

REVIEW PLAN

03SEP19

Project Name: Johnson County, Kentucky Section 202

P2 Number: 475556

Decision Phase Document Type:

1. Integrated Detailed Project Report, draft and final;
2. Certified Cost Estimate of the Tentatively Selected Plan, draft and final

Design Phase Document Type:

1. Draft Design Report, draft and final
2. Plans and Specifications, draft and final
3. Engineer's Considerations and Instruction for Field Personnel Letter (ECIFP)

Project Type: Special Authority, Flood Risk Management

District: Louisville District

District Contact:

[REDACTED]

Major Subordinate Command (MSC): Great Lakes and Ohio River Division (LRD)

MSC Contact:

[REDACTED]

Review Management Organization (RMO):

FRM-PCX

RMO Contact:

Decision Phase:

[REDACTED]

Design/Implementation Phase:

[REDACTED]

Review Plan Activity	Date
Date of Review Plan submission:	08JUL19
Date of RMO Endorsement of Review Plan:	06SEP19
Date of MSC Approval of Review Plan:	06SEP19
Date of IEPR Exclusion Approval:	28MAY19
Has the Review Plan changed since PCX Endorsement?	Added reviewers
Date of Last Review Plan Revision:	19SEP19
Date of Review Plan Web Posting:	30SEP19:S
Date of Congressional Notifications:	N/A

Decision Document Phase Milestone Schedule

Milestone	<u>Schedule</u>	<u>Complete</u>
1. Focused Alternatives Array Milestone:	17DEC18	Yes
2. MSC Agency Decision Milestone (TSP):	12DEC19	No
3. MSC Commander Approval:	06MAY20	No

Design/Implementation Phase Milestone Schedule

Milestone	<u>Schedule</u>	<u>Complete</u>
1. Execute PPA:	05FEB20	No
2. Initiate P&S / Design:	15FEB20	No
3. Draft P&S / Design Complete:	16FEB21	No
4. BCOES Cert Complete:	17AUG21	No
5. P&S Approval:	20SEP21	No

Project Fact Sheet

Project Name: Johnson County, Kentucky, Section 202 Project

Location: Paintsville, Johnson County, Kentucky

Authority: Section 202 of the Energy and Water Development Appropriations Act of 1981 (PL 96-367; 94 STAT. 1339); Administrative Provisions of Supplemental Appropriations Act of 1982 (PL 97-257); Bipartisan Budget Act of 2018 (PL 115-123)

Sponsor: Johnson County Fiscal Court

Type of Study: Integrated Detailed Project Report, draft and final; Certified Cost Estimate of the Tentatively Selected Plan, draft and final; Draft Design Report, draft and final; Engineer's Considerations and Instruction for Field Personnel Letter (ECIFP)

SMART Planning Status: The project is not being studied under the requirements set forth by 3x3x3, but is utilizing SMART Planning principles and risk informed decision making.

Project Area: Johnson County is located in the coalfields of Eastern Kentucky. Paintsville, its county seat, is located at the confluence of Paint Creek and the Levisa Fork of the Big Sandy River. Critical infrastructure for the county include the Big Sandy Rural Electrical Cooperative Company, Paintsville Fire Department, and the Paul B. Hall Regional Medical Center.

Problem Statement: Paintsville and Johnson County have a long history of severe flooding dating to 1918. Road closures and localized flooding are persistent problems for local residents and businesses within the study area. Long-term flood risk management measures will have to carefully consider these impacts in developing a recommended plan.

Federal Interest: Federal interest is established in Section 202 of the Energy and Water Development Appropriations Act of 1981. The current total project cost is estimated to range from \$100M-\$118M and is 100% federally funded.

Risk Identification: The preliminary array of structural measures being considered for this study center on floodwalls, closure structures, and pump stations. After a careful consideration of the project scope and the factors affecting this scope, the project will not be required to undergo a Type I and Type II IEPR review. This decision takes into account the District's wealth of knowledge and experience formulating, designing and constructing flood damage reduction projects.

1. FACTORS AFFECTING THE LEVELS OF REVIEW

Johnson County, Kentucky is located in the coalfields of Eastern Kentucky amid the foothills of the Appalachian Mountains in the Cumberland Plateau. It is the most significant coal producing region in the state and is also important in terms of natural gas production. As part of the Big Sandy River Basin, Johnson County lies within the Mountain and Creek Bottom Area, which is characterized by high, sharp-crested ridges with little level upland area and narrow stream valleys. Flat, level ground is usually found along stream terraces, where typically local communities are located such as Flat Gap, Staffordsville, Van Lear, and its county seat, Paintsville.

One of the headwaters of the Big Sandy River Basin is located in Johnson County: the Levisa Fork which collects rainfall through Paint Creek, Little Mudlick Creek and other small tributaries. Paintsville Lake is located approximately 8 miles upstream of the Levisa Fork, and controls flows in the upper portions of Paint Creek basin. Flash flood conditions within the Johnson County are created during heavy rainfall events where flows coming off of the surrounding ridges overwhelm the tributaries below, and create flood risks for local communities.

Paintsville is the largest community in Johnson County with a population of approximately 5500 citizens, and contains critical infrastructure for the entire region such as the Big Sandy Rural Electrical Cooperative Company, Paintsville Fire Department, and the Paul B. Hall Regional Medical Center.

The Paintsville experiences both headwater flooding from Paint Creek and its tributaries, and backwater flooding from the Levisa Fork during heavy rainfall events. The most significant of these events occurred in the spring of 1977 when 7 inches of rainfall within a 48 hour period created life threatening flood conditions along Tug and Levisa Forks of the Big Sandy River, the upper Cumberland River, the Guyandotte River, and the Clinch and Powell Rivers. The floods killed 10 people in east Kentucky and 22 people in the four state area (Kentucky, Tennessee, Virginia, and West Virginia) with damages estimated at \$175 million at the time, or roughly \$711 million in today's dollars. This event was the impetus for the authority granted by the Federal government in 1981 to address ongoing flooding in the coal-producing communities of Eastern Kentucky, Western West Virginia, and Western Virginia.

Given this, the primary factors affecting the scope of this review are:

A) Challenges: Paintsville and Johnson County have a long history of severe floods dating to 1918. Existing conditions and previous studies suggest a unique hydrologically dynamic within the project area. The Paint Creek basin is divided into two parts by an operating Corps project, Paintsville Lake. Uncontrolled flow exists below the dam at Paintsville Lake and the area is subject to flash flooding. Road closures and localized flooding are persistent problems for residents and businesses within the study area. Approximately 829 residences and businesses are affected by flood risks in the town of Paintsville, while an additional 432 are

affected in Johnson County. Long-term flood risk management measures will have to carefully consider these impacts in developing and constructing a recommended plan within 5 years, as required by the Bipartisan Budget Act of 2018 (PL 115-123).

B) Life Safety: The preliminary array of structural measures being considered for this study center on floodwalls and closure structures. The size and location of these engineering features will depend on the results of a two-dimension hydrologic model and coincident frequency analysis. After a careful consideration of the potential project scope, and the factors affecting this scope, the project will not be required to undergo a Type I and Type II IEPR, Safety Assurance Review (SAR). This decision takes into account the District's wealth of knowledge and experience formulating, designing and construction flood damage reduction projects. Furthermore, the project delivery team has already established a Risk Cadre Team lead and will initiate a qualitative risk assessment (QRA) that will guide the design team from concept to final design and will continue to be developed through construction following the current draft guidance of EC 1165-2-218. This QRA will present tolerable risk guidelines (TRG) that will be used as the principle judge to determine if there will be a significant threat to human life. If significant threat to human life is found the district will evaluate at that time if a SAR is warranted and will revise the review plan accordingly.

C) Modelling: Two hydrologic models have been developed for Johnson County, Kentucky. The first was developed by the Louisville District for the Paint Creek watershed. The second model was developed for the Huntington District, U.S. Army Corps of Engineers, as part of a national CWMS implementation effort for the Big Sandy River Basin. Additional modelling may be needed along Paint Creek to evaluate flood risks from the dam at Paintsville Lake and confluence with Levisa Fork. This effort is critical for making informed decisions about the watershed.

Three hydraulic models have been developed for Johnson County, Kentucky. The first was a steady flow model developed by the Huntington District, U.S. Army Corps of Engineers. The second model was developed by the Huntington District as part of a national CWMS implementation effort for the Big Sandy River Basin. The third was a unsteady flow model developed by the Louisville District for Paint Creek and Levisa Fork by modifying the first steady flow model.

D) Governor Request for Peer Review: The Governor of Kentucky has not requested peer review by independent experts for this project.

E) Public Dispute: The study is not anticipated to be controversial or result in significant public dispute as to the size, nature, or effects or to the economic or environmental costs and benefits.

F) Project Design/Construction: The anticipated design will take advantage of

prevailing practices and methodologies. Engineering solutions for the project are not expected to be based on novel methods, involve the use of innovative techniques, or present complex challenges for interpretation. It is also not anticipated that the project would require unique construction sequencing or redundancy.

2. REVIEW EXECUTION PLAN

A) District Quality Control (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 Louisville District will manage the DQC process. The DQC for the decision and design documents will ensure that all documents conform to proper criteria, that appropriate planning and design methods have been followed, that an internal check of the planning and design has been completed and is indicated on the DQC certification documents for both planning and design documents.

The DQC will be an iterative process and conducted throughout the life of the design to avoid or minimize any delays in completion of the study or project. Documentation of DQC activities is required and will be in accordance with Louisville District's and LRD QMS procedures, as well as EC 1165-2-217.

1) Products to Undergo DQC. Decision and design/implementation documents that will be subjected to DQC include:

Decision documents to undergo DQC

- (1) Draft and final versions of the DPR and environmental documentations with appendices. The DQC will include the entire DPR including a Cost and Schedule Risk Analysis (CSRA), economic analysis, as well as RE Planning documents.
- (2) Draft and final versions of cost estimate of the TSP.

Table 1 below lists the required team members according to each significant area of expertise needed to accomplish the decision document objectives.

Table 1 : District Quality Control Team for Decision Documents of the project*

Name	Role	Office	Telephone	Email
[REDACTED]	Senior Planner/DQC lead	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NEPA Specialist/Environmental	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Hydraulics and Hydrology and Certified Risk Reviewer / Climate Preparedness and Resiliency	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cultural Resources	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering / Levee Safety	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Design	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Mechanical Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Economics	[REDACTED]	[REDACTED]	[REDACTED]

*Team member name subject to change based on availability.

Design/Implementation documents to undergo DQC

- (3) Draft and final DDR.
- (4) Draft and final P&S.
- (5) Engineer’s Considerations and Instruction for Field Personnel Letter (ECIFP)

Table 2 below lists the required team members according to each significant area of expertise needed to accomplish the Design/Implementation documents objectives.

Table 2: District Quality Control Team for Design/Implementation Documents of the project*				
Name	Role	Office	Telephone	Email
[REDACTED]	Hydraulics and Hydrology and Certified Risk Reviewer	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Design	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Mechanical Engineering	[REDACTED]	[REDACTED]	[REDACTED]

- 2) **Required DQC Expertise.** A senior planner will be assigned as the DQC Review Lead during the decision phase of the project. The technical disciplines represented on the DQC team will mirror that of the project delivery team. The lead Civil Engineer/Project Engineer will lead the DQC efforts during the Design Phase.

- 3) **Documentation of DQC.** All comments will be inputted into, responded and resolved through the Design Review and Checking System (DrChecks) found on Projnet Suite at <https://www.projnet.org>. 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 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 assess whether further specific concerns may exist.

The DQC documentation in DrChecks will include the text of each concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (See appendix for Vertical Team) and the agreed upon resolution. If a concern cannot be satisfactorily resolved between the DQC 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 EC 1165-2-217 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation in the ATR Summary Report and the DrChecks comment evaluation that the concern has been elevated to the vertical team for resolution.

DQC reviewers will document their approval by completing a signature sheet which will be provided to the ATR team. District Quality Control documentation will also include a Dr. Checks summary review report.

B) Agency Technical Review (ATR).

ATR ensures consistency with established criteria, guidance, procedures, and policy. The ATR assesses whether the analyses presented within the decision and design documents prepared for the project are technically correct and comply with published USACE guidance, and explains the analyses and results in a reasonably clear manner for the public and decision makers. The ATR process is managed within USACE by the designated RMO and is conducted by a qualified team from outside the District that was not involved in the day-to-day production of the project or products. The ATR teams will be comprised of senior USACE personnel who are CERCAP approved reviewers in their field of study and members of the related community of practice. The ATR Review Lead will be from outside of the MSC.

B) Products to Undergo ATR.

ATR will be performed throughout the decision phase and design/implementation document phase in accordance with the regional QMS as found in Qualtrax and Engineering Circular 1165-2-217. The ATR shall be documented and discussed at the MSC Decision Milestone (MDM). Certification of the ATR will be provided prior to the District Commander signing the final report. Products to undergo ATR include:

Decision Phase Products

- (1) Draft and final DPR and environmental documentations with appendices.
- (2) Draft and final cost estimates of the TSP
- (3) Cost and Schedule Risk Analysis (CSRA).

Design/Implementation Phase Products

- (4) Draft and final DDR.
- (5) Draft and final Plans and Specifications.
- (6) Draft and final Independent Government Estimates (Cost Estimate Review)

Products 1 and 2 are related to the decision phase of the project, while products 3, 4, and 5 are focused on the Design/Implementation Phase of the project. Whenever practical the ATR team member used for the decision phase will also be used for the design/implementation phase ATR.

C) Required ATR Team Expertise.

Table 3 lists the technical disciplines and requisite expertise deemed appropriate to successful accomplishment of the project objectives during the decision and design phases of the project. The selected ATR members are listed according to discipline.

Table 3 – ATR Team Requirements		
ATR Team Members/Disciplines	Expertise Required	Product (listed above in numerical order)
Planning Review Leader for Product 1	The ATR lead should be a senior professional preferably with experience in preparing flood risk management decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR Lead will also serve as the planning reviewer. The ATR Lead should be certified as an ATR through the Planning Community of Practice.	1, 2
Environmental/NEPA Specialist	The NEPA Compliance reviewer will be an expert in the field of environmental compliance (specifically with NEPA, the Endangered Species Act, and the Clean Water Act with certification as an ATR through the Planning Community of Practice.	1
Hydraulics & Hydrology/Certified Risk Reviewer	The hydraulic engineering reviewer will be an expert in the field of hydraulics and hydrology and have a thorough understanding of open channel dynamics and/or computer modeling techniques that will be used such as HEC-RAS.	1, 3, 4

	<p>The reviewer will be certified and listed in CERCAP, and be a certified risk reviewer.</p> <p>The risk analysis reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other related guidance, including familiarity with how Information from the various disciplines involved in the analysis interact and affect the results.</p>	
<p>Cost Engineering</p> <p>Review leader for products 2 and 5.</p>	<p>Cost MCX Staff or Cost MCX Pre-Certified Professional as assigned by the Walla Walla Cost Engineering Mandatory Center of Expertise with experience preparing cost estimates for design and construction of levees, floodwalls, and pump stations. In addition the team member will be familiar cost estimating for similar civil works projects using MCACES.</p>	1, 2, 5
<p>Real Estate</p>	<p>The reviewer will be knowledgeable in the preparation of real estate documents and actions involving land acquisitions, easements, rights of entry and disposals.</p>	1
<p>Geotechnical Engineering</p> <p>Review Leader Products 3 and 4.</p>	<p>Recognized expert in the field of engineering analysis, design, and construction of flood damage reduction systems. The geotechnical design engineer shall be a licensed professional engineer. This reviewer shall have a proven track record of design of structures used in flood damage reduction systems. The reviewer will also be certified and listed in CERCAP.</p>	1, 3, 4
<p>Structural Engineering</p>	<p>The structural engineering reviewer should have extensive design and evaluation knowledge of hydraulic steel and concrete structures, river control structures, flood protection structures, I-Walls (including an understanding of gap formation for I-walls), and T-Walls, and concrete structures founded on both shallow foundations and steel driven pile foundations. They should have considerable experience with stability analyses of concrete structures.</p>	1, 3, 4
<p>Economist</p>	<p>A senior level economist with extensive knowledge of Ability to Pay, and Section 202 Program unique economic issues. The reviewer must be certified and listed in CERCAP.</p>	1

D) Documentation of ATR

All comments will be input into, responded and resolved through the Design Review and Checking System (DrChecks) found on Projnet Suite at <https://www.projnet.org>. ATR comments will be provided in a manner similar to the DQC comments. Some situations, especially addressing incomplete or

unclear information, comments may seek clarification in order to assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, 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 EC 1165-2-217 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation in the ATR Summary Report and the DrChecks comment evaluation that the concern has been elevated to the vertical team for resolution. At the conclusion of each ATR effort, the ATR team will prepare an ATR Summary Report, which will be 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 Review 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 prior to the District Commander signing the final report.

Table 4 – Decision Phase – ATR		
Review Item	Estimated Cost Per Person (\$K)	Estimated Review Time
ATR Lead/Planning (initial comments)	5	1 week ; early December 2019
ATR Lead/Planning (back check)	2	1 week ; late January 2020
H&H - (initial comments)	3	1 week ; early December 2019
H&H - (back check)	2	1 week ; late January 2020
Cost MCX - (initial comments)	5	1 week ; early December 2019
Cost MCX - (back check)	2	1 week ; late January 2020
Real Estate – (initial comments)	3	1 week ; early December 2019
Real Estate – (back check)	2	1 week ; late January 2020
Geotechnical – (initial comments)	3	1 week ; early December 2019
Geotechnical – (back check)	2	1 week ; late January 2020
NEPA – (initial comments)	3	1 week ; early December 2019
NEPA – (back check)	2	1 week ; late January 2020
Civil – (initial comments)	3	1 week ; early December 2019
Civil – (back check)	2	1 week ; late January 2020
Structural (2)– (initial comments)	6	1 week ; early December 2019
Structural (2) – (back check)	4	1 week ; late January 2020
Economist – (initial comments)	3	1 week ; early December 2019
Economist – (back check)	3	1 week ; late January 2020
Total Decision Phase ATR effort	\$54	

Table 5 - Design/Implementation Phase – ATR		
Review Item	Estimated Cost Per Person (\$K)	Estimated Review Time
Geo-tech (and Civil) (bi-weekly calls)	10	Bi-weekly; Feb20-Feb21
ATR Lead/Geotechnical (initial comments)	5	1 week ; early Jan 2021
ATR Lead/Geotechnical (back check)	2	1 week ; late Jan 2021
H&H – (bi-weekly calls)	10	Bi-weekly; Feb20-Feb21
H&H - (initial comments)	3	1 week ; early Jan 2021
H&H - (back check)	2	1 week ; late Jan 2021
Cost MCX - (initial comments)	5	1 week ; early Jan 2021
Cost MCX - (back check)	2	1 week ; late Jan 2021
Structural (2)– (bi-weekly calls)	20	Bi-weekly; Feb20-Feb21
Structural (2) – (initial comments)	6	1 week ; early Jan 2021
Structural (2) – (back check)	4	1 week ; late Jan 2021
Total Design/Implementation Phase ATR effort	\$69	

C) Public Involvement

This Review Plan will be posted to the LRD web site to allow the public an opportunity to comment. This will not result in a formal comment period and there is no set time frame for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary.

D) Independent External Peer Review

IEPRs are the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of a proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision is made as to whether IEPR is appropriate. Where designated, IEPR panels will consist of independent, recognized technical experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for planning, design and construction of a Civil Works project. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted during project feasibility studies, upon approval, the feasibility study serve as a federal decision document. 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 covers the entire decision document, including key component actions taken to address the underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-217.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), considers the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare, and in some cases may include decision document reviews during the Feasibility Phase. Type II IEPR is managed outside the USACE and is 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 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.

Decision on IEPR.

IEPR Type 1 - The requirement for a Type 1 IEPR is based upon Section 2034 of WRDA 2007, Section 1044 of the water Resources Reform and Development Act of 2014, Section 1141 of WRDA 2018, the office of Management and Budget Peer Review Bulletin, and other USACE policy considerations.

The current guidance in EC 1165-2-217 regarding triggers for Type 1 IEPR includes conditions beyond the statutory requirements. At the direction of HQ USACE in a memorandum for major subordinate commands and District Commanders titled "Interim Guidance on Streamlining Independent External peer review (IEPR) for improved Civil Works Product Delivery" Dated April 5th, 2019, specifically paragraph 4, LRL has considered the three mandatory conditions, outlined there-in, and determined that the Johnson County Decision Phase documents will not be required to undergo Type 1 IEPR. The three conditions are met in the following ways:

- (1) The project authorization is \$118M and therefore under the \$200M threshold.
- (2) We do not anticipate that the State Governor will request an IEPR on the decision document.
- (3) We do not anticipate the alternatives developed will be controversial or cause adverse impacts to environmental, cultural, or any other resources relevant to the community, based on the feedback from the local sponsor and scoping effort with resource agencies.

IEPR Type 2 - In the same memo mentioned above, specifically paragraph 8, Section 2035 of WRDA 2007 has expired. However USACE continues to stress the importance of Type II IEPR, also known as a Safety Assurance Review

(SAR), on high risk design and construction activities. The LRL District Chief of Engineers, is responsible for making the risk informed decision whether this project would benefit from a SAR. This decision considers a number of factors such as:

- (1) Significant threat to human life
- (2) Use of innovative materials or techniques
- (3) If the engineering is based on novel methods
- (4) Presents complex challenges for interpretations
- (5) Contains precedent setting methods or models
- (6) Or present conclusions that are likely to change the prevailing practices.

The LRL District Chief of Engineers has considered these factors, outlined above, and determined that the Johnson County Design and Implementation Phase documents will not be required to undergo a SAR. This decision takes into account the districts wealth of knowledge and experience formulating, designing and construction flood damage reduction projects. Furthermore, the PDT has already established a Risk Cadre Team lead and will initiate a qualitative risk assessment (QRA) that will guide the design team from concept to final design and will continue to be developed through construction following the current draft guidance of EC 1165-2-218. This QRA will present tolerable risk guidelines (TRG) that will be used as the principle judge to determine if there will be a significant threat to human life. If significant threat to human life is found the district will evaluate at that time if an SAR is warranted and will revise the review plan if it is. For the structural solution in the Paintsville area significant threat to human life is not expected.

E) Cost Engineering Review

LRL, in conjunction with LRD and the ATR Lead, is responsible for coordinating with the Cost Engineering MCX located in the Walla Walla District for review of the cost estimate for this project's decision and implementation documents including the independent Government Estimate. For decision and design phase documents prepared under this Review Plan, regional cost personnel that are pre-certified by the MCX, and assigned by the Cost Engineering MCX, will conduct the cost engineering ATR. The MCX will provide the Cost Engineering MCX certification. Either the ATR Review Lead or the Cost Engineering MCX shall make the selection of the cost engineering ATR team member.

F) Model Review and Approval/Certification

MSC Commanders are responsible for assuring models for all planning activities are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Therefore, the use of a certified and approved planning model is highly recommended and should be used whenever appropriate. Planning models 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 selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC and ATR.

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 and ATR.

1) 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
HEC-FDA 1.2.5 (Flood Damage Analysis)	The Hydrologic Engineering Center's Flood Damage 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 program will be used to evaluate and compare the future without- and with-project plans to aid in the selection of a recommended plan to manage flood risk.	Certified

2) Engineering Models. The following engineering models are anticipated to be used in the development of the decision and implementation documents:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-RAS 4.1 (River Analysis System)	The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions. [For a particular study the model could be used for unsteady flow analysis or both steady and unsteady flow analysis. The review plan should indicate how the model will be used for a particular study.]	HH&C COP Preferred Model
HED-SSP (Version 2.0)	The software package can be used to perform frequency, duration, coincident frequency, and curve combination analyses on flow data and other hydrologic data.	HH&C COP Preferred Model
HEC-HMS 3.4	The Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) program provides the capability to perform rainfall-runoff and transform computations, simple channel routing computations, and reservoir storage computations.	HH&C COP Preferred Model
MCACES	Microcomputer-Aided Cost Estimation System; Used to generate detailed cost estimates for each alternatives.	Approved
GEOSTUDIO (2016) with SLOPEW and SEEPW	GeoStudio is useful for a wide variety of geotechnical problems; dams, levees, earthquake deformation, etc. Used for slope stability and seepage analysis for floodwall design.	Approved
LPILE (2016)	LPILE is a special-purpose program based on rational procedures for analyzing a pile under lateral loading using the p-y method. Used for deep foundations on things like pumping stations.	Approved
PYWALL (2015)	PYWall is used for the analysis of flexible retaining walls. Used for floodwall design.	Approved
AUTODESK INVENTOR	Autodesk Inventor is a 3D solid modeling FEA program used for stress analysis and design of materials. Inventor will be used to design hydraulic steel structure elements, such as steel closure gates.	
BENTLEY RAM ELEMENTS	Bentley RAM Elements is a 3D structural modeling FEA program used for structural analysis and design of structures. Elements will be used to analyze and design the pump station structures.	
ENSOFT LPILE	Ensoft LPile analyzes piles under lateral loading and considers soil-structure interaction. LPile could be used to analyze the structural response of the pump station foundation piles.	

ENSOFT PYWALL	Ensoft PYWall analyzes flexible retaining walls based on limit-equilibrium theory and considers soil-structure interaction. PYWall could be used to analyze flexible retaining walls in soils, such as tie back walls.	
USACE CASE CI-WALL	CI-Wall is a USACE software developed under ERDC's CASE program for analyzing and designing I-Walls for flood protection.	
USACE CASE CT-WALL	CT-Wall is a USACE software developed under ERDC's CASE programs for analyzing and designing T-Walls for flood protection.	

Geotechnical and structural models used may be updated or refined during design.

G) Policy and Legal Review

All decision phase 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 by the MSC Commander, or warrant a recommendation by the MSC Commander to higher authority for approval. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies.

H) Value Engineering

Value Engineering (VE) studies will be performed for this project in accordance with ER 11-1-321, 01 Jan 2011, change 1 and ER 1110-2-1150, Para. 14.7, 31Aug99.

3. **REVIEW PLAN APPROVAL AND UPDATES.** The MSC Commander is responsible for approving this review plan. The review plan is a living document and may change as the study progresses. The Louisville District is responsible for keeping the review plan up-to-date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the review plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The Commander Approved Review Plan, along with the Commanders' approval memorandum, will be posted on the Louisville District's webpage.
4. **REVIEW PLAN POINTS OF CONTACT.** Public questions and/or comments on this review plan can be directed to the following points of contact:
 - Keith Keeney, Lead Planner, Louisville District, 502-315-6871
 - Michael Moore, Project Manager, Louisville District, 502-523-6967
 - Jake Sinkhorn, Project Engineer, Louisville District, 502-315-6286

ATTACHMENT 1: TEAM ROSTERS.

Project Delivery Team*				
Name	Role	Office	Telephone	Email
[REDACTED]	Lead Planner	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Project Manager	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NEPA Lead/Environmental	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cultural Resources	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	GIS Specialist	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Hydraulics and Hydrology	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	PE and Civil Designer	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Environmental Engineer	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Economics	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Legal Counsel	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Public Affairs	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Mechanical Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Climate Preparedness and Resiliency	[REDACTED]	[REDACTED]	[REDACTED]

*Team member name subject to change based on availability.

District Quality Control Team for Decision Phase Documents of the project*

Name	Role	Office	Telephone	Email
[REDACTED]	Senior Planner/DQC lead	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NEPA Specialist/Environmental	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Hydraulics and Hydrology and Certified Risk Reviewer / Climate Preparedness and Resiliency	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cultural Resources	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering / Levee Safety	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Design	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Mechanical Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Economist	[REDACTED]	[REDACTED]	[REDACTED]

*Team member name subject to change based on availability.

District Quality Control Team for Design Phase Documents of the project*

Name	Role	Office	Telephone	Email
[REDACTED]	Hydraulics and Hydrology and Certified Risk Reviewer	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering / Levee Safety	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Design	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Mechanical Engineering	[REDACTED]	[REDACTED]	[REDACTED]

Agency Technical Review Team for Decision Phase Documents of the project*				
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[REDACTED]	Senior Planner/ATR lead	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NEPA Specialist/Environmental	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Hydraulics and Hydrology	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Geotechnical Engineering / ATR Team Lead	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Economist	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]

Agency Technical Review Team for Design/Implementation Phase Documents of the project*				
Name	Role	Office	Telephone	Email
[REDACTED]	Geotechnical Engineering / ATR Team Lead	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Hydraulics and Hydrology	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Civil Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Structural Engineering	[REDACTED]	[REDACTED]	[REDACTED]

Vertical Team Coordination

Vertical Team Coordination

Name	Role	Office	Telephone	Email
[REDACTED]	Review Manager	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Economist	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Environmental	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Plan Formulation	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	RID	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	OC	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	WM	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	E&C	[REDACTED]	[REDACTED]	[REDACTED]

ATTACHMENT 2: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
ASA(CW)	Assistant Secretary of the Army for Civil Works	NED	National Economic Development
ATR	Agency Technical Review	NER	National Ecosystem Restoration
CAP	Continuing Authorities Program	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMS	Quality Management System
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RED	Regional Economic Development
IEPR	Independent External Peer Review	RMC	Risk Management Center
		RMO	Review Management Organization
LERRDs	Lands, Easements, Rights-of-Way, Relocations, Disposal/borrow areas	RTS	Regional Technical Specialist
MCX	Mandatory Center of Expertise	SAR	Safety Assurance Review
MDM	MSC Decision Meeting	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act

ATTACHMENT 4: CERTIFICATION OF RISK INFORMED DECISION
FOR TYPE II IEPR

**CERTIFICATION OF RISK INFORMED DECISION
FOR TYPE II Independent External Project Review (IEPR),**

The Johnson County, Kentucky Section 202 flood risk management project was evaluated for review under a Type II IEPR in accordance with Appendix E of EC 1165-2-217. Based on its present scope, there are no innovative materials or techniques to be used. The project does not require redundancy, resiliency, or robustness. It does not have unique construction sequencing and overlapping schedules and is below the \$200 million limit required for such projects. Lastly, both the public and local sponsor support the project and will not require an Environmental Impact Statement.

After a careful consideration of the factors outlined above, the project will not be required to undergo a Type II IEPR, Safety Assurance Review (SAR). This decision takes into account the Districts wealth of knowledge and experience formulating, designing and construction flood damage reduction projects. Furthermore, the project delivery team has already established a Risk Cadre Team lead and will initiate a qualitative risk assessment (QRA) that will guide the design team from concept to final design and will continue to be developed through construction following the current draft guidance of EC 1165-2-218. This QRA will present tolerable risk guidelines (TRG) that will be used as the principle judge to determine if there will be a significant threat to human life. If significant threat to human life is found the district will evaluate at that time if a SAR is warranted and will revise the review plan accordingly. For the structural solution in the Paintsville area significant threat to human life is not expected.

[REDACTED]