

# REVIEW PLAN

April 2021

**Project Name:** Ledbetter, Livingston County Kentucky CAP Section 14

**P2 Number:** 473999

**Decision Document Type:** Detailed Project Report

**Project Type:** Continuing Authority Program Section 14 Streambank Stabilization Project

**District:** United States Army Corps of Engineers District, Louisville (LRL)

**Review Management Organization (RMO):** Louisville District

**RMO Contact:** [REDACTED], PMP, Chief, Civil Works - Planning, Programs, and Project Management Branch, 502-315-6880

## **Key Review Plan Dates**

**Date of RMO Endorsement of Review Plan:** Pending

**Date of LRL Approval of Review Plan:** Pending

**Date of Last Review Plan Revision:** None

**Date of Review Plan Web Posting:** None

## **Milestone Schedule**

	<b><u>Scheduled</u></b>	<b><u>Actual</u></b>	<b><u>Complete</u></b>
<b><u>Tentatively Selected Plan:</u></b>	21-April-21	(enter date)	(Yes/No)
<b><u>Public Review of Draft Report:</u></b>	07-May-21	(enter date)	(Yes/No)
<b><u>Final Report Approval:</u></b>	27-July-21	(enter date)	(Yes/No)

## **Project Fact Sheet**

April 2021

**Project Name:** Ledbetter, Livingston County, Kentucky CAP Section 14

**Location:** Kentucky, Livingston County, City of Ledbetter

**Authority:** Continuing Authority Program Section 14 Streambank Stabilization Project

**Sponsor:** City of Ledbetter, Kentucky

**Type of Study:** CAP Feasibility

**Project Area:** The project scope of work includes the design of streambank erosion protection along the Ohio River in the city of Ledbetter, Kentucky. Specifically, the project is located on the left bank of the Ohio River at approximately River Mile 927.6, approximately 8.6 miles downstream of the Smithland Lock & Dam in Livingston County, Kentucky.

**Problem Statement:** The streambank along the Ohio River at the project site is actively eroding and at high risk of causing damage to public infrastructure (Riverview Drive). The principal cause of the erosion is rapid drawdown of the Ohio River, sand seam piping, and scour of the failed materials resulting from flow coming out of a drainage swale. The area of erosion is estimated to extend approximately 80 feet in a generally north-south direction into the bank and is estimated to be approximately 80 feet long in a generally east-west direction. Since 2015, approximately six (6) feet of bank have been lost per year. Based on recent measurements, the erosion rate in the last year in the direction of the road has increased to 8 feet per year. There are nine (9) properties and two (2) residential structures that could be negatively impacted when Riverview Drive fails due to erosion. When the road fails, the residential properties will have no ingress and egress route.

**Federal Interest:** Section 14 of the Flood Control Act of 1946, as amended, authorizes the US Army Corps of Engineers (USACE) to study, design and construct emergency streambank and shoreline works to protect public services including (but not limited to) streets, bridges, schools, water and sewer lines, National Register sites, and churches from damage or loss by natural erosion.

**Alternatives Considered:** In addition to the No Action Alternative, three preliminary alternatives and two options for the relocation of Riverview Drive will be evaluated. These alternatives are riprap, a sheetpile retaining wall, and a combination of sheetpile and excavation with backfill replacement and suitable stone to stabilize the bank.

**Recommended Alternative:** The method of streambank protection is to backfill the area with a granular fill, likely KY 357's, place a filter fabric over the granular fill, place 12-inches of topsoil and then seed and mulch the area and then overlay the bank with an 18-inch layer of KY Class II Channel Lining for approximately 130 feet. The granular fill will act as a filter, allowing the water to exit the bank through the sand seam but prevent the sand from being removed in the process. A detailed survey of the area would be necessary to accurately calculate material quantities.

The protection would consist of backfilling the area and placing riprap on a 2 horizontal to 1 vertical slope along the river bank to form a 2 horizontal to 1 vertical slope. Once placed, the fill would be overlaid with an 18-inch layer of Kentucky Class II Channel Lining at a slope no steeper than 2H:1V to the top of the slope. The riprap protection would be keyed into the bench area between the river bank and the river. A rough estimate of the material requirements to backfill the existing gully that has formed and riprapping the river bank would be as follows: clearing and grubbing approximately 0.25 acres, placement of 2,650 cubic yards of Kentucky Class II Channel Lining and 0.2 acres of seeding and mulching.

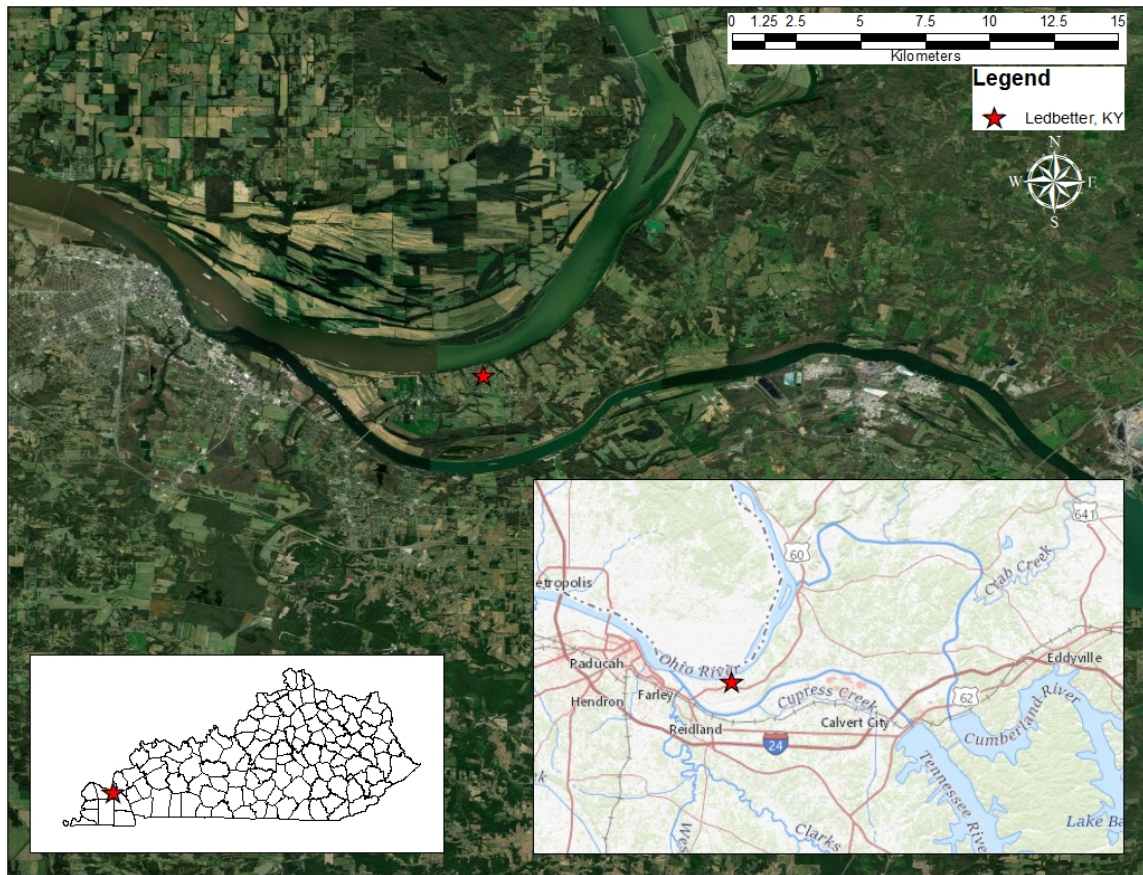
**Preliminary Cost Range:** The implementation costs is estimated to be approximately \$600k to \$1.2 million. The city of Ledbetter will assist in the acquisition of any necessary real estate and provide comments on the acceptability of the selected alternative from this feasibility study.

**Betterments:** Based on the combined Federal Interest Determination/Focused Alternatives Array Milestone (FID/FAAM) evaluation on August 26, 2020 the scope includes approximately 75 feet downstream and 150 feet upstream betterments at the expense of the Non-Federal Sponsor totaling approximately \$225,000. The betterments are not cost-shared. The federal project should add 50 feet upstream and downstream.

**Risk Identification:** The risk and consequences of a failure to Riverview Drive are threefold. The most serious is to vehicles and their occupants that are unaware of the failure and its impact to the road. The other two are environmental and economic. As the active erosion occurs, a large amount of sediment is introduced into the Ohio River, which in turn has an environmental impact. A road closure due to erosion would result in the loss of ingress and egress for nine (9) residential properties.

The level of detail for the project is conceptual. Much of the in-depth efforts for this project will be conducted during the Design and Implementation Phase including a formal survey of the area, confirmation of the integrity of subsurface soils, compliance with Section 106 of the National Historic Preservation Act, and real estate efforts.

Figure 1: Ledbetter, KY Project Location



## 1. FACTORS AFFECTING THE LEVELS OF REVIEW

### Scope of Review.

- Will the study likely be challenging?

The alternatives considered for this project, including the placement of rock, are not challenging from a design perspective, given the size and location in Kentucky.

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.

This project does not include any impoundments, floodwalls, or levees. From a life safety perspective, there is minimum risk. The threat to human life is not significant.

The risks identified with this project as having the most likely probability of occurrence pertain to cost and scope. There is a lack of subsurface information within the recommended plan, there are insufficient costs to account for environmental mitigation requirements, and the quantity of fill material required is an estimate. There is no land survey of the recommended plan, and there are potential environmental and water quality issues.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues?

The project will neither be justified by life safety or will involve significant threat to human life/safety assurance. There is no reason to believe that any measures involved in the project are associated with a significant threat to human life. This project does not include any impoundments, floodwalls, or levees. From a life safety perspective, there is minimum risk. Placement of stone is not challenging, from a design perspective. The threat to human life is not significant.

- Has the Governor of an affected state requested a peer review by independent experts?

The Governor has not requested peer review by independent experts.

- Will it likely involve significant public dispute as to the project's size, nature, or effects?

The project/study is not anticipated to be controversial nor result in significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project.

- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project?

The project/study is not anticipated to be controversial nor result in significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project.

- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve 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?

The anticipated project design will take advantage of prevailing practices and methodologies. It is not expected to be based on novel methods or involve the use of innovative techniques, or present complex challenges for interpretation.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule?

The project will not require unique construction sequencing or redundancy.

- Is the estimated total cost of the project greater than \$200 million?

No.

- Will an Environmental Impact Statement be prepared as part of the study?

No.

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?

No.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures?

No.

- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat?

No.

## 2. REVIEW EXECUTION PLAN

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

**District Quality Control.** All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfils the project quality requirements of the Project Management Plan.

**Agency Technical Review.** ATR is performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC. If significant life safety issues are involved in a study or project a safety assurance review should be conducted during ATR.

**Cost Engineering Review.** All decision documents shall be coordinated with the Cost Engineering Mandatory of Expertise (MCX). The MCX will assist in determining the expertise needed on the ATR team. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews typically occur as part of ATR.

**Policy and Legal Review.** All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H provides guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations 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. These reviews are not further detailed in this section of the Review Plan.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the teams are identified in later subsections covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information.

**Table 1: Levels of Review**

<b>Product(s) to undergo Review</b>	<b>Review Level</b>	<b>Start Date</b>	<b>End Date</b>	<b>Cost</b>	<b>Complete</b>
Draft DPR and EA	Initial DQC	30-April-2021	10-May-2021	\$8,000	No
Draft DPR and EA	Legal Review	11-May-2021	18-May-2021	N/A	No
Draft DPR and EA	Public/ATR/LRL	20-May-2021	21-June-2021	N/A	No
Draft DPR and EA	Final DQC (all comments resolved)	28-June-2021	6-July-2021	\$2000	No
Draft DPR and EA	ATR included 2 <sup>nd</sup> level (concurrent review closeout)	7-July-2021	14-July-2021	\$15,000	No
Final DPR and EA	Final Policy & Legal (LRL)	15-July-2021	23-July-2021	\$1500	No
Final DPR and EA	Final Report Approval	27-July-2021			

**a. DISTRICT QUALITY CONTROL**

The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). The DQC Lead should prepare a DQC Plan and provide it to the RMO and MSC prior to starting DQC reviews. Table 2 identifies the required expertise for the DQC team.

**Table 2: Required DQC Expertise**

<b>DQC Team Disciplines</b>	<b>Expertise Required</b>
DQC Lead / Plan Formulation [REDACTED]	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead will also serve as a reviewer for plan formulation and must have experience with Section 14 projects.
Environmental/Cultural Resources [REDACTED]	A senior professional with experience conducting environmental resource analysis in the CAP program.



Geotechnical Engineering [REDACTED]*	A senior professional with experience in design of streambank stabilization projects in the CAP program.
Climate Change/ Hydrology/Hydraulic [REDACTED]*	A senior professional with experience in conducting H&H analysis and writing climate change narratives in the CAP program.
Cost Engineering [REDACTED]	Team member will be experienced in design and construction of streambank protection projects. In addition the Team member will be familiar cost estimating for similar civil works projects using MCACES.
Real Estate [REDACTED]	A senior professional with experience in real estate analysis including betterments in the CAP program.

\* may be adjusted

**Documentation of DQC.** DrChecks will be used to document all DQC comments, responses and resolutions. Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in EC 1165-2-217, on page 19 (see Figure F), and Attachment 3 of this Review Plan.

Documentation of completed DQC should be provided to the District, RMO and ATR Team leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews (see EC 1165-2-217, section 9

## **b. AGENCY TECHNICAL REVIEW**

The ATR will assess whether the analyses are technically correct and comply with guidance, and that documents explain the analyses and results in a clear manner. An RMO manages ATR. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h)(1)). Table 3 identifies the disciplines and required expertise for this ATR Team.

**Table 3: Required ATR Team Expertise**

<b>ATR Team Disciplines</b>	<b>Expertise Required</b>
ATR Lead / Plan Formulation / Cultural Resources/ Environmental Resources [REDACTED]	The ATR lead should be a senior professional preferably with experience in preparing Section 14 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 a senior water resources planner who possesses experiences with the NEPA process and whom also has extensive experience with formulation of CAP projects (especially Section 14 projects). The ATR Lead MUST be from outside LRD.
Geotechnical Engineering	A senior professional with experience in design of streambank stabilization projects in the CAP program.
Climate Change / Hydrology & Hydraulics	A senior professional with experience in conducting H&H analysis and writing climate change narratives in the CAP program.
Cost Engineering	Team member will be experienced in design and construction of streambank protection projects. In addition, the Team member will be familiar cost estimating for similar civil works projects using MCACES.

**Documentation of ATR.** DrChecks will be used to document all ATR comments, responses and resolutions. Comments should be limited to those needed to ensure product adequacy. If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the EC 1165-2-217 issue resolution process. Concerns can be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review (see EC 1165-2-217, Section 9), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR may be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

## **c. INDEPENDENT EXTERNAL PEER REVIEW**

### **(i) Type I IEPR.**

Type I IEPR is managed outside of the USACE and conducted on 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.

**Decision on Type I IEPR.** CAP Section 14 projects are excluded from a Type I IEPR unless there is an EIS (EP 1105-2-58 and EC 1165-2-217). This project will be a Finding of No Significant Impact (FONSI) so a Type I IEPR is not required. There are no known consequences of non-performance of the Type I IEPR on project economics or the environmental and social well-being of the public.

Additionally, this project is limited in scope and would not significantly benefit from Type I IEPR. A rough estimate of the material requirements to backfill the existing gully and riprap the river bank is approximately 0.25 acres, placement of 2,650 cubic yards of Kentucky Class II Channel Lining and 0.2 acres of seeding and mulching (these estimates do not include the betterments).

**Products to Undergo Type I IEPR.** This project will not undergo IEPR.

### **(i) Type II IEPR.**

The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction for hurricane, storm and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. A Type II IEPR Panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, and periodically thereafter on a regular schedule.

**Decision on Type II IEPR.** Type II IEPR Safety Assurance Review (SAR) is required only if life safety is a concern. In accordance with EC 1165\_2-217, the feasibility study, which consists primarily of a streambank stabilization project involving riprap backfill and streambank protection, was evaluated for life safety risks. This subject does not meet the requirements for a mandatory Type II IEPR. The project does not represent a significant threat to human life; it is not controversial; and there has been no request for a Type II IEPR by a governor or the head of a Federal or state agency. There are no change in life safety risk based on implementation of this streambank stabilization project, and project failure would not result in any life safety issues. This determination was coordinated with the LRL District Chief of Engineers and the Type II review is not recommended.

#### d. MODEL CERTIFICATION OR 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 are any models and analytical tools used 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 a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

**Planning Models.** No planning models are anticipated to be used in the development of the decision document:

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. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when 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.

**Table 6: Engineering Models.** These models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
MCACES	Microcomputer-Aided Cost Estimation System; Used to generate detailed cost estimates for each alternatives.	Approved
HEC-RAS, 5.0.7	Description: Software to simulate hydraulic processes of the Ohio River in the study area.	HH&C COP preferred

#### e. POLICY AND LEGAL REVIEW

Policy and legal compliance reviews for draft and final planning decision documents are delegated to the District (see CELRD-PDP, Delegation of Decision-Making and Approval Authority for Specified Elements of the Continuing Authorities Program (CAP) to the Louisville District 16 December 2020).

##### (i) Policy Review.

The policy review is conducted by the LRL Chief of Planning and Policy (Policy Reviewer).

- The Policy Reviewer will be invited to participate in key meetings during the development of decision documents as well as Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Reviewer should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- In addition, the Policy Reviewer may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

**(ii) Legal Review.**

Representatives from the LRL Office of Counsel will be assigned to participate in reviews. The LRL Chief of Planning and Policy or Planning Section Chief will coordinate membership and participation with the office chiefs.

- In some cases legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.
- Each participating Office of Counsel will determine how to document legal review input.

## ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
[REDACTED]	Planning	Project Manager	(502) 315-6420
[REDACTED]	Engineering	PE/A	(502) 315-6604
[REDACTED]	Geotechnical	Engineer	(502) 315-6244
[REDACTED]	H&H	Engineer	(502) 315-6126
[REDACTED]	Cost	Engineer	(502) 315-6126
[REDACTED]	Real Estate	Specialist	(502) 315-6957
[REDACTED]	Environmental	Wildlife Biologist	(502) 315-7451
[REDACTED]	Cultural Resources	Archaeologist and Tribal Liaison	(502) 315-7468
[REDACTED]	Office of Counsel	Assistant District Counsel	(502) 315-6768
[REDACTED]	Customer	Customer	(270) 654-2653 (207) 928-2105

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Phone Number
[REDACTED]	CELRL PMC-PL	Planning Team Lead	(502) 315-6776
[REDACTED]	CELRL PMC-PL	Wildlife Biologist	(502) 315-6130
[REDACTED]	CELRL-ED-T-G	Chief, Geotechnical Design Section	(502) 315-6450
[REDACTED]	CELRL-EDT-H	Chief, Geotechnical Design Section	(502) 315-6473
[REDACTED]	CELRL-ED-M-C	Chief, Cost Engineering	(502) 315-6268
[REDACTED]	CELRL-REC	Chief, Civil & Support Branch Real Estate Division	(502) 315-6956

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
[REDACTED]	CEMVR-PD-C	Biologist	(309) 794-5791
Geotechnical Engineering TBD			
Climate Change / Hydrology & Hydraulics TBD			
Cost Engineering TBD			

## ATTACHMENT 2: STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

### COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Ledbetter, Kentucky CAP Section 14 Streambank Stabilization Project. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks<sup>SM</sup>.

\_\_\_\_\_  
[Redacted]  
ATR Team Leader  
CEMVR-PD-C

\_\_\_\_\_  
Date

\_\_\_\_\_  
[Redacted]  
Project Manager  
CELRL PMC-PL

\_\_\_\_\_  
Date

\_\_\_\_\_  
[Redacted]  
Project Engineer  
CELRL-EDC-C

\_\_\_\_\_  
Date

\_\_\_\_\_  
[Redacted]  
Review Management Office Representative  
CELRL PMC-PL

\_\_\_\_\_  
Date

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows: There are no significant concerns.

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

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<div><div></div><div>Chief, Engineering Division (home district) CELRL-ED</div></div>	Date

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<div><div></div><div>Chief, Planning, Programs, and Project Management Branch (home district) CELRL PMC-PL</div></div>	Date



## ATTACHMENT 3: STATEMENT OF DISTRICT QUALITY CONTROL

### PROJECT NAME PROJECT AUTHORITY CERTIFICATION OF DISTRICT QUALITY CONTROL

#### 1. Statement of Quality Control – Completion of District Quality Control

District Quality Control (DQC) review has been completed for the *PROJECT*. DQC was conducted to comply with the requirements of EC 1165-2-217. During the DQC, 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 need consistent with law and existing US Army Corps of Engineers policy.

#### 2. Summary of DQC Review Comments

#### 3. Certification

_____ [REDACTED], P.G. Chief, Planning Section CELRL-PMC-PL	_____ Date
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_____ [REDACTED] Project Manager CELRL-PMC-PL	_____ Date
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_____ [REDACTED] DQC Lead / Plan Formulation CELRL-PMC-PL	_____ Date
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_____ [REDACTED] Environmental/Cultural Resources CELRL-PMC-PL	_____ Date
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<div></div> Geotechnical Engineering CELRL-ED-T-G	Date
<div></div> Climate Change/ Hydrology/Hydraulic CELRL-EDT-H	Date
<div></div> Cost Engineering CELRL-ED-M-C	Date
<div></div> Real Estate CELRL-REC	Date

**ATTACHMENT 4: REVIEW PLAN REVISIONS LOG**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>

## ATTACHMENT 5: 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	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 of 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