

REVIEW PLAN

**Harpers Slough Habitat Rehabilitation and Enhancement Project
Pool 9, Upper Mississippi River
Allamakee County, Iowa, and Crawford County, Wisconsin
Upper Mississippi River Environmental Management Program**

Project P2#: 114844

St. Paul District (MVP)

**MSC Approval Date: Pending
Last Revision Date: July 2011**



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REVIEW PLAN

Harpers Slough Habitat Rehabilitation and Enhancement Project Pool 9, Upper Mississippi River Allamakee County, Iowa, and Crawford County, Wisconsin

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1. PURPOSE AND REQUIREMENTS

Purpose

This Review Plan defines the scope and level of peer review for the Harpers Slough Habitat Rehabilitation Project.

References

- a. Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, January 31, 2010.
- b. EC 1105-2-407, Assuring Quality of Planning Models.
- c. Engineering Regulation (ER) 1110-1-12, Quality Management, September 30, 2006.
- d. ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, November 20, 2007.
- e. Engineering Pamphlet (EP) 1165-2-502, Water Resources Policies and Authorities - Ecosystem Restoration - Supporting Policy Information, 1999.
- f. Project Management Plan (PMP) for study.

Requirements

This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design; construction; and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-407).

a. District Quality Control/Quality Assurance (DQC) – All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the PMP. The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the district and the home Major Subordinate Command (MSC).

b. Agency Technical Review (ATR) – ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published Corps of Engineers (USACE) guidance and whether the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by a designated Risk Management Organization (RMO) and is

conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be composed of senior USACE personnel and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.

c. Independent External Peer Review (IEPR) – IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR: Type I is generally for decision documents and Type II is generally for implementation products.

(1) Type I IEPR – Type I IEPRs are managed outside USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

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

d. Policy and Legal Compliance Review – All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy and warrant approval or further recommendation to higher authority by the Chief of Engineers. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

e. Cost Engineering Review and Certification – All decision documents shall be coordinated with the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District. The DX, or in some circumstances regional cost personnel who are pre-certified by the DX, will conduct the cost ATR. The DX will provide certification of the final total project cost.

f. Model Certification/Approval – EC 1105-2-407 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, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, formulate potential alternatives to address the problems and take advantage of the opportunities, evaluate potential effects of alternatives and support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data are still the responsibility of the users and are subject to DQC, ATR, and IEPR. 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, and the professional practice of documenting the application of the software and modeling results will be followed. Use of engineering models is also subject to DQC, ATR, and IEPR.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is Ecosystem Planning Center of Expertise (ECO-PCX).

The RMO will coordinate with the Cost Engineering DX to conduct ATR of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

Decision Document: The Decision Document for the Harpers Slough Habitat Rehabilitation and Enhancement Project (HREP) is composed of a Definite Project Report (DPR) with an integrated Environmental Assessment (EA) document to satisfy National Environmental Policy Act (NEPA) requirements. The DPR will require approval by the Division Commander, Mississippi Valley Division (MVD).

Study/Project Description: Pool 9 is part of the 9-foot channel project on the Upper Mississippi River System (UMRS) and was created in 1938 by the construction of Lock and Dam 9. The entire pool extends over 31.3 miles (river miles 647.9 to 679.2). The project pool elevation is 620.0 feet above mean sea level (msl 1912 adjusted), which creates a pool surface area of 29,125 acres. The Harpers Slough study area is a backwater complex located primarily

on the Iowa side of the Mississippi River in Pool 9, about 3 miles upstream of Lock and Dam 9 between river miles 665 and 650. The study area is adjacent to the navigation channel and lies in the Harpers Slough Closed Area of the Upper Mississippi River National Wildlife and Fish Refuge. The project area is around 4,150 acres and is a complex of islands, backwaters, and sloughs. The habitat concerns within the study area center around the general degradation of habitat quality in lower Pool 9. This degradation is the result of the loss of islands, declining bathymetric diversity, and a decline in aquatic vegetation over the past few decades. However, submersed aquatic vegetation has recovered in the last 10 years, especially within the last 5 years. The study area lies within the Closed Area of the Upper Mississippi River National Wildlife and Fish Refuge and is considered critical habitat for migrating waterfowl and other water birds. The decline in migration habitat quality is of great concern to the U.S. Fish and Wildlife Service and State resource management agencies.

Habitat deficiencies in the Harpers Slough area include the continued loss of the mosaic of habitat, especially the continued disappearance of islands and emergent vegetation. The area also lacks a deep, protected aquatic habitat that would serve as overwintering habitat for Centrarchid fish and associated species. This type of over-wintering habitat is extremely rare in lower Pool 9 and has been declining with the loss of islands and bathymetric diversity.

Aquatic ecosystem restoration is a primary mission of the USACE Civil Works program and is defined as achieving a "return of natural areas or ecosystems to a close approximation of their conditions prior to disturbance, or to less degraded, more natural conditions"(EP 1165-2-502). In some circumstances, as at Harpers Slough, a return to pre-disturbance conditions may not be feasible. In those instances, "the goal is to partially or fully reestablish the attributes of a naturally functioning and self regulating system." The goal of this project is to return the Harpers Slough area ecosystem to less degraded, more natural conditions by restoring natural functions and processes.

The purpose of the proposed project is to enhance about 4,150 acres of existing waterfowl and fish habitat by providing protection from wind- and boat-generated waves in the Harpers Slough area and reducing the flow of sediment-laden water into the area. The project would create a "shadow" effect in and behind islands to permit aquatic vegetation to become established in the shallow water areas. Based on planning efforts to date, the conceptual plan involves restoring/stabilizing about 111 acres of islands, creating 34 acres of emergent wetlands, and dredging 18 acres of deep-water habitat. The islands would be constructed with material dredged from the immediate vicinity, if possible.

The study is being completed under authority of the Upper Mississippi River System Environmental Management Program (UMRS EMP) in Section 1103 of the 1986 Water Resources Development Act (WRDA). Over the course of its first 13 years, EMP proved to be one of this country's premier ecosystem restoration programs, combining close collaboration between Federal and State partners, an effective planning process, and a built-in monitoring process. This success led Congress to reauthorize EMP in WRDA 1999 (Public Law 106-53).

Section 509 of the 1999 Act made several adjustments to the program and established the following two elements as continuing authorities:

- Planning, construction, and evaluation of fish and wildlife habitat rehabilitation and enhancement projects (known as HREPs).
- Long-term resource monitoring, computerized data inventory and analysis, and applied research (known collectively as Long-Term Resource Monitoring Program (LTRMP)).

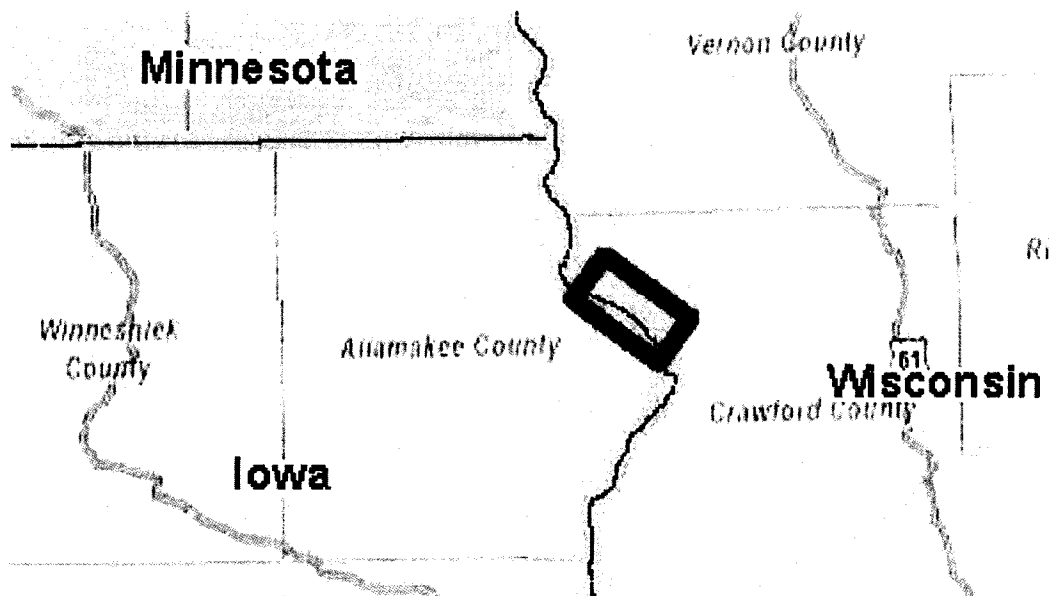
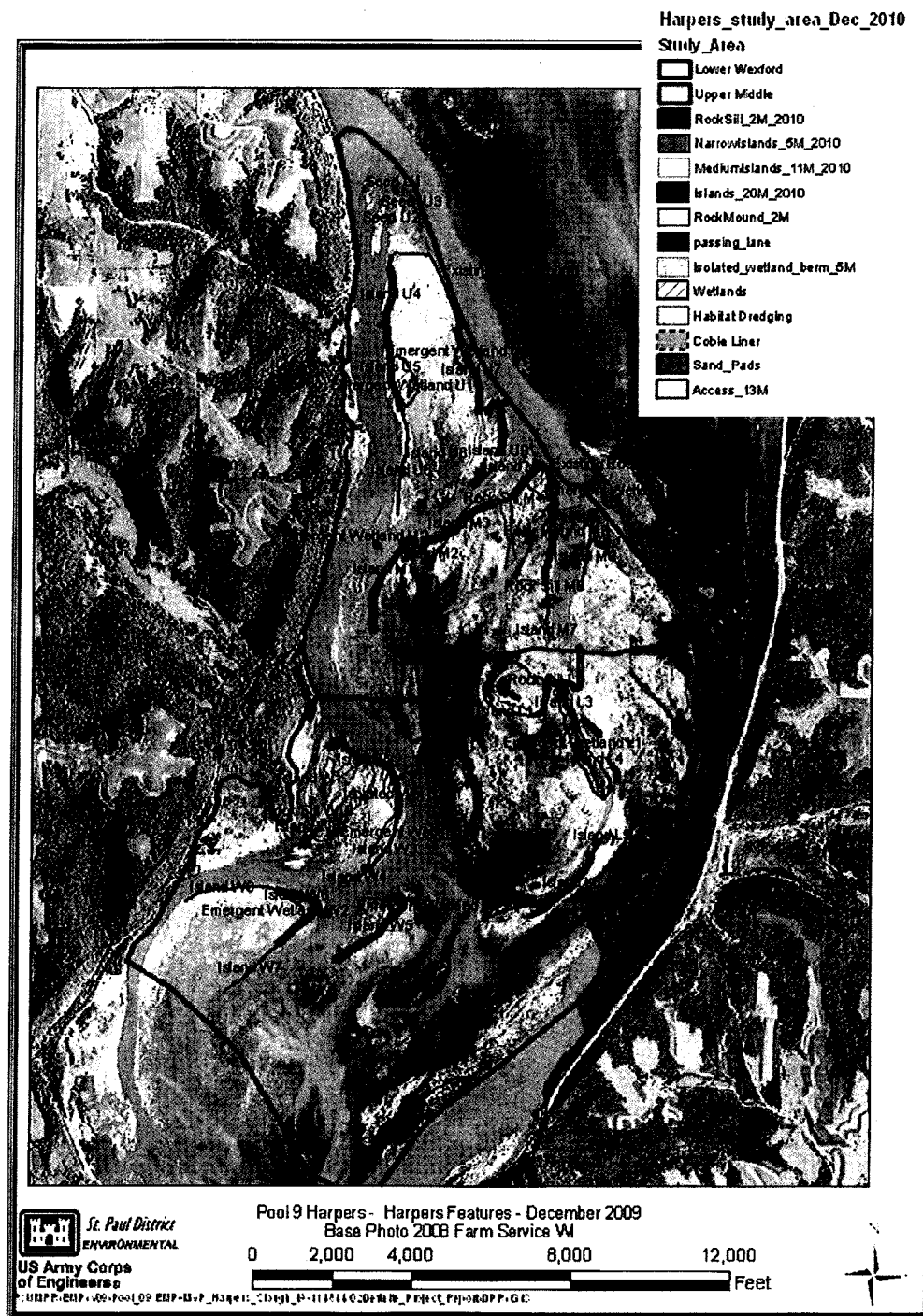


Figure 1. Location of Harpers Slough study area in Pool 9 of the Upper Mississippi River.



Factors Affecting the Scope and Level of Review

Implementation of this project has been determined to be of low risk for a number of factors:

- Implementation will not likely be technically challenging; measures identified for implementation have been successfully engineered and implemented on ecosystem restoration projects similar in size and scope.
- The project will not likely have significant economic, environmental, and/or social effects on the Nation other than beneficial environmental effects (fully assessed in the Feasibility Study Report).
- The project does not involve significant threat to human life/safety.
- The project/study is not likely to have significant interagency interest and has significant support from the State of Wisconsin Department of Natural Resources and the U.S. Fish and Wildlife Service, which manages the land as part of the Upper Mississippi River National Wildlife and Fish Refuge.
- The project/study likely will not be controversial. The interagency project delivery team (PDT) has conducted significant public outreach and has demonstrated broad public support for the project. Elected officials in the project area are supportive of the project.
- The project report is not likely to contain influential scientific information or be a highly influential scientific assessment.
- The proposed project design is not based on novel methods, does not involve the use of innovative materials or techniques, does not present complex challenges for interpretation, does not contain precedent-setting methods or models, and does not present conclusions that are likely to change prevailing practices. As noted above, the tentatively selected plan includes a range of measures that have been successfully implemented on similar ecosystem restoration projects on the Upper Mississippi River by the St. Paul District (MVP).
- The proposed project design will not require redundancy, resiliency, and/or robustness.
- The proposed project does not employ unique construction sequencing or a reduced or overlapping design construction schedule.

In-Kind Contributions

This project has no cost-share sponsor. The project is located on the Upper Mississippi River Wildlife and Fish Refuge managed by the U.S. Fish and Wildlife Service and is, therefore, 100 percent federally funded.

4. DISTRICT QUALITY CONTROL (DQC)

District Quality Control: DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is under review. The design products for the Harpers Slough HREP were developed entirely internal to the Corps of Engineers by the project delivery team. Basic quality control tools used on the Harpers Slough HREP include a Quality Management Plan providing for seamless review, peer quality checks and reviews, supervisory reviews, project delivery team (PDT) reviews, a biddability, constructability, operability, and environmental (BCOE) review, in-house product development checklists, and established Business Quality Practices (BQPs) used to ensure quality procedures are followed. MVP is formalizing its DQC requirements to meet EC guidelines. Because much of the review was completed before new guidance was received, an informal DQC process was undertaken. DQC consisted primarily of review by Section Chiefs, Branch Chiefs, and/or senior staff within specific disciplines. Comments were discussed with individual PDT members and incorporated into the PAR and DPR as necessary. The products submitted for ATR are a reflection of this process. The district Office of Counsel and Environmental Compliance Officer will review the Draft and Final DPR for legal sufficiency and compliance with environmental laws, regulations, and executive orders. Summary points related to DQC are included in Attachment 5.

The Harpers Slough HREP plans and specifications will also receive an Independent Technical Review (ITR) from reviewers of disciplines similar to those used for the ATR on the project. DQC also includes certification of the plans, specifications, and DDR by a BCOE signoff certification, which includes the chiefs of construction, engineering, and operations divisions and the chiefs of the civil construction and geotechnical functional elements.

DQC efforts include the necessary expertise to address compliance with published Corps policy. When policy and/or legal concerns arise during DQC efforts that are not readily and mutually resolved by the PDT and the reviewers, the district seeks issue resolution support from Mississippi Valley Division and Headquarters, U.S. Army Corps of Engineers (HQUSACE) in accordance with the procedures outlined in Appendix H, ER 1105-2-100 or other appropriate guidance.

Value Engineering: As part of the DQC, a Value Engineering (VE) Study following the six-phase VE methodology will be completed on the Preliminary Draft DPR. VE is a process used to study the functions a project is to achieve. VE takes a critical look at how these functions are proposed to be met, and it identifies alternative ways to achieve the equivalent function while increasing the value and the benefits of the project. In the end, it is hoped that the project will realize a reduction in cost, but increased value is the focus of the process, rather than simply reducing cost. The VE team will be comprised of district team members with similar disciplines as the PDT and partner agency personnel who have not been involved in the project (see attachment 5).

5. AGENCY TECHNICAL REVIEW (ATR)

The ATR review is intended to address technical issues with the Problem Appraisal Report (PAR), the Draft DPR and Plans and Specifications. ATR review must cover the draft PAR, draft DPR and integrated EA (including NEPA and supporting documentation), and implementation document (plans and specifications). Technical review should focus on issues related to plan formulation, hydrology and hydraulics, geotechnical investigations, design, environmental, cultural inventories, and cost estimates.

Products to Undergo ATR

Problem Appraisal Report: The purpose of the PAR is to document the early steps in the planning process and form the basis for the preparation of the Draft DPR. The PAR will document existing and predict future habitat conditions and deficiencies; identify problems, constraints, and opportunities; define measurable habitat goals and objectives to address these problems and opportunities; and identify potential measures that would address the goals and objectives.

Draft Definite Project Report: The purpose of the integrated DPR and Integrated EA is to document the planning process for ecosystem restoration of the Harpers Slough study area on the Upper Mississippi River, to provide the opportunity for participation in the planning process for river management partners and the public, to meet USACE planning guidance and to meet NEPA requirements. The DPR and EA will document existing and predict future habitat conditions and deficiencies; identify problems, constraints, and opportunities; define habitat goals and objectives; identify and evaluate measures and alternatives that would address the goals and objectives; document the effects of the alternatives in accordance with NEPA and other environmental laws and regulations; and recommend a selected plan for habitat restoration and enhancement.

Final Definite Project Report: A supplemental ATR would be completed if there are substantial changes to the project from the Draft DPR based on comments received during the public and agency review.

Implementation Document (Plans and Specifications): An ATR would be completed on 95% documents for Plans and Specifications.

Required ATR Team Expertise

Expertise required for an ATR team is detailed below. Not all of these disciplines were required for the Harpers Slough DPR, reflecting the nature of specific project features and processes. The ATR team will vary slightly based on the product being reviewed. For the Problem Appraisal, the review would focus on planning, environmental, and hydraulic engineering. The Draft DPR will require all disciplines and the implementation document (Plans and Specifications) will focus on environmental, hydraulic engineering, geotechnical, and design.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	The Planning reviewer should be a senior water resources planner with experience in ecosystem restoration and IWR-Plan.
Environmental	The Environmental reviewer should be a senior biologist with experience in ecosystem restoration, NEPA compliance and U.S. Fish and Wildlife Service HEP.
Cultural Resources	The Cultural Resources reviewer should be a senior archaeologist.
Hydraulic Engineering	The Hydraulic Engineering reviewer should be an expert in the field of hydraulics and have a thorough understanding and knowledge of large river hydrodynamics and computer modeling techniques (steady/unsteady flow modeling). Experience with wind fetch and wave generation models is desired.
Geotechnical Engineering	The Geotechnical reviewer should be a senior geotechnical engineer.
Civil Engineering	The Civil Engineering reviewer should be a senior civil engineer.
Cost Engineering	The Cost Engineering reviewer should be a senior cost engineer.
Construction/Operations	The Construction reviewer should be a senior construction manager with experience in the construction of ecosystem restoration projects.

Documentation of ATR

DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those required to ensure adequacy of the product. The four key parts of a quality review comment will normally include the following:

- a. The Review Concern – Identify the product’s information deficiency or incorrect application of policy, guidance, or procedures.
- b. The Basis for the Concern – Cite the appropriate law, policy, guidance, or procedure that has not been properly followed.
- c. The Significance of the Concern – Indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability.

d. The Probable Specific Action Needed to Resolve the Concern – Identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern; the PDT response; a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, and MSC), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall include the following:

- a. Identify the document(s) reviewed and the purpose of the review.
- b. Disclose the names of the reviewers and their organizational affiliations and include a short paragraph on both the credentials and relevant experiences of each reviewer.
- c. Include the charge to the reviewers.
- d. Describe the nature of their review and their findings and conclusions.
- e. Identify and summarize each unresolved issue (if any).
- f. Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the Alternative Formulation Briefing (AFB), draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

Decision on IEPR

Application of an IEPR requires a risk-informed decision considering the following factors (Appendix D of EC 1165-2-209):

a. The consequences of nonperformance on project economics, the environment, and social well-being (public safety and social justice).

b. Whether the product is likely to contain influential scientific information or be a highly influential scientific assessment.

c. If and how the decision document meets any of the possible exclusions described in Paragraph 11.d.(3) and Appendix D of EC 1165-2-209, detailed below:

- (1) No Environmental Impact Statement (EIS).
- (2) Project is not controversial.
- (3) Negligible adverse impacts on scarce or unique cultural, historic, or tribal resources.
- (4) No substantial adverse impacts on fish and wildlife and their habitat prior to mitigation.
- (5) Before mitigation, only negligible adverse impact on a species listed as endangered or threatened.

d. Mandatory triggers for IEPR include the following:

- (1) Significant threat to human life: The project involves dredging, protection and restoration of islands, and wetland creation to maintain and restore fish and wildlife habitat. The project area is backwater lake and side channel habitat that currently poses no risk to human life, and the recommended restoration measures will not change that condition.
- (2) Total cost of the project is greater than \$45 million: The total project cost is approximately \$15 million
- (3) Where the Governor of an affected State requests a peer review by independent experts: The Governors of the States of Iowa and Wisconsin have not requested an IEPR.
- (4) Request of IEPR by a State or Federal agency: The States of Iowa and Wisconsin, which have participated in the development of the project features, have not requested an IEPR of the project nor has any Federal agency.
- (5) Controversy 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: The public review of the project is forthcoming; however, the

interagency PDT has already undertaken a significant outreach effort. No controversy exists, and the public is generally supportive of the project.

- (6) Methods are novel or complex: The project does not involve novel or complex design or construction techniques. These types of ecosystem restoration features have been constructed by MVP with a history spanning more than 25 years.
- (7) The Chief of Engineers determines IEPR is necessary: To date, the Chief of Engineers has not determined that an IEPR is necessary.
- (8) When a decision document does not trigger a mandatory Type I IEPR, it is appropriate to make a risk-informed decision: The project is very limited in scope, cost and risk such that the project would not significantly benefit from IEPR. Its scope, cost and risk are comparable to those of other projects developed under the EMP.

Because the project does not meet the mandatory EC-1165-209 triggers, nor does its implementation incur significant risk, nor does it appear that the DPR would benefit from the IEPR process and because the project does meet the criteria for exclusion based on WRDA 2007, Sec 2034, it is thereby recommended that the Harpers Slough HREP be excluded from Type I and Type II IEPRs. The MVD endorsement for exclusion from IEPR, dated 30 June 2011, is attached.

Products to Undergo Type I IEPR

Not Applicable.

Required Type I IEPR Panel Expertise

Not Applicable.

Documentation of Type I IEPR

Not Applicable.

7. MODEL CERTIFICATION AND APPROVAL

Planning Models

Planning models include models or a suite of models used to create outputs that are subsequently used to justify the tentatively selected plan. Planning models are certified for use and ensure that standards are applied equally in ecosystem restoration projects. The planning models in the table below were used in the development of the decision document.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Habitat Evaluation Procedure (HEP)/Habitat Suitability Index (HSI)	<p>Evaluates existing, future without-project and future with-project ecosystem conditions. Serves as the basis for ecosystem assessment and effectiveness of alternative plans. The following metrics were evaluated with HEP/HSI:</p> <ul style="list-style-type: none"> • Diving Duck Migration • Bluegill (with winter modifications) • Smallmouth Bass <p>Each model is a standard HSI model that has been used by the MVP for \$46 million in construction projects since 1990.</p>	Approved and/or in the process of certification
HEAT (Habitat Evaluation and Assessment Tool)	Accounting software for input of HEP developed by ERDC.	In the process of certification
IWR-Plan	USACE cost-effectiveness and incremental cost analysis software; used in the formulation, evaluation and comparison of alternative plans. In addition, IWR-Plan identifies "best buy" plans from the range of alternative plans and performs incremental cost analysis to provide insight on cost-effectiveness.	Certified

Engineering Models

Engineering models assist in the evaluation of existing and future conditions to gauge the effects of the tentatively selected plan on the surrounding environment, but they are not used to determine the outputs for the benefits of the plan itself. Engineering models involve the application of science and can be used in both the design of project alternative measures and the assessment of effects. The following engineering models were used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study
Steady State 1-Dimensional RMA 2-dimensional hydraulic model, ADAH	The Hydrologic Engineering Center's Steady State 1-dimensional model was used to evaluate potential impacts on 100-year flood levels. An existing ADAH model was used for the existing conditions. RMA-2 was used for with-project conditions. These models were used to determine flow patterns with and without project features.
Wind Fetch and Wave Generation Model	A geospatial model of the average wind fetch and wave generation characteristics on Harpers Slough for pre- and post- project was used to judge the effects proposed island alternatives would have on sediment resuspension and assist in the prediction of aquatic vegetation response.

8. REVIEW PRODUCTS SCHEDULES AND COSTS

Product	District Quality Control	Value Engineer	Agency Technical Review	Higher Level Review
Problem Appraisal Report – Decision Document Review Plan and IEPR – Model Certification	Documentation		ATR review of PAR (IPER and model certification not required)	
				FSM – approval
Preliminary Draft DPR	Documentation	VE study		
			ATR - address technical issues and review of DQC	
				AFB - approval
Draft DPR	Documentation			Draft DPR - approval for Public Release
Final DPR	Documentation		ATR if substantial changes based on review	Final Approval
Plans and Specs	Documentation		ATR - BCOE stage	None

Value Engineering Study – Draft Definite Project Report

The VE Study schedule for the Draft DPR will be as follows, beginning from the receipt of all necessary documents:

- VE Review/Comments Complete – 1 week.
- VE Study Report Complete – 1 week.
- PDT Response to VE Report – 1 week.

VE costs on the DPR are estimated to be \$30,000.

Agency Technical Review

Problem Appraisal Report – for Feasibility Scoping Meeting

The ATR schedule for the PAR will be as follows, beginning from the receipt of all necessary documents:

- ATR Review/Comments Complete – 1 week.
- PDT Review/Backcheck Complete – 1 week.

ATR costs on the PAR are estimated to be \$15,000.

Draft Definite Project Report

The ATR schedule for the Draft DPR will be as follows, beginning from the receipt of all necessary documents:

ATR Conference Call – Within the first week of review.

ATR Review/Comments Complete – 4 weeks.

PDT Review/Backcheck Complete – 2 weeks.

ATR Closeout Complete – 2 weeks.

ATR costs on the Draft DPR are estimated to be \$50,000.

Final Definite Project Report

Supplementary ATR – If needed based on any substantial changes resulting from public review.

Implementation Document (Plans and Specifications)

The ATR schedule for the Plans and Specifications will be as follows, beginning from the receipt of all necessary documents:

ATR Review/Comments Complete – 1 week.

PDT Review/Backcheck Complete – 1 week.

ATR Closeout Complete – 1 week.

ATR costs on the Plans and Specifications are estimated to be \$15,000.

Type I IEPR Schedule and Cost

Not Applicable.

Model Certification/Approval Schedule and Cost

Not Applicable.

9. PUBLIC PARTICIPATION

Significant public outreach has been conducted by the interagency PDT, which has contributed greatly to the development of the DPR. Public Scoping meetings were held in Lansing, Iowa, in December 2001 and March 2011. Additional public outreach will be conducted following the completion of the ATRs and review by the MSC on the Draft DPR. Review of the report will be

actively coordinated with State and Federal agencies, and the report will be released to the public for review and comment. Submitted comments will be considered in the final DPR.

10. REVIEW PLAN APPROVAL AND UPDATES

The MVD Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, and RMO members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the Review Plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the home district's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

11. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

- Dennis D. Anderson, Project Manager, St. Paul District (MVP), (651) 290-5272
- Jeffrey T. DeZellar, P.E., EMP Program Manager, St. Paul District (MVP), (651) 290-5433
- Elizabeth Ivy, District Support Team (MVD), 601.634.5310
- Jodi Staebell, Ecosystem Restoration Planning Center of Expertise (MVR), (309) 794-5448

ATTACHMENT 1: TEAM ROSTERS

MVP Project Delivery Team			
Title/Discipline	Name	Phone	E-mail
Planner/Fisheries	Dennis Anderson	651-290-5272	dennis.d.anderson@usace.army.mil
Hydrology/Hydraulics	Scott Jutila	651-290-5631	scott.a.jutila@usace.army.mil
Hydrology/Hydraulics	Corby Lewis	651-290-5806	corby.r.lewis@usace.army.mil
Geotechnical	Joel Face	651-290-5656	joel.j.face@usace.army.mil
Cost/Specs/EC-D Lead	Jeff Hansen	651-290-5649	jeffrey.l.hansen@usace.army.mil
Civil/Layout/Specs	Russel G. Fischer	651-290-5464	russell.g.fischer@usace.army.mil
GIS/Layout	Michael Walker	651-290-5801	michael.r.walker@usace.army.mil
Environmental	Dave Potter	651-290-5713	david.f.potter@usace.army.mil
Cultural Resources	Bradley Perkl	651-290-5370	bradley.e.perkl@usace.army.mil
O&M Channels & Harbors	Paul Machajewski	507-455-6150	paul.r.machajewski@usace.army.mil
Construction	Scott Baker	507-454-6150	scott.l.baker@usace.army.mil
Public Affairs	Mark Davidson	651-290-5201	mark.d.davidson@usace.army.mil

ATR Reivew Team				
Title/Discipline	Name	Phone	E-mail	District
ATR Lead/Plan Formulation	Christopher Fassero	402-995-2679	christopher.a.fassero@usace.army.mil	NWO
Hydraulic				MVR
Geotechnical				MVR
Geotechnical, Branch Chief				MVR
Environmental/HEP				MVS
Environmental/HEP				MVS
Cost Engineering				NWW

ATTACHMENT 2: COMPLETION OF AGENCY TECHNICAL REVIEW

DEFINITE PROJECT REPORT

The Agency Technical Review (ATR) has been completed for the draft Definite Project Report for the Harpers Slough Habitat Rehabilitation and Enhancement Project on the Upper Mississippi River, under the Upper Mississippi River Environmental Management Program (EMP). The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

SIGNATURE

TBD
ATR Team Leader
TBD

Date

SIGNATURE

Dennis D. Anderson
Project Manager
CEMVP-PD-E

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

All concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE

Michael J. Bart, P.E.
Chief, Engineering and Construction Division
CEMVP-EC

Date

SIGNATURE

Thomas L. Crump, P.E.
Chief, Regional Planning and Environment Division
North
CEMVP-PD

Date

IMPLEMENTATION DOPCUMENT (PLANS AND SPECIFICATIONS)

The Agency Technical Review (ATR) has been completed for the draft Plans and Specifications for the Harpers Slough Habitat Rehabilitation and Enhancement Project on the Upper Mississippi River, under the Upper Mississippi River Environmental Management Program (EMP). The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

SIGNATURE

TBD
ATR Team Leader
TBD

Date

SIGNATURE

Dennis D. Anderson
Project Manager
CEMVP-PD-E

Date

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page/Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NEPA	National Environmental Policy Act
ATR	Agency Technical Review	NER	National Ecosystem Restoration
BCOE	Bidability, Constructability, Operability and Environmental		
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Definite Project Report	OMB	Office of Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PAC	Post Authorization Change
ECO-PCX	Environmental Planning Center of Expertise	PAR	Problem Appraisal Report
EIS	Environmental Impact Statement	PCX	Planning Center of Expertise
EMP	Environmental Management Program	PDT	Project Delivery Team
EO	Executive Order	PL	Public Law
EP	Engineering Pamphlet	PMP	Project Management Plan
ER	Engineering Regulation	QA	Quality Assurance
FDR	Flood Damage Reduction	QC	Quality Control
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	RED	Regional Economic Development
FSM	Feasibility Scoping Meeting	RMC	Risk Management Center
GRR	General Reevaluation Report	RMO	Review Management Organization
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RTS	Regional Technical Specialist
HREP	Habitat Rehabilitation and Enhancement Project	SAR	Safety Assurance Review
IEPR	Independent External Peer Review	UMRS	Upper Mississippi River System
ITR	Independent Technical Review	USACE	U.S. Army Corps of Engineers
LRR	Limited Reevaluation Report	VE	Value Engineering
LTRMP	Long-Term Resource Monitoring Program	WRDA	Water Resources Development Act
MSC	Major Subordinate Command		
MVD	Mississippi Valley Division		
MVP	St. Paul District		

ATTACHMENT 5: DISTRICT QUALITY CONTROL (DQC) SUMMARY

District Quality Control: MVP is in the process of formalizing its DQC requirements to meet EC guidelines. Because much of the review of the PAR and DPR was completed prior to the receipt of new guidance, an informal DQC process was undertaken. DQC consisted primarily of review by Section Chiefs, Branch Chiefs, and/or senior staff within specific disciplines. Comments were discussed with individual PDT members and incorporated into the DPR as necessary.

The district Office of Counsel would review the Draft and Final DPR for legal sufficiency. The district Environmental Compliance Officer would review the Draft and Final DPR for compliance with environmental laws, regulations, and executive orders.

A summary of major contributions/revisions resulting from DQC discussions is included below:

a. **HEP Analysis** – HSI formulation has taken considerable effort for this project. The use of multiple metrics (waterfowl, fish) makes it a challenge to ensure that alternative measures are accurately modeled and benefits are accounted for. In most cases, combinations of alternative measures do not produce a simple additive effect in the calculation of benefits. DQC discussions helped to identify various combinations of alternative measures that were grouped together as an alternative and given a specific Average Annual Habitat Unit (AAHU) as opposed to a cumulative AAHU for each alternative measure.

b. **Plan Formulation** – Plan formulation for the Harpers Slough Habitat Rehabilitation and Enhancement Project has been an iterative process among team members, the public, interagency partners, and DQC reviewers. The team undertook multiple iterations of the planning process to ensure that problems, opportunities, goals, and objectives were clearly identified and provided a logical connection between steps of the plan formulation from the beginning of the planning process to the plan recommendation. The need to minimize effects to the endangered mussel, Higgins' eye pearlymussel, imposed significant constraints and required numerous iterations of planning and design to achieve the ecosystem goals and objectives while minimizing the impacts to the endangered mussel.

c. **Applicable Planning Models** – Various ecological/biological response models were considered for this project. Results from hydrodynamic models (ADAH and RMA2) and wind fetch/wave models were used to provide information for the metrics used in the HEP models, specifically current, wave resuspension of sediments (turbidity, suspended solids) and aquatic vegetation response to changes in hydrodynamic and water quality conditions under existing, future without action and various action alternatives. The justification of benefits relies solely on the HEP analysis. The hydrodynamic and wind/wave models added another level of scientific rigor, but they were not directly used in the analysis of ecosystem benefits.

Value Engineering Study: A preliminary VE study was completed in 2004. However, given all the changes in scope of the project, another VE study will be completed. The VE study will be completed using USACE standard VE methodology, consisting of six phases:

Information Phase: During the information phase, the team reviewed the documents and current conditions of the project. It was at this time that the team identified the goals of the study and attempted to answer the following questions: what is the project, what does the project do, what must the project do, and what does the project cost.

Function Analysis Phase: During the function analysis phase, the team defined the project functions using a two-word active verb/measurable noun context to develop a Function Analysis System Technique (FAST) Diagram. The team took a critical look at how these functions are being met, and the team identified alternative ways to achieve the equivalent function while increasing the value of the project.

Creativity Phase: During the creative phase, the team speculated by conducting brainstorming sessions to generate ideas for alternative designs. All team members contributed ideas. Critical analysis of the ideas was discouraged. A complete list of the ideas generated during the creative phase is included in Appendix A. This list indicates which ideas were developed during later phases of the process.

Evaluation Phase: Evaluation, testing, and critical analysis of all ideas generated during the creative phase was performed during the evaluation phase to determine potential for savings and possibilities for risk. The team determined which of the ideas generated should be developed into proposals and which should be developed into comments. All other ideas were either being done or were determined by the team not to be feasible. These ideas were discarded from further development.

Development Phase: The VE team members developed the selected ideas from the evaluation phase into proposals and comments during the development phase. Proposal descriptions, along with sketches, technical support documentation, and cost estimates were prepared to support implementation of ideas. Additional comments were included for items of interest that were not developed as proposals.

Presentation Phase: A formal presentation was conducted after the study was complete. The participants of the presentation are determined by the project manager. A draft VE Study Report is distributed for review and coordination by the PDT for determination of recommended action for each proposal. After the recommended action has been supplied to the VE team, the recommended action will be noted with each proposal. An "accepted" recommendation means that the team will give the proposal additional consideration. If the value-added-accepted proposal is not incorporated into the final design, the PDT will need to document that rational in the final product.

CERTIFICATION OF LEGAL REVIEW

The Definite Project Report for the Harpers Slough Habitat Rehabilitation and Enhancement Project, including associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, St. Paul District, and approved as legally sufficient.

Date

District Counsel, CEMVP-OC

Draft Definite Project Report and Integrated Environmental Assessment for the Harpers Slough Habitat Rehabilitation and Enhancement Project, Environmental Management Program, Upper Mississippi River, Pool 9, Allamakee County, Iowa, and Crawford County, Wisconsin

Environmental Compliance: In compliance with Section 7 of the Endangered Species Act, the District has coordinated the proposed actions with the U.S. Fish and Wildlife Service relative to threatened and endangered species. Pursuant to Section 106 of the National Historic Preservation Act, 16 USC § 470 (NHPA), coordination with the Wisconsin State Historic Preservation Office (SHPO) has been completed. In accordance with the Clean Water Act, a 404(b) (1) Evaluation has been prepared and included in the Draft Definite Project Report (DPR). The DPR describes the proposed action and environmental impacts. The DPR has been determined to be legally sufficient by Office of Counsel. The U.S. Fish and Wildlife Service and State resource agencies have been partners from the beginning of the planning and design process. The U.S. Fish and Wildlife and State resource agencies, upon completion of the public review process, will provide letters on the proposed project in compliance with the Fish and Wildlife Coordination Act. Table 9-2 of the DPR indicates the status of compliance with applicable environmental laws, regulations, and executive orders. The project is in full environmental compliance for this stage of planning process.

Date

District Environmental Compliance Officer
CEMVP-PD