



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
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CINCINNATI, OH 45202-3222

CELRD-PD-S

19 October 2018

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, Louisville District,
ATTN: Barry Schueler, 600 Martin Luther King Jr. Place, Rm 751/PO Box 59, Louisville, KY
40201-0059

SUBJECT: Review Plan and Integrated Environmental Assessment for Barren River Lake,
KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment
(P2# 153975) – LRD Approval

1. References:

- a. Engineering Circular (EC) 1164-2-217 “Civil Works Review”, dated 20 FEB 2018.
- b. Memorandum, CECW-P, Subject: Revised Delegation of Authority in Section 2014(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343), dated 07 JUN 2018.
- c. Memorandum, CELRL-PM-C, Subject: Barren River Lake, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment (P2# 153975); Request for Approval, dated 28 AUG 2018.
- d. Memorandum, CESWD-PDP, Subject: Recommended Approval of the Review Plan for the Barren River Lake, Kentucky Water Supply Storage Reallocation Study, dated 24 AUG 2018.
- e. Memorandum, CELRD-PD-S, Approval Memorandum for Barren River Water Supply Reallocation, Bowling Green, KY, Memorandum of Agreement (MOA) and Delegation Authority, 07 JUN 2017.
- f. Review Plan, Barren River Lake, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment (REVISED), original date: 17 AUG 2018.

CELRD-PD-S

SUBJECT: Review Plan and Integrated Environmental Assessment for Barren River Lake, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment (P2# 153975) – LRD Approval

2. The subject Review Plan (RP) and Type 1 IEPR Exclusion Request was submitted to the Great Lakes and Ohio River Division on 28 August, 2018. The report will present the results of a study to assess the feasibility of reallocating storage in Barren River Lake, KY to the City of Bowling Green, KY and Bowling Green Municipal Utilities (BGMU) for municipal and industrial (M&I) water supply. The proposed reallocation is in response to the letter of intent sent from the City of Bowling Green, KY for a reallocation study of water storage in 2015. In 2017, the City of Bowling Green, KY and U.S. Army Corps of Engineers (USACE) entered into a contributed funds agreement and the reallocation study will be completed utilizing all non-Federal funds. The district provided a revised RP incorporating all recommended changes and edits generated by the MSC review.
3. The LRD review team has reviewed the attached RP and IEPR Exclusion Request and concurs that it describes an appropriate scope and level of review. The RP satisfies peer review policy requirements described in EC 1165-2-217, and adequately defines the scope and level of peer review for the activities to be performed for the subject project phase. Regarding the IEPR Exclusion Request, per Reference 1.b., the MSC Commander has delegated authority to approve the IEPR Exclusion based upon a risk-informed decision and recommendation. The district notes within the RP that the trigger criteria for initiating a Type-1 IEPR was not met. Additionally, the Water Management and Reallocation Studies Center of Expertise (PCX) concurs with the Review Plan findings and the recommendation for such a Type-1 IEPR exclusion.
4. I concur with the recommendation of the RMO and approve the enclosed RP. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP and the dollar values of all project costs should be removed.
5. Point of contact for this action within LRD is Mr. Philip Tilly, at 513-684-3025, philip.r.tilly@usace.army.mil.

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FOR:

Encl
as

R. MARK TOY
Major General, USA
Commanding

REVIEW PLAN

BARREN RIVER LAKE, KY WATER SUPPLY STORAGE REALLOCATION REPORT AND INTEGRATED ENVIRONMENTAL ASSESSMENT

LOUISVILLE DISTRICT

MSC Approval Date: 19 October 2018

Original Date: 17 August 2018

Last Revision Date: 19 October 2018



**US Army Corps
of Engineers®**

REVIEW PLAN

**BARREN RIVER LAKE, KY WATER SUPPLY STORAGE REALLOCATION REPORT
AND INTEGRATED ENVIRONMENTAL ASSESSMENT**

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1. PURPOSE AND REQUIREMENTS

- a. **Purpose.** This Review Plan defines the scope and level of peer review for the Barren River Lake, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment.



Figure 1: Barren River Lake is located in south central Kentucky.

b. References

- (1) Engineering Circular (EC) 1165-2-217, Civil Works Review, 20 February 2018
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 31 March 2011
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007
- (5) ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 March 2014
- (6) LRD Regional Business Processes Manual, Section 08504 LRD – QC / QA Procedures for Civil Works, Engineering and Design Products

- c. **Requirements.** This review plan was developed in accordance with EC 1165-2-217, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering

review and certification (per EC 1165-2-217) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO responsible for managing the overall peer review effort described in this Review Plan is the Planning Center of Expertise for Water Management and Reallocation Studies.

3. STUDY INFORMATION

- a) **Decision Document.** The decision document is the Barren River, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment. The report will present the results of a study to assess the feasibility of reallocating storage in Barren River Lake, KY to the City of Bowling Green, KY and Bowling Green Municipal Utilities (BGMU) for municipal and industrial (M&I) water supply. The proposed reallocation is in response to the letter of intent sent from the City of Bowling Green, KY for a reallocation study of water storage in 2015. In 2017, the City of Bowling Green, KY and U.S. Army Corps of Engineers (USACE) entered into a contributed funds agreement and the reallocation study will be completed utilizing all non-Federal funds.
- b) **Study/Project Description.** Barren River Lake is located on Barren River, 79.2 miles above its confluence with the Green River. The dam is located 12 miles east of Scottsville, Kentucky and 15 miles southwest of Glasgow, Kentucky. Barren River Lake is approximately 22 miles west of Bowling Green, Kentucky and 95 miles south of Louisville, Kentucky. Barren River Lake is situated in the rural, rolling hills of Allen, Barren, and Monroe counties in South Central Kentucky. The project is a principal unit in the overall plan of development for the Ohio River Basin. The essential features of Barren River Lake are a dam and a reservoir. The dam is a combination rolled earth fill and random rock, approximately 3,970 feet in length, with a height of 146 feet above the streambed. The top of the earthen embankment is at elevation 618 feet above mean sea level (msl). The drainage area above the dam is 940 square miles. Barren River Lake covers 20,150 acres at maximum flood mitigation pool. The project is authorized and operated for the purposes of flood control, recreation, fish and wildlife enhancement, and water supply. When not needed to store flood waters, USACE manages more than 10,000 acres for wildlife management and recreation.
- c) **Factors Affecting the Scope and Level of Review.** Engineering Circular 1165-2-217 stipulates that the appropriate scope and level of review be made as a risk-informed decision and provides criteria for doing so. This review plan for the Barren River, KY Water Supply Storage Reallocation Report and Integrated Environmental Assessment includes District Quality Control (DQC), Agency Technical Review (ATR), as well as Policy and Legal Compliance Reviews. At this time, it is not expected that an Independent External Peer Review (IEPR) will be necessary. There were two inherent risks identified by the PDT with this project. One risk is the potential for an increase in the pool elevation of the reservoir and the other inherent risk is the possibility for additional analyses of potential failure modes for the dam if this pool raise were to occur. If it becomes apparent as the study progresses that the preferred plan would result in an increase in the conservation pool elevation of the reservoir, the need for IEPR will be re-evaluated. Additionally, an increase in the conservation pool elevation would require a review of the Potential Failure Mode Analysis for the dam, and an analysis of the effect of a higher pool

elevation on the probability of failure and consequences as required by ER 1110-2-1156 Safety of Dams – Policy and Procedures. Barren River Dam is currently rated a DSAC 4 dam. This review plan will be updated if at a later time it is determined that an IEPR is needed. Additional details are provided in Section 6 of this Review Plan.

d) In-Kind Contributions. No in-kind products are anticipated.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The Louisville District shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Louisville District Quality Management System. In accordance with EC 1165-2-217, a DQC Review Lead will be assigned by the home district.

a. Documentation of DQC. All substantive comments will be provided in DrChecksSM review software using the four part comment structure. The four part comment structure includes: 1) Clear Statement of the Concern, 2) Basis for the Concern, 3) Significance of the Concern, and 4) Recommended Actions to Resolve the Concern. A DrChecks DQC report will be provided to the ATR team prior to/along with the ATR documents at the beginning of the review period.

Non-substantive comments and response can occur through track changes and comment functions in Microsoft Word, through the comment function for .pdf files, or hard copy markups. They can also be tracked in a Microsoft Excel spreadsheet. Original comments should be retained in the project directory. A DQC report will be prepared that will contain a brief introduction, a summary that explains any critical or unresolved comments, and a copy of comments and responses that were entered into DrChecksSM. In accordance with EC 1165-2-217, a DQC Certification Form will be completed.

b. Products to Undergo DQC. The draft Barren River Lake Water Reallocation Report and Environmental Assessment, including all appendices, will undergo DQC. This includes but is not limited to the hydrology and hydraulics modeling, demand and supply analysis, and draft water storage agreements. In addition, DQC reviewers should also review any risk registers, decision management plans, and decision logs that may be used for product development.

c. Required DQC Expertise. Peer review for DQC will be conducted by in-house staff who are not directly involved in the production of the water reallocation report. Specific areas of expertise that are expected to be required are included in Table 1.

Table 1: Expertise expected to be needed for DQC.

DQC Team Members/Disciplines	Expertise Required
Planning	The Planning reviewer should be a senior water resources planner with experience in include formulation and evaluation of alternatives for water supply and/or reallocation, and assessment of significance of impacts on other project purposes

	(e.g. flood risk mitigation, navigation, hydropower, recreation, water quality, fish & wildlife) at multi-purpose projects.
Economics	The economics reviewer should be a senior economist with experience in development of population and water use forecasts, cost allocation at multi-purpose projects, assessing financial feasibility of reallocation to M&I water supply, calculation of storage pricing based on updated cost of storage and benefits foregone methods. The reviewer should also be able to evaluate Inputs into a spreadsheet model for water demand and supply. Lastly, the reviewer should also be able to provide expertise for water storage agreements
Environmental Resources	The reviewer should be a senior NEPA practitioner who is able to review the combined report to confirm that all environmental and cultural resource statues are in compliance and that impact evaluation is adequate.
Water Management	The water management reviewer will be a senior engineer with expertise in water control manuals and operations of multipurpose projects and river basin systems, including an understanding of storage accounting. They should also have expertise in developing and running rules based reservoir and river system simulation models including HEC-ResSim.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR team leader will be from outside the home MSC. 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 and appropriate consultation with Communities of Practice to select the ATR team and throughout the ATR will take place.

- a. **Products to Undergo ATR.** The draft Barren River Lake Water Reallocation Report and Environmental Assessment, including all appendices, will undergo ATR. This includes but is not limited to the hydrology and hydraulics modeling, demand and supply analysis, and draft water storage agreements. In addition, ATR reviewers should also review any risk registers, decision management plans, and decision logs that may be used for product development.
- b. **Required ATR Team Expertise.** ATR will be conducted by in-house staff who are not directly involved in the production of the water reallocation report. Specific areas of expertise that are expected to be required are included in Table 1.

ATR Team Members/Disciplines	Expertise Required
Planning	The Planning reviewer will be a senior water resources planner who is certified to conduct ATR reviews. They will be required to have experience in formulation and evaluation of alternatives for water supply and/or reallocation studies, and assessment of significance of impacts on other project purposes (e.g. flood risk mitigation, navigation, hydropower, recreation, water quality, fish & wildlife) at multi-purpose projects.
Economics	The economics reviewer will be a senior economist who is certified to conduct ATR reviews. They will be required to have experience in development of population and water use forecasts, cost allocation at multi-purpose projects, assessing financial feasibility of reallocation to M&I water supply, calculation of storage pricing based on updated cost of storage and benefits foregone methods. The reviewer should also be able to evaluate Inputs into a spreadsheet model for water demand and supply. Lastly, the reviewer should also be able to provide expertise for water storage agreements
Environmental Resources	The reviewer should be an ATR certified senior NEPA practitioner who is able to review the combined report to confirm that all environmental and cultural resource statues are in compliance and that impact evaluation is adequate.
Water Management	The water management reviewer must be a senior engineer with expertise in water control manuals and operations of multipurpose projects and river basin systems, including an understanding of storage accounting. They must also have expertise in developing and running rules based reservoir and river system simulation models including HEC-ResSim.
Climate Change	In accordance with ECB 2016-25, a member of the Climate Preparedness and Resiliency Community of Practice (CoP) will participate in the ATR review.

c. **Documentation of ATR.** DrChecksSM review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those 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 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 DrChecksSM will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, 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 DrChecksSM with a notation that the concern has been elevated to the vertical team for resolution.

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

- 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.

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

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-217, 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. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis,

environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-217.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.
- a. **Decision on IEPR.** The PDT has used a risk-informed process to recommend that an Independent External Peer Review (IEPR) Type I review is not necessary. This recommendation is informed by the fact that none of the triggers described in the Water Resources Reform and Development Act (WRRDA) of 2014 Section 1044 or EC 1165-2-217 Section 11.d.1 requiring a mandatory IEPR are expected to be met. Also, it is not expected that the preferred plan would result in an increase in the conservation pool elevation of the reservoir. An increase in the conservation pool would require consideration by Headquarters USACE Dam Safety Officer (DSO) along with a review of the Potential Failure Mode Analysis for the dam as described in Chapter 24 of ER 1110-2-1156 Safety of Dams – Policy and Procedures. If any of these factors change during the development of the study, the need for IEPR will be re-evaluated.

Per guidance contained in Section 15.c of EC 1165-2-217, when a decision document does not trigger a mandatory Type I IEPR, a risk-informed recommendation will be developed. The process shall consider the consequences of non-performance on project economics, the environment, and social well-being (public safety and social justice), as well as indicate whether the produce is likely to contain influential scientific information or be a highly influential scientific assessment, or involve other issues that provide a rationale for determine the appropriate level of review. Furthermore, the recommendation must make a case that the study is do limited in scope that it would not significantly benefit from IEPR.

The following considerations were made by the PDT when making a risk-informed decision not to recommend a Type I IEPR:

- There is no significant threat to human life. Barren River Lake Dam has a dam safety action class (DSAC) 4 rating. Based on preliminary information for previous studies, it is not expected that the preferred plan would result in an increase in the conservation pool elevation of the reservoir. As described in ER 1110-2-1156 Section 24.4.2.1 for dams with DSAC 4:

Transfers and assignments of existing agreements and new agreements for the allocation of authorized, uncontracted water supply storage or the reallocation of storage from the existing conservation pool (or in some rare cases, the inactive pool or

sediment reserve), are permitted, provided the reallocation report, if required, is approved, all other implementation requirements are complete, and the district commander had informed the non-Federal entity in writing, of the project's DSAC and the current status of the dam and reservoir; that the dam will be subject to elevated monitoring and evaluation; and that, upon execution of a water storage or surplus agreement, the non-Federal entity will be required to share in the costs of IRRM and other remediation consistent with current policy.

- It is expected that the total project cost will be less than \$200 million
- Not expected that any Governors of any affected states will request a peer review by independent experts;
- It is not expected that any heads of a Federal or state agency charged with reviewing the project will determine that the project is likely to have significant adverse impacts on any environmental, cultural, or other resources after implementation of any proposed mitigation.
- The study is not likely to involve significant public dispute as to the size, nature, or effects of the project;
- The study is not likely to involve significant public dispute as to the economic or environmental cost or benefit of the project ;
- The information in the decision document is not to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices; and
- There are no other circumstances where the Chief of Engineers has determined that a Type I IEPR is warranted.

The PDT has considered the criteria above in its recommendation to exclude this study from Type I IEPR. It is a standard reallocation study involving standardized methods and well-established criteria for determination of water supply demand, analysis of alternatives, and derivation of user costs. There is therefore minimal risk of substantial non-performance related to project economics. The project is not expected to result in any significant impacts, or non-compliance, to environmental or cultural resources. The analysis of environmental impacts does not involve a large degree of uncertainty or high risk. An environmental assessment is being prepared as part of the study to determine whether it is appropriate for a Finding of No Significant Impact (FONSI) to be prepared. Health and safety would not be impacted through the preferred plan. As discussed previously, the Barren River Lake Dam has a DSAC rating of 4. The risk of non-performance with regard to matters pertaining to social well-being, including life and safety, is minimal.

This study does not involve novel, untested, or influential scientific information or methods. The study analyses, while complex, are within the typical scope of similar reallocation studies. Methodology and required data and analyses are well-established in USACE guidance for such studies. The primary tools for the analysis for this reallocation study will be HEC ResSIM and a spreadsheet to evaluate demand and supply.

The limited scope of this action, use of well-established criteria, minimal anticipated environmental impacts, and low uncertainty, are all indicative of an action that would benefit little from further review by IEPR. In accordance with EC 1165-2-214, the PDT will be requesting IEPR Exclusion through Northwestern Division.

Type II IEPR, the Safety Assurance Review, are conducted on design and construction activities for any 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. Reallocation of storage does not meet the criteria for Type II IEPR.

- b. Products to Undergo Type I IEPR.** Not Applicable.
- c. Required Type I IEPR Panel Expertise.** Not Applicable.
- d. Documentation of Type I IEPR.** Not Applicable.

7. POLICY AND LEGAL COMPLIANCE REVIEW

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

8. COST ENGINEERING AND AGENCY TECHNICAL REVIEW MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

Because the water reallocation would not result in any Federal construction, coordination with the Civil Works Cost Engineering and Agency Technical Review (MCX) is not needed.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

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 the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

- a. **Planning Models.** The following planning models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Alternative Water Source Analysis (BGMU) and Water Supply Needs Analysis (USACE)	Calculates supply and demand for water supply in the City of Bowling Green and Barren River	Will need approval for one time use through Planning Center of Expertise for Water Management and Reallocation Studies/HQUSACE Approval process

- b. **Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document: HEC-ResSIM.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-ResSIM	This model aids engineers and planners in predicting the behavior of reservoirs. ResSim will be used to determine changes to reservoir operations under alternative reallocation plans.	H&H Preferred Model

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The Louisville District shall provide labor funding by cross charge labor code. It is not expected any funding will be needed for travel. The Project Manager will work with the ATRT Leader to ensure that adequate funding is available and is commensurate with the level of review needed. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring. The ATRT leader shall provide organization codes for each team member and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes. Reviewers shall monitor individual labor code balances and alert the ATRT Leader to any possible funding shortages. Per EC 1165-2-217, ATR will be certified for the draft and final decision documents and supporting analyses.

Each ATR reviewer will have \$4,500 with an additional \$3,000 for the ATR team lead to set up the review team. It is estimated that ATR will cost approximately \$25,500 for the study. ATR will be scheduled in or around October 2018. It is expected to take three to four weeks to review the draft documents, resolve comments, and prepare an ATR report. An additional two weeks will be needed to review the final documents.

- b. **Type I IEPR Schedule and Cost.** Not Applicable.
- c. **Model Certification/Approval Schedule and Cost.** Engineering models used for the study will be reviewed for acceptability by the ATR team. Funds in the amount of \$5,000 for the water demand

spreadsheet review will be set aside and funds in the amount of \$8,000 for the RESSIM model review will be set aside.

11. PUBLIC PARTICIPATION

This study will include a public involvement program designed to meet NEPA requirements; solicit public and government agency input about the water supply storage reallocation; ensure that public and agency concerns are addressed; and keep the public and agencies involved in the development of the study and proposed reallocation. Coordinating with US Fish & Wildlife Service will occur to ensure compliance with the Endangered Species Act and the Fish and Wildlife Coordination Act. State and local agencies and organizations to be included in the coordination are the Missouri State Historic Preservation Officer, Missouri Department of Natural Resources, and federally recognized affiliated Native American Tribes. Significant and relevant public comments that are received during early coordination will be provided to the reviewers. At this time, it is anticipated that an EA will be sufficient; however, if that assumption needs to be re-evaluated and a scoping meeting is conducted, comments collected during the scoping meeting will be provided to the ATR reviewers.

The draft reallocation report and integrated environmental assessment will be released for concurrent vertical team, ATR, and public review for a 30-day public comment period within 60 days of the TSP milestone meeting approval.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, 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 Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

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

- Barry Schueler, Project Manager.
- Ronny Sadri, Great Lakes and Ohio River Division District Support Planner.
- Cherilyn Plaxco, Technical Director Center of Expertise for Water Management and Reallocation Studies.

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team

Role	Individual	Contact
Project Manager		502-315-6780
Plan Formulation		502-315-6796
Economist		502-315-6796
H&H/Water Management		502-315-6364
Biologist/NEPA specialist		502-315-6130
Archeologist		502-315-7468
Dam Safety		502-315-6460
DQC Lead		502-315-6776

Agency Technical Review Team

Role	Individual	Contact
ATR Team Lead/Planning		918-669-7196
Economics		817-886-1798
Environmental/NEPA		817-886-1864
Hydraulics/Water Management		918-669-7537
Climate Change		509-540-6498

Vertical Team

Role	Individual	Contact
RMO		501-324-5036
MSC		513-684-3008
RIT		202-761-4589
HQ Office of Counsel		202-761-8525

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the <type of product> for <project name and location>. The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer’s needs consistent with law and existing 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 DrCheckssm.

SIGNATURE

Name
ATR Team Leader
Office Symbol/Company _____ Date

SIGNATURE

Name
Project Manager
Office Symbol _____ Date

SIGNATURE

Name
Architect Engineer Project Manager¹
Company, location _____ Date

SIGNATURE

Name
Review Management Office Representative
Office Symbol _____ Date

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

Name
Chief, Engineering Division
Office Symbol _____ Date

SIGNATURE

Name
Chief, Planning Division
Office Symbol _____ Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number