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

REPLY TO
ATTENTION OF

CENWD-RBT

19 MAY 2015

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-CJ /Whitney Wolf)

SUBJECT: Review Plan (RP) Approval for the Tadpole Missouri River Recovery Program Adaptive Management Project.

1. References:

   a. Tadpole Missouri River Recovery Program Adaptive Management Review Plan.

   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.

Encl

JOHN S. KEM
BG, USA
Commanding

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BUILDING
601 E 12TH STREET
KANSAS CITY MO 64106-2824

REPLY TO ATTENTION OF

CENWK-ED

13 March 2015

MEMORANDUM FOR Commander, Northwestern Division, USACE, ATTN: Mr. Douglas Putman.

SUBJECT: Tadpole Missouri River Recovery Program (MRRP) Adaptive Management Project Review Plan (P2#448168)

1. The review plan for the Tadpole MRRP Adaptive Management Project is attached for Northwestern Division's review and approval. The review plan was prepared in accordance with EC-1165-2-214 and uses RMC's review plan template for ATR for implementation documents and other work products in accordance with the EC policy memo dated 15 December 2012.

2. The MRRP Adaptive Management Projects are currently after the implementation phase and now in the Adaptive Management process.

3. The point of contact for this memorandum is the project manager, Whitney Wolf at (816) 389-3315.

3/19/15

DAVID L. MATHEWS, P.E.
Chief, Engineering Division
Kansas City District

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MRRP ADAPTIVE MANAGEMENT PROJECTS

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

Selected MRRP Sites Adaptive Management Measures

US Army Corps of Engineers®

03/17/2015

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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 MRRP Adaptive Management Projects. 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 #448168). 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 RP 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

- ER 5-1-11, USACE Business Processed
- EC 1165-2-214, Civil Works Review Policy, 15 December 2012
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 Mar 2014
- ER 1110-1-12, Quality Management, 31 Mar 2011

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

Scope –Tadpole MRRP Adaptive Management Project:

The intent of the Tadpole Island Chute was to create new, off-channel, shallow water habitat that could serve a variety of functions ranging from food production and foraging area to velocity refuge for intercepted drifting larval fish. However, several factors related to the current geomorphic condition of the chute are preventing this type of habitat from developing. In addition, there have been areas of concern in the navigation channel adjacent to the chute where shoaling occurred and likely was at least partially due to the large amount of water being diverted by the chute.

Factors of concern include:

1) Depth of the chute
2) Velocity in the chute
3) Percentage of flow diverted by the chute
4) Shoaling in the main channel near the exit of the chute
5) Lack of deep entrance conditions across revetment structures at the chute entrance
6) High head differential across the entrance revetment

These factors are closely related to each other and are largely driven by the low sinuosity of the current configuration of the chute and the low chute-to-river ratio (C/R). The current sinuosity is 1.04 and the C/R is 0.82. This effectively makes the chute act as an unimpeded "shortcut" for the river creating a more rapid drop in head which in turn increases the flow diversion and velocity. The flow and velocity in turn cause more erosion and scours the bed of the chute deeper. In order to control these factors with the current configuration, the flow must be heavily controlled with entrance structures thus restricting fish interception.

Potential solutions for this site should address each of the issues as they relate to each other and function as a system. Ad hoc solutions such as the Phase I repair after the 2011 flood might be effective to control some of the symptoms (i.e. flow diversion percentage), but do not offer long term improvement towards the overall goals of the chute.

Additionally, there are some non-technical constraints that should be considered to increase the likelihood of the adaptive management solutions being implemented quickly and effectively. These other considerations/constraints include:

1) Proximity of the chute to existing levee
2) Adhering to the original design intent and project area to avoid new environmental impacts
3) Utilizing cost effective methods that can be implemented within the existing chute

Proposed Design

In an effort to meet the needs stated above, the following elements are proposed for consideration in a solution:

1) A series of internal rock dikes in the chute to break up the current straight flow lines through the chute.
2) Sizing and positioning of the internal dikes to strategically direct flow into the banks at key locations to force an increase in sinuosity and C/R ratio through natural erosion and aggradation processes.
3) Removal of soil and trees from the banks opposite new dikes to speed new bend formation.
4) Placement of removed soil and trees on and adjacent to the new dikes to create new point bars with woody debris.
5) Addition of rootless dikes and/or sills in the main channel adjacent to the chute.

The justification for these features is described below.

Rock Dikes

After construction of Tadpole Chute in 2006, the banks of the chute proved relatively erodible as the chute developed to full design width in fewer years than similar chutes such as the Overton North chute. Because of this, it is reasonable to believe that natural processes could be used successfully to reshape and lengthen the chute to improve its habitat function. By placing a series of dikes within the chute, the flow in the chute could be strategically redirected to encourage erosion of the bank in areas where chute lengthening and increased sinuosity are desired and encourage deposition to form shallow point bars where there is currently deep straight flow. Figure 2 shows the recommended layout for dike addition with these goals in mind. The dikes would be constructed rooted into the bank with a portion of the dike at CRP elevation, as well as a sill on the end of the dike at a lower elevation, likely -3 CRP.FUNCTION – The function

of the added dikes will be to impede direct flow through the straight chute and, instead, force the flow to meander. Initially this meander will be entirely within the existing chute width, but ultimately the areas opposite the ends of the new dikes will erode, lengthening the entire chute and increasing both the sinuosity and C/R ratio. As the flow is directed into the areas of newly eroded bank, it is expected that deposition will occur around the dike roots creating more diverse, shallow point bar habitat.

Single dikes with a lower sill will be used to minimize the rock placement in the chute. While larger dikes installed in pairs would likely speed the development of the new bends, single dikes with sills should accomplish the same goal over a longer time and with less hard features. While single dikes will minimize the rock placement in the chute, some rock is necessary to continually “train” the chute to develop with greater sinuosity. In addition, the minimal rock structures will help maintain the new alignment when the chute experiences higher flows during floods.

While the dikes in the chute will mimic the dikes in the BSNP, it is important to note that there is a distinct difference. The dikes in the BSNP are paired with outside bend revetments and function together with them to limit channel width and lock the channel in place. The dikes in the chute will intentionally NOT be paired with a revetment. By removing that outside bend protections the function of the dikes is substantially different. While there will be sedimentation around the dike root to form a point bar on the inside bend.

This lengthened chute alignment will help address the factors of concern listed above by increasing retention time in the chute and reducing the rate of head drop. This will limit the amount of flow that is diverted from the navigation channel and reduce the initial head drop across the entrance structures.

<u>Bank Excavation and Point Bar Construction</u>

In addition to the placement of rock dikes, it is recommended that the chute banks opposite of each dike be at least partially excavated to encourage the formation of the new bend through outside bend erosion. The material that is excavated, including trees cleared from the bank, should be placed on and around each of the new dikes to act as, and encourage further development of, point bars on the inside of each new bend. Figure 3 shows possible locations of outside bend excavation and inside bend point bar construction. The area on the bank across from dike number six will not be excavated due to the presence of potential wetland type areas in that vicinity. This area would still be anticipated to erode as the chute naturally develops in response to the dike placement, but the area would not be disturbed through construction activity.

Main Channel Rootless Dikes and Sills

To address the shoaling concern adjacent to the chute, it is recommended to consider adding one or two rootless dikes at an elevation of -2 CRP near the right descending bank just upstream of the chute exit. These would be on the downstream end of the inside bend sandbar on Searcy's bend (approximately RM178.4 to RM179.8). These rootless dikes would be intended to function to consolidate flow entering the channel crossing to provide enough flushing flow to keep the channel clear in the crossing to where the flow exiting Tadpole chute rejoins the main channel. The existing sandbar likely provides some of this constricting function, but not at the higher elevations that a rootless dike could. However, the presence of the sandbar might make it impractical or impossible to construct adequate rootless dikes where needed.

In addition to the rootless dikes on the right bank, it is proposed to add a 75 foot long sill at -2 CRP elevation to dike #185.81. This dike is the "kicker" for the crossing or the first spur dike downstream of the crossing control structure. Typically, the kicker does not have a sill like the majority of inside bend dikes. However, the addition of a short sill here should help direct the flow into the crossing further consolidating the flow through the area where shoaling is a concern. Figure 4 shows the proposed main channel BSNP modifications.

The recommended locations for two rootless dikes and one sill extension are shown in Figure 4. However, the practicality and constructability of these features should be determined prior to contract award.

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 - The risk to the Tadpole Adaptive Management project's execution in FY 15 will be the determination of NEPA process being required, or not, per project site. Other typical risks include competing requirements for project people resources.

A concept graphic showing the overall project the features to be constructed is attached to this document.

Include documentation of risk-informed decisions on which levels of review are appropriate.

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 **2** 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 a Environmental Analysis ATR to validate any NEPA impacts. We will also conduct a design ATR for all sites of the MRRP Adaptive Management Projects. 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 2 for PDT/DQC/ATR members.

The draft charge questions for the ATR team are:

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.
-

Required ATR Team Expertise: The ATR team will be chosen based on each individual's qualifications and experience with similar projects. The proposed ATR Team members are listed at ATTACHMENT 2: TEAM ROSTERS directly following the required expertise in that discipline. The ATR Team Expertise by discipline require are:

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.

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.

6. Independent External Peer Review (IEPR)

IEPR may be required for implementation 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 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted.

Decision on Type II IEPR. A Type II IEPR will **NOT** be performed during the Implementation Phase on the design and construction activities associated with the MRRP Adaptive Management Projects. A risk-informed decision was made as to whether IEPR is appropriate based on the factors to consider for conducting a Type II IEPR review that are outlined in EC 1165-2-214, Appendix E, Section 2 (a) thru (c). A risk informed decision was made that this project does **NOT** pose a significant threat to human life (public safety). We base this on the adaptive management measures we will undertake on these sites will be only to return the original project to function as

designed. The project scope will take place within the same foot print as the original project and require no new real estate.

Specifically, as these projects apply to the criteria in EC 1165-2-214,15 for a Risk Informed Decisions on Appropriate Reviews for Type I IEPR and or Type II SAR, they:

- These projects do not address hurricane and storm risk management and flood risk management or;
- These projects are not where Federal action is justified by life safety or; these do not.
- These projects are not where failure of the project would pose a significant threat to human life; this applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities (based on identified risks and threats).
- These projects do not involve the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices; **these do not.**
- These projects' design do not require redundancy, resiliency, and robustness; **to the degree as they would apply to a life safety/property protection project.**
- These projects has unique construction sequencing or a reduced or overlapping design and construction schedule; for example, significant project features accomplished using the Design-Build or Early Contractor Involvement (ECI) delivery systems: **these do not.**

Further,

- Are not a significant threat to human life.
- Estimated total costs of the project, including mitigation costs, ARE NOT greater than $45 million individually or collectively.
- Are not requested by the Governor of an affected State for a peer review by independent experts; or
- Are not such that the DCW or the Chief of Engineers would determine that the project study is controversial due to significant public dispute over either the size, nature, or
- have not had a request by the head of a Federal or state agency charged with reviewing the project study if he/she determines that the project is likely to have a significant adverse impact on environmental, cultural, or other resources under the jurisdiction of the agency after implementation of proposed mitigation plans, or
- haven't had a significant public dispute as to size, nature or effects of the project.
- haven't had a significant public dispute as to the economic or environmental cost or benefit of the project.

- are not cases where information is based on novel methods, presents complex challenges for interpretation, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices.
  (a) Are not likely to be any other circumstance where the Chief of Engineers determines Type I IEPR is warranted.

7. 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.

8. Review Schedule and Costs

To the 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.

a. ***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 and overall review schedule that shows timing and sequence of all reviews.

Project Phase / Submittal	Review Start	Review Complete
DQC Review	**15APR 2015**	**1 MAY 2015**
ATR Review	**15JUN2105**	**30JUN2015**
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**

9. ***IEPR Schedule and Cost.*** NA

10. Public Participation

As required by EC 1165-2-214, the approved Review Plan will be posted on the District public 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.

10. 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.

11. 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 1 COMPLETION OF AGENCY TECHNICAL REVIEW

ATTACHMENT 1 COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *NEPA & Design products* for *<MRRP Adaptive Management Projects>*. 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[sm].

SIGNATURE _____ _____

Name TBD Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Whitney Wolf Date
Project Manager (home district)
Office Symbol –CENWK-PM-CJ

_____ _____

SIGNATURE _____ _____

Putman, Douglas A Date
CENWD-RBT

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.

SIGNATURE _____ _____

David L.Mathews P.E. Date
Chief, Engineering Division (home district)
Office Symbol CENWK-ED

SIGNATURE _____ _____

Name NA Date
Dam Safety Officer[2] (home district)

Office Symbol

[1] Only needed if some portion of the ATR was contracted
[2] Only needed if different from the Chief, Engineering Division.

ATTACHMENT 2: TEAM ROSTERS

ATTACHMENT 2: TEAM ROSTERS

Review Plan Points of Contact:

Name/Title	Organization	Email/Phone
Wolf, Whitney K NWK PROJECT MANAGER	**PM-CJ**	**(816) 389-3315 Whitney.K.Wolf@usace.army.mil**
Gossenauer, Michael B NWK TECHNICAL LEAD	**ED-HR**	**816-389-3162 Michael.B.Gossenauer@usace.army.mil**
Jalili-Kamali, Shahrzad D NWK	**ED-HR**	**816-389-3229 Shahrzad.D.Jalili-Kamali@usace.army.mil**
Hill, Heather B NWK	**ED-HR**	**816-389-2305 Heather.B.Hill@usace.army.mil**
Williams, Aaron R NWK	**ED-HR**	**816-389-3396 Aaron.R.Williams@usace.army.mil**
Campbell, James D NWK	**FO-MO**	**816-389-3680 James.D.Campbell@usace.army.mil**
Marske, Andrew N NWK	**ED-GC**	**816-389-3371 Andrew.N.Marske@usace.army.mil**
John Clarkson/Senior Manager	**CEIWR-RMC**	**john.d.clarkson@usace.army.mil**

The DQC Team will be performed by:

Name/Title	Review	Organization	Email/Phone
Hall, Anthony D NWK	PEER	**ED-HR**	Per USACE Global
Granet, Jesse J NWK	PEER	**PM-PR**	Per USACE Global
White, Zachary L NWK	PEER	**PM-CJ**	Per USACE Global
Bass, Neil N NWK	PEER	**PM-PR**	Per USACE Global
Rudy, James D NWK	PEER	**FO-MO**	Per USACE Global
Shumate, Eric D D NWK	BCOES	**Chief, ED-H**	Per USACE Global
Owen, Jacob W NWK	BCOES	**Chief, ED-G**	Per USACE Global
Switzer, Jennifer L NWK	BCOES	**Chief, PM-P**	Per USACE Global
Kraft, Frederick C NWK	BCOES	**Chief, CD-C**	Per USACE Global
Turner, James B NWK	BCOES	**Chief, ED-D**	Per USACE Global
Mathews, David L NWK	BCOES	**Chief, ED**	Per USACE Global
John Clarkson/Senior Manager		**CEIWR-RMC**	**john.d.clarkson@usace.army.mil**

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
Kniep, Michelle R MVS-ATR LEAD	CEMVP-PD-F	Michelle.R.Kniep@usace.army.mil (314) 331-8404
Gordon, David MVS Hydraulic Engineering	CEMVS-EC-HD	(314) 331-8358 David.Gordon@usace.army.mil
George, Timothy K MVS Ecologist	CEMVP-PD-C	314-331-8459 Timothy.K.George@usace.army.mil
Conroy, Patrick J MVS GeoTechnical	CEMVS-EC-GT	314-331-8430 Patrick.J.Conroy@usace.army.mil
Sunderman, Kirk J MVR Civil Engineering	CEMVR-EC-DM	309-794-5140 Kirk.J.Sunderman@usace.army.mil

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

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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.)

Michelle Kniep- Team Lead- Water Resources Planner, St. Paul District Michelle Kniep 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.

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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.

Timothy George- Environmental/NEPA –Ecologist -St. Paul District Mr. George serves as an ecologist and chief of the Environmental Compliance Branch within MVD's Regional Planning and Environment Division North. He received a Bachelor of Science in Biological Sciences from Western Illinois University in 1975 and a Master's Degree in Zoology from the University of Illinois in Campaign-Urbana in 1977. Mr. George has worked since 1980 in natural resource management, regulatory, and planning. With planning, he has worked in the areas of impact assessment, NEPA document preparation, habitat evaluation models, wetland evaluation and mitigation planning, threatened and endangered species, and ecosystem and habitat restoration project planning.

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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.

Patrick Conroy, P.E., Geotechnical Engineer, Mr. Conroy currently serves as a Supervisory Civil Engineer in the Geotechnical Branch of the St. Louis District. He also serves as a Regional Technical Specialist in Geotechnical Engineering for the Mississippi Valley Division, providing technical advice and counsel to geotechnical engineers throughout the Division. He has a BS in Civil Engineering from the University of Missouri at Rolla (December 1979) and an MS is Civil Engineering from Oklahoma State University, Special Program in Geotechnical Engineering (July 1987). He is a registered Professional Engineer in the State of Missouri. Mr. Conroy has 34+ years of experience in many facets of geotechnical engineering including the investigation, design, and construction of large civil works flood control
and navigation projects.

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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).

David Gordon, P.E., River Engineering, Mr. Gordon is currently the Chief of Hydraulic Design at the U.S. Army Corps of Engineers St. Louis District office. Amongst other responsibilities, he is responsible for navigation engineering to maintain a safe, dependable, and environmentally friendly navigation channel along the Mississippi River by evaluating the river for maintenance dredging activities and by modeling, designing and implementing river training structures. He has worked for a total of 17 years as a hydraulic engineer. During this time he has also completed details as a Project Manager for EMP Projects and for the Locks 27 Major Rehab Project, as the Assistant Chief of the Engineering and Construction Division, and as the Chief of Dam and Levee Safety within the Geotechnical Branch. He has authored several technical papers and has made presentations at several conferences. Mr. Gordon received the International Navigation Association's De-Paepe Willems Award for the U.S. Section.

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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.

Kirk Sunderman, P.E., Civil Engineering, Rock Island District Kirk Sunderman is a Project Engineer with 22 years of design experience with the U.S. Army Corps of Engineers at the Rock Island District. He currently serves as the technical design leader for the Cedar Rapids, Iowa, Flood Risk Management Project. His primary design expertise includes flood risk management projects, roads & trails, and environmental enhancement projects. He also has collateral duties as the Waterloo Flood Area Engineer. In this position, he is responsible for leading district response teams on emergency management actions within the Iowa and Cedar River Basins. He received his Bachelor of Science in Civil Engineering from Iowa State University and is a registered Professional Engineer in the State of Iowa.

ATTACHMENT 3: REVIEW PLAN REVISIONS

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Revision Date	Description of Change	Page / Paragraph Number