



**US Army Corps
of Engineers**
Kansas City District

PROJECT REVIEW PLAN

*Kansas Citys, Missouri and Kansas – Section 216
FLOOD RISK MANAGEMENT PROJECT
Updated for
Phase 2 of the FEASIBILITY STUDY*

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HEARTLAND ENGINEERS 

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PROJECT REVIEW PLAN

Kansas Citys, Missouri and Kansas – Section 216 FLOOD RISK MANAGEMENT PROJECT Updated for Phase 2 of the FEASIBILITY STUDY

1. DOCUMENT OBJECTIVE

This Project Review Plan (PRP) is a part of the Project Management Plan (PMP) under the QC/QA element in accordance with EC 1105-2-408 and the Standard Operating Procedures for Planning Centers of Expertise. This PRP provides guidance to the Project Delivery Team (PDT) on the specific review levels, responsibilities, and process requirements for execution of reviews for the Kansas Citys feasibility study.

2. GENERAL INFORMATION AND EXECUTIVE SUMMARY

Feasibility Background.

The U.S. Army Corps of Engineers Kansas City District (CENWK) along with local project sponsors, are conducting a feasibility study of the existing flood protection project for the Kansas City metropolitan area. The entire metropolitan system of seven flood protection (levee) units withstood the Missouri River Flood of 1993, but some elements of the system were seriously challenged as the flood crested. This event raised a concern that the levees may provide less than the level of protection for which they were designed.

Feasibility Purpose.

This feasibility study will update and verify data on the level of flood risk management provided by the Kansas Citys, Missouri and Kansas, Local Flood Protection Project, and will develop alternative plans for increasing the reliability of the existing system. Such plans will be technically viable, economically feasible and environmentally acceptable.

Summary Study Scope and Execution Parameters.

The Project Management Plan for this study is based on a two-phase approach to performing the feasibility study. Phase 1 (now complete) developed an Interim Feasibility Report which recommended improvements to increase the performance and reduce the flood risk of four of the seven levee units within the Kansas Citys system. These units included the Argentine Unit, the North Kansas City Unit, the East Bottoms Unit, and the Fairfax-Jersey Creek Unit. A fifth levee unit, the Birmingham Unit, was determined to meet the authorized level of performance assuming continued adequate operations and maintenance efforts. Phase 2 (underway now) will develop the Final Feasibility Report which will address the two remaining levee units, the

Armourdale and the Central Industrial District (CID) Units, and other minor isolated locations in the system.

Study Sponsors.

Feasibility funding source is 50% Federal General Investigations (GI) -- Civil Works Appropriation and 50% local cost share funding. The Feasibility Cost Sharing Agreement (FCSA) for this study was signed by the City of Kansas City, Missouri as the primary sponsor. Additional sponsors are:

- Phase 1 Additional Sponsorship: Conducted in conjunction with three additional cost sharing sponsors who are responsible for levee units involved in Phase 1 of the study. Those are the North Kansas City Levee District, the Fairfax Drainage District and the Kaw Valley Drainage District.
- Phase 2 Additional Sponsorship: Conducted in conjunction with one additional cost sharing sponsor, the Kaw Valley Drainage District, who is responsible for some levee units involved in the Phase 2 of study.

Specific Feasibility Study Objectives.

1. *Adequately evaluate the reliability and performance of the existing Kansas City levee system using Corps of Engineers risk-based analysis evaluation procedures as outlined in Engineering Manual 1110-2-1619, Engineering and Design Risk Based Analysis for Flood Damage Reduction Studies; and in Engineering Regulation 1105-2-101, Planning Risk Analysis for Flood Damage Reduction Studies. Work towards this objective will comprise the core of the existing conditions inventory.*

2. *Formulate an array of plans for increasing the levee unit reliability through cost-shared construction project with individual levee sponsors, and evaluate these plans using a broad-based set of evaluation criteria as described by Engineering Regulation (ER) 1105-2-100, Guidance for Conducting Civil Works Planning Studies. This regulation is grounded in the laws which apply to the Civil Works Program and to the Corps of Engineers missions, and is particularly based on the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) (March 10, 1983). The P&G were established pursuant to Section 103 of the Water Resources Planning Act (Public Law 89-80) and Executive Order 11747. If such plans are deemed feasible, then...*

3. *Develop all documentation necessary to seek appropriate project approvals through HQUSACE and associated Congressional authorizations. Such documentation typically includes a planning report, NEPA documentation, engineering analysis and recommendations, and the supporting technical and functional documents.*

Study Authority.

Section 216 of the 1970 Flood Control Act provides authority to reexamine completed civil works. Section 216 reads as follows:

The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which has been completed and which were

constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying structures or their operation, and for improving the quality of the environment in the overall public interest.

Original Project Authorizations.

Specifically, this study examines the adequacy of the “Kansas Citys Local Flood Protection Project” as authorized by the 1936, 1944, 1946, and 1951 Flood Control Acts. The Kansas City project is a unit of the Missouri River basin comprehensive plan. A modification to raise three of the levee units (Armourdale, Argentine, and CID) was authorized by Public Law 87-874 on October 23, 1962. The overall project was authorized as seven official levee units (which can be divided into a total of nine different unit elements).

Local Project Ownership.

The five owner-operators of the Kansas Citys Local Flood Protection Project are listed below. These non-Federal organizations own and maintain the systems with the Corps providing regular inspections and technical review of significant modifications to the system. Financial sponsorship of this feasibility study (cost-shared 50% Fed and 50% Non-Fed) is shared among four sponsors as indicated:

Levee Unit	Levee Owner
Central Industrial District (MO & KS)	City of Kansas City, Missouri (MO portions) Kaw Valley Drainage District (KS portions)
Armourdale	Kaw Valley Drainage District
Argentine	Kaw Valley Drainage District
Birmingham	Birmingham Drainage District (BDD) (for this study Kansas City, MO is acting for the BDD as financial sponsor)
North Kansas City	North Kansas City Levee District City of Kansas City, Missouri (Airport area only)
Fairfax-Jersey Creek	Fairfax Drainage District (primary owner/operator) Kaw Valley Drainage District (extreme lower end)
East Bottoms	City of Kansas City, Missouri

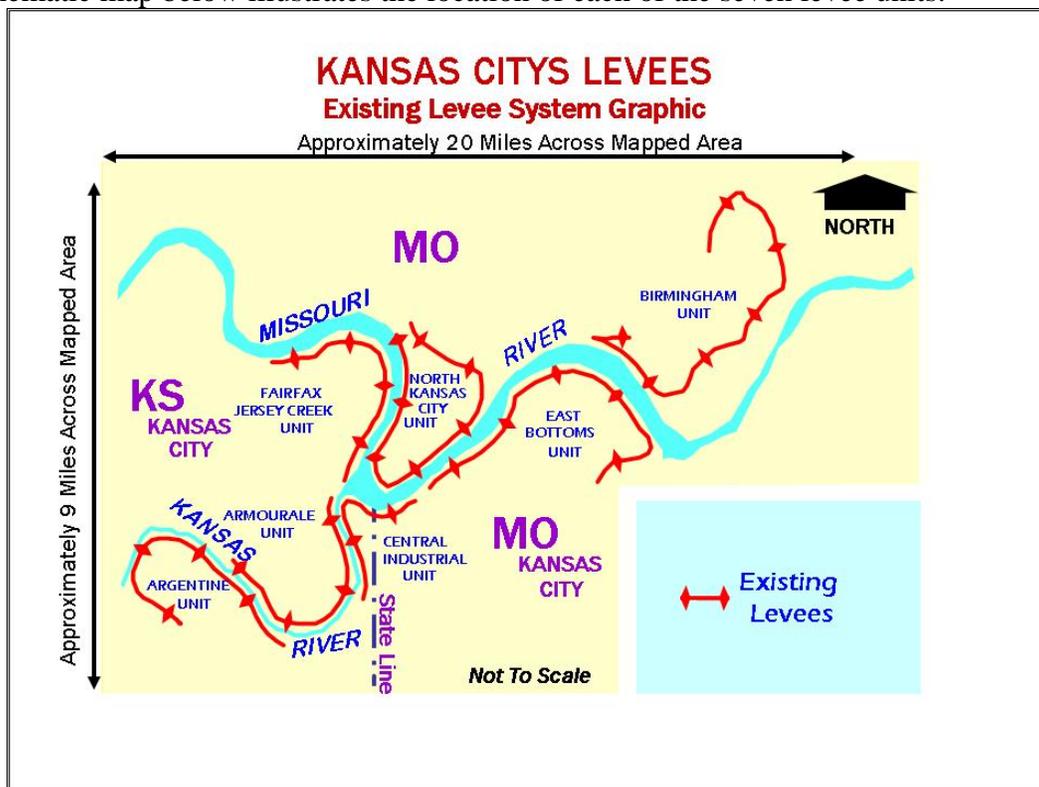
Description of Existing Overall Project.

The protective works under study are within the immediate metropolitan area and vicinity of Kansas City, Missouri and Kansas City, Kansas along the Missouri and Kansas Rivers. The protective works consist principally of levees, floodwalls, bridge and approach alterations, and channel improvement and alteration. The project extends over the lower 9.5 miles of the Kansas River and on the Missouri River from 6.5 miles upstream to 9.5 miles downstream of the mouth

of the Kansas River. The 32 square mile protected area covers the heavily industrialized floodplains of the two rivers. Each of the seven flood protection units was designed and constructed in coordination with the other, but each is operationally independent. Complete effectiveness of the overall project is contingent on adequate reservoir control in the upper Missouri and Kansas River basins.

The study area includes protected areas within Jackson and Clay Counties, Missouri and Wyandotte County, Kansas. Communities (or portion thereof) within the study area include Kansas City, North Kansas City, Randolph, and Birmingham in Missouri, and Kansas City, Kansas. The seven flood protection units are named as follows: North Kansas City Unit; Central Industrial District Unit; Birmingham Unit; Northeast Industrial District (East Bottoms) Unit; Fairfax-Jersey Creek Unit; Armourdale Unit; and the Argentine Unit.

The schematic map below illustrates the location of each of the seven levee units:



3. INDEPENDENT TECHNICAL REVIEW COMPLETED FOR PHASE 1

In addition to district level product development reviews (internal peer and interdisciplinary reviews), an Independent Technical Review (ITR) Team was established concurrent with the Product Delivery Team (PDT), and was routinely brought in for review and comment at key points of the study process. The ITR team was comprised of technical experts from several Corps districts and the Corps Flood Risk Management (previously Flood Damage Reduction) Center of Expertise. The ITR process was consistent with EC 1110-1-105 Independent Technical Review. Documentation of the ITR effort was submitted along with the Phase 1

interim feasibility report. Issues that arose were addressed and resolved. The Dr. Checks review system was used for ITR comment and review documentation.

4. LEVELS OF REVIEW SELECTED FOR FEASIBILITY PHASE 2

Product Development Reviews -- Internal Peer Review (IPR) & Interdisciplinary Review. Internal Peer Review and Interdisciplinary PDT Review will be conducted within CENWK for feasibility study products. These internal reviews (or design checks) constitute a major portion of the quality control process for each deliverable product. It is the responsibility of each PDT member, their supervisors, and the Project Manager (PM) to ensure that every product undergoes these reviews. It is the responsibility of the supervisor or section chief for each team member to ensure that a qualified internal peer reviewer is selected and conducts the peer review of their product prior to incorporation and completion of the overall product. The PM will organize and document the Interdisciplinary PDT Reviews, whereby interim products are examined for cross-discipline integration and consistent use of interdisciplinary information.

Architect-Engineer (A-E) or Consulting Contracts.

Contracts used on this project will undergo a Quality Assurance Review of each deliverable product by assigned district PDT members. Additionally, any products developed by contract will also undergo ITR along with other products. All contractors are required to submit a Quality Management Plan to the PM for approval.

Independent Technical Review.

ITR will be conducted consistent with the successful ITR approach and team membership used in Phase 1. The Phase 2 ITR scope will consist of the products developed only during Phase 2. The PDT and ITR technical agreements and resolutions reached during Phase 1 will form the basis for additional product development and ITR in Phase 2. Furthermore, in accordance with EC 1105-2-408 dated 31 May 2005, and CECW-CP Memorandum dated 8 November 2006, all outside independent review teams for qualifying projects is coordinated through the Corps of Engineer Flood Risk Management Center of Expertise (FRM-PCX, South Pacific Division). The CX works collaboratively with the Division staff and the District project manager to find team member staff outside the Kansas City District with the requisite experience and qualifications to review the project. Review comments will be documented, processed, and resolved through the Dr. Checks software package.

External Peer Review (EPR).

External Peer Review (EPR) will apply to feasibility Phase 2 products as the potential exists for recommendations (construction) costing more than \$45 Million. EPR is an additional national level independent review process, outside the Corps of Engineers, to ensure that projects which are of national or regional interest meet the requirements of Federal participation. Conduct of EPR is guided by EC 1105-2-408 "Peer review of Decision Documents" and the requirements of WRDA 2007 (PL 110-114) regarding peer review.

However, it is generally agreed that this study does not involve novel methods, complex challenges, precedent setting methods or models, nor landmark conclusions affecting Corps policy. Nor is the study considered highly controversial as it addresses an existing levee project.

Phase 2 of the study will generally use Corps of Engineers standard criteria, methods, and models which are recognized and endorsed by the Corps engineering and technical communities.

It is likely that CENWK will use a standing contract with the National Academy of Sciences to undertake the EPR. Anticipated cost of the Phase 2 EPR is estimated at between \$350,000 to \$450,000. Based on WRDA 2007 language, the costs for EPR are fully Federally funded. The EPR will likely consist of at least four members (to include structural engineer, geotechnical engineer, economist and environmental scientist). The exact composition of the EPR team and the expertise needed by EPR members will be selected through CENWK negotiations with the National Academy of Sciences and concurrent approval by the CESPDP FRM-PCX. The EPR will be conducted using letters (review comments) along with some in-person on-site coordination and orientation. Feasibility products, backup information, ITR comments and resolution documentation, along with significant and relevant public comments will be provided to the EPR members.

References.

- Refer to ER 1110-1-105, the primary Corps ITR regulation.
- EC 1105-2-408 dated 31 May 2005
- CECW-CP Memoranda dated 8 November 2006 and 30 March 2007.
- Refer to CENWK Business Quality Procedure (BQP) 5.5.04 (Quality Plans). Pertinent excerpts are quoted below:

5.6 ITRT Members:

- *Verify compliance with established policy, principles and procedures.*
- *Verify criteria applied.*
- *Verify assumptions, methods, procedures, and material used in analyses.*
- *Evaluate alternatives.*
- *Verify the appropriateness of data used and level of data obtained.*
- *Verify completeness of design and documents.*
- *Verify reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.*
- *Conduct spot checks for interdisciplinary coordination.*
- *Identify the specialized knowledge, experience, or training required to competently complete the product.*
- *Verify comments are resolved by:*
 - *Verifying incorporation of their comments or,*
 - *Accepting the verification conducted by either the PM or ITRT Leader or,*
 - *Withdrawing the comment.*

6.1.7.7.3 Independent Technical Review: Qualified staff verifies the work meets reasonable professional levels and satisfies the client's needs and expectations. For small, simple, low complexity, low risk projects, independent technical review can be accomplished at the section level. Independent technical review can be managed at branch levels when a few disciplines are involved, the project is of moderate cost and complexity and the risk for life safety is relatively low. Independent technical review for all other projects should include individuals who do not have a vested interest in the project and are not involved in the day-to-day direction of the product. The PMP should define the level of independent technical review. Independent technical review is not a detailed check but a broad overview including:

- *Review of criteria applied,*
- *Review of the methods of analysis and design,*
- *Compliance with client and/or program requirements,*
- *Completeness of design and documents,*

- *Spot checks for interdisciplinary coordination,*
- *Biddability, constructability, operability and environmental.*

6.1.7.7.4 *Independent reviewers are brought on board early on to participate in establishing criteria selection and broad approaches to be taken in addressing potential issues thus ensuring seamless review.*

5. COMPOSITION AND ORGANIZATION OF THE ITR TEAM

Discipline-Specific Guidance & Requirements.

ITR Team representation is required in the disciplines listed below. A statement of qualifications is required for each team member prior to acceptance as an ITR Team member and for any subsequent changes thereto.

Hydrology & Hydraulics: Team member will be an expert in the field of large-river hydrology & hydraulics, have a thorough understanding of the dynamics of the confluence of two rivers, and be familiar with interior drainage issues related to levee construction. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, HEC-RAS, UNET, and TABS).

Structural: Team member will have a thorough understanding of levee, flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gatewell structures, utility penetrations, stoplog & sandbag gaps, and other closure structures). Very critical ITR team member.

Mechanical: Team member shall be familiar with levee pump station and closure structure design. *Engineering disciplines other than Mechanical may be acceptable for review of this area of work subject to meeting the experience requirement stated above.*

Electrical (if deemed necessary): Team member shall be familiar with levee pump station and electrical utilities design. Electrical ITR requirements for this study are very minimal.

Geotechnical: Team member will have extensive experience in levee & floodwall design, post-construction evaluation, and rehabilitation. Very critical ITR team member.

Economics: Team member will have extensive experience in related flood risk management projects, and have a thorough understanding of HEC-FDA.

Plan Formulation: Team member will be familiar with current flood risk management planning and policy guidance, and have experience in plan formulation for large-scale flood risk management projects.

Civil / Site / Utilities / Relocations: This requirement may require a dedicated team member, or may be satisfied by structural or geotechnical reviewer, depending on individual qualifications. Team member will have experience in utility relocations and positive closure requirements for levee construction.

Cost Estimating: Team member will be familiar with cost estimating for similar projects using MCACES and will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. Cost estimating efforts will be coordinated with the Cost Engineering Center at USACE-Walla Walla District.

Other disciplines/functions involved in the project include Hazardous/Toxic Waste, Environmental/NEPA, Real Estate, Cultural Resources, and Legal. In each case, any required Independent Technical Review within these disciplines may be accomplished within Kansas City District or by other independent sources. The general experience requirements and principles contained in this document also apply to these disciplines/functional areas. (*Exception: Legal review is not under the purview of the ITR Team Leader but is instead responsible to the Corps of Engineers Office of Counsel chain-of-command*).

ITR Team Leader.

One member of the ITR Team will act as the ITR team leader. ITR team leader designation is based on input from ITR Team members and the CENWK Project Manager, the PDT, CENWK staff, along with higher headquarters and PCX review. The ITR leader shall, in addition to discipline-specific review requirements, be responsible for:

- Acting as a liaison between the Product Development Team and the ITR Team
- In conjunction with the PM, the ITR team leader will perform active coordination of the ITR process and study findings with the Corps Flood Risk Management Center of Expertise (FRM-PCX) in South Pacific Division, and ensure compliance with PCX review.
- Distributing information for review and coordinating efforts of the ITR Team.
- Ensuring that individual ITR Team members are operating IAW the guidelines established for ITR by ER 1110-1-105.
- The ITR team is *not* geographically co-located. Therefore, it is of paramount importance that the ITR Team Leader be capable of organizing the total ITR efforts across District and Division boundaries.
- A substitute ITR Team Leader from the ITR team will be named by the ITR team leader for periods of extended (over 60 days) absence.

ITR and PDT Communication.

The ITR team members will be contacted on a regular basis by the corresponding PDT members so as to be kept aware of criteria selection and the broad approaches employed in this study thus ensuring a seamless review when products are submitted for ITR. The PM and the ITR leader will coordinate the exact timing, duration and information requirements for various interim and final ITR reviews.

6. ITR AND EPR SCHEDULE

Phase 2 feasibility was initiated in mid-2006. Early phase 2 activities ran concurrently with the conclusion of Phase 1. All scheduled events are subject to available funding and team resources.

- **Initial Phase 1 ITR Team Site Visit** was accomplished early in Phase 1.

- **Initial Phase 2 ITR Workshop** was conducted in Oct 06. The purpose was to seek ITR and PDT alignment on issues and criteria early in Phase 2.
- **Complete Phase 2 Engineering Products** in Sep 08. ITR of these products will follow immediately thereafter.
- **Other Phase 2 Analysis and Products** (HTRW, Economics, Plan Formulation, Real Estate, and Environmental documentation) will be complete in Feb 09. ITR of these products will follow immediately thereafter.
- **Hold AFB** review with HQUSACE, selected ITR and EPR members, and sponsors Apr 09.
- **Issue draft feasibility report** for Public Comment and Public Meetings in Jun 09.
- **Start EPR** of draft main Feasibility Report, EIS Supplement, and supporting Appendices Jul 09.
- **Issue Division Commander's Letter** of Transmittal in Sep 09.
- **A final feasibility report** is expected in 2010 depending on CWRB and HQUSACE policy reviews & guidance timeframe.

7. ITR AND EPR BUDGET

ITR for Phase 2 is currently budgeted at \$47,000. *Note that the final ITR budget is dependent on the number of the reviews actually required to resolve any issues developed during the feasibility study.*

EPR for Phase 2 is currently budgeted at \$350,000 to \$450,000. Based on WRDA 2007 language, the costs for EPR are fully Federally funded.

8. PUBLIC COMMENT OPPORTUNITIES

This Project Review Plan will be available on the national Corps of Engineers planning website, and the CENWK project website, at the following links:

http://www.usace.army.mil/cw/cecw-cp/peer/peer_rev.html

<http://www.nwk.usace.army.mil/projects/7levees/>

Public and Agency Review for this project will be conducted in accordance with NEPA, as well as the provisions of the Water Resources Development Act (WRDA) 2000, and as outlined in ER 1105-2-100.

Public input from the NEPA workshops and the public meetings will be available to the ITR and EPR members to ensure that public comments have been considered in the development of reviews and final reports.

9. REVIEW TEAM MEMBERS

ITR, PCX, and PDT members are identified in a separate Project Review Plan appendix. Updates to the member listing will occur as team members change.

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