US Army Corps of Engineers®

Prepared by:

Memphis District

Mississippi Valley Division

Below Kennett Missouri Seepage Berm, Phase 1 (System 11)

Review Plan

PREPARED BY:

N

ENDORSED BY:

APPROVED BY:

MSC Approval Date *'Pending'*

Last Revision Date: *none*

Section 1
Introduction

1.1 Purpose

This Review Plan (RP) for Below Kennett Missouri Seepage Berm (464229 – P2 Number for St. Francis Construction Supplemental), will help ensure a quality-engineering project is developed by the Corps of Engineers in accordance with EC 1165-2-217, "Review Policy for Civil Works". As part of the Project Management Plan this RP establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products and lays out a value added process and describes the scope of review for the current phase of work. The EC outlines several general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, and Sustainability (BOCES) Review, and Policy and Legal Compliance Review. This RP will be provided to Project Delivery Team (PDT), DQC, ATR, and BCOES Teams. The technical review efforts addressed in this RP, DQC and ATR, are to augment and complement the policy review processes. The District Chief of Engineering has assessed that the life safety risk of this project is not significant; therefore a Type II IEPR/Safety Assurance Review (SAR) will not be required, see Paragraph 5.1. The documents to be reviewed under this review plan include plans, specifications, and DDR.

1.2 References

- EC 1165-2-217, Review Policy For Civil Works, 20 February 2018
- ER 1110-1-12, Quality Management, 31 Mar 2011
- ER 1110-1-12, Quality Management, Change 2, 31 Mar 2011
- ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews, 1 January, 2013
- EM 1110-2-1913 Design, Construction, and Evaluation of Levees, 30 April 2000
- Memphis District's Quality Manual: https://qualtrax.usacegis.us/

    1. In Qualtrax, folder down:
       USACE Business Management System
       Enterprise Quality Management System (eQMS) documents
       MVD regional Business Processes Manual
       Quality Management System (QMS) Operational Process

    2. Open "MVM - QMS District Quality Management Plan 150305 (QMS100 1)"

1.3 Review Management Organization

The RMO for this project is the Mississippi Valley Division (MVD). The RMO will assure that an ATR team is assembled in accordance with this review plan. The RMO will review the ATR report and sign the accompanying completion statement at the completion of the ATR.

Section 2
Project Description

2.1 Project Description

The project consist of an approximate 6 mile long area located along the left (east) bank of the St. Francis River between levee baseline stations 21/48+00 and 27/00+00. This levee reach is considered part of the 5 segment, 115.5 mile long East Bank St. Francis to Big Lake West Levee System (System 11) and is more specifically within the 17 mile stretch known as Segment 37 (Segment ID 4004000037). The approximate study area, as seen in the figure below, is directly west of Kennett, Missouri (Dunklin County) and runs south towards the Varney River sleeve levee confluence area with the St. Francis River.

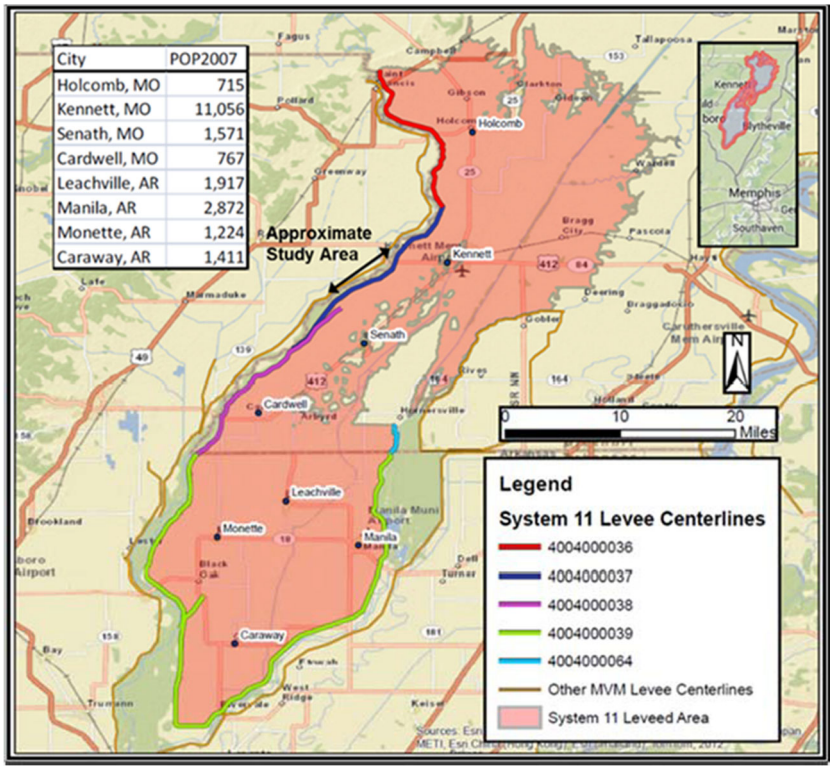

Figure 1 - System 11 General Vicinity Map

Figure 1 - System 11 General Vicinity Map

The project scope includes analysis of excessive seepage potential and the subsequent remediation of critical upward seepage gradients expressed along the landside levee toe and within adjacent ditch work running parallel to the levee. Project work described in the following paragraphs includes:

- Backfilling multiple large drainage ditches running parallel to the landside levee toe
- Construction of continuous, semi-pervious landside berms
- Re-orienting interior drainage away from the levee through a combination of existing/ new ditch work and re-grading fields adjacent to the levee.

All current drainage ditches running parallel to the landside levee toe and within the proposed landside seepage berm footprint will be cleared, grubbed, and backfilled with similar material as used in the berm construction. Any structures or culverts within this footprint will also be demolished and removed. Since the current ditches are typically continuous, any orphaned sections of the ditch will also be filled in to an elevation similar to the adjacent land.

2.2 Project Sponsor

Operation and maintenance is shared between Federal and non-federal entities. The non-federal local sponsor is Drainage District No. 48 of Dunklin County, Missouri.

Section 3
District Quality Control

3.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo DQC in accordance EC 1165-2-217. The District shall perform these minimum required reviews in accordance with District's Quality Management Plan. .

See Attachment 1, Table 5 for the DQC Lead, reviewers, and reviewer's disciplines.

3.2 Documentation

Documentation of DQC activities is required and will be implemented in accordance with EC 1165-2-217.

3.3 DQC Schedule and Estimated Cost

Although DQC is always seamless, the following milestone reviews are schedule in Table 1 . The cost for the DQC is approximately $60,000.

Project Phase/Submittal	Review Start Date	Review End Date
DQC 65% Plans, Specs, & DDR Review	10-JAN-2020	14-FEB-2020
DQC Final Plans, Specs, & DDR Review	16-MAR-2020	17-APR-2020

Table 1 DQC Schedule

Section 4
Agency Technical Review

4.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo ATR in accordance EC 1165-2-217. ATR reviews will occur seamlessly at the scheduled milestones as shown in Section 4.6. A site visit will not be scheduled for the ATR Team.

4.2 Documentation of ATR

Documentation of ATR will occur using the requirements of EC 1165-2-217. This includes the four part comment structure and the use of DrChecks[SM].

4.3 Products to Undergo ATR

The ATR team will review the Plans, Specifications, DDR, and design documents for the DD48 – Below Kennett Seepage Berm project.

4.4 Required Team Expertise and Requirements

ATR teams shall be established in accordance with EC 1165-2-217. The following disciplines shall be required for ATR of this project:

ATR Lead: The ATR team lead shall be a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting ATRs. The lead shall have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline.

Geotechnical Engineer - shall have experience in the field of geotechnical engineering, analysis, design, and construction of levees and seepage berms. The geotechnical engineer shall have experience in subsurface investigations, soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction.

Hydraulic Engineer – shall have experience in the analysis and design of open channel and riverine hydraulic engineering. The hydraulic engineer shall be knowledgeable and experienced sediment design and turbulent flow design.

Civil Engineer – Reviewer shall be a senior level, professionally registered engineer with extensive experience in the engineering construction field with particular emphasis on levee safety projects.

4.5 Statement of Technical Review Report

After the final ATR, the ATR Lead will produce an ATR Review Report in accordance with EC 1165-2-217. The report must be submitted to the RMO for review and signature of the accompanying Statement of Completion of ATR. The district will then complete and sign a Certification of ATR.

4.6 ATR Schedule and Estimated Cost

Although ATR is always seamless, the preliminary ATR milestone schedule is listed in Table 2. The cost for the ATR is approximately $25,000.

Project Phase/Submittal	Review Start Date	Review End Date	Site Visit
ATR Final P&S and DDR Review	16-MAR-2020	17-APR-2020	N/A

Table 2 ATR Schedule

Section 5
Safety Assurance Review

5.1 Decision on SAR

The district's Chief of Engineering has determined that a Type II IEPR/SAR is not required for this project.

Section 6
Public Posting of Review Plan

As required by EC 1165-2-217, the approved RP will be posted on the District public website (https://www.mvm.usace.army.mil/About/Offices/Programs-and-Project-Management/Peer-Review-Plans/). This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the RP are necessary.

Section 7
Review Plan Approval and Updates

The MSC Commander, or delegated official, is responsible for approving this RP. The Commander's approval reflects vertical team input (involving the District, and MSC) as to the appropriate scope, level of review. The RP is a living document and should be updated in accordance with 1165-2-217. All changes made to the approved RP will be documented in Attachment 2, Table 9 RP Revisions. The latest version of the RP, along with the Commanders' approval memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage.

Section 8
Engineering Models

The use of certified, validated, or agency approved engineering models is required for all activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, BCOES, policy and legal review, and SAR (if required). Where such approvals have not been completed, appropriate independent checks of critical calculations will be performed and documented. The following engineering models, software, and tools are anticipated to be used:

Model Name	Version	Validation Date
Add relevant engineering and planning models used		

Table 3 Models and Status

Section 9
Review Plan Points of Contact

Title	Organization	Phone
	CEMVM-PM-P	
	CEMVM-EC	

'Table 4 RP POC's

ATTACHMENT 2
Review Plan Revisions

Revision Date	Description of Change	Page/Paragraph Number

Table 9 RP Revisions

ATTACHMENT 3

Rationale to not Perform a SAR

MEMORANDUM FOR RECORD

SUBJECT: Rationale Not to Conduct a Safety Assurance Review (SAR) for SFB-C, Below Kennett Seepage Berm Construction Project

1. This memorandum documents the rationale used in determining that the subject project does not benefit from conducting a SAR using the guidelines set forth in the memorandum SUBJECT: Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil Works Product Delivery, dated 05 April 2019.

2. Project Background. The project consist of an approximate 8 mile long study area located along the left (east) bank of the St. Francis River between levee baseline stations 19/18+00 and 28/00+00. This levee reach is considered part of the 5 segment, 115.5 mile long East Bank St. Francis to Big Lake West Levee System (System 11) and is more specifically within the 17 mile stretch known as Segment 37 (Segment ID 4004000037). The approximate study area, as seen in the figure below, is directly west of Kennett, Missouri (Dunklin County,Missouri) and runs south towards the Varney River sleeve levee confluence area with the St. Francis River.

The project scope includes analysis of excessive seepage potential and the subsequent remediation of critical upward seepage gradients expressed along the landside levee toe and within adjacent ditch work running parallel to the levee. Project work described in the following paragraphs includes:

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3. The following factors were evaluated by the Project Delivery Team (PDT) and are discussed below:

a. Significant threat to human life: While this project provides protection to a population center of Kennett, MO and surrounding area, the threat of failure and risk to human life is very low. The purpose of this project is to address uncontrolled underseepage. If the project fails to address the seepage, we will continue to floodfight and monitor in high water events.