



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND OR 97208-2870

CENWD-RBT

28 MAR 2016

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-CJ /David Carte)

SUBJECT: Review Plan (RP) Approval for the Missouri River Recovery Program
Searcy Bend Interception MRRP Project

1. References:

a. Review Plan for the Missouri River Recovery Program Searcy Bend Interception MRRP Project.

b. EC 1165-2-214 Civil Works Review, 15 December 2012.

2. Reference 1.a. above has been prepared in accordance with reference 1.b. above.

3. The RP has been coordinated with the Business Technical Division, Northwestern Division, U.S. Army Corps of Engineers, which is the Review Management Organization for the plan. The Review Plan includes District Quality Control and Agency Technical Review.

4. I hereby approve this RP, which is subject to change as circumstances require, consistent with the study development process and the Project Management Business Process. Subsequent revisions to this RP or its execution will require written approval from this office.

5. For further information, please contact Mr. Douglas Putman, P.E. at (503) 808-3883.

A handwritten signature in black ink, appearing to read "Scott A. Spellmon".

SCOTT A. SPELLMON
BG, USA
Commanding

Encl

**Review Plan
U.S. Army Corps of Engineers
Kansas City District
Northwestern Division**

**Missouri River Recovery Program
Searcy Bend Interception MRRP**



**US Army Corps
of Engineers®**

January 2016

(This page intentionally left blank)

Table of Contents

1. Purpose and Requirements 1

 a. Purpose..... 1

 b. Guidance and Policy References..... 1

 c. Requirements..... 1

2. Review Management Organization 1

3. Project Description and Information 2

 a. Scope..... 2

 b. Proposed Design..... 4

4. District Quality Control (DQC) 4

5. Agency Technical Review (ATR)..... 4

6. Required ATR Team Expertise: 6

7. Independent External Peer Review (IEPR) 8

8. Policy and Legal Compliance Review 9

9. Review Schedule and Costs 9

10. ATR Schedule and Cost..... 9

11. Public Participation 9

12. Review Plan Approval and Updates.....10

13. Models10

Attachment 1a - Completion of Agency Technical Review
Attachment 1b - Certification of Agency Technical Review.....
Attachment 2 -- Searcy Bend Interception Risk Management Matrix.....
Attachment 3 -- Team Rosters.....
Attachment 4 -- Review Plan Revisions.....

(This page intentionally left blank)

1. Purpose and Requirements

a. Purpose

This Review Plan is intended to ensure a quality-engineering project is developed by the Corps of Engineers. This Review Plan has been developed for the Searcy Bend Interception MRRP, Project Environmental Assessment and Plans/ Specifications/ Design Documentation Report/O&M Manual. This Review Plan was prepared in accordance with EC 1165-2-214, "Civil Works Review Policy". The Review Plan shall layout a value added process that assures the correctness of the information shown. It is imperative that the vertical teaming efforts are proactive and well-coordinated to assure collaboration of the report findings, conclusions, and recommendations, and that there is consensus at all levels of the organization with the recommended path forward. This Review Plan describes the scope of review for the current phase of work, and is included in the Project Management Plan (P2 #454322). All appropriate levels of review (DQC, ATR, IEPR, BCOES, and Policy and Legal Review) will be included in this Review Plan as appropriate, and any levels not included will require documentation in the Review Plan of the risk-informed decision not to undertake that level of review. The REVIEW PLAN identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project. This Review Plan should provide to the PDT, DQC, ATR and IEPR Teams.

b. Guidance and Policy References

- EC 1165-2-209, Civil Works Review Policy, 31 January 2012
- EC 1165-2-214, Civil Works Review Policy, 15 December 2012
- ER 1105-2-100, Planning Guidance Notebook, 22 April 2000
- ER 1110-1-12, Quality Management, 31 March 2011
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 March 2014
- ER 5-1-11, USACE Business Processed, 1 November 2000

c. Requirements

This review plan was developed in accordance with EC 1165-2-214, 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.

2. Review Management Organization

The USACE Northwestern Division is the Review Management Organization (RMO) for this project. Contents of this review plan have been coordinated with the Northwestern Division, the Major Subordinate Command (MSC). In-Progress Review (IPR) team meetings with the RMC, NWD, and HQ will be scheduled on an "as needed" basis to discuss programmatic, policy, and technical matters. This review plan will be updated for each new project phase.

3. Project Description and Information

a. Scope

Searcy Bend Interception MRRP Adaptive Management Project:

A recently completed “Effects Analysis” study identified multiple hypotheses related to the current lack of pallid sturgeon recruitment on the Missouri River. Several of these hypotheses were related to the loss of habitat and changes in the hydraulic conditions of the lower Missouri River as a result of the Bank Stabilization and Navigation Project (BSNP). The objective of the Searcy Bend Interception MRRP project is to enhance sturgeon embryo interception and rearing habitat at the project location or, more specifically, to promote the transfer of free drifting sturgeon embryos (interception) into channel margin habitats (food producing and foraging habitats). This project will use AdH modeling to better understand pre-project conditions and assist with the evaluation of proposed alternatives. Post construction, physical and biological surveys will be conducted to better understand project performance and model refinement. These lessons learned may be used in future habitat restoration projects designed to improve interception and rearing habitats on the lower Missouri River.

In an effort to meet the needs stated above, the following elements are proposed for design: A series of new or modified rock dikes and rock dike notching and/or revetment notching to promote particle capture with the intent to increase interception and rearing habitat at the project location.

The scope of this project is to develop a design for the above solution and contract this work out to the Bank Stabilization and Navigation Project (BSNP) MATOC contractor pool for construction of the proposed design.

The design will meet all current guidance, regulations, and requirements, and ensure continued operation in the future with minimal O&M costs

This project includes the generation of an Environmental Assessment (NEPA), construction drawings, specifications, design documentation, and creation of an Operations and Maintenance Manual and Record Drawings. All items will be reviewed in accordance with this Review Plan.

Refer to Figure 1 below for a project location map and general position of the proposed dikes notches in red and added dike extensions in green. The green areas are projected natural deposition, not manually place deposition. The red areas are anticipated erosion after dike modification. This is a draft concept plan example that will likely change after the through the modeling process.

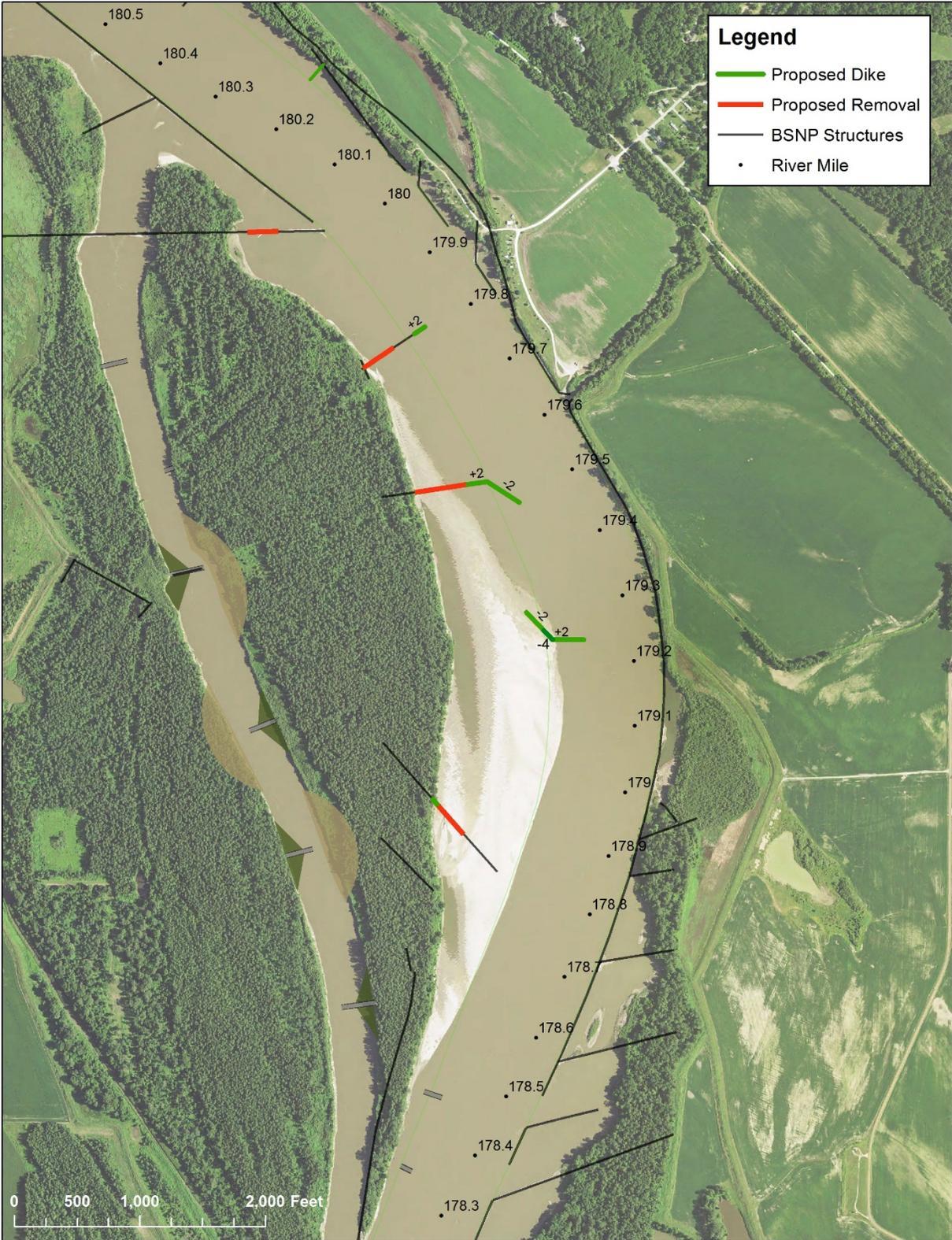


Figure 1 - Site Plan - Searcy Bend

b. Proposed Design

The following elements are proposed for consideration to achieve the purpose of this project:

1. Removal of portions of existing rock and piling structures to increase flow and sediment transport within the area of the sandbar.
2. Placing a series of new rootless rock structures along the right edge of the rectified channel line to:
 - a. Direct flow from the navigation channel towards the sandbar;
 - b. Ensure the navigation channel is maintained.
3. Excavate portions of the sandbar in the vicinity of the new structures to promote the desired hydraulic conditions.
4. Addition of a rooted rock structure upstream of the project site to prevent deposition of sediment within the navigation channel; and a structure on the downstream end of Tadpole Island to prevent further erosion of the island.

Work Product to be Reviewed – The project will have a NEPA document, Plans/SPECS/DDR/Front End, ECIF, and O&M Update to be reviewed to the ATR level.

Risk – Project risk are delimited in Attachment 2 - Searcy Bend Interception Risk Management Matrix.

Sponsor Peer Review of In-Kind Contributions - There will not be in-kind contributions for this effort. The Project is 100% federally funded.

4. District Quality Control (DQC)

All implementation 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 Project Management Plan (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 MSC. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. Additionally, the PDT is responsible to ensure consistency and effective coordination across all project disciplines during project design and construction management. See Attachment 3 for PDT and DQC members and disciplines.

Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC. DrChecks review software can be used to document DQC comments.

5. Agency Technical Review (ATR)

ATR is mandatory for all implementation documents (including supporting data, analyses, environmental compliance documents, etc.). NWK will conduct an Environmental Analysis ATR

to validate any NEPA impacts. The objectives of ATRs are to ensure consistency with established criteria, guidance, procedures, and policy. The ATRs will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. Management of ATR reviews is dependent upon the phase of work and the reviews are conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. Determine and obtain an ATR agreement on key data such as hydraulic and geotechnical parameters early in design process. The goal is to have early involvement of ATR team, especially when key decisions are made. The ATR Lead should be invited virtually to all PDT meetings, in order to understand the design efforts and to know when to engage other ATR members for key decisions. Value added Lessons Learned from the ATR team should be shared early on to have the best chance of being adopted by the PDT. Most of the ATR effort should be accomplished midway through the design effort; after completion of design the ATR effort will check that the effort agreed to at mid-point was accomplished. This is consistent with the requirement that the ATR members shall not be involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC. A site visit will not be scheduled for the ATR Team. See Attachment 3 for PDT/DQC/TR members.

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

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) the basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) 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; and
- (4) 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 in order to then assess whether further specific concerns may exist. The ATR documentation in DrChecks includes 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, MSC, and HQUSACE), 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. Certification of ATR should be completed, based on work reviewed to date, for the final report. A draft certification is included in Attachment 1.

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:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- 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.

6. Required ATR Team Expertise:

The planned ATR reviewers from MVP/MVS/MVR include the following:

ATR Lead –

[REDACTED]

MVS-CEMVP-PD-F

Environmental

[REDACTED]

CEMVP-PD-P

Geotech

[REDACTED]

CEMVR-EC-G

H&H/River Eng

[REDACTED]

CEMVS-EC-HD

Civil Engineer

[REDACTED]

CEMVR-EC-DN

The ATR team shall be chosen based on each individual's qualifications and experience with similar projects. Specifically for this project, the reviewers should be familiar with large river design, dike construction, and large river pallid sturgeon habitat development. Therefore, this ATR team shall consist of a River Engineer, Geotechnical Engineer, Environmental/ NEPA Ecologist, and Civil Engineer. All members are required to have a minimum of five years of experience in design of similar projects, be a licensed engineer, and registered in CERCAP.

The draft charge question for the ATR team is: do the implementation documents support the goal of promoting particle capture with the intent to increase interception and rearing habitat at the project location or, more specifically, to promote the transfer of free drifting sturgeon embryos (interception) into channel margin habitats (food producing and foraging habitats).

The ATR for this project is to be conducted by the St. Louis (MVS) and St. Paul District (MVP) qualified cadre. The reviewers are identified and listed below. The ATR will be in compliance with EC 1165-2-214. Comments from the ATR team will be captured, resolved, and back checked via DrChecks. After resolution of the comments, and in accordance with NWK BQP 7.3.01, an ATR Certification will occur. Certification requires that the reviewers have witnessed the resolution of their comments sufficiently and accurately addressed on the contract documents. Disputes and significant unresolved ATR concerns will be handled in accordance EC 1165-2-214. A site visit will not be scheduled for the ATR team.

ATR Lead – May be combined with Plan Formulation The ATR lead should be a senior professional with expertise and experience in preparing Civil Works decision documents and conducting ATR. The lead should 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.)

River Engineering - ATR Team member will be a licensed engineer with a minimum of 10 years' experience in analysis of large complex river systems. Individual must have experience in river systems that are used and maintained for navigation and should be knowledgeable of channel morphology, bank stabilization techniques, and Corps of Engineers hydraulic models (HEC-RAS).

Geotechnical Engineering – ATR Team member will be a licensed geotechnical engineer with a minimum of 10 years' experience in design, construction, and analysis of existing flood damage reduction projects including but not limited to levees, and channel structures along large river systems. Individual must have worked on at least two multi-objective and multi-stakeholder planning studies.

Environmental/NEPA - Ecologist – ATR Team member will be an experienced natural resource specialist with a background with preparation of EA's and EIS large GI projects. Strong background with environmental laws, policies, requirements and procedures. Experience will include a background with regulatory and permitting processes. Background with habitat analysis and cultural resources.

Civil Engineer - ATR Team member will be a licensed General Civil Engineer with at least 10 years' experience with analysis of failure and risk associated with flood control projects. The team member should have experience with plan formulation for large multi-objective and multi-stakeholder planning studies.

Economist – ATR Team member will be an experienced economist who has worked on multiple USACE aquatic ecosystem restoration studies. Specifically, the reviewer will have experience conducting Cost-Effective/Incremental Cost Analysis (CE/ICA). The reviewer will be certified for ATR of aquatic ecosystem restoration studies by the USACE Planning sub-COP for Economics.

The team leader will make a decision on the need for other review disciplines. Legal review is not under the purview of the ATRL but is instead responsible to the Corps of Engineers Office of Counsel chain-of command.

ATRs 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 sample Statement of Technical Review for the plans and specifications is included in Attachment 1.

7. Independent External Peer Review (IEPR)

Independent External Peer Review (IEPR). 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. Any work product, report, evaluation, or assessment that undergoes DQC and ATR also may be required to undergo IEPR under certain circumstances. A risk-informed decision, as described EC 1165-2-209, will be made as to whether IEPR is appropriate for that product. IEPR panels will be made up of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. Panel members will be selected using the National Academies of Science (NAS) policy for selecting reviewers. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents.

a. Type I IEPR is conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, a high level of complexity, novel, or precedent-setting approaches; has significant interagency interest; has significant economic, environmental, and social effects to the nation; or where the Chief of Engineers determines that the project is controversial. However, it is not limited to only those cases and most studies should undergo Type I IEPR.

b. Type II IEPR, a Safety Assurance Review (SAR), shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life. External panels will conduct reviews of the design and construction activities prior to the 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. Since the decision document is the basis of ultimate design, safety assurance will be incorporated into the project as appropriate.

The proposed alternations do not meet the decision criteria set forth within Paragraph 2 of Appendix E of EC 1165-2-214 and have been assessed by the District, Chief of Engineering to pose no significant threat to human life or life safety.

The dike additions/alterations project is not considered a flood risk management project, but is considered concept evaluation to develop lessons learned that may be used in future habitat restoration projects designed to improve interception and rearing habitats on the lower Missouri River. Furthermore, the project: does not include the use of innovative materials or techniques; does not present complex challenges; does not contain precedent-setting methodology as dike construction/notching, with the intent to erode or deposit sediment, has been a predominant control method of the BSNP project for decades; does not present conclusions that differ from prevailing practices; does not include any unique construction sequencing or scheduling challenges.

The project has low life safety risks. The probability of un-intended erosion during or after construction that would affect navigation or public areas of this Missouri River is unlikely. However, if irregular erosion were to occur, the scope and severity impact would be low. There is a low risk that construction problems occur during the construction process.

8. Policy and Legal Compliance Review

All implementation documents will be reviewed throughout the project 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 home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies.

9. Review Schedule and Costs

To extend practical reviews should not extend the design schedule but should be embedded in the design process. Reviewers should be involved at key decision points and are encouraged to provide timely over the shoulder comments.

10. ATR Schedule and Cost

The preliminary review schedule is listed in the table below. The cost for the ATR is approximately \$18,000. Reference the monthly P2 schedule for updates to the schedule and cost of the ATR throughout the project. Provide an overall review schedule that shows timing and sequence of all reviews.

Project Phase / Submittal	Review Start	Review Complete
DQC Review	25 Jan 2016	29 Jan 2016
ATR Review	1 Feb 2016	15 Feb 2016
Report Revisions and Back check	NA	NA
Submit Report to QCC	NA	NA
QCC Review	NA	NA
Report Revisions	NA	NA
Submit Report to SOG	NA	NA
SOG Review	NA	NA
Report Revisions	NA	NA
IEPR	NA	NA

IEPR Schedule and Cost: NA

11. Public Participation

As required by EC 1165-2-214, the approved Review Plan will be posted on the District 15 website <http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx>). Information will be conveyed to the public through the use of press releases and media interviews, as necessary, and through the use of posting information to the Kansas

City District’s website. There will be a formal public review for the NEPA (Environmental Assessment) for these MRRP Adaptive Management Projects. The public will have 30 days to provide comments on the documents; after all comments have been submitted, the comments will be provided to the technical reviewers and responses will be given to the public.

12. Review Plan Approval and Updates

The MSC for this review plan is the Northwestern Division. The MSC Commander is responsible for approving this Review Plan. The Commander’s approval reflects vertical team input (involving the Kansas City District, MSC, and HQUSACE members) as to the appropriate scope and level of review for the study and endorsement by the RMC. Like the PMP, the Review Plan is a living document and may change as the study progresses. The District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander’s approval will be documented in an Attachment to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-endorsed by the RMC and 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, will be posted on the District’s webpage <http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx> and linked to the HQUSACE webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. Models

The use of certified or approved models for all activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. 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. 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 (if required). We do not anticipate the use of models, but if the need occurs the models would only be a HEC-RAS or Adaptive Hydraulics (2d) model, which are both USACE approved.

Model	Status
HEC-RAS or Adaptive Hydraulics	USACE approved.

Attachment 1a - Completion of Agency Technical Review

The Agency Technical Review (ATR) has been completed for the construction documents for the Missouri River Recovery Project (MRRP) Searcy Bend Interception MRRP project. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. 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 US 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 DrChecks.


ATR Team Leader
CEMVP-PD-F

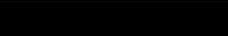
Date


Project Manager
CENWK-PM-CJ

Date

Attachment 1b - Certification of Agency Technical Review

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution. As noted above, all concerns resulting from the ATR of the project have been fully resolved.


Chief, Engineering Division
CENWK-ED

Date

Attachment 2 -- Searcy Bend Interception Risk Management Matrix

This attachment documents the vertical team's risk informed recommendation to not conduct Type II IEPR.

The following table, based on the US Army Field Manual 5-19, *Composite Risk Management*, was used to assess each identified risk. Risk Management Matrix Definitions:

Probability Definitions:

Frequent -- Occurs very often, known to happen regularly. In illustration, given 500 or so exposures to the hazard, expect that it will definitely happen. Examples of frequent occurrences could be project delays, contract modifications, scope increases, or cost increases.

Probable -- Occurs several times, a common occurrence. In illustration, given 1000 or so exposures without proper controls, it will occur at some point. Examples might include weather delays or personnel changes.

Seldom -- Remotely possible; could occur at some time. Usually several things must go wrong for it to happen. Examples might include loss of earmark funding, a flood, or an earthquake.

Unlikely -- Can assume will not occur, but not impossible. Examples might include an accidental fatality or project-critical quality oversight.

Severity Definitions:

Catastrophic -- Complete project failure or the loss of ability to accomplish the project; loss of major or project-critical systems, equipment, or resource; major property or facility damage; severe environmental damage; project-critical security failure; or unacceptable collateral damage.

Critical -- Severely degraded project quality or project feature; significantly increased scope, budget (more than 25% in one quarter or more than \$100K) or schedule (more than 1 month); partial loss of a critical resource or temporary loss of a resource exceeding one month's time; extensive major damage to equipment or systems; significant damage to property or the environment; security failure; significant collateral damage.

Marginal -- Degraded project quality or project feature; minor damage to equipment or systems, property, or the environment; increase in scope, budget (less than 25% in one quarter or less than \$100K) or schedule (less than 1 month); lost days due to injury or illness not exceeding one month; minor damage to property or the environment.

Negligible -- Little or no adverse impact on project quality, scope, schedule, or budget; first aid or minor medical treatment; slight equipment or system damage, but fully functional or serviceable; little or no property or environmental damage.

Risk Assessment Matrix

SEVERITY	PROBABILITY			
	FREQUENT	PROBABLE	SELDOM	UNLIKELY
CATASTROPHIC	Extremely High	Extremely High	High	Medium
CRITICAL	Extremely High	High	Medium	Low
MARGINAL	High	Medium	Low	Low
NEGLIGIBLE	Medium	Low	Low	Low

The following table details the risks, frequency, severity, risk assessment, and how the risk contributes to the IEPR decision. The risks were developed by reviewing the IEPR triggers from EC 1165-2-214.

Based on the below assessment, it is the risk-informed decision of the vertical team that a Type II IEPR is not required for this project.

TODAY'S DATE		14-Jan-16		Searcy Bend Interception MRRP Project	RISK MATRIX	
UPDATED						
BY WHOM		DEC				
RISK IDENTIFICATION		PROB	SEVERITY	INITIAL RISK	Response Strategy	RESIDUAL RISK
Risk 1. Contractor Delays; Trigger: Slip in schedule of 30 days or more for any critical path activity. Inadequate submittals or the inability to resolve comments in the draft work plans or in the draft versions of the Report.		SELDOM	MARGINAL	MED	Risk 1. Response Strategy: Mitigate by quick NWK response and monitoring of submittal progress.	LOW
Risk 2. Weather Delays. Excessive precipitation can cause high river levels preventing construction progress. Trigger: Slip in baseline schedule for more than 30 days for this activity.		SELDOM	NEGLIGIBLE	LOW	Risk 2. Response Strategy: Accept. The project schedule will have to be modified according to the documented and negotiated actual weather delays. If this occurs, a project change request will be required if the delay exceeds 30 days.	LOW
Risk 3. The direction of the design. If modeling & CE/ICA delay too long Task Order, it may impact our design schedule over the course of the FY. Risk 3. Trigger: modeling & CE/ICA impact schedule 30 days or more.		UNLIKELY	MARGINAL	LOW	Risk 3. Response Strategy: Monitor modeling & CE/ICA.	LOW

Searcy Bend Interception MRRP (P2 No. 454322)

TODAY'S DATE		14-Jan-16		Searcy Bend Interception MRRP Project		RISK MATRIX	
UPDATED							
BY WHOM		DEC					
RISK IDENTIFICATION		PROB	SEVERITY	INITIAL RISK	Response Strategy	RESIDUAL RISK	
Risk 4. Timing of Tree Clearing. Timing of the tree clearing needs to occur in the winter for the sake of the NLEB and Indiana bats. Clearing trees outside the designated winter dates November 1st - March 31st would require a significant effort to insure the bats are not impacted. Risk 4. Trigger: Recognition that timeline falls over the period indicated.		LIKELY	MARGINAL	MED	Risk 4. Response Strategy: Insure we execute early enough to avoid the period indicated or as a fall back have NWK in-house labor clear the trees necessary for construction.	LOW	
Risk 5. Necessity of Bank Clearing. Currently, the project is to be constructed from the water, limiting the amount of necessary clearing on the bank. If the project was changed to need to be performed from land, the addition of an access road and area needed for equipment would at least double to amount of trees that would need to be cleared to complete the project. Risk 5. Trigger: Now, decision and recognition of allowing construction from either bank or floating plant.		FREQUENT	MARGINAL	HIGH	Risk 5. Response Strategy: See Risk 4 "Timing of Tree Clearing."	LOW	
Risk 6. The area should be clear of cultural impacts, but if any archaeological artifacts were discovered, further analysis would be required.		UNLIKELY	CRITICAL	LOW	Risk 6. Response Strategy: further analysis would be required upon the event. We have checked historical records for possible shipwrecks and discovery is unlikely.	LOW	

Searcy Bend Interception MRRP (P2 No. 454322)

TODAY'S DATE		14-Jan-16		Searcy Bend Interception MRRP Project		RISK MATRIX	
UPDATED							
BY WHOM		DEC					
RISK IDENTIFICATION		PROB	SEVERITY	INITIAL RISK	Response Strategy	RESIDUAL RISK	
Risk 6. Trigger: if archaeological artifacts are discovered							
Risk 7. Funding shortfalls Risk 7. Trigger: Identification of insufficient or no funding.		UNLIKELY	MARGINAL	LOW	Risk 7. Response Strategy: Monitor situation and be prepared to obligate in FY16 or FY 17.	LOW	
Risk 8. Schedule delay over 1 month Risk 8. Trigger: 20 day delay.		SELDOM	MARGINAL	MED	Risk 8. Response Strategy: Track design progress using Earned Value Management. Identify early and often threats to schedule delays. Brief schedule at each PRB.	LOW	
Risk 9. Contract acquisition strategy not being conducive to acceptable cost, high quality, and good schedule. Risk 9. Trigger: Recognition of probably delay due to acquisition strategy.		UNLIKELY	MARGINAL	LOW	Risk 9. Response Strategy: Use the familiar and well fitted BSNP MATOC Contract to avoid problems.	LOW	
Risk 10. A flood during construction damages ongoing work or causes changes to the site conditions.		SELDOM	NEGLIBLE	LOW	Risk 10. Response Strategy: Build in contractual flexibility to define the parameters of the flood event and work through the event to construction complete with minimal delay.	LOW	

Searcy Bend Interception MRRP (P2 No. 454322)

TODAY'S DATE		14-Jan-16		Searcy Bend Interception MRRP Project		RISK MATRIX	
UPDATED							
BY WHOM		DEC					
RISK IDENTIFICATION		PROB	SEVERITY	INITIAL RISK	Response Strategy	RESIDUAL RISK	
Risk 10. Trigger: Flood event.					And NEGLIBLE on overall ability to complete construction.		
<p>Risk 11. IEPR impacts to cost and schedule or unresolved comments.</p> <p>Risk 11. Trigger: Decision to perform IEPR in the review plan.</p>		UNLIKELY	MARGINAL	LOW	Risk 11. Response Strategy: Develop Review plan early to determine if IEPR is necessary in order to plan/prepare for extended costs and duration or re-scope the project to remove critical elements causing an IEPR risk informed decision. SEE ABOVE	LOW	
<p>Risk 12. In-House Design Risks: Availability of resources, resource reprioritization, work load, or critical personnel changes.</p> <p>Risk 12. Trigger: Recognition of possible delay of over 20 days leading to a 30 day delay.</p>		LIKELY	MARGINAL	MED	Risk 12. Response Strategy: Track design progress using Earned Value Management. Identify early and often threats to schedule delays. Brief schedule at each PRB.	LOW	

Attachment 3 – Team Rosters

Review Plan Points of Contact:

Name/Title	Organization	Email/Phone
[REDACTED] Project Manager	CENWK-PM-CJ	[REDACTED]
[REDACTED] Technical Lead	CENWK-ED-HR	[REDACTED]
[REDACTED]	CENWK-ED-DT	[REDACTED]
[REDACTED]	CENWK-ED-HR	[REDACTED]
[REDACTED]	CENWK-PM-PR	[REDACTED]
[REDACTED]	CENWK-PM-PR	[REDACTED]
[REDACTED]	CECT-NWK-C	[REDACTED]
[REDACTED]	CENWK-ED-DC	[REDACTED]
[REDACTED]	CENWK-ED-GC	[REDACTED]
[REDACTED]	CENWK-FO-MO	[REDACTED]
[REDACTED]	CENWK-PM-PF	[REDACTED]
[REDACTED] Senior Manager	CEIWR-RMC	[REDACTED]

The DQC Team will be performed by:

Name/Title	Review	Organization	Email/Phone
[REDACTED] NWK	PEER	CENWK-ED-HR	[REDACTED]
[REDACTED]	PEER	CENWK-PM-PR	[REDACTED]
[REDACTED]	PEER	CENWK-PM-CJ	[REDACTED]
[REDACTED]	PEER	CENWK-FO-MO	[REDACTED]
[REDACTED]	BCOES	Chief, CENWK-ED-H	[REDACTED]
[REDACTED]	BCOES	Chief, CENWK-ED-G	[REDACTED]
[REDACTED]	BCOES	Chief, CENWK-PM-P	[REDACTED]
[REDACTED]	BCOES	Chief, CENWK-CD-C	[REDACTED]

[REDACTED]	BCOES	Chief, CENWK-ED-D	[REDACTED]
[REDACTED]	BCOES	Chief, CENWK-ED	[REDACTED]
[REDACTED] Manager	Senior	CEIWR-RMC-WD	[REDACTED]

ATR Team members listed below have been reviewed by Hank Mildenberger, Anthony Hall, Glen Bellew, and Michael Gossenauer for their qualifications, skills, experience level, and prior work on NWK MRRP projects. The ATR Team Lead, Michelle Kniep, has coordinated several MRRP project ATR's. She will also validate these ATR Reviewer's qualifications in CERCAP prior to the start of the ATR review as personal schedules often require alternate qualified individuals.

The ATR Team will likely consist of the following MVS/MVP members:

Name/Title	Organization	Email/Phone
[REDACTED]	CEMVP-PD-F	[REDACTED]
[REDACTED]	CEMVP-PD-P	[REDACTED]
[REDACTED]	CEMVR-EC-G	[REDACTED]
[REDACTED]	CEMVS-EC-HD	[REDACTED]
[REDACTED]	CEMVR-EC-DN	[REDACTED]

The required expertise is listed below followed by the proposed ATR Team member and their qualifications.

ATR Lead – May be combined with Plan Formulation The ATR lead should be a senior professional with expertise and experience in preparing Civil Works decision documents and conducting ATR. The lead should 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.)

[REDACTED] Team Lead- Water Resources Planner, St. Paul District

[REDACTED] Serves as a Water Resources Planner in the Plan Formulation Section of MVD's Regional Planning and Environment Division North. She is currently a Regional Technical Specialist for General Plan Formulation in the Mississippi Valley Division. She received her Bachelor of Science degree in civil engineering from Washington University in 1997. She has been a study manager and project manager for civil works projects involving flood risk management and ecosystem restoration for both Continuing Authorities and specifically-authorized projects since 1997.

Environmental/NEPA -Ecologist - ATR Team member will be an experienced natural resource specialist with a background with preparation of EA's and EIS large GI projects. Strong background with environmental laws, policies, requirements and procedures. Experience will

include a background with regulatory and permitting processes. Background with habitat analysis and cultural resources.

Environmental, St. Paul District

has 16 years experience between Rock Island and St. Paul Districts, working on all aspects of environmental planning studies. also served for 5 years as a Biologist, Regional Technical Specialist for MVD and is currently the Chief of the Environmental Planning Section for MVP. Work experience has included impact assessment, mitigation planning and other activities for fisheries and floodplain resources. has a Bachelor of Science in Biology from the University of Wisconsin, Platteville; and a Master of Science in Biology from the University of Wisconsin, La Crosse.

Geotechnical Engineering – ATR Team member will be a licensed geotechnical engineer with a minimum of 10 years' experience in design, construction, and analysis of existing flood damage reduction projects including but not limited to levees, and channel structures along large river systems. Individual must have worked on at least two multi-objective and multi-stakeholder planning studies.

Geotechnical Engineering, Rock Island District

has over 25 years of experience with the Corps of Engineers, Rock Island District, Geotechnical Branch. areas of expertise include the application of geotechnical principles to riverine habitat development and groundwater analysis. He holds an MS, Civil and Environmental Engineering, from the University of Iowa.

River Engineering - ATR Team member will be a licensed engineer with a minimum of 10 years' experience in analysis of large complex river systems. Individual must have experience in river systems that are used and maintained for navigation and should be knowledgeable of channel morphology, bank stabilization techniques, and Corps of Engineers hydraulic models (HEC-RAS).

River Engineering, St. Louis District

received a BS in Civil Engineering from the University of Rolla (2003) and spent several years working as a civil engineer with the Forest Service before coming to the St. Louis District in 2008. In St. Louis he has been the project manager for the planning and design of a new hydraulic laboratory building; created and ran hydraulic sediment response models to aid in the design of river training structures; conducted river training structure and levee inspections / damage assessments; and has been the technical lead of the "Regulating Works Project". The regulating works project creates and maintains the navigation channel on the Mississippi River between the Missouri and Ohio Rivers through the use of river training structures, revetments, construction dredging, and rock removal. completed the engineering, and plans and specifications for the emergency removal of rock and bedrock of the Mississippi River during the historic low water of 2012-13. He has also served a 4 month detail as Chief of the Hydraulic Design Section. is a registered professional engineer in the state of Missouri.

Civil Engineer - ATR Team member will be a licensed General Civil engineer with at least 10 years' experience with analysis of failure and risk associated with flood control projects. The team member should have experience with plan formulation for large multi-objective and multi-stakeholder planning studies.

██████████ Civil Engineer, Rock Island District

██████████ received her B.S.E. from The University of Iowa, Iowa City, IA in May 1997 and has fourteen years of civil engineering experience. ██████████ worked as a design engineer for French-Reneker Associates from 1997 to 1999 before joining the US Army Corps of Engineers, Rock Island District, as a project engineer/team leader and civil designer. She has lead, designed, and technically reviewed projects involving flood risk management, recreation, and environmental protection and restoration. She serves as an assistant flood area engineer for the Burlington Flood Area located in southeastern Iowa and western Illinois.

Attachment 4 -- Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number