

**Elijah Root Dam Removal Great Lakes Fishery and Ecosystem Restoration Project,
Portage, Kalamazoo County, MI**

REVIEW PLAN
Last Updated: October 23, 2023

1. OVERVIEW

- **Project Name:** Elijah Root Dam Removal Section 506 Great Lakes Fishery Restoration Project
- **Location:** Portage, Kalamazoo County, Michigan
- **P2 Number:** 509250
- **Decision and Environmental Compliance Document Type:** Detailed Project Report (DPR) and Environmental Assessment (EA)
- **Congressional Authorization Required:** No
- **Project Purpose(s):** Ecosystem restoration and recreational improvements
- **Non-Federal Sponsor:** City of Portage

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

- **District:** Detroit District (LRE)
 - Project Manager or Project Planner
- **Major Subordinate Command (MSC):** Great Lakes and Ohio River Division (LRD)
- **Review Management Organization (RMO):** Great Lakes and Ohio River Division (LRD) Planning and Policy Office

2. KEY REVIEW PLAN DATES

Date of RMO Endorsement of Review Plan	Pending
Date of MSC Approval of Review Plan	Pending
Date of IEPR Exclusion Approval	N/A
Has the Review Plan changed since RMO Endorsement?	N/A
Date of Last Review Plan Revision	23 October 2023
Date of Review Plan Web Posting	Pending

3. MILESTONE SCHEDULE AND OTHER DATES

	Scheduled Start	Scheduled End	Actual	Status – Complete?
Federal Interest Determination and Feasibility Scoping Meeting	17 Jul 2023	17 Jul 2023	3 Aug 2023	Yes
FCSA Execution	01 September 2023	15 December 2023		
Tentatively Selected Plan		25 January 2025		
District Quality Control	02 March 2025	29 March 2025		
Release Draft Report to Public/ATR	01 April 2025	01 May 2025		
Final Report Transmittal		28 July 2025		

4. PURPOSE, AUTHORITY, STUDY DESCRIPTION, AND PRODUCTS

- a. Purpose. This review plan defines levels and scopes of review required for the feasibility phase products including Scope, Schedule, and Budget.
- b. Authority. Great Lakes Fishery and Ecosystem Restoration Program (GLFER), Section 506 of the Water Resources Development Act (WRDA) of 2000.
- c. Study Description. This study was initiated to investigate ecosystem restoration of Portage Creek in Portage, Michigan. The study focuses on the Elijah Root dam which has two spillways and remnant structures associated with the historic mill. Significant deterioration of the dam and mill have made the structure a safety hazard in the Bicentennial Park.

The 6ft head dam and spillway structures are owned by the City of Portage. The project area is contained within the park but would have impacts on several properties with riparian rights along the creek. Within the project stream several other projects have been accomplished including removal of the Alcott dam in 2018, the Milham Park dam in 2021, and sediment removal to clean up a lower section of the creek in 2014. The Elijah Root dam removal project would continue a trend of restoration within Portage Creek and the larger Kalamazoo River Watershed, which is an Area of Concern (AOC) under EPA regulation.

5. REFERENCES

- Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 1 May 2021.
- Engineer Circular 1105-2-412 – Planning – Assuring Quality of Planning Models, 31 March 2011.
- EC 1105-2-407: Planning Models Improvement Program: Model Certification (CECW-CP, 31 May 2005)
- ECO-PCX White Paper: Recommendations to Headquarters, U.S. Army Corps of Engineers on Certification of Ecosystem Output Models (May 2008)
- LRD Qualtrax Procedure 14323
- LRE Quality Management Plan, 14 December 2018
- Office of Management and Budget, Final Information Quality Bulletin for Peer Review, Federal Register Vol. 70, No. 10, January 14, 2005, pp 2664-267
- Planning Bulletin 2013-02, Subject: Assuring Quality of Planning Models (EC 1105-2-412), 31 March 2013.
- The online USACE Planning Community Toolbox provides more review reference information at:
<https://planning.erdc.dren.mil/toolbox/current.cfm?Title=Peer%20Review&ThisPage=Peer&Side=No>.

6. RISK IDENTIFICATION

Table 1. Risk Matrix

Functional Group	Risk/Concern	Mitigation/Contingency	Risk Level (H, M, L) ¹
Project Management/ Planning	<ul style="list-style-type: none"> Federal Sponsor viability Funding Allocations/Schedule delays 	<ul style="list-style-type: none"> Coordinate early and frequently with NFS Include NFS in scheduling meetings to avoid slips or incorporate delays into schedule early 	L M
Economics/Planning	<ul style="list-style-type: none"> Changing guidance especially in terms of project benefits calculations 	<ul style="list-style-type: none"> Follow current guidance and remain up to date on changing guidance. Frequent communication with the Vertical Team 	L
Engineering	<ul style="list-style-type: none"> Bridge replacements at Milham Road and Lover's Lane – schedule slip and cost to complete Existing structure is damaged and deteriorated and could further damage during work 	<ul style="list-style-type: none"> City will coordinate and fund replacement if these tasks are part of the project Conduct assessment of dam safety during feasibility 	M M
Hydraulics and Hydrology	<ul style="list-style-type: none"> CLOMR needed 	<ul style="list-style-type: none"> Coordinate with FEMA early in the feasibility phase 	M
Environmental/ Cultural	<ul style="list-style-type: none"> Cultural resources in the area. Sediment characterization. Compliance with environmental regulations Public opposition to the project 	<ul style="list-style-type: none"> Archeological surveys completed early in the feasibility process Sediment sampling conducted early in feasibility Early and frequent communication with regulatory agencies Create a communication plan early and provide public several opportunities to review and provide input on the project 	M M L L
Real Estate	<ul style="list-style-type: none"> Utility located within the project area Dredge material placement Riparian ownership along the channel 	<ul style="list-style-type: none"> Identify all utility and coordinate with NFS Characterize sediment and identify placement site early on in feasibility Coordinate with city and landowners 	M M M
¹ risk level is H: High for risks with large negative consequences, M: medium for lesser consequences or unlikely to occur high risks, L: for risks that are very minor in consequences and/or very unlikely to occur.			

7. REVIEW EXECUTION PLAN

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

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

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

Table 2: Schedule and Costs of Reviews

Product to undergo Review	Review Level	Site Visit	Start Date	End Date	Cost	Complete
Draft Feasibility Report / EA or EIS	District Quality Control (DQC)	Yes/No	M/D/Y	M/D/Y	\$35,000	Yes/No
Draft Feasibility Report / EA or EIS	Agency Technical Review (ATR)	Yes/No	M/D/Y	M/D/Y	\$25,000	Yes/No
Draft Feasibility Report / EA or EIS	Policy and Legal Compliance Review	Yes/No	M/D/Y	M/D/Y	N/A	Yes/No
Final Feasibility Report / EA or EIS	DQC	N/A	M/D/Y	M/D/Y	\$35,000	Yes/No
Final Feasibility Report / EA or EIS	ATR	N/A	M/D/Y	M/D/Y	\$25,000	Yes/No
Final Feasibility Report / EA or EIS	Policy and Legal Compliance Review	N/A	M/D/Y	M/D/Y	N/A	Yes/No

Table 3: Review Teams - Disciplines and Expertise

Discipline / Role	Expertise	DQC	ATR
DQC Team Lead	Extensive experience preparing Civil Works decision documents and leading DQC. The lead may serve as a DQC reviewer for a specific discipline (planning, economics, environmental, etc.).	Yes	No
ATR Team Lead	Professional with extensive experience preparing Civil Works decision documents and conducting ATR. Skills to manage a virtual team through an ATR. The lead may serve on the ATR team for a specific discipline (such as planning, economics, or environmental work).	No	Yes
Planning	Skilled water resources planner knowledgeable in complex planning investigations and the application of SMART principle to problem solving.	Yes	Yes
Economics	Experience with applying theory, methods and tools used in the economic evaluation of water resources projects.	Yes	Yes
Environmental Resources	Experience with environmental evaluation and compliance requirements, national environmental laws and statutes, applicable Executive Orders, and other planning requirements.	Yes	Yes
Cultural Resources	Experience with cultural resource survey methods, area of potential effects, National Historic Preservation Act Section 106, and state and federal laws pertaining to American Indian Tribes.	Yes	Yes
HTRW	Experienced with HTRW lead will have extensive experience reviewing contamination associated with projects involving impoundments and dam removal.	Yes	Yes
Hydrologic and Hydraulic Engineering	Engineer with experience applying hydrologic and hydraulic engineering principles and analytic tools to project planning, design, construction, and operation.	Yes	Yes
Geotechnical and Structural Engineer	Engineer(s) with experience in geotechnical and structural review and design of dam removal projects.	Yes	Yes
Cost Engineering	Experience using cost estimation software; working knowledge of water resource project construction; capable of making professional determinations using experience.	Yes	Yes
Construction/Operations	Extensive construction management experience and operations work.	Yes	Yes
Real Estate	Experience developing Real Estate Plans and experience in real estate fee/easement acquisition and residential/business relocations for Federal and/or Federally Assisted Programs for implementation of Civil Works projects.	Yes	Yes
Climate Preparedness and Resilience	A member of the Climate Preparedness and Resiliency Community of Practice knowledgeable of inland hydrology climate change assessment policy and practice.	Yes	Yes
Dam Safety Construction Liaison	Experience with understanding dam safety concerns and providing support to teams during planning, design and implementation of dam removal projects.	Yes	Yes

8. DOCUMENTATION OF REVIEWS

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

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

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

9. SUPPORTING INFORMATION

Study or Project Background

Study Authority

The Elijah Root Dam Removal is authorized under Section 506 of the Water Resources Development Act (WRDA) of 2000, as amended (Great Lakes Fishery and Ecosystem Restoration Program) (Public Law 106-541). The Great Lakes Fishery and Ecosystem Restoration Program directs the Secretary of the Army to “plan, design, and construct projects to support the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes.”

Study or Project Area

The study location is in the City of Portage, Michigan along a section of Portage Creek, a tributary of the Kalamazoo River. The southern extent of the project begins at Interstate Highway 94 and extends to the north approximately 2.3 miles upstream to the Garden Lane crossing. The east and west boundaries of the project area are located within the Bicentennial Park.

Study or Project Area Map

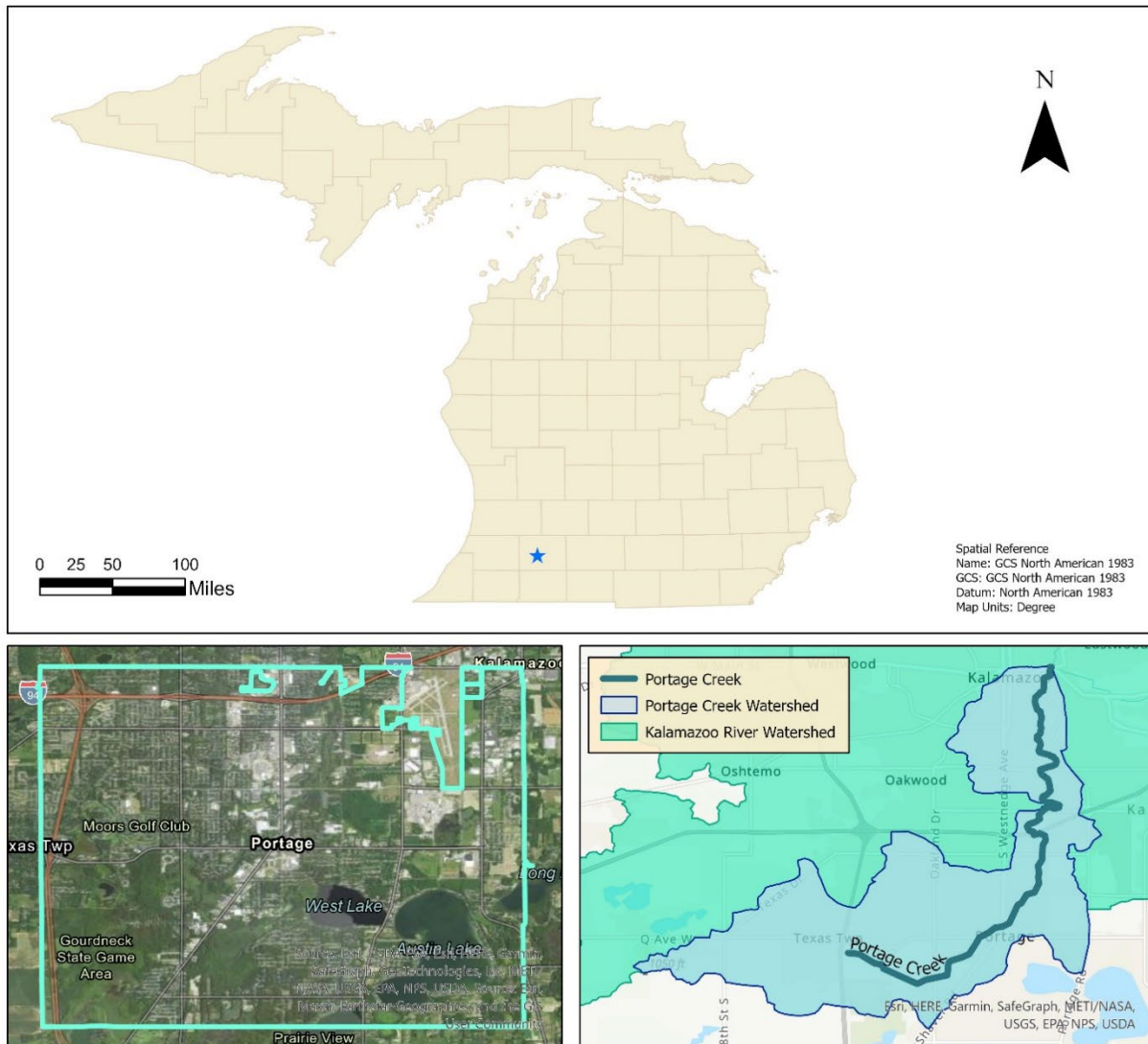


Figure 1 – Study Area Map.

Problem Statement

Riverine ecosystems in the United States have historically been impacted by dams, as humans expanded across North America, utilizing rivers for power generation, water storage, and navigation. Many of the dams created for power generation are no longer in use and now serve only to impede or prevent movement of aquatic organisms along the channel, flood potential wetland habitat, trap sediment in the reservoir, and pose a potential safety hazard. In summary, the Elijah Root dam no longer serves its initial power generation purposes, is in disrepair and poses a safety hazard to the City of Portage, and negatively impacts the riverine ecosystem.

Goals and Objectives

- Project Goal: Improve the aquatic ecosystem of Portage Creek through the removal of the unsafe and deteriorated Elijah Root dam, while increasing recreational opportunities along the river.
- Objective: Improve aquatic habitat for fish, wildlife, and native plants by reestablishing the natural meander of the river.
- Objective: Remove impediments to water flow, fish migration, and human recreation.
- Objective: Establish a sustainable riparian corridor along the river.
- Objective: Improve water quality and remove excess sediment within the channel.
- Objective: Increase recreational opportunities along the creek by removing impediments to paddlers, increasing the cold-water fishery, and constructing recreational features.

Future Without Project Conditions

Without the Federal project, species diversity would remain low in the vicinity of Elijah Root Dam. The dam would continue to cause reduced river flow through the City of Portage. Water quality would continue to be degraded and few fish would utilize the project area. The Michigan DNR would continue to incur labor and other costs to stock Brown Trout in multiple locations along Portage Creek. A 2.7-mile section of Portage Creek would continue to be isolated from the headwaters. The existing dam structure would continue to deteriorate and pose a public safety hazard located within the city's park.

Types of Measures/Alternatives Being Considered

- Alternative 1: No Federal Action
- Alternative 2: Repair or replace the existing dam structure.
- Alternative 3: Dam removal, sediment removal, and stream bank stabilization.
- Alternative 4: Dam removal, sediment removal, stream bank stabilization, water main relocation, and construction of recreational features.

Estimated Cost/Range of Costs

Costs for each alternative are provided below. The cost estimates are based off review of similar projects, scaled to the fiscal year of anticipated construction, and include a 100% cost contingency at the time of Federal Interest Determination.

- Alternative 1: \$0
- Alternative 2: \$850,000 – \$1.8 million
- Alternative 3: \$4 million – \$9.5 million
- Alternative 4: \$6 million – \$14 million

10. MODELS TO BE USED IN THE STUDY

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making.

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

Table 4: Planning Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval
IWR Planning Suite Version 2.0.9	Cost Effectiveness/Incremental Cost Analysis (CE/ICA). The Institute for Water Resources Planning Suite (IWR-PLAN) is a decision support software package that is designed to assist with the formulation and comparison of alternative plans. While IWR-PLAN was initially developed to assist with environmental restoration and watershed planning studies, the program can be useful in planning studies addressing a wide variety of problems. IWR-PLAN can assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR-PLAN can assist with plan comparison by conducting a CE/ICA analysis, identifying the plans which are the best financial investments and displaying the effects of each on a range of decision variables. The ecological habitat units calculated using the Habitat Evaluation Process will be used as inputs in IWR-PLAN to evaluate the benefits associated with each project alternative.	Certified
Lacustrary Qualitative Habitat Evaluation	The Lacustrary Qualitative Habitat Evaluation Index (LQHEI), developed by the Ohio Environmental Protection Agency, is designed to provide a measure of habitat quality that generally corresponds to those physical and biological factors that affect fish communities, and which are generally important to other aquatic life (e.g. invertebrates). The LQHEI consists of five metrics based on shoreline habitat quality: (1) substrate type/quality; (2) cover type; (3) shoreline morphology; (4) riparian zone and bank erosion; and (5) aquatic vegetation quality. Scores could theoretically range between zero and 100 (low	Certified for Regional Use in the Great Lakes

	scores represented low habitat quality/high human disturbance and high scores indicated high habitat quality/little human disturbance). This index will be one of the metrics used to characterize existing conditions and evaluate ecosystem restoration plans.	
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EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE-developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. For example, HH&C models need to comply with the requirements of HH&C CoP Enterprise Standard 08101.

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

Table 5: Engineering Models.

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
HEC-RAS 6.3 (Flood Damage Reduction River Analysis Software)	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.	CoP Preferred
AutoCAD Civil3D	Civil engineering design and documentation software for surface construction modelling. The program will be used to produce conceptual drawings and perform volume estimation for cost estimates, including impounded sediment volume estimates.	Certified

11. FACTORS AFFECTING LEVEL AND SCOPE OF REVIEW

All planning products are subject to the conduct and completion of District Quality Control (DQC). Type II Independent External Peer Review (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. This study has been determined to be subject to DQC and ATR but not IEPR/SAR. Information in this section helps in the scoping of reviews through the considerations of various potential risks.

Objectives of the Reviews

Scope of work and safety hazards identified for this project indicate that a DQC and ATR review are sufficient to identify any issues or concerns during the feasibility phase. IEPR is not considered necessary.

Assessing the Need for IEPR

Mandatory IEPR Triggers

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

Discretionary IEPR

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

Potential IEPR Exclusion

- Is the project cost greater than \$200 million? **No**; and
- Does the project have an Environmental Impact Statement (EIS)? **No**
- Does the study include an EIS? **TBD**; and
- Is the study being conducted under the general continuing authorities of the CAP? **No**

12. RISK INFORMED DECISIONS ON LEVEL AND SCOPE OF REVIEW

Targeted ATR: N/A

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

Decision on Safety Assurance Review: No human safety risks are expected, and a Safety Assurance Review is not anticipated.

13. POLICY AND LEGAL COMPLIANCE REVIEW

Policy and legal compliance review of draft and final planning decision documents is delegated to the MSC (see Director's Policy Memorandum 2019-01).

(i) Policy Review.

The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The makeup of the Policy Review team will be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Review team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- Teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

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

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

14. PUBLIC COMMENT

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

15. DOCUMENTS DISTRIBUTED OUTSIDE THE GOVERNMENT

For information distributed for review to non-governmental organizations, the following disclaimer shall be placed on documents: ***"This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It does not represent and may not be construed to represent any agency determination or policy."***

Appendix A - Brief Description of Each Type of Review

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

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

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.

Policy and Legal Compliance Review. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander.

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