



REPLY TO
ATTENTION OF

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

CENWD-PDD

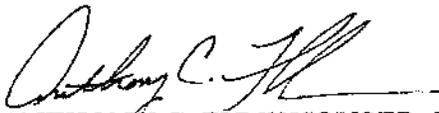
08 MAR 2013

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-PF/Christina Ostrander)

SUBJECT: Review Plan (RP) Approval for the Missouri River Bed Degradation Feasibility Study

1. Reference EC 1165-2-209, Civil Works Review Policy, 31 January 2012.
2. The enclosed RP for the Missouri River Bed Degradation Feasibility Study has been prepared in accordance with the reference guidance.
3. The RP has been revised to address all review comments. All comments have been back-checked and closed out.
4. I hereby approve this RP, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this RP or its execution will require review by CENWD-PDD and approval by this office.
5. The RP should be posted to the internet and available for public comment.
6. Please contact Jeremy Weber, at 503-808-3858, if you have further questions regarding this matter.

Encl


ANTHONY C. FUNKHOUSER, P.E.
BG, USA
Commanding

REVIEW PLAN

For

Missouri River Bed Degradation Feasibility Study

PN 146254

Kansas City District

February 11, 2013

(Supersedes all previous drafts)



**US Army Corps
of Engineers** ®

REVIEW PLAN

*Missouri River Bed Degradation Feasibility Study
Missouri River, Kansas and Missouri*

TABLE OF CONTENTS

Table of Contents

1.0 PURPOSE AND REQUIREMENTS..... 1

2.0 REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION..... 2

3.0 STUDY INFORMATION 2

4.0 DISTRICT QUALITY CONTROL (DQC)..... 5

5.0 AGENCY TECHNICAL REVIEW (ATR) 5

6.0 INDEPENDENT EXTERNAL PEER REVIEW (IEPR) 9

7.0 POLICY AND LEGAL COMPLIANCE REVIEW 11

8.0 COST ENGINEERING AND ATR MANDATORY CENTER OF EXPERTISE (MCX) REVIEW
AND CERTIFICATION..... 11

9.0 MODEL CERTIFICATION AND APPROVAL..... 11

10.0 REVIEW SCHEDULES AND COSTS 12

11.0 PUBLIC PARTICIPATION 13

12.0 REVIEW PLAN APPROVAL AND UPDATES 14

13.0 REVIEW PLAN POINTS OF CONTACT 14

ATTACHMENT 1: TEAM ROSTERS 15

ATTACHMENT 1: TEAM ROSTERS (Cont)..... 16

ATTACHMENT 2: STATEMENTS OF COMPLETION AND CERTIFICATION OF AGENCY
TEHCNICAL REVIW..... 17

ATTACHMENT 3: REVIW PLAN REVISIONS..... 19

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS..... 20

1.0 PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of review for the Missouri River Bed Degradation Feasibility Study Report. The review plan is a standalone document but is also included as an appendix to the Missouri River Bed Degradation Project Management Plan (PMP). The Missouri River Bed Degradation Project is a cost-shared project, authorized under the Section 216, Flood Control Act of 1970 “Review of Completed Projects”.

b. References

- (1) Engineer Circular (EC) 1165-2- 214, Civil Works Review Policy, 15 December 2012.
- (2) Engineering Regulation (ER) 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (3) ER 1110-2-12, Quality Management, 30 Sep 2006
- (4) EC 1105-2-412 Assuring Quality of Planning Models, 31 March 2011
- (5) Planning SMART Guide located at the Planning Community Toolbox Website at: <http://planning.usace.army.mil/toolbox/smart.cfm?Section=1&Part=>
- (6) Missouri River Bed Degradation Feasibility Study, Project Management Plan (currently being revised as a SMART planning project)
- (7) Decision Management Plan (DMP) concerning Viable Array of Alternatives, December 2012
- (8) District Quality Control Plan, Missouri River Bed Degradation Study, December 2012.

c. Requirements. This review plan was developed in accordance with EC 1105-2-214, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents. The EC 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), and 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 and planning model certification/approval. Review requirements are addressed in sections 4 through 9 of this review plan.

2.0 REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The Review Management Organization (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 the Flood Risk Management (FRM) PCX.

The RMO will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure that the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules, and contingencies.

It is noted that safety assurance reviews are required for projects involving life safety issues. The Safety Assurance Review or Type II IEPR would be implemented after the feasibility study is complete and the project is the design phase of work. At that time the RMC will become the RMO.

3.0 STUDY INFORMATION

- a. Decision Document.** The purpose of the study is to identify and evaluate alternatives to address the impacts of river bed degradation on the lower Missouri River, from Rulo, NE to the mouth at St. Louis, MO. The study will identify and evaluate alternatives to minimize or eliminate future impacts of the bed degradation to the Federal infrastructure and local public infrastructure. The technical studies to establish baseline conditions are complex and require substantial engineering analysis and application of judgment. The study will identify and evaluate various combinations of measures to form implementable alternatives and conduct the environmental assessment. The combinations may include measures for implementation by others, for cost shared implementation, and possibly for implementation by the Corps of Engineers. The project will produce a Feasibility Report. The report will require MSC, HQUSACE, and Chief of Engineers approval and Congressional authorization to move forward to a cost-shared design and construction project.
- b. Study Description.** The study is being carried out under the U.S. Army Corps of Engineers' General Investigations (GI) Program. Authorization for the study is via Section 216 of Public Law 91-611, Flood Control Act of 1970. The Missouri River Bank Stabilization and Navigation Project (BSNP) is the project of interest, both as a causal factor, and as part of the impacted federal infrastructure. The study will examine the effects of degradation on the long-term stability and sustainability of the BSNP. There are significant flood risk management features, located primarily within the Kansas City Reach and near St. Joseph, MO, that are dependent on the stability of the BSNP and are potentially also impacted by continued bed degradation. Recommendations for structural or operating changes that have potential for minimizing degradation impacts will be considered. In addition, the study will consider approaches to help or maintain or enhance the viability of federally constructed ecosystem projects such as constructed wetlands and shallow water habitat. The study will also inventory and assess measures that protect local and public infrastructures. The

feasibility study total project cost is estimated at \$4,800,000 and is being cost share at 50/50 with the non-federal sponsor. If the decision document is approved by the Chief of Engineers, implementation of a recommended plan will require Congressional authorization. An estimated total project cost for implementation is unknown but would likely be below the \$15M range.

The BSNP purpose is to maintain a navigation channel that is 9 feet deep and 300 feet wide. Features of the BSNP consist mainly of rock revetments and dikes that restrict lateral movement of the river channel and maintain a self-scouring navigation channel. Adjustments are made occasionally to these features to maintain the navigation channel at the authorized depth. The BSNP is a self-scouring system with no associated locks and dams. Water to support required flows during the navigation season are made from releases from the system of dams on the main stem of the Missouri River and also with limited amounts of flow from dams on the tributaries to the Missouri River. The management of releases is through the Missouri River Basin Water Management Office (MRBWM) and as described in the Mainstem System Master Water Control Manual, revised March 2006 (Master Manual).

There are a number of channel improvements, levees, and floodwalls within the Kansas City reach that comprise the Kansas City Metropolitan Levee System. This flood risk management (FRM) system covers a two-state and multi-community area with multiple levee districts and supporting agencies. Other FRM systems exist along the lower Missouri River to provide protection for other communities. The federal FRM systems are operated and maintained by public entities. In some cases, there are shared boundaries between the FRM systems' structures and the features of the BSNP.

A fish and wildlife mitigation program was authorized for the BSNP in the Water Resources Development Act (WRDA) of 1986, based on the 1981 feasibility study and Environmental Impact Statement (EIS). In 2000, the Corps of Engineers completed formal consultation with the U.S. Fish and Wildlife Service (USFWS) for protection of the pallid sturgeon, a federally listed endangered fish species native to the Missouri River. In addition the USFWS issued a biological opinion (BiOp) in 2000 (amended in 2003) requiring the Corps of Engineers to restore 7,530 acres of shallow water habitat. The restoration activities are undertaken via the Missouri River Recovery Program (MMRP).

Generalized risk can be discussed in terms of the proposed measures that may be evaluated. When addressing a problem such as riverbed degradation there are multiple factors that may affect the effectiveness of measures. The causes of degradation are interdependent and it may not be possible to address degradation fully through implementation of measures targeted at addressing causes on an individual basis.

From the standpoint of alternative formulation, the study is complex. Implementable measures will improve the long-term stability of the river bed to different degrees. Individually, each measure may provide benefit to certain infrastructures of concern but on their own merits, however, there is not likely a single implementable measure that would provide comprehensive benefits. Some measures may have environmental benefits and others may need more in-depth consideration of environmental impacts. Some measures may

require implementation of a surveillance plan to evaluate their effectiveness and require some mechanisms for future adjustments. It is envisioned that the study will require development of several combinations of measures to form alternatives for comparisons.

c. Factors Affecting the Scope and Level of Review. This section points out significant elements of the project that will affect the review of the decision document.

- The BSNP is a highly complex system that was put in place over an extended period of time.
- Response by the river to historic adjustments is difficult to assess and quantify due to the combinations of influences such as drought, cutoffs, flow modification, dredging, etc. on the river morphology.
- Influences that cause degradation are interdependent.
- Modeling sediment transport is a state of the art technology and could result in an over or underestimation of the river response to adjustments.
- A mobile bed model has been developed using Hydrologic Engineering Center River Analysis (HEC-RAS) software. Review of the model setup and calibration is required early in the study as the mobile bed model is the foundation of the study analysis and screening.
- Significant interagency interest is anticipated.
- The project poses complex challenges for interpretation of information/data, including the fact that bed elevation and surface water elevations are important components of assessing and quantifying impacts.
- The alternative development and evaluation may be more complex than typical studies and will rely on professional judgment and at least some degree of qualitative analysis. There may not be implementable measures that can fully address the problems.
- There is potential life safety risk. Generally life safety risk for levees and FRM structures has been identified and continues to be evaluated under the Kansas Citys, Missouri and Kansas, FRM Study. However, there are additional flood risks that may be posed by future bed degradation. These risks have been qualitatively evaluated and would be expected to have a low probability of occurrence. The low probability is based on the historical close monitoring during and after flood events and based on a historical record of prompt execution of repair work following flood events. The District Chief of Engineering has reviewed and concurs with this assessment of life safety risk.
- It is anticipated the study will receive favorable public support as evidenced by the number of stakeholders participating and supporting the study.
- An EIS is not anticipated at the outset of the study but there is risk that EIS would eventually be deemed necessary. An Environmental Assessment (EA) will be completed if an EIS is not required.

d. In-Kind Contributions. In-kind contributions will be credited for public communications, setting up meeting venues and maintaining information for a website and stakeholder contact list, preparing posters and other informational displays, and hosting meetings. In addition the sponsor is provided work-in-kind (WIK) credits for project coordination team costs. The

scope of the remainder of WIK primarily includes the development of infrastructure inventories that can be used in screening or establishing baseline conditions. These WIK contributions are relatively straightforward and primarily involve information gathering and consolidation but not to involve highly detailed or final engineering, economic, or environmental analysis. The engineering, economic, and environmental analysis will be conducted by the Corps of Engineers project delivery team. Therefore, the WIK contributions have been reviewed by the PDT to verify the quality of the information for acceptance and crediting; the PDT will incorporate the information provided into the report documentation through the work of conducting the analysis and economic assessments using the inventory information as appropriate.

- e. **Background Information/Reports.** A full listing of historical documents is not provided herein. However, the following documents for the project contain information that the Agency Technical Review Lead (ATRL) and Agency Technical Review Team (ATRT) should become familiar with. These documents will be posted to the project Sharepoint site. An ATRT folder will be placed on the project Sharepoint where key reference documents and links to other pertinent background information will be posted:

- (1) Missouri River Bed Degradation 905 (b) Analysis, August 2009 and presentation slides.
- (2) Report Synopsis, December 19, 2012
- (3) Decision Management Plan (DMP-1) December 19, 2012
- (4) Risk Register for DMP-1, December 19, 2012

4.0 DISTRICT QUALITY CONTROL (DQC)

The decision document (including supporting data, analyses, environmental compliance documents, etc.) will undergo District Quality Control (DQC). The Kansas City District will manage the DQC. Documentation of DQC activities is required and will be conducted in accordance with the Quality Manual of the Kansas City District and Northwestern Division. Peer reviews will be conducted on all work products in accordance with the project Quality Management Plan (QMP) and established quality management processes. A record of key comments/concerns addressed within the DQC will be provided to the ATR team at each review.

5.0 AGENCY TECHNICAL REVIEW (ATR)

- a. **General.** ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the production of the project/product. The purpose of this review is to ensure that the product is consistent with established criteria, guidance, procedures, and policy. The review will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATRT will be from outside the home district. The ATRL will be from outside the home MSC. The ATRL and other applicable team members will participate

in vertical team meetings (frequency to be determined). These meetings – generally referred to as In-Progress Reviews (IPRs) - will be conducted for development of or sharing key study information, making key study decisions and to address policy concerns as they are encountered during the study process.

b. Products for Review. The project delivery team will develop products requiring ATR. At a minimum these review products will include:

- (1) Mobile Bed Model development and calibration,
- (2) Documentation of initial screening,
- (3) Draft Feasibility Report (including National Environmental Policy Act (NEPA) documentation and technical appendixes).
- (4) The ATRT will back check their comments in the Final Report (including NEPA documentation and technical appendixes).

c. Required ATRT Expertise. The ATRT will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATRT will reflect the significant disciplines involved in the planning and engineering effort. The ATR team will consist of team members from the following disciplines:

ATR Team Members/Disciplines	Expertise Required
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.)
Plan Formulation	Team member will be an experienced planner with a minimum of 10 years in water resources planning and with a background of working with large GI studies and feasibility reports. The planner should be familiar with navigation, flood risk management, environmental restoration alternative development and with planning policy and guidance for plan formulation and the SMART planning process.
Economics	Team member will have extensive experience with multi-purpose projects such as flood-risk management, water supply and navigation. Experience with analysis of RED and OSE accounts is desirable. The purpose of this economic analysis is to calculate projected future damages under without-project conditions and under alternative with-project conditions to identify the economic value of the damages avoided for each alternative plan. Future damages include repair and replacement costs for at-risk-infrastructure, which is owned and maintained by federal, state, and local governments, and by

	<p>private entities. In addition, bed degradation increases BSNP maintenance and operations costs and impacts Missouri River main stem dam project operation (e.g. discretionary releases for downstream municipal water supply). Damages avoided, which are project benefits, are calculated as the difference between projected damages under without-project and with-project conditions. Existing HEC-FDA model from the Kansas Citys Levee Feasibility study may be used if necessary for detailed analysis of catastrophic events.</p>
Hydraulic Engineering	<p>Team member will be a licensed hydraulic engineer with a minimum of 10 years experience in analysis of large complex river systems. Individual must have experience with Corps of Engineers hydraulic AND sedimentation models (HEC-RAS). Individual must have experience with sediment transport AND is strongly desired to have experience with degradation problems. Individual must have worked on at least two multi-objective and multi-stakeholder planning studies. An engineer with degradation experience is recommended. This is a critical discipline may require more than one reviewer depending on the strength of the reviewers experience.</p>
Structural Engineering	<p>Team member will be a licensed structural engineer with a minimum of 10 years experience in design, construction, and analysis of existing flood damage reduction projects including but not limited to urban levees, floodwalls, and channels along large river systems. Individual should have experience in risk and reliability assessments. Individual must have worked on at least two multi-objective and multi-stakeholder planning studies.</p>
Geotechnical Engineering	<p>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 urban levees, floodwalls, and channel structures along large river systems. Individual must have worked on at least two multi-objective and multi-stakeholder planning studies.</p>
Risk Analysis - Life Safety	<p>A senior level engineer with experience with conducting safety assurance reviews for feasibility level engineering analysis. This reviewer may be filled with a reviewer from the engineering disciplines listed above.</p>
Environmental/NEPA	<p>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</p>
Cost engineering	<p>Team member will be assigned by the MCX.</p>
Civil Engineer	<p>General Civil engineering with at least 10 years experience with analysis of failure and risk associated with utilities and flood control projects. The team member should have experience with plan formulation for large multi-objective and multi-stakeholder planning studies.</p>
Navigation	<p>Team member will be an engineer with a minimum of 10 years experience in operations of the Missouri River - or experience with</p>

	adjustment and design criteria for similar navigation features.
Real Estate	Team member will be familiar with necessary components in a real estate plan involving multiple alternative measures. Experience with screening methods for projects covering large areas is ideal.
Other disciplines/functions	The team leader will make a decision on the need for other review disciplines. These may include but are not limited to Risk Analysis, Water Quality, Cultural Resources, Hazardous/Toxic Waste and Legal. 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.

Appropriate selection of the leader of the ATRT will be made to assure independence. The name of the ATRL and list of the selected ATRT members and disciplines will be provided as an attachment to this review plan when available.

d. Documentation of ATR. Design Review and Checking System (DrChecks) software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should 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 be 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 PDT 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 will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATRT will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall also:

- 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 prepared by the PCX;
- Describe the nature of their review and their findings and conclusions; and
- Include a verbatim copy of each reviewer's comments and the PDT’s responses.

ATR may be certified when all ATRT concerns are either resolved or referred through the vertical team to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the draft and final report.

6.0 INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

- a. General.** IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) and will address the adequacy and acceptability of the economic, engineering and environmental methods, models and analysis used. There are two types of IEPR reviews.
- **Type I IEPR.** Type I IEPR reviews are managed by an OEO on project studies. Type I IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. The type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, engineering analysis, 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. The Type I IEPR will cover the entire decision document and will address all underlying engineering, economic, and environmental work, not just one aspect of the study. Type II IEPR (Safety Assurance Review) is anticipated during project implementation phase. Therefore, safety assurance will be addressed during the Type I IEPR.
 - **Type II IEPR.** Type II IEPR or Safety Assurance Reviews (SAR) are also managed by an OEO, 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 conduct reviews of the design and construction documentation prior to the initiation of physical construction and, until construction activities are completed. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare.
- b. Decision on IEPR.** EC 1165-2-214 requires external peer reviews for projects where information is based on novel methods, presents complex challenges for interpretation, contains precedent-setting methods or models, presents conclusions that are likely to change prevailing practices, addresses important safety risks or is likely to affect policy decisions that have a significant impact. An IEPR is anticipated for the project due to the complex nature of the problem and the challenges involved in analysis. Type II IEPR Safety Assurance review is likely to be required in design and implementation phase. Therefore, type II IEPR Safety Assurance considerations will be addressed during the Type I IEPR.

- c. Products for Review.** The IEPR will be performed concurrently on the draft Feasibility Study Report (including NEPA/environmental compliance documentation and technical appendixes). The IEPR review will be conducted concurrently with public review of the draft document.
- d. Required IEPR Panel Expertise.** The IEPR should consist of at a minimum a four- person panel to include members that have expertise in the following areas:

Hydraulic Engineer: Team member will have extensive experience with large river system hydraulics.

Geotechnical Engineer: Team member will have extensive experience in levee and floodwall design, pre- and post-construction evaluation, and rehabilitation. A licensed professional engineer is required.

Plan Formulation: Team member will have extensive experience in the Corps planning process and be knowledgeable of Corps policies and guidelines. He or she should be familiar with navigation projects, as well as flood risk management projects.

Economics: Team member will have extensive experience in multi-purpose projects, such as flood-risk management, water supply, and navigation. A spreadsheet model is being developed to evaluate projected future damages under without-project conditions and under alternative with-project conditions to identify the economic value of the damages avoided for each alternative plan. Damages avoided, which are project benefits, are calculated as the difference between projected damages under without-project and with-project conditions. The existing HEC-FDA model from the Kansas Citys Levee Feasibility study may be used if necessary for detailed analysis of catastrophic events.

Risk Assessor: The team member will have extensive experience with reviewing FRM and similar water resources projects for assessment and presentation of risk and public safety considerations.

Other potential panel members may include those with expertise in environmental and cost engineering.

- e. Documentation of IEPR.** DrChecks review software will be used to document IEPR comments and aid in the preparation of the Review Report. Comments should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 3. The OEO will be responsible for compiling and entering comments into DrChecks. The IEPR team will prepare a Review Report that will accompany the publication of the final report for the project and shall:

- 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 (scope/responsibilities) as prepared by the PCX;

- Describe the nature of their review and their findings and conclusions; 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.

7.0 POLICY AND LEGAL COMPLIANCE REVIEW

Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in the Washington level 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. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.

8.0 COST ENGINEERING AND ATR MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

The decision document will include feasibility level cost estimates. The MCX, located in Walla Walla District will lead the cost engineering review and certification. The RMO is responsible for coordination with the MCX. The MCX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The MCX will also provide the Cost Engineering certification.

9.0 MODEL CERTIFICATION AND APPROVAL

- General.** The use of certified or approved models for all planning activities is required by EC 1105-2-412. This policy is applicable to all planning models currently in use, models under development and new models. The use of a certified or approved model does not constitute technical review of the planning product. The selection and application of the model and the input data and results are the responsibility of the users and is subject to DQC, ATR, and, if appropriate, IEPR. Independent review is applicable to all models, not just planning models.

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. As part of the USACE Scientific and Engineering

Technology (SET) initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

- b. Both the planning models (including the certification/approval status of each model) and engineering models used in the development of the decision document are described below:
- c. **Planning Models.** The following planning models are anticipated to be used:

A spreadsheet model is being developed to evaluate projected future damages under without-project conditions and under alternative with-project conditions to identify the economic value of the damages avoided for each alternative plan. Damages avoided, which are project benefits, are calculated as the difference between projected damages under without-project and with-project conditions. In accordance with EC1105-2-412, the spreadsheet model will need review and approval before being an accepted model for the study. The PCX will coordinate the review.

HEC-FDA 1.2.4. (Certified). The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The existing HEC-FDA model from the Kansas Citys Levee Feasibility study may be used if necessary for detailed analysis of catastrophic events.

Other models, such as HEP or IWR Planning Suite may be utilized, but are not specified at this time. The need for a model to assess navigation benefits or damages is not anticipated.

- d. **Engineering Models.** A mobile bed model will be developed using HEC-RAS software. The software is standard Corps of Engineers software. The model setup and calibration will require specialized review due to the use of the sediment transport analysis component of the HEC-RAS system and the high degree of reliance on model results for study decisions.

10.0 REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost.

Key project milestone dates are as follows:

- CW261 Alternatives Milestone and IPR - 15 Aug 2013
- XX999 Detailed Screening and IPR – 6 Jun 2014
- XX999 ATR Draft Feasibility Report – March 2015
- CW262 Tentatively Selected Plan - IPR and Draft Report 27 May 2015
- CW263 Agency Decision - 9 Jul 2015

- CW160 Submit Final Report - 2 Dec 15
- CW270 Submit Chief's Report - 8 Feb 2016

At a minimum the ATR will conduct the following reviews:

Mobile Bed Model Setup and Calibration	Jan/Feb 2013
Detailed Screening	June 2014
Draft Feasibility Report	March 2015

Interim products for discussion and informal review will be provided. These will include information pertaining to the methodologies being used in the study, baseline conditions analysis and future conditions analysis. It is anticipated that reviewers will be assigned for early involvement. Intermittent involvement by members of the ATRT will be requested before the Tentatively Selected Plan (TSP) documentation is completed. This should help facilitate the review of the draft report and provide opportunity for the PDT to get feedback at key decision points in the study process. Details about the timing of the early involvement and ATR kickoff will be determined with the PDT and ATRL.

In conjunction with the execution of ATR, the RMO will coordinate with the Cost Engineering MCX, located in Walla Wall District for determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of review charge(s). The MCX will provide the Cost Engineering MCX certification.

The estimated ATR and Cost MCX review is \$80,000.

- b. IEPR Schedule and Cost.** The government cost for IEPR cost is estimated at \$300,000. The IEPR would be conducted concurrently with public review of the draft Feasibility Report which occurs after the Agency Decision Milestone (July 2015). The sponsor is aware that the cost shared project will pay the cost to award and manage the contract and for the PDT to respond to IEPR comments.
- c. Model Certification/Approval Schedule and Cost.** The spreadsheet model discussed in section 9.c above will require review and approval for use in the feasibility study. The model is not anticipated to be overly complex or controversial and therefore it is anticipated that internal Corps expertise will be utilized. This review is outside the ATR and will be managed and coordinated through the PCX. The model is underdevelopment and is anticipated to be ready to review prior to the alternatives milestone – currently scheduled for August of 2013. The estimated cost of the review is \$10,000.00.

11.0 PUBLIC PARTICIPATION

The public will be able to comment on the feasibility study during the decision making process. A public scoping meeting is planned but has not been held. The sponsor will provide assistance for the public meeting and comment management under WIK contribution to the project.

12.0 REVIEW PLAN APPROVAL AND UPDATES

Review plans for decision documents and supporting analyses are coordinated with the appropriate Planning Center(s) of Expertise (PCXs) based on the primary purpose of the decision document to be reviewed. The lead PCX for this study is the FRM PCX. The PCX has selected the ATRL. The ATRL will determine additional ATR members.

The Northwestern Division is responsible for approving the review plan. Approval is provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, and HQUSACE 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 will be documented in the attachment - Review Plan Revisions. Changes to the review plan will be approved by following the process used for initially approving the plan. The MSC will review the decision on the level of review and any changes made in updates to the project. The latest version of the approved Review Plan, along with the Commanders' approval memorandum, will be posted on the Home District's webpage located at <http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx>.

13.0 REVIEW PLAN POINTS OF CONTACT

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

District Quality Control

Kansas City District..... Christina Ostrander, Project Manager (816) 389 3143
Kansas City District..... Cassidy Garden, Engineering Lead (816) 389 3851

Agency Technical Review

Agency Technical Review Lead (ATRL)..... Craig O. Evans (651) 290-5594

IEPR

Review Management OfficeTBD

RMO

FRM-PCX, POCEric Thaut, Deputy Director (415) 503-6852

ATTACHMENT 1: TEAM ROSTERS

TABLE 1: Product Delivery Team		
Functional Area	Name	Office Symbol
Project Manager	Christina Ostrander	PM-PF
Product Delivery Team Members		
1. Civil Design Section/Engineering Lead		ED-GC
2. Hydrology and Hydraulics		ED-HR
3. Geotechnical		ED-GD
4. Structural		ED-DS
5. Economics		PM-PF
6. NEPA, Section 106 and Main Report		PM-PR
7. Economics		PM-PF
8. Cost Engineering		ED-DC
9. Hydrology and Hydraulics		EC-HR
10. GIS		ED-GS
11. Real Estate Mapping & Appraisal		
12. Project Controls		PM-CG
13. Program Analysis		PM-CG
14. Communications		PM-PF
15. Public Affairs		PA
Contractor Delivery Team Members		
1. Economics/Plan Formulation		DMA*
2. Environmental Baseline/NEPA		DMA
3. Inventory/GIS		DMA

*David Miller and Associates, Inc.

TABLE 2: Agency Technical Review Team		
DISCIPLINE	NAME	OFFICE SYMBOL
Team Leader/Plan Formulation	Craig Evans	CEMVP-PD-F
Economics		
Hydraulic Engineering		
Structural Engineering		
Geotechnical Engineering		
Risk Analysis - Life Safety		
Environmental/NEPA		
Cost engineering		
Civil Engineer		
Navigation		
Real Estate		
Other disciplines/functions		

ATTACHMENT 1: TEAM ROSTERS (Cont)

DISCIPLINE	NAME	EDUCATION & EXPERIENCE

Vertical Team

The Vertical Team (VT) consists of members of the HQUSACE and CENWD Offices. The Vertical Team plays a key role in facilitating execution of the Feasibility study through participation in In-Progress Reviews (IPR) at key decision points in the study. At each decision point an IPR review will be held with the VT. A Decision Management Plan for execution of work through to the next decision will be drafted to record the decisions made by the VT at the IPRs. The Vertical Team is responsible for providing the PDT with issue resolution support and guidance as required. The Vertical Team will remain engaged seamlessly throughout the study via teleconferences as required and will attend In Progress Reviews and other key decision briefings. Generally the IPRs will be held in conjunction with the milestone schedule; however the VT and PDT may elect to hold more frequent IPR meetings. Jeremy Weber, District Support Planner, NWD is the District PM's primary Point of Contact on the Vertical Team.

ATTACHMENT 2: STATEMENTS OF COMPLETION AND CERTIFICATION OF AGENCY TECHNICAL REVIEW

COMPLETION OF AGENCY TECHNICAL REVIEW

The District has completed the Feasibility Study of Missouri River Bed Degradation Study, Kansas and Missouri. Notice is hereby given that an agency technical review has been conducted as defined in the Review Plan to comply with the requirements of EC 1165-2-214. During the agency technical review, compliance with established policy principals and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analysis; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appeared to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments closed in DrChecks.

Craig O. Evans, P.E.
Agency Technical Review Team Leader
CEMVP-PD-F

Christina Ostrander
Project Manager
CENWK-PM-PF

TBD
Review Management Office Representative

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact, and resolution)

As noted above, all concerns resulting from the agency technical review have been fully resolved.

Dave Mathews
Chief, Engineering Division
CENWK-ED

Jennifer Switzer
Chief, Planning Branch
CENWK-PM-P

ATTACHMENT 3: REVIW 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>
ASA(CW)	Assistant Secretary of the Army for Civil Works	O&M	Operation and maintenance
ATR	Agency Technical Review	OMB	Office and Management and Budget
ATRL	Agency Technical Review Lead	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
ATRT	Agency Technical Review Team	OEO	Outside Eligible Organization
BSNP	Missouri River Bank Stabilization and Navigation Project	OSE	Other Social Effects
BiOP	Biological Opinion	PCX	Planning Center of Expertise
DQC	District Quality Control/Quality Assurance	PDT	Project Delivery Team
EA	Environmental Assessment	PMP	Project Management Plan
EC	Engineer Circular	PL	Public Law
EIS	Environmental Impact Statement	QMP	Quality Management Plan
EO	Executive Order	QA	Quality Assurance
ER	Ecosystem Restoration	QC	Quality Control
FDR	Flood Damage Reduction	RED	Regional Economic Development
FEMA	Federal Emergency Management Agency	RMC	Risk Management Center
FRM	Flood Risk Management	RMO	Review Management Organization
Home District/MSD	Kansas City District /Northwestern Division – organizations responsible for the preparation of the decision document	RTS	Regional Technical Specialist
HQUSACE	Headquarters, U.S. Army Corps of Engineers	SAR	Safety Assurance Review
IEPR	Independent External Peer Review	SMART	Planning process that is: Specific, Measurable, Attainable, Risk Informed, Timely
IPR	In Progress Review	USFWS	U.S. Fish and Wildlife Service
MRRP	Missouri River Recovery Program	USACE	U.S. Army Corps of Engineers
MCX	Mandatory Center of Expertise	VT	Vertical Team
MSC	Major Subordinate Command - Northwestern Division is the MSC for the project	WRDA	Water Resources Development Act
NWK	Kansas City District	WRDA	Water Resources Development Act
NWD	Northwestern Division	WRDA	Water Resources Development Act
NED	National Economic Development		
NER	National Ecosystem Restoration		
NEPA	National Environmental Policy Act		