is considered to be the Running Reelfoot Bayou 12-digit Hydrologic Unit Code (080102020406), which encompasses approximately 44,562 acres. However, the focus for the study is the channel of RRB, tributaries and adjacent lands.

Running Reelfoot Bayou lies between the Mississippi River to the west and the Chickasaw Bluff formation to the east. Historically, the Mississippi River meandered across the area, but levees and channel improvements now limit channel migration and flooding. The area between the levees and the bluff is flat and row crops cover most of the land. The topography of the western side of the bluff limits its value for agriculture and it is mostly covered in upland forests.

Figure 1. Running Reelfoot Bayou Study Area Map



Problem Statement: The U.S. Army Corps of Engineers (USACE) enlarged and channelized the RRB in Tennessee in the 1950s to aid in the reduction of flood risk in the area. The channelization caused ecosystem degradation, which abandoned stream meanders and enlarged the channel, impacted adjacent wetlands, and supported an increase in agricultural development along the top bank of much of the RRB. Much of the stream is not representative of a well-functioning ecosystem with low biodiversity and highly limited aquatic and associated terrestrial habitat. Significant resources such as wetlands, bottomland hardwood (BLH) forests, and wildlife, have been impacted and are scarce in the area, contributing to larger habitat loss in the Lower Mississippi Alluvial Valley (LMAV). The riparian corridor from Reelfoot Lake to the Obion River is degraded reducing the value of the existing habitat as a wildlife corridor and the Mississippi Flyway. Habitat fragmentation, in the form of tree clearing and land leveling for agricultural production, as well as residential and commercial needs, have isolated stands of suitable habitat preventing the movement of native wildlife species within their historic range. Loss of movement can cause problems within wildlife populations such as disease, starvation, and loss of genetic variation. The Indiana and northern long-eared bats are listed by the US Fish and Wildlife Service (USFWS) as endangered and threatened, respectively, and several migratory bird species are known to occur in the area. The Mississippi Flyway is a well-known, publicly recognized corridor for waterfowl and other migratory bird species within the LMAV.

Sedimentation is a major issue that caused a loss of biological integrity, as well as flooding agricultural, as well as State and Federally owned and managed lands, adjacent to the stream during normal and high-water events. Currently, it is recognized that the loss of capacity is causing damages in the form of excessive sedimentation and tree mortality to the Lake Isom National Wildlife Refuge, Tumbleweed Wildlife Management Area, and the White Lake Refuge. Sedimentation disrupts the food chain, prevents the growth of healthy aquatic vegetation, causes a loss of flow capacity, can cause injury or mortality in aquatic species, interrupts the reproductive cycle of many fish and aquatic invertebrates, and may contribute to high nutrients and other pollution in the stream. High nutrients cause a loss in dissolved oxygen, toxic algae blooms and shifts in aquatic food resources. Aquatic and terrestrial habitat corridors are disconnected reducing habitat quality, quantity and complexity.

In addition to the problems noted above, the Running Reelfoot Bayou is included by the Tennessee Department of Environment and Conservation as a Category 5 (one or more uses impaired) 303(d) listed stream. The mileage impaired is noted as 23.8 miles, and impairments include low dissolved oxygen, loss of biological integrity due to siltation, flow alteration, nutrients, and physical substrate habitat alterations. Pollutant sources include non-irrigated crop production, channelization, upstream impoundment, and landfill.

Federal Interest: The USACE enlarged Running Reelfoot Bayou in 1959, as part of the Mississippi River and & Tributaries project for flood control. Prior to channelization, the capacity of Running Reelfoot Bayou contributed to flooding in the area. While the enlargement of Running Reelfoot Bayou enabled water level management in Reelfoot Lake and improved conditions for agricultural production, reduced flooding in the downstream areas caused long term drying in wetlands and led to BLH clearing.

The Running Reelfoot Bayou, Tennessee Study provides an opportunity to evaluate the restoration of ecosystem functions that have been lost or degraded over time between Reelfoot Lake and Lake Isom, and further to the Obion and Mississippi Rivers. Restoration of significant resources would be fostered by the reconnection of aquatic habitat, including the main channel, abandoned stream meanders or meander scars, and adjacent or isolated wetlands and floodplain habitat, and terrestrial habitat including BLH forest and riparian corridors. These reconnections would increase habitat quality, quantity and complexity; biodiversity and connectivity; and improve hydraulic/hydrologic interactions within the study area. Restoration of significant resources such as BLH forest; wetlands; wildlife, including federal and state listed threatened and endangered species and American bald eagle habitat, would contribute to an improvement in ecosystem form and function of the greater Reelfoot Lake area and the Lower Mississippi Alluvial Valley (LMAV) ecoregion. Summer roosting habitat for the Indiana and northern long-eared bat, as well as reproductive habitat for several migratory bird species would be improved through reforestation of this portion of the Mississippi Flyway, as well as the improvement of foraging opportunities along RRB aquatic corridors. Reconnection of aquatic habitat may also improve fish passage by improving structures as bridges, culverts, and other crossings that were constructed without consideration of species dispersion or distribution.

In addition to reconnecting habitat and hydrologic interactions, there are opportunities to reduce sedimentation and improve channel and bank stability in RRB. Reduction of uncontrolled sediment input into the RRB would improve water quality issues identified by the TDEC including siltation, low dissolved oxygen, and excess nutrients, and may provide ancillary benefits to adjacent lands that are currently impacted by highwater events. A reduction in sedimentation would improve food chain function, foster growth of healthy aquatic vegetation, improve flow capacity, and improve the ability of aquatic invertebrates and fish to reproduce. Improvement of stream stability and reforestation along the stream would balance nutrients increasing dissolved oxygen levels and improving water temperature.

Recommendations from this feasibility study could complement restoration efforts by other agencies, including the Tennessee Wildlife Resources Agency (TWRA) and the USFWS indicating institutional recognition of the RRB and surrounding area. Reelfoot Lake and Lake Isom National Wildlife Refuges (NWR) have preserved large, but disconnected, tracts of BLH. The USFWS manages the refuges and TWRA manages the fishery in Reelfoot Lake. Running Reelfoot Bayou is the main outlet of Reelfoot Lake, which is one of the few natural lakes in west Tennessee and was formed during the New Madrid earthquakes of 1811-12. Reelfoot Lake covers approximately 15,000 acres and is one of the largest natural, freshwater lakes in the U.S. It is nationally unique in both its formation and proximity to the Mississippi River. The National Park Service lists Reelfoot Lake as a Threatened National Natural Landmark. The USFWS describes the Reelfoot National Wildlife Refuge as an inviolate sanctuary for migratory birds and suitable for fish and wildlife-oriented recreational development, the protection of natural resources, and the conservation of endangered or threatened species (https://www.fws.gov/refuge/Reelfoot/about.html). Running Reelfoot Bayou connects Reelfoot Lake to Lake Isom NWR, and further to the Obion River System which still has a diverse fish community that includes some rare species of darters and is a tributary of the Mississippi River. The Lake Isom NWR lies adjacent to Running Reelfoot Bayou and approximately two miles south of Reelfoot Lake, though is largely disconnected from the Lake through habitat degradation

between Refuges. This NWR includes approximately 1,850 acres of differing habitat types, and is recognized as a refuge and breeding ground for migratory birds and other wildlife as an inviolate sanctuary for migratory birds (https://www.fws.gov/refuge/Lake_Isom/about/). In addition to the Reelfoot Lake fishery, the TWRA manages both the Tumbleweed Wildlife Management Area and White Lake Refuge, which occur along the RRB, and would benefit from the improvement of aquatic and terrestrial and reconnections. Restoring Running Reelfoot Bayou is a key component in improving the overall ecosystem health of this unique system and the LMAV.

The Public recognizes the importance of the area surrounding the RRB, as evidenced by high visitor ratings, waterfowl and American bald eagle tours, and events such as the Reelfoot Eagle Festival.

Goals and Objectives:

The Corps objective in any ecosystem restoration planning study is to contribute to national ecosystem restoration (NER). Contributions to national NER outputs are increases in the net quantity and/or quality of desired ecosystem resources.

The goal of the study is to restore ecosystem functions including habitat connectivity and complexity, improvement of water quality and nutrient cycling, and the improvement of flow through the area.

1. Restore habitat connections and complexity.
2. Reduce sedimentation and improve water quality.
3. Maximize habitat value through adjacent land use.
4. Improve or modify flow to restore aquatic habitat.
5. Decrease impacts of invasive species on native habitat.

Inventory and Forecast:

Inventory (Existing Conditions)
The PDT conducted the following inventory and forecast of conditions based on a review of existing information from USACE records. Additional information was provided by the sponsor and others during the charette, scoping meetings, and interagency team meetings since the execution of the FCSA in preparation for the Alternatives Milestone.

Degradation of ecosystem form and function, as discussed in the Problem Statement, has occurred due to the channelization of RRB in 1959. Dominant land-use in the area is agriculture, with approximately 76% of the acreage being identified as cultivated cropland, according to the National Landuse Classification Data. In addition to the heavy emphasis on agriculture, the area is known for recreational opportunities including hunting, fishing and birdwatching within the Reelfoot Lake National Wildlife Refuge and State Park, Lake Isom National Wildlife Refuge, Tumbleweed Wildlife Management Area, and the White Lake Refuge areas which exist adjacent to Running Reelfoot Bayou. It is estimated that approximately 240 acres of trees currently exist within the banks and immediately adjacent to the RRB channel. In addition, the RRB channel that was constructed by the USACE in the 1950's has been impacted by a loss of approximately 50-

75% of channel capacity throughout the project reach. This has caused a reduction in the flow capacity of Running Reelfoot Bayou, which appears to impact adjacent landowners as well as the Wildlife Refuges and Management areas, noted above.

Environmental resources have been impacted beginning with the channelization of the stream leading to clearing of BLH forests, draining and filling of wetlands, and an increase in agricultural land use. Approximately 17% of the land use in the study area remains forested with a small amount of other wetland types. There is a known industrial waste facility that exists within the study area, which may impact Running Reelfoot Bayou through sedimentation and possibly the release of leachates into a tributary of the stream. The USACE is in contact with the Tennessee Department of Environment and Conservation regarding this matter.

Forecast:

Future without project
It is expected that dominant land-use in the area will remain in agricultural production. An approximately 2,344-acre solar farm is expected to be constructed within the study area, but not likely to affect the project area due to the distance from Running Reelfoot Bayou to the proposed solar farm site. While some increases or decreases in habitat quantity may occur, most remaining habitat exists within Federal or State protected lands and the RRB channel. Some increases could occur with continued flooding on croplands leading to enrollment in Wetland Reserve Programs or other similar programs.

Recreational opportunities including hunting, fishing and birdwatching with the within the previously mentioned Refuge and Wildlife Management areas are expected to remain relatively stable. Sedimentation and tree growth is likely to continue to reduce the capacity of the RRB channel, as well as adjacent lands, in the absence of a USACE project.

The USACE is in contact with the Tennessee Department of Environment and Conservation regarding the industrial waste facility. In the absence of a federal project, this site is not expected to be impacted or improved.

As noted, approximately 17% of the land use in the study area remains forested with a small amount of other wetland types. The majority of forested lands within proximity to the project area are protected and under the ownership of the TWRA and/or the USFWS. It is expected that these land cover types would remain relatively stable in the absence of a federal project.

Future with project
Future with project conditions would include improved ecological conditions, including an increase in biodiversity and connectivity; improved water quality; increased habitat value; improved stream stability; and improved flow.

Measures and Alternatives:

Measures	
Reforestation of BLH along RRB channel and tributaries	Retained
Restoration of herbaceous vegetation within floodplain	Retained
Flowage easement	Retained
Modify and/or relocate existing excavated embankment material	Retained
Improve wetland functions and low-lying areas for habitat	Retained
Reconnect and/or enhance old meanders and flow paths	Retained
Sediment detention	Retained
Construct levees to contain flows within the floodplain	Retained
Floodplain bench cuts	Retained
Pool and riffle structures	Retained
Riser pipes/water management structures on adjacent lands	Retained
Strategic placement of coarse woody debris	Retained
Reconstruct slopes for stability	Screened
Strategic sediment removal	Retained
Grade control structures	Retained
Restore original channel dimensions	Screened
Longitudinal Stone Toe Protection	Retained

Alternatives
Alternative 1: No Action

Alternative 2: Restore appropriate native vegetation on lands that are currently inundated by frequent events.

Alternative 3: Restore wetlands with shallow/deeper water complex on lands that are currently inundated by frequent events.

Alternative 4: Construct floodplain (FP) bench(es) along one or both sides of channel. Modify or relocate spoil piles to restore FP habitat. Restore wetlands and appropriate native vegetation on lands between spoil piles and the RRB channel.

Alternative 5: Improve and/or reconnect abandoned meanders and flow paths. Restore wetlands and appropriate native vegetation on lands on lands that are currently inundated by frequent events.

Alternative 6: Strategically remove sediment in channel where habitat is impacted by sedimentation. Construct sediment detention in high sediment runoff areas to prevent future impacts from sedimentation. Place grade control/pool and riffle complex(es), as appropriate. Construct longitudinal stone toes for bank stability, as appropriate. Restore appropriate native vegetation on lands along riparian corridor.

Alternative 7: Restore wetlands and appropriate native vegetation on lands that are currently inundated by frequent events. Strategically remove sediment from channel where habitat is impacted. Place grade control/pool and riffle complex(es), as appropriate. Construct sediment detention in high sediment runoff areas. Construct longitudinal stone toes for bank stability, as appropriate.

Alternative 8: Construct FP bench(es) along one or both sides of channel. Modify or relocate spoil piles to restore FP habitat. Restore wetlands and appropriate native vegetation on lands between spoil piles and the RRB channel, along with lands that are currently inundated by frequent events (outside spoil piles). Improve and/or reconnect abandoned meanders and flow paths. Construct riser pipes/water management structures on adjacent lands for seasonal water management. Design for passive and direct connections to refuge/wildlife areas. Place grade control/pool and riffle complex(es), as appropriate. Construct sediment detention in high sediment runoff areas. Construct longitudinal stone toes for bank stability, as appropriate.

Risk Identification and Key Assumptions:

Key Assumptions:
The USACE assumed that 1959 Flood Control Project to be functioning, as designed, with no major maintenance required to restore the benefits provided to the Public. However, tree growth and sedimentation within the channel have negatively impacted flow capacity.

The PDT has formulated alternatives that would, at a minimum, maintain existing channel capacity, and restore ecosystem functions. ER measures that would provide flood storage and flow capacity are included in the formulation of alternatives.

Risk Identification:

The existing Federally authorized project has not been fully maintained. The Non-federal sponsor O&M obligations may impact the implementability of any identified Ecosystem Restoration modifications.

Sedimentation/lack of maintenance could potentially affect life safety if the operation of the Spillway is impacted.

Non-point or undefined sediment inflows from tributaries to the RRB channel may reduce the functionality of some ecosystem improvement measures, if not considered in project design.

Channel stability could be impacted by some ecosystem improvement measures, if not considered in project design.

There may be dam and levee safety considerations depending on any features that may be designed to hold water or sediment.

Multiple ecological models may be required to fully capture benefits associated with diverse environmental aspects of management measures.

It may be challenging to locate willing sellers for potential land acquisitions.

Removing, relocating or modifying spoil piles may reduce the area of prime farmland or induce flooding adjacent to the stream.

Existing spoil may reduce restorable area.

There is no authority to modify the existing water control plan for the Reelfoot Spillway.

Older structures that could be considered for the National Register of Historic Places, such as bridges or culverts, may be impacted by fish passage or other ecosystem improvement measures.

1. FACTORS AFFECTING THE LEVELS AND SCOPE OF REVIEWS

Mandatory Decision on Conducting IEPR (Section 6.4 of ER 1165-2-217).

- Is the estimated total project cost, including mitigation, greater than $200 million? **No.**
- Has the Governor of an affected state requested a peer review by independent experts? **No.**
- Has the Chief of Engineers determined the project study is controversial due to significant public dispute over the size, nature or effects of the project or the economic or environmental costs or benefits of the project (including but not limited to projects requiring an Environmental Impact Statement)? **No.**

Discretionary/Risk-Informed Assessment on Conducting IEPR (Section 6.5 of ER 1165-2-217). When none of the three mandatory triggers for IEPR are met, MSC Commanders have the discretion to conduct IEPR based on a risk informed assessment of the expected contribution of IEPR to the project.

Discretionary Decision (Section 6.5.1 of ER 1165-2-217). Section 2034 of the Water Resources Development Act of 2007 (hereafter referred to as Section 2034), outlines the requirements for considering whether to subject a study to peer review where IEPR is discretionary. IEPR is discretionary when the head of a federal or state agency charged with reviewing the project study determines that the project is likely to have a significant adverse impact on environmental, cultural, or other resources under the jurisdiction of the agency after implementation of proposed mitigation plans and he/she requests an IEPR.

- Has the head of a federal or state agency charged with reviewing the study determined that the project is likely to have a significant adverse impact on environmental, cultural, or other

resources under the jurisdiction of the agency after implementation of proposed mitigation plans and he/she requests an IEPR? **No.**

Risk-Informed Decision (Section 6.5.2 of ER 1165-2-217). Beyond the mandatory and discretionary requirements in Section 2034, PDTs must make a recommendation based on a risk-informed assessment of whether or not conducting IEPR would substantially benefit or add value to the project study and provide the rationale for the recommendation in the RP. This assessment and documentation in the RP will consider a variety of factors to indicate whether the covered subject matter (including data, use of models, assumptions, and other scientific and engineering information) has life safety concerns, is novel, is controversial, is precedent setting, has significant interagency interest, or has significant economic, environmental and social effects to the Nation.

- **Does the Study present significant life safety concerns?** The proposed alternatives are not expected to pose life safety concerns by means of sudden flow releases (such as a levee or dam failure may) from any measures that are implemented. If any proposed features require impounding structures, the levee and dam safety process will be followed. Any potential impacts to roads or bridges would be identified and mitigated during the study process, and prior to construction. A 2D HEC-RAS model is under development to evaluate the potential impacts of the proposed alternatives to life safety, flood durations, flow velocities, water surface elevations and extent of flooding. A rough order of magnitude sediment assessment will be conducted within the feasibility phase to inform the tentatively selected plan. In addition, a sediment balance study must be performed during PED to ensure that RRB capacity is not further reduced by the implementation of the selected plan such that spillway safety is compromised. No residential or commercial properties lie along the RRB channel. However, the significant reduction of the originally authorized channel capacity (due to lack of dredging maintenance by the sponsor on the original project) for the purpose of providing free outflow from Reelfoot Lake, may adversely affect the Reelfoot Lake Spillway operation, in turn, leading to the potential for risks to life safety. Construction of the ecosystem restoration alternatives may impede future work that would restore the originally constructed channel dimensions.

- **Is the Study expected to cover novel subject matter?** No. Channelization, loss of forested habitat, land-use alteration, and aquatic ecosystem degradation are common contibutors to overall ecosystem degradation. Previously certified/approved models will be used for H&H and environmental assumptions for existing and future with and without project conditions. Data will be collected as necessary.

- **Is the Study controversial?** The non-federal sponsor has indicated their support for the project as well as the support of surrounding land-owners, therefore, no controversy surrounds this study. However, during the first public scoping meeting, attendees noted an increase in frequency, depth, duration, and extent of flooding in the area and indicated that a loss of channel capacity was the perceived cause of the flooding. In addition, the Reelfoot Lake Spillway and West Tennessee Tributaries projects, which lie adjacent to the RRB Basin, faced public controversy in the past.

- **Is the Study precedent setting?** No, all alternatives proposed are well-known and suitable solutions for ecosystem function restoration.

- **Is the Study a matter of significant interagency interest?** The interagency team has been involved in meetings and provided input; however, the interest has not reached a threshold of 'significant'.

- **Is the Study expected to have significant economic, environmental and social effects to the Nation?** The Study is not expected to have significant economic, environmental and social effects to the Nation.

Level and Scope of Review.

- **Will the study likely be challenging?** While all studies have challenges, the Running Reelfoot Bayou Feasibility Study is not expected to be unusually technically difficult, or present challenges that cannot be overcome through thorough and transparent coordination and technical expertise. The lack of an established Reelfoot Lake Spillway Water Control and Operation Manual adds complexity and uncertainty to the study, as spillway releases may affect proposed project features. However, a USGS discharge and stage gage exists just below the spillway and a HEC-RAS model is being developed to evaluate the effects of potential spillway operation scenarios on the proposed features, as well as flood durations, flow velocities, water surface elevations and extent of flooding. This data and modeling will help to mitigate the risk and uncertainty identified. A technically challenging feature for this study is the lack of data on the movement of sediment in the channel and overall basin. Sediment supply from Reelfoot Lake, the adjacent bluff hills and adjacent agricultural lands, as well as sediment transport capacity in and along RRB is unknown. Potential technical challenges include acquiring land for ecosystem restoration purposes, as well as meeting stakeholder and non-federal sponsor expectations for flow capacity restoration. A policy challenge that is currently being addressed includes a determination on whether the lack of dredging maintenance along the RRB channel over the last several decades will impact the study execution, alternatives, existing conditions, or future without project conditions.

- **Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.**
  The existing Federally authorized project has not been fully maintained. The Non-federal sponsor O&M obligations may impact the implementability of any identified Ecosystem Restoration modifications. This is currently a high risk, considering the unknowns involved with the sponsor maintenance obligations. Projects risks to agricultural lands and excavated embankment materials adjacent to RRB are low magnitude. Exact locations have not been determined. Locating willing sellers for potential land acquisitions along the RRB is a medium magnitude risk. No authority to modify the existing water control plan for the Reelfoot Spillway is a medium magnitude risk, as there are no plans to modify the operation of the spillway. Impacts to structures that could be considered for the National Register of Historic Places, such as bridges or culverts, is a low magnitude risk, and no locations have been identified at present. Non-point or undefined sediment inflows from tributaries to the RRB channel may reduce the functionality of some ecosystem improvement measures, if

not considered in project design. This is a low magnitude risk, and no locations have been identified. Channel stability along the study area could be impacted by some ecosystem improvement measures, if not considered in project design. This is a low risk as measures will be evaluated throughout the planning process.

- **Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues?** The project is not expected to be justified by life safety. Depending on the alternative selected, and the proximity of features to the RRB channel, there is a potential for life safety risk if appropriate consideration is not given to the functioning of the Reelfoot Lake Spillway and the capacity of the RRB channel.The potential of selecting an alternative with life safety risk is low.

- **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 project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?** Not expected.

- **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, as an ecosystem restoration study, the purpose of the study is to select a plan that reasonably maximizes fish and wildlife resources.

- **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, as an ecosystem restoration study, the purpose of the study is to select a plan that reasonably maximizes fish and wildlife resources.

Assessment of the District Chief of Engineering. The District Chief of Engineering has evaluated risks and determined **there is not** a significant threat to human life associated with the proposed alternatives. However, the significant reduction of the originally authorized channel may adversely affect the Reelfoot Lake Spillway operation, in turn, leading to the potential for risks to life safety. Construction of the ecosystem restoration alternatives may impede future efforts to restore the originally constructed channel dimensions. As noted in 2.d. below, if the characteristics of the recommended plan warrant a Safety Assurance Review, a panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, on a regular schedule.

2. REVIEW EXECUTION PLAN

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

District Quality Control. All decision documents will 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 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.

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. 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, and Director's Policy Memorandum 2019-01, both provide 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.

Public Review. The district will post the Review Plan and approval memo on the district internet site once approved by the MSC. Public comment on the adequacy of the Review Plans will be accepted and considered. Public review opportunities will occur prior to the tentatively selected plan milestone which is scheduled for 17 June 2022, and again once the draft Feasibility Report with Integrated NEPA Review is released, scheduled for 19 August 2022.

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

Table 1: Schedule and Costs of Review

Product(s) to undergo Review	Review Level	Start Date	End Date	Cost	Complete

Planning Model Review	Model Review (see EC 1105-2-412)	10/25/2021	05/31/2022	$35,000	No
Draft Feasibility Report / EA or EIS	District Quality Control	07/21/2022	08/11/2022	$60,000	No
Draft Feasibility Report / EA or EIS	Agency Technical Review	08/19/2022	09/30/2022	$85,000	No
Draft Feasibility Report / EA or EIS	Public Review	08/19/2022	09/30/2022	n/a	No
Draft Feasibility Report / EA or EIS	Policy and Legal Review	08/19/2022	09/30/2022	n/a	No
Final Feasibility Report / EA or EIS	District Quality Control	09/18/2023	10/09/2023	$50,000	No
Final Feasibility Report / EA or EIS	Agency Technical Review	10/16/2023	11/27/2023	$50,000	No
Final Feasibility Report / EA or EIS	Policy and Legal Review	12/13/2023	01/24/2024	$N/A	No

a. DISTRICT QUALITY CONTROL

The home district will manage DQC and will appoint a DQC Lead to manage the local review (see ER 1165-2-217, section 4.4.2.1). Table 2 identifies the required expertise for the DQC team. The DQC Team members should not be involved in the production of any of the products reviewed.

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 engineering, planning, economics, environmental resources, etc.).
Planning	A Water Resources Planner with at least 5 years of experience in Ecosystem Restoration Projects.

Economics	Experience in Ecosystem Restoration Projects as well as the IWR Planning Suite (CEICA) and HEC-FDA models used in the study.
Environmental Resources	A biologist/ecologist/environmental engineer with experience in the restoration of riparian freshwater and bottomland hardwood ecosystems; NEPA documentation review for compliance with current policy; review of quality and applicability of ecosystem benefits evaluations using ecological/habitat models; and experience with estimating duck use days
Cultural Resources	Specialist with experience in historic properties, Native American sites, and programmatic agreements; USACE Civil Works projects; and compliance with cultural resource laws and USACE policies.
Hydrology/Hydraulic Engineering	Senior Engineer with experience in geomorphology and Ecosystem Restoration Projects including structural and non-structural alternatives and the HEC-HMS and HEC-RAS models. Reviewer should also have experience with water managenment functions, specifically spillway operations.
Civil Design	Senior Engineer with experience in ecosystem restoration projects.
Geotechnical	Senior Engineer with experience in ecosystem restoration features to include detention, channel modification, grade control and stream bank stabilization.
Cost Engineering	The Cost Engineering panel member should have 15 years demonstrated experience or combined equivalent of education and experience in assessing ecosystem restoration features.
Real Estate	Senior Specialist with experience in Ecosystem Restoration policy, urban land acquisition and appraisal, and LERRDS.

Documentation of DQC. Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the 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, in Appendix D on page 81. Documentation of completed DQC will 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.

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. The RMO will manage the ATR, and no site visit for the ATR is expected to be required. The review will be 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 ER 1165-2-217, section 5.5.3.1). Table 3

identifies the disciplines and required expertise for this ATR Team (also see Attachment 1 - the ATR Team roster (*Not yet identified*)).

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).
[1]Planning	An ATR-approved Senior or Certified Planner with experience in ER projects.
Economics	A senior economist with experience in ecosystem restoration projects, IWR-Planning suite.
[1]Environmental Compliance	Senior Specialist with experience in ER projects to include the restoration of riparian freshwater and bottomland hardwood ecosystems; NEPA documentation review for compliance with current policy; review of quality and applicability of ecosystem benefits evaluations using ecological/habitat models; and experience with estimating duck use days
Cultural Resources	Senior Specialist with experience in historic properties, Native American sites, and programmatic agreements; USACE Civil Works projects; and compliance with cultural resource laws and USACE policies.
Hydrology and Hydraulic Engineering	Senior Engineer with experience in geomorphology and Ecosystem Restoration Projects including structural and non-structural alternatives and the HEC-HMS and HEC-RAS models.
Civil Design	Senior Engineer with experience in Ecosystem Restoration Projects.
Geotechnical	Senior Engineer with experience in Ecosystem Restoration Projects.
Cost Engineering	Reviewer should have experience in ecosystem restoration features, 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.
Real Estate	Senior Specialist with experience in Ecosystem Restoration to include policy considerations, land acquisition and appraisal, and LERRDS.
Climate Preparedness and Resilience CoP Reviewer	A member of the Climate Preparedness and Resiliency Community of Practice certified to perform ATR for Inland Flood RiskManagement.
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.

1 This study requires reviewers who are certified in Environmental Compliance as well as Ecosystem Restoration, these can be filled either by Planning or Environmental or some combination of both.

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 5.8.3.1-5.8.3.4). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the ER 1165-2-217 issue resolution process. Concerns will be closed in DrChecks by noting the concern has been elevated. The ATR Lead will prepare a Statement of Technical Review (see ER 1165-2-217, Section 5.11), 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.

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Assessment of IEPR Conditions and Factors

Section 1 of this Review Plan assesses the factors affecting the levels and scopes of reviews including IEPR. These factors include three mandatory conditions (cost of a project, request by the Governor of an affected state, or a determination by the Chief of Engineers) that independently require performance of IEPR. Additional discretionary factors or scenarios may also lead to the performance of IEPR. A risk-informed decision regarding the performance of IEPR is made through assessment of both the mandatory conditions and discretionary factors.

Decision on IEPR.

Recommendation on IEPR. IEPR is not recommended for this study. The project does not meet the three mandatory conditions in WRDA 2007, Section 2034 and ER 1165-2-217 requiring IEPR including: determination by the Chief as controversial; requested IEPR by the Governor; or project cost of $200 million or more. As documented in Section 1, additional discretionary questions have also been addressed as negative. There are no significant adverse environmental impacts driving another Agency to request IEPR, conversely, the project would be expected to significantly improve the environment. Also, interagency coordination is on-going and will be throughout the study. The project is expected to have no more than negligible adverse impacts on scarce or unique tribal, cultural resources. As an ecosystem restoration project, no substantial adverse impacts on fish and wildlife species, species listed as endangered or threatened species under the Endangered Species Act of 1973 or the critical habitat of such species designated under such Act is expected. The proposed alternatives do not directly pose risks to life safety, and there areno novel methods used for this study. There are no complex challenges or precedent setting methods/model and the study is not likely to change prevailing practices. This project does not include rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates within the same footprint or for the same purpose as an existing water resource project. Construction methods will remain within industry standards.

d. SAFETY ASSURANCE REVIEW

Safety Assurance Reviews (SAR) 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. If the characteristics of the recommended plan warrant a Safety Assurance Review, a panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, on a regular schedule.

Decision on Safety Assurance Review. A final decision on performing a SAR will be made once the Recommended Plan is finalized. This decision will be documented in a separate review plan that covers the implementation phase.

e. 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
Stream Condition Index Model	The Stream Condition Index (SCI) is a multi-scale watershed assessment that incorporates the complete condition of the stream including hydrology/hydraulics, geomorphology, water quality, and plant and animal habitat.	Regionally certified for use in DeSoto County, MS. Requires certification for use in West Tennessee.
Mississippi Alluvial Valley (MAV) - ydrogeomorphic Model (HGM)	This model provides an approach for assessing the function of the forested wetlands that occur in the MAV.	Regionally Certified - 2019

Habitat Evaulation Procedures	HEP is a species-habitat approach to impact assessment and habitat quality for selected evaluation species. (Species have not yet been identified).	Approved for Regional use. Some HEP Species may require spreadsheet certification.
Envirofish 1.0	Provides habitat assessment up the 5-year floodplain for optimal habitat, and the 2-year floodplain for sub-optimum habitat. Assessment of spawning and rearing habitat. HSI values based on expert opinion and inter-agency team concurrence. Fish access assessed based on fish accesss study.	Approved for single-uses previously. Would require certification.
Envirofish 2.0	Provides habitat assessment up the 5-year floodplain for optimal habitat, and the 2-year floodplain for sub-optimum habitat. Assessment of spawning and rearing habitat. HSI values based on expert opinion and inter-agency team concurrence. Fish access assessed based on fish accesss study.	Pending regional certification.
Duck Use Days	The Duck Use Days model provides quantitative methods to estimate duck-use days based on daily energetic requirements of waterfowl species to determine incremental benefits and impacts of land and water resource development projects on waterfowl habitats and populations in the Mississippi Alluvial Valley during the nonbreeding season.	Certified for Regional Use
IWR-Planning Suite II	The IWR-Plan was developed by the Institute of Water Resources as accounting software to compare habitat benefits among alternatives. This model will be used to determine best buy alternatives and incremental cost analysis of alternatives.	Certified
HEC-FDA 1.4.2	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.	Certified
ECAM	The Economic Consequences Model (ECAM) is a regional economic development model that is utilized to measure the effects of unmitigated floodwaters on regional production and employment. Thus, this model assesses negative impacts to regional economies	Pending approval for single use.
RECONS	This program provides estimates of regional economic impacts and contributions associated	Certified

	with USACE projects. Contributions are measured as economic output, jobs, income, and value added at a local, state and national level	

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 6.0 (River Analysis System) 1D or 2D may be used (or latest, as determined appropriate by tech lead)	Developed and maintained by the Hydrologic Engineering Center (HEC). The software performs 1-D steady and unsteady flow river hydraulics calculations and has capability for 2-D (and combined 1-D/2-D) unsteady flow calculations. It will be used for steady flow analysis to evaluate the future without-project and future with-project conditions. 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 the project area. Most recent certified version will be used at the appropriate time.	HH&C CoP Preferred Model
HEC-HMS	Developed and maintained by the Hydrologic Engineering Center (HEC). Project may use HEC-HMS features to estimate volume and timing of run-off; effects of dams in watershed; channel routing effects. HEC-HMS may be used to model frequency events and specific alternatives or measures.	Certified
Micro-Computer Aided Cost Engineering System (MCACES) MII Version 3.0	MCACES is a cost estimation model. This model will be used to estimate costs for the feasibility study.	Certified

f. POLICY AND LEGAL REVIEW

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

(i) Policy Review.

The policy review team will be selected 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 may 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 will be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR will 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 will 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

(Delete this attachment before posting the Review Plan on the District web page.)

PROJECT DELIVERY TEAM		
Name	Office	Position
	West Tennessee River Basin Authority (NFS)	Executive Director
	Project Management	Project Manager
	Plan Formulation	Plan Formulator
	Engineering Division	H&H – Technical Lead
	Environmental Compliance	Environmental Manager
	Engineering Division	Civil Engineer
	Engineering Division	Civil Engineer
	Engineering Division	H&H
	Economics	Economist
	Environmental Compliance	Archaeologist
	Environmental Compliance	Tribal Liasion
	Real Estate	Real Estate Specialist
	Engineering Division	Cost Engineer
	Technical Services	Geographer
	Environmental Compliance	Aesthetics, Recreation, EWN Expert
	Environmental Compliance	HTRW Expert
	Environmental Compliance	Social Justice
	Office of Counsel	Attorney
	Office of Counsel	Attorney
	DQC Lead	Economics/RPEDS Liaison
	ATR Lead	LRD RTS Environmental

DISTRICT QUALITY CONTROL		
Name	Position	Experience
	DQC Lead	13 years of Planning experience having worked as Plan Formulator, Economist, and Environmental Compliance Section Chief. Subject matter expert in Agriculture flood risk management. 11 years of preparing feasibility and technical documents. 8 plus years conducing DQC on feasibility, CAP documents, and economic analysis. Currently building DQC section for RPEDS. B.S. and M.S. degrees in Agriculture Economics.
TBD	Planning	

TBD	Economics	
TBD	Environmental Resources	
TBD	Cultural Resources	
TBD	H&H Engineer	
TBD	Civil Design	
TBD	Geotechincal Engineering	
TBD	Cost Engineering	
TBD	Real Estate	

AGENCY TECHNICAL REVIEW		
Name	Position	Experience
	ATR Team Lead	Regional Technical Specialist for Environmental Analysis and Compliance for the Great Lakes and Ohio River Division (LRD). Account Manager to the North Atlantic Division for the Ecosystem Planning Center of Expertise. Mr. Hall has worked for the Corps for 20 years. He has a Bachelor of Science degree from the University of Tennessee, Knoxville in Wildlife and Fisheries Science. He has performed ATR spanning all Division regions, serving as ATR Team Lead for numerous projects including section 14, 1135, 729, and 531 authorities, as well as, General Investigations, Dam Safety and Hydropower Rehabilitations, and many other unique authorities. He currently serves as a board representative for ERDCs Environmental Restoration Research Area Review Group. Mr. Hall is certified for ATR in Environmental Compliance and Ecosystem Restoration.
	Planning	
	Economics	
	Environmental Compliance	
	Cultural Resources	
	H&H Engineer	
	Civil Design	

	Geotechnical Engineering	
	Real Estate	
	Climate Preparedness and Resilience CoP Reviewer	
	Risk and Uncertainty	

POLICY AND LEGAL COMPLIANCE REVIEW TEAM		
Name	Office	Position
	CECW-PC	Economist
	CEMVD-PDP	MR&T Env Program Manager
	CEMVD-PDP	Senior Env Planner
	CECW-PC	Economist
	CEMVD-PDP	Senior Env Planner
	CEMVD-PDP	Archeologist
	CEMVD-RBW	Civil Engineer (Hydraulic)
	CEMVD-RB	Levee Safety Program Manager
	CEMVD-RBT	Structural Engineer
	CEMVD-RB	Levee Safety Program Manager
	CENWS-ENH-W	Civil Engineer
	CEMVD-PDR	Realty Specialist
	CECC-MVD	Attorney
	CEMVD-PDP	Operating Director – National Ecosystem Restoration Planning Center of Expertise
	CEMVD-RBT	Cost Engineer

ER 1165-2-217 Civil Works Review Policy
Review Plan Checklist
Running Reelfoot Bayou, TN Feasibility Study

Section Number (ER 1165-2-217)	Topic	Is the Information Provided in the Review Plan?	Location in the Review Plan
Overview			
3.6.2.1.1.	Project Title (Name)	Yes	p1 – cover sheet
3.6.2.1.1.	Purpose of the Work Product	Yes	P2 – Project Fact Sheet (added)
3.6.2.1.1.	Goals and Objectives	Yes	p5
3.6.2.1.2.	POC - District	Yes	p1 – cover sheet
3.6.2.1.2.	POC - MSC	Yes	p1 – cover sheet
3.6.2.1.2.	POC - RMO	Yes	p1 – cover sheet
3.6.2.1.3.	Basic background information - Description	Yes	p2 – fact sheet
3.6.2.1.3.	Map	Yes	P3
3.6.2.1.4.	Actions	Yes	P 11 –Review Execution Plan
3.6.2.1.4.	Timing of construction	n/a	n/a
3.6.2.1.4.	Estimated cost (or range of costs)	n/a	n/a
3.6.2.1.5.	Description of the future with and without project conditions. Special emphasis should be given to measures and alternatives to be considered to address the inherent risks involved	Yes	p6
3.6.2.1.6.	Indicate whether existing conditions, failure of the project, or future conditions would pose a significant threat to human life or the environment.	Yes	p6
3.6.2.1.6.	If a significant risk is posed, identify the population at risk and the problems the study/project is addressing, including information uncertainty	Yes	P7
Documentation of Risks and Issues			
3.6.2.2.	Document Risks and Issues – key assumptions	Yes	P8

3.6.2.2.	Document Risks and Issues	Yes	P 9
3.6.2.2.	Is sensitive information protected by placing it in appendices? These must be deleted if the plan is to be posted on the internet.	No	
3.6.2.2.1.	Documentation of Risk-Informed Decisions	Yes	P9
3.6.2.2.2.	District Chief of Engineering Assessment of Threat to Human Life	Yes.	P 11
3.6.2.2.3.	Risks during construction (may not apply to planning unless modifying a structure)	n/a	n/a
3.6.2.3	A list of the anticipated deliverables/work products that are expected to be technically evaluated during study/project development and the schedule for their delivery. The timing and sequence of the reviews (including deferrals) and anticipated costs.	Yes	P12 – Table 1
3.6.2.4	The objective of the reviews.	Yes	P12
Public Review Opportunities			
3.6.2.5.	Public review opportunities – how and when will reviews occur	Yes	P11
3.6.2.5.	Public review opportunities – when will significant public comments be provided to reviewers	Yes	P11
Reviewer Disciplines			
3.6.2.6.	Reviewer discipline and expertise - DQC	Yes	P13 – Table 2
3.6.2.6.	Reviewer discipline and expertise - ATR	Yes	P14 – Table 3
3.6.2.6.	Reviewer discipline and expertise - IEPR	n/a	n/a
Team Rosters			
3.6.2.6.	Roster - PDT	Yes	p19
3.6.2.6.	Roster - DQC	Yes	P19
3.6.2.6.	Roster - ATR	Yes	P20
5.5.1.	ATR Lead - an ATR Team Lead will be established before the Alternatives Milestone.	Yes	P20
3.6.2.6.	Roster - IEPR	n/a	n/a
3.6.2.6. 3.5.2.3.3	Roster – P&LCR	Yes	P20
Reviews and Schedules			

3.6.2.7.	Number of reviews and schedule	Yes	P12 – Table 1
5.6.4.	ATR Schedule – the ATR schedule must be presented as part of the Review Plan.	Yes	P12 – Table 1
Planning and Engineering Models			
3.6.2.8.	List of models	Yes	P15 – Table 5&6
3.6.2.8.	Version of each model	Yes	P15 – Table 5&6
3.6.2.8.	Status of each model	yes	P15 – Table 5&6
In-Kind Contributions			
3.6.2.9.	List of In-Kind Contributions	pending	
Site Visits			
3.6.2.10. 5.6.4.3.	Will a site visit be required - ATR	no	P13
3.6.2.10.	Will a site visit be required - IEPR	n/a	n/a
3.6.2.10.	Will a site visit be required – SAR (if applicable)	n/a	n/a
Disclaimer Statement			
3.6.2.11.	Disclaimer statement		p10
Mandatory IEPR			
6.4.1	Mandatory IEPR – is the total project cost greater than $200 million?	No	P9
6.4.2.	Mandatory IEPR – has the Governor of an affected state requested IEPR?	No	P9
6.4.3.	Mandatory IEPR – has the Chief of Engineers determined the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project?	No	P9
Discretionary IEPR			
6.5.1.1.	Discretionary IEPR – has the head of a Federal or state agency determined the project is likely to have a significant adverse impact on environmental resources?	No.	n/a
6.5.1.1.	Discretionary IEPR – has the head of a Federal or state agency determined the project is likely to	No.	n/a

	have a significant adverse impact on cultural resources?		
6.5.1.1.	Discretionary IEPR – has the head of a Federal or state agency determined the project is likely to have a significant adverse impact on other resources?	No.	n/a
6.5.1.1.	Discretionary IEPR – has the head of a Federal or state agency requested an IEPR?	No.	n/a
6.5.1.2. 6.5.1.2.1. 6.5.1.2.2. 6.5.1.2.3.	These sections in ER 1165-2-217 relate to agency requests for IEPR. The provisions include MSC Commander collaboration with agency heads, decisions regarding conduct of IEPR, and an appeals process. While the sections relate to IEPR, there are no specific requirements in the sections involving Review Plan content.	n/a	n/a
6.5.2.	Risk-Informed Decision. Has the PDT made a recommendation based on a risk-informed assessment of whether or not conducting IEPR would substantially benefit or add value to the project study? Is a rationale provided for the recommendation?	Yes	P14
IEPR Exclusion Considerations			
6.6.	IEPR Exclusion - A project study subject to peer review because total costs are greater than $200M may be excluded from IEPR if any of the following three sets of conditions apply	n/a	n/a
IEPR Exclusion - Condition 1 – No EIS and Chief of Engineers' Determinations			
6.6.1.	Condition 1 - Does the study include an EIS?	n/a	
6.6.1.1	Condition 1 - Has the Chief of Engineers determined the project is not controversial?	n/a	
6.6.1.2.	Condition 1 - Has the Chief of Engineers determined the project has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?	n/a	
6.6.1.3.	Condition 1 - Has the Chief of Engineers determined the project has no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures?	n/a	

6.6.1.4.	Condition 1 - Has the Chief of Engineers determined the project 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 or the critical habitat of such species?	n/a	
IEPR Exclusion – Condition 2 – Routine, Rehabilitation with Minimal Life Safety Risk			
6.6.2.1.	Condition 2 - Involves 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	n/a	
6.6.2.2.	Condition 2 - Is for an activity for which there is ample experience within USACE and the industry to treat the activity as being routine	n/a	
6.6.2.3.	Condition 2 - Has minimal life safety risk	n/a	
IEPR Exclusion – Condition 3 – No EIS and CAP			
6.6.3.	Condition 3 - If the project study does not include an EIS and is being conducted under the general continuing authorities of the CAP.	n/a	