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

CELRD-PDS-R

14 Jan 2013

MEMORANDUM FOR Commander, U.S. Army Engineer District, Louisville, Attention, Amy Babey (CELRL-PM-P), Louisville District, U.S. Army Corps of Engineers, 600 Dr. Martin Luther King Jr. Place, Louisville, Kentucky

SUBJECT: Review Plan for the 2011 Flood Event (Paducah, Russell Allison – Ambraw, Brevoort, Wabash Levee Unit #5 and Evansville) Great Lakes and Ohio River Division (LRD) Approval Memorandum

1. The attached Review Plan (RP) for the 2011 Flood Event (Paducah, Russell Allison – Ambraw, Brevoort, Wabash Levee Unit #5 and Evansville) was distributed for review to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-209 "Civil Works Review Policy" on 29 Nov 2012.

2. The authorized names and locations of the levee rehabilitation projects are: the Paducah, KY Levee System in McCracken County, Kentucky; Russell Allison-Ambraw Levee in Lawrence and Crawford Counties, Illinois; Brevoort Levee Segment in Knox County, Indiana; Wabash Levee Unit # 5 in Gibson and Posey Counties, Indiana and Evansville Levee in Vanderburgh County, Indiana. Each PIR presents the history of the projects and the damages incurred by levees in Kentucky, Indiana, and Illinois during the 2011 Flood Event and a recommendation for a method of repair to restore the levees to their pre-disaster condition.

3. Authority for the Levee Rehabilitation Projects for the 2011 Flood Event is contained in the Flood Control and Coastal Emergency Act (Public Law 84-99) which states:

> "USACE also has authority under PL 84-99, Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities including disaster preparedness, Advance Measures, emergency operations (Flood Response and Post Flood Response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated source."

Under the authority of PL 84-99, an eligible flood protection system can be rehabilitated if damaged by a flood event. The flood system would be restored to its pre-disaster status at no cost to the Federal system owner, and at 20% cost to the eligible non-Federal system owner. All systems considered eligible for PL 84-99 rehabilitation assistance have to be in the Rehabilitation and Inspection Program (RIP) prior to the flood event. Acceptable operation and maintenance by the public levee sponsor are verified by levee inspections conducted by the

Corps on a regular basis. The Corps has the responsibility to coordinate levee repair issues with interested Federal, State, and local agencies following natural disaster events where flood control works are damaged.

4. Project Descriptions

a. Several areas of the Paducah Levee System along the Ohio River sustained damage resulting from the flood events during the spring of 2011. Damages that were considered eligible for repair under the PL 84-99 program include the following five items: 1) erosion damage on the bank of a diversion channel; 2) a slope failure on the riverbank adjacent to a floodwall; 3) rutting damage along the crown and 4) rutting on the landside slope and toe of the levee embankment (both from flood fighting activities) and 5) loss of vegetative protection along the riverside of the levee.

b. The Brevoort Levee had three areas where severe sand boils were documented by Louisville District engineers during the spring 2011 flood event. The local sponsor placed sandbag rings around the sand boils during the flood in an effort to reduce foundation loss beneath the levee, but a permanent solution is needed to assure the integrity of the system. Although the levee did not fail during the spring 2011 flood, repairs are warranted to reduce the risk of failure during future high water events due to the loss of the levee's soil foundation.

c. Multiple areas of the Russell Allison-Ambraw Levee have been damaged as a result of the recent flood event of 2011. The levee sustained three overtopping breaches at stations 985+00, 1000+00, and 1020+00, which were repaired in September 2011 by the local sponsor Russell Allison-Ambraw Levee District. A team of Louisville District personnel inspected additional damages caused by the Spring 2011 flood event on 2 February 2012.

d. The Wabash River section had seven areas where severe sand boils were documented by Louisville District engineers during the flood event. The local sponsor attempted to sandbag the sand boils in an effort to reduce foundation loss beneath the levee, but a permanent solution is needed to assure the integrity of the system. Although the levee did not fail during the recent flood, repairs are warranted to reduce the risk of failure during future high water events due to the loss of the levee's soil foundation. Severe rutting damage on the crown of the levee attributed to the flood fighting efforts occurred along the Patoka River section of the project.

e. The Evansville Levee System was damaged along the Ohio River and Pigeon Creek resulting from the flood events during the spring of 2011. Approximately 3000 feet of wave wash erosion of the levee embankment was sustained along the majority of the riverfront of the Knight Township (Ohio River) Section from Sta. 382+53 to 417+14. A second area of previously existing wave wash erosion from Sta. 361+29 to 290+00 on the Knight Township (Ohio River) section was exacerbated by the Spring 2011 flood; however, the local sponsor indicated repair work for this area would be accomplished by a grant funded contract that was awarded in the fall of 2011. The damages at Sta. 361+29 to 290+00 are thus not considered for

repair in the Project Information Report because the local sponsor is already in the process of repairing this area. Two flap gates suffered internal structural damage at the Delaware Pump Station; additionally, a flap gate near the Diamond Avenue Pump Station failed when the flap gate seating fractured where the gate met the headwall. Repairs are warranted to prevent further deterioration of the levee embankment and to avoid flap gate failure during a future flood event.

5. The Review Plan (RP) is the key to ensuring credibility and accountability regarding Project Information Reports (PIR) for the 2011 Flood Event (Paducah, Russell Allison – Ambraw, Brevoort, Wabash Levee Unit #5 and Evansville) through the definition of scope and level of peer review for the decision document. Additionally, this RP is the basis for compliance with the Information Quality Act requirement to ensure and maximize the quality, objectivity, utility and integrity of information provided in this report to be disseminated by the agency.

6. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes the scope of review for work phases and addresses all appropriate levels of review consistent with the requirements described in EC 1165-2-209.

7. I concur with the recommendations of the RMO and approve the enclosed RP for the Review Plan (RP) for the 2011 Flood Event for Paducah, Russell Allison – Ambraw, Brevoort, Wabash Levee Unit #5 and Evansville.

8. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP should be removed.

9. If you have any questions or need additional information, please contact Mrs. Adrienne Gordon, P.E., PMP, CELRD-PDS-R, at (513) 684-6055.

Margaret W. Burcham

Encl

MARGARET W. BURCHAM
Brigadier General, USA
Commanding

DECISION DOCUMENT AND IMPLEMENTATION DOCUMENTS REVIEW PLAN

For

Flood Control and Coastal Emergency (FCCE) Levee Rehabilitation Projects
2011 Flood Event
Project Information Reports (PIRs) and Implementation Documents
(Plans and Specifications)

Louisville District

MSC Approval Date: 14 January 2013
Last Revision Date: *None*

US Army Corps
of Engineers ®

DECISION DOCUMENT AND IMPLEMENTATION DOCUMENTS REVIEW PLAN
For
Flood Control and Coastal Emergency (FCCE) Levee Rehabilitation Projects
2011 Flood Event
Project Information Reports (PIRs) and Implementation Documents

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Project Information Reports (PIRs) for the Paducah, KY Levee System in McCracken County, Kentucky; Russell Allison-Ambraw Levee in Lawrence and Crawford Counties, Illinois; Brevoort Levee Segment in Knox County, Indiana; Evansville Levee in Vanderburgh County, Indiana; and Wabash Levee Unit # 5 in Gibson and Posey Counties, Indiana. These PIRs were written by the U.S. Army Corps of Engineers (USACE) Louisville District (LRL) under the general direction of the USACE Great Lakes and Ohio River Division (CELRD).

The historic flood crest of spring 2011 at Paducah was the culmination of months of above normalprecipitation across the midwestern United States. It also was the result of unusual timing, which saw the primary flow crest from both the Ohio and Mississippi River watersheds occur at nearly the same time at their confluence near Cairo, Illinois which impacted the flooding at Paducah. The spring of 2011 was the wettest in 117 years of record in the Ohio River watershed. Flooding began in portions of the basin as early as February, and extended through May. The excessively wet pattern caused numerous flood events on faster responding tributaries, while building two primary flood peaks along the slower responding mainstem Ohio River. The Ohio River first crested in March, then began rising again in April before cresting in early May. The spring of 2011 was the wettest on record in the Wabash River watershed. The initial flooding occurred in local headwater areas most susceptible to flash flooding and gradually built up along the Wabash River and its major tributaries to near-record levels in the lower portion of the basin through late April and early May.

The damages caused at the Brevoort Levee System were several sand boils which were prevalent along Brevoort throughout the 2011 flood event transporting large amounts of fine sand material to the surface. Although the levee did not fail during the spring 2011 flood event, flood related damages are considered significant enough that the engineering characteristics of the levee foundation in these areas are suspect for current and future levee integrity. The Evansville Levee incurred approximately 3000 feet of wave wash erosion of the levee embankment along the majority of the riverfront of the Knight Township (Ohio River) Section from Sta. 382+53 to 417+14 and two flap gates suffered internal structural damage at the Delaware Pump Station. Additionally, a flap gate near the Diamond Avenue Pump Station failed when the flap gate seating fractured where the gate met the headwall. At Wabash Levee Unit # 5, seven areas in the Wabash River Section were damaged where severe sand boils were documented. The local sponsor attempted to sandbag the sand boils in an effort to reduce foundation loss beneath the levee, but a permanent solution is needed to assure the integrity of the system. Although the levee did not fail during the recent flood, repairs are warranted to reduce the risk of failure during future high water events due to the loss of the levee's soil foundation. Severe rutting damage on the crown of the levee attributed to the flood fighting efforts occurred along the Patoka River section of the project. The Paducah Levee suffered erosion damage in at least two areas, severe damage to two flap gates, slope failure of the riverbank, sloughing damage at the toe of the levee and loss of vegetative protection, and rutting damage due to flood fighting efforts. The Russell-Allison-Ambraw Levee System sustained three overtopping breaches, which were repaired by the non-Federal Sponsor in September 2011. Other damages observed were: approximately 2500 feet of scouring along the landside slope and toe caused by overtopping (landside toe and approximately 15 feet out from the toe have been repaired, but approximately 1900 feet of erosion was noticed on the slope); approx. 1800 feet of

wave wash was noticed along the riverside slope; and approx. 250 feet of erosion was noticed at the riverside toe.

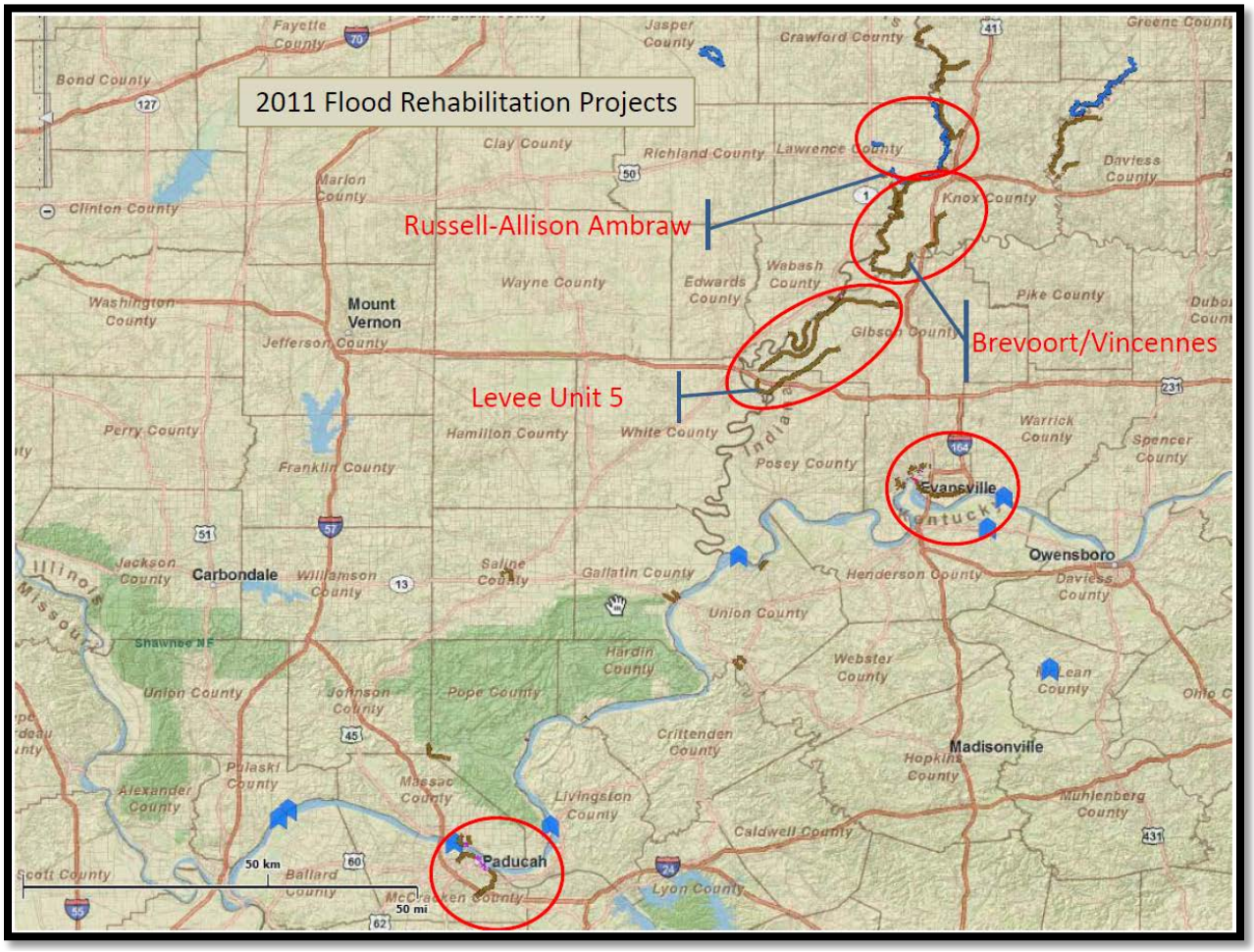

Figure 1 – Locations of Levee Rehabilitation Projects from the 2011 spring Flood Event

b. References

(1) ER 500-1-1 Emergency Employment of Army and Other Resources - Civil Emergency Management Program, 30 September 2001
(2) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
(3) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
(4) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
(5) Decision Document Project Management Plan (PMP) for Levee Rehabilitation Projects for the 2011 Flood Event
(6) Major Subordinate Command (MSC) and/or District Quality Management Plan(s)
(7) ER 11-1-321, Army Programs, Value Engineering, 01 January 2011

c. Requirements. This Decision Document and Implementation Document Review Plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair,

replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Major Subordinate Command (MSC), the Great Lakes and Ohio River Division located in Cincinnati, Ohio. The MSC will coordinate and approve the review plan. The Louisville District will post the approved review plan on its public website.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

a. Decision Document and Implementation Documents**.** The authorized names and locations of the levee rehabilitation projects are: the Paducah, KY Levee System in McCracken County, Kentucky; Russell Allison-Ambraw Levee in Lawrence and Crawford Counties, Illinois; Brevoort Levee Segment in Knox County, Indiana; Evansville Levee in Vanderburgh County, Indiana; and Wabash Levee Unit # 5 in Gibson and Posey Counties, Indiana. The purpose of the Project Information Report (PIR) is to present the history of the projects and the damages incurred by levees in Kentucky, Indiana, and Illnois during the 2011 Flood Event and to recommend a method of repair to restore the levees to their pre-disaster condition.

Authority for the Levee Rehabilitation Projects for the 2011 Flood Event is contained in the Flood Control and Coastal Emergency Act (Public Law 84-99).

USACE also has authority under PL 84-99, Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities including disaster preparedness, Advance Measures, emergency operations (Flood Response and Post Flood Response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated source.

Rehabilitation: Under the authority of PL 84-99, an eligible flood protection system can be rehabilitated if damaged by a flood event. The flood system would be restored to its pre-disaster status at no cost to the Federal system owner, and at 20% cost to the eligible non-Federal system owner. All systems considered eligible for PL 84-99 rehabilitation assistance have to be in the Rehabilitation and Inspection Program (RIP) prior to the flood event. Acceptable operation and maintenance by the public levee

sponsor are verified by levee inspections conducted by the Corps on a regular basis. The Corps has the responsibility to coordinate levee repair issues with interested Federal, State, and local agencies following natural disaster events where flood control works are damaged.

b. Study/Project Description.

Brevoort Levee System:

Project Damages - The Brevoort Levee had three areas where severe sand boils were documented by Louisville District engineers during the spring 2011 flood event. The local sponsor placed sandbag rings around the sand boils during the flood in an effort to reduce foundation loss beneath the levee, but a permanent solution is needed to assure the integrity of the system. Although the levee did not fail during the spring 2011 flood, repairs are warranted to reduce the risk of failure during future high water events due to the loss of the levee's soil foundation.

Paducah Levee System:

Project Damages - Several areas of the Paducah Levee System along the Ohio River sustained damage resulting from the flood events during the spring of 2011. Damages that were considered eligible for repair under the PL 84-99 program include the following five items: 1) erosion damage on the bank of a diversion channel; 2) a slope failure on the riverbank adjacent to a floodwall; 3) rutting damage along the crown and 4) rutting on the landside slope and toe of the levee embankment (both from flood fighting activities); and 5) loss of vegetative protection along the riverside of the levee.

Russell-Allison Levee System:

Project Damages – Various areas of the Russell-Allison-Ambraw Levee have been damaged as a result of the recent flood event of 2011. The levee sustained three overtopping breaches at stations 985+00, 1000+00, and 1020+00, which were repaired in September 2011 by the local sponsor Russell-Allison-Ambraw Levee District. A team of Louisville District personnel inspected additional damages caused by the Spring 2011 flood event on 2 Febuary 2012. The additional damage was observed in three areas. Area #1 is approximately 1900 feet scouring along the land side slope of the levee between Stations 1081+00 and 1100+00. The scouring was caused by overtopping of approximately 2500 feet of levee between Stations 1100+00 to 1075+00 during the 2011 event; the sponsor has repaired landside toe and approximately 15 feet out from the toe, but damage remains on the slope of the levee. Area #2 is appproximatly 1800 feet of wave wash observed along the riverside slope from Station 985+50 to 1003+50. Area #3 is approximately 250 feet of riverside slope and toe erosion from Station 1051+00 to 1053+50. The District Flood Response Levee Rehabilitation Assistance Team has determined the damages to Area #1, Area #2, and Area #3 of the Russell-Allison Levee Section are not the result of deferred or deficient maintenance by the public sponsor, and the repair of the damages to Area #1, Area #2, and Area #3 of the Russell-Allison Levee Section are not a part of the operation and maintenance responsibilities of the public sponsor.

Evansville Levee:

Damage to the Evansville Levee System occurred along the Ohio River and Pigeon Creek resulting from the flood events during the spring of 2011. Approximately 3000 feet of wave wash erosion of the levee embankment was sustained along the majority of the riverfront of the Knight Township (Ohio River) Section from Sta. 382+53 to 417+14. A second area of previously existing wave wash erosion from Sta. 361+29 to 290+00 on the Knight Township (Ohio River) section was exacerbated by the Spring 2011 flood; however, the local sponsor indicated repair work for this area would be accomplished by a grant funded contract that was awarded in the fall of 2011. The damages at Sta. 361+29 to 290+00 are thus not considered for repair in the Project Information Report because the local sponsor is already in the process of repairing this area. Two flap gates suffered internal structural damage at the Delaware Pump Station; additionally, a flap gate near the Diamond Avenue Pump Station failed when the flap gate seating fractured where the gate met the headwall. Repairs are warranted to prevent further deterioration of the levee embankment and to avoid flap gate failure during a future flood event.

Wabash Levee Unit No. 5:

Project Damages – The Wabash River section had seven areas where severe sand boils were documented by Louisville District engineers during the flood event. The local sponsor attempted to sandbag the sand boils in an effort to reduce foundation loss beneath the levee, but a permanent solution is needed to assure the integrity of the system. Although the levee did not fail during the recent flood, repairs are warranted to reduce the risk of failure during future high water events due to the loss of the levee's soil foundation. Severe rutting damage on the crown of the levee attributed to the flood fighting efforts occurred along the Patoka River section of the project.

c. Factors Affecting the Scope and Level of Review. This review plan will describe the anticipated review process and levels of review for the Levee Rehabilitation Projects for the 2011 Flood Event. This Review Plan is a standalone document to accompany the Project Management Plan. The DQC will be managed from within the district in accordance with the PMP and District Quality Management Plans. The ATR team members, identified by the MSC, will come from outside the home district and the ATR team lead will be selected from outside the MSC. At this time no IEPR is anticipated.

- Project risks could occur if funding is not received within a time-frame that would allow award of construction contracts and rehabilitation of the levees this calendar year. The magnitude of this risk would be great in that the levees would not be returned to their pre-disaster condition, leaving them in a weakened state as we approach the next flood season. This would leave the communities without a sufficient level of flood risk management;
- An assessment from the Louisville District Chief of Engineering regarding whether or not the projects involve a significant threat to human life follows:

> "The projects eligible for PL-84-99 assistance are a variety of projects. Paducah has a large population center associated with it and would be a significant threat to life, except the damage incurred in the last event is not significant enough to seriously impact the overall performance of the levee System. These units are eligible for rehabilitation under the PL 84-99 law however. Levee Unit #5 and Breevort are mainly agricultural units but there are small populations located behind them. These structures were more severely damaged and the structural integrity is greatly impacted. Even with

this severe damage the threat to significant loss of life is not great given the vast area protected and the depth of inundation."

- There is not a request by the Governor of an affected state for a peer review by independent experts;
- The project is not likely to involve significant public dispute as to the size, nature, or effects of the project – the levee provides flood risk management for the communities. Therefore, there is no known opposition to the levee rehabilitation;
- The project is not likely to involve public dispute as to the economic or environmental cost or benefit of the project. Therefore, there is no known opposition to the levee rehabilitation;
- The recommended repair alternatives for the rehabilitation of the levees are all standard practice and are being recommended to return the levees to their pre-flood condition. The models, methodology and approach of the levee rehabilitation Project Information Reports do not deviate from the standards of Flood Risk Management, nor do they present any extraordinary challenges. An Environmental Assessment may not be required for each of the levee rehabilitation projects. Some of the projects fall under the realm of a categorical exclusion. All environmental requirements will be met. The Project Information Reports are unlikely to possess significant interagency interest, and do not involve any significant threats to human life or safety assurance issues. The consequences of project non-performance with and without the project are similar because it is a rehabilitation project. It is not likely that the project will have significant economic, environmental, or social effects to the nation, such as (but not limited to) more than negligible adverse impacts on scarce or unique cultural, historic, or tribal resources; substantial impacts on fish and wildlife species or their habitat, prior to implementation of mitigation; more than negligible adverse impact on species listed as endangered or threatened, or to the designated critical habitat of such species, under the Endangered Species Act, prior to implementation of mitigation. Rehabilitation of these projects has been authorized under Public Law 84-99. It is not expected that implementation costs will exceed the $45 million cutoff for IEPR requirement.
- The project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule .
- The repairs indicated in the project information reports do not require redundancy, resiliency, and/ or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule. The repairs do not provide any redundant features because they restore the levee to pre-flood condition; no repairs constitute a failsafe. Placement of riprap, sand berms, erosion control mats, and gravel on the levee embankment prevent future damage to the levee embankment. The repairs are necessary to reduce the risk of failure from damages caused by the 2011 flood and do not provide the levee systems with any additional capabilities beyond typical operation.

d. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. All of the levees are federally-constructed levees with the exception of the Russell Allison-Ambraw Levee which is non-Federally constructed. There are no known in-kind products to be provided by the non-Federal sponsor on the Russell Allison-Ambraw Levee. Provision of borrow material area(s) is the responsibility of the non-Federal Sponsor. With the Federally-constructed levees, all costs are Federal costs. Therefore, there would be no in-kind products from the sponsor.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

a. Documentation of DQC. DQC of the PIR's was documented by signature sheets with senior-level checkers, Subject Matter Experts, and Supervisors, and were provided to the ATR team at review.

b. Products to Undergo DQC. This Project Information Reports will undergo DQC consistent with the District/MSC Quality Management plans.

c. Required DQC Expertise. The required expertise needed to conduct DQC consistent with the District/MSC Quality Management plans would be comprised of Geotechnical Engineering/Levee Safety, Planning, and Cost Estimating expertise . The Geotechnical Engineer/Levee Safety reviewer should be familiar with methods of remediating levees with seepage and slope stability concerns as well as best practices for repairing embankment erosion damage.

The Cost Engineering peer reviewer should be a supervisor and/or team leader, designated individuals from the senior staff familiar with the type of work, or other qualified personnel that typically provides a quality check during the development process of the cost estimating product(s).

The Planning Reviewer should be senior level staff familiar with the ER 1105-2-100 Planning Guidance Notebook and applicable laws, regulations, and policy.

5. AGENCY TECHNICAL REVIEW (ATR)

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

a. Products to Undergo ATR. The Project Information Reports will undergo ATR (including NEPA and supporting documentation).

b. Required ATR Team Expertise. The ATR Team will consist of a team lead and additional team members with expertise in engineering/ levee safety , planning, and cost estimating. The engineering representative should have experience with levee design and engineering principles. The planner should have experience with the planning principles and guidelines and the plan formulation process. The cost estimator should be familiar withapplicable cost estimating

procedures and applicable cost engineering regulations. The PDT should make the initial assessment of what expertise is needed based on the PMP and the factors affecting the scope and level of review outlined in the review plan, and may suggest candidates. The appropriate RMO, in cooperation with the PDT, vertical team, and other appropriate centers of expertise, will determine the final make-up of the ATR team. The following table provides examples of the types of disciplines that might be included on the ATR team and some sample descriptions of the expertise required.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and implementation 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 may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer for the Decision Document * should be a senior water resources planner with knowledge of the ER 1105-2-100 Planning Guidance Notebook and applicable laws, regulation, and policy.
Geotechnical Engineering/Levee Safety	The Geotechnical Engineering/Levee Safety reviewer will be an expert in the field of levee safety and have a thorough understanding of seepage mechanics and means of preventing material loss from the foundation of a levee. The reviewer should be familiar with best practices for levee embankment earthwork, and common repair methods for damage within the levee right of way. The reviewer should have an understanding slope stability problems commonly associated with levee embankments and river banks and be familiar with common repair techniques.
Cost Engineering	The Cost Engineering reviewer (Decision Document*) should be a qualified senior cost engineer experience in the construction estimating field of study. The reviewer should have extensive knowledge of Civil Works levee projects and have an understanding of Public Law 84-99.
Real Estate	The Real Estate Representative should have experience in plan formulation and implementation of Flood Risk Management (FRM)projects and applicable underlying policies

** Planning and Cost Engineering reviewers required only for decision documents*

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in 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, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

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

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

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

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether

IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. Decision on IEPR. Any project, including the Levee Rehabilitation Projects, can have residual risks and public safety concerns that are significant during the occurrence of flood events exceeding the capacity of the levee system. without the project are similar because it is a rehabilitation The following paragraphs describe the issues associated with potential overtopping and discuss specifically how those risks are being addressed for the levee rehabilitation projects.

For any overtopping event, there will always be an impact on floodplain residents, businesses, transportation systems, and other critical infrastructure systems. Typically, the Paducah Levee Rehabilitation Project has a large population center associated with it. However, the damage incurred in the 2011 Flood Event is not significant enough to seriously impact the overall performance of the levee system. However, the levee system is eligible for rehabilitation under PL 84-99. Wabash Levee Unit #5 and Breevort are mainly agricultural units but there are small populations located behind them. These structures were more severely damaged and the structural integrity is greatly impacted. Even with this servere damage, the threat to significant loss of life is not great given the vast area protected and the depth of inundation.

Since the scope of the levee rehabilitation is limited in that the levees are being returned to their pre-flood condition, and since they don't meet any of the trigger criteria for Type I IEPR or Type II IEPR, the projects would not benefit from either Type I or Type II IEPR.

b. Products to Undergo Type I IEPR. Not-Applicable.

c. Required Type I IEPR Panel Expertise. Not-Applicable.

d. Documentation of Type I IEPR. Not-Applicable.

7. POLICY AND LEGAL COMPLIANCE REVIEW

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

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO (MSC) is responsible for coordination with the Cost Engineering DX.

9. MODEL CERTIFICATION AND APPROVAL

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

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. The LRL Levee PIR Economic Worksheet was developed in the Louisville District and has served as the only model utilized for economic analysis associated with LRL Levee PIR studies. This worksheet was designed to meet all requirements established in EP 500-1-1, Appendix D – Economic Analysis. With this worksheet, expected annual damages are manually calculated by computing the area under the damage-frequency curve. This manual computation is required by the LRL economist as curves typically produced by H&H for FRM studies (stage-discharge and discharge-frequency) are not produced for Levee PIR studies, thus prohibiting utilization of HEC-FDA 1.2.4. Expected annual damages are calculated for both the existing and with-project conditions and annual

benefits for various plans are derived by calculating the difference between the two. The benefits for each alternative studied are then measured against the respective cost for each alternative in a cost-benefit analysis. This analysis yields a net benefit determination and a benefit-to-cost ratio for each alternative. The alternative with the highest net benefits (which is otherwise engineeringly feasible, environmentally sound, and publicly acceptable) is determined as the NED plan.

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

Software Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
Micro-Computer Aided Cost Estimating System (MCACES), Second Generation (MII), Version 4.1	MII provides an integrated costs estimating system that meets the USACE requirements for preparing cost estimates. MCACES was used to produce estimates and was reported by using Microsoft Excel.	Required per ETL 1110-2-573

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost.

Decision Document Phase (Project Information Reports).

ATR Schedule and Cost for each of the four (4) PIRs varied. Both schedule and cost significantly exceeded optimum time frames and amounts, respectively. This resulted because of a number of factors. Future PL 84-99 project rehabilitation work efforts within the Great Lakes and Ohio River Division should be significantly improved upon as the overall process is now more established.

Implementation phase (Plans & Specifications).

The ATR time frame for this phase is approximately four to six weeks overall per rehabilitation project effort and will take place concurrently if documents for projects are available at the same time (this would be contingent upon no more than two sets of plans and specifications being with the ATR team at any one time). If more than two sets of Plans and Specifications are available at the same time, or if there are schedule constraints with the ATR Team, the District can provide suggestions for candidates outside the District/Division to serve as a backup ATR Team (this will be coordinated with the MSC). All comments will be included in DrChecks. The District will review ATR comments in approximately one to two weeks. The ATR team will then back check its comments (in DrChecks) in approximately one to two weeks and verify that comments have been sufficiently resolved. The cost of ATR for each rehabilitation effort, including ATR team initial review of Plans & Specifications, communication with the district during its review of ATR comments, and back check by the ATR team is estimated at approximately $20,000. This amount assumes no significant disagreement(s) between the district and ATR team.

b. Type I IEPR Schedule and Cost. Not Applicable.

c. Model Certification/Approval Schedule and Cost. Planning models have not been used in the development of the Project Information Reports. The LRL Levee PIR Economic Worksheet was developed in the Louisville District and has served as the only model utilized for economic analysis associated with LRL Levee PIR studies. This worksheet was designed to meet all requirements

established in EP 500-1-1, Appendix D – Economic Analysis. With this worksheet, expected annual damages are manually calculated by computing the area under the damage-frequency curve. This manual computation is required by the LRL economist as curves typically produced by H&H for FRM studies (stage-discharge and discharge-frequency) are not produced for Levee PIR studies, thus prohibiting utilization of HEC-FDA 1.2.4. Expected annual damages are calculated for both the existing and with-project conditions and annual benefits for various plans are derived by calculating the difference between the two. The benefits for each alternative studied are then measured against the respective cost for each alternative in a cost-benefit analysis. This analysis yields a net benefit determination and a benefit-to-cost ratio for each alternative. The alternative with the highest net benefits (which is otherwise engineeringly feasible, environmentally sound, and publicly acceptable) is determined as the NED plan.

11. PUBLIC PARTICIPATION

The final Project Information Reports and plans and specifications will also be made available to the public on the Louisville District website.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review for the Project Information Reports. Like the PMP, the Review Plan is a living document and may change. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval 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 latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the MSC.

13. REVIEW PLAN POINTS OF CONTACT

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

- Louisville District Project Manager, 502-315-6875
- MSC Lead, 513-684-3086
- Review Management Organization Representatives:
  - LRD Chief, EOC, 513-684-3089
  - LRD Business Technical Division, 513-684-3018

14. VALUE ENGINEERING

Value Engineering is required for Federal projects in excess of $2,000,000 total cost pursuant with Memorandum for Record, 5 December 2012, SUBJECT: Updated Legal and Regulatory Requirements for Value Engineering on Corps of Engineers Projects (para. 2.h.), as follows:

> "The current version of the ER provides that OMB Circular A-131 *requires* VE studies in all federal projects /programs over $1M in total cost. This provision is no longer supported by the Circular. Instead, the Circular A-131 now holds that VE is required for agency project and programs at or above $2M."

ATTACHMENT 1: TEAM ROSTERS:
FLOOD RESPONSE LEVEE REHABILITATION TEAM ROSTER AND AGENCY REVIEW TEAM (ATR) ROSTERS FOR PIR's AND PLANS AND SPECIFICATIONS

Spring 2011 Flood Response Levee Rehabilitation Assistance Team			
Area	**Name**	**Office Symbol**	**Telephone**
Emergency Management		OP-E	(502) 315-6921
Project Management		PM-P-F	(502) 315-6875
Economics		PM-P-F	(502) 315-6796
Environmental		PM-P-E	(502) 315-6795
Cultural Resources		PM-P-E	(502) 315-6872
Engineering and Design		ED-T-G	(502) 315-6463
Engineering and Design		ED-T-G	(502) 315-7446
Engineering and Design		ED-T-C	(502) 315-6424
GIS		ED-T-T	(502) 315-2615
GIS		ED-T-T	(502) 315-7091
CADD		ED-T-G	(502) 315-2623
Hydraulics and Hydrology		ED-T-H	(502) 315-6292
Hydraulics and Hydrology		ED-T-H	(502) 315-6380
Real Estate		RE-C	(502) 315-6956
Cost Engineering		ED-M-C	(502) 315-2621
Funding Support		PM-C	(502) 315-6895
P2 Schedules and Resourcing		PM-R&C	(502) 315-6808
Office of Counsel		OC	(502) 315-6658
Office of Counsel		OC	(502) 315-6653

Agency Technical Review (ATR) Team for PIR's			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead		CENWK	(816) 389-3553
Civil Engineer/ Cost Estimating		CEMVP	(615) 290-5625
Civil Engineer		CEMVP	(651) 290-5647
Civil Engineer/ Plan Formulation		CELRH	(304) 399-5859

Agency Technical Review (ATR) Team for Plans & Specifications			
Area	**Name**	**Office Symbol**	**Telephone**
Agency Technical Review Team Lead		CENWK	(816) 389-3553
Geotechnical Engineer		CENWK	(816) 389-2189
Structural Engineer		CEMVP	(816) 389-3237
Real Estate Representative		TBD	TBD

ATTACHMENT 2: AGENCY TECHNICAL REVIEW DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Project Information Report (PL 84-99 Rehabilitation) for the Brevoort Levee Unit in Louisville District. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks℠.

_____ *18 October 2012*
Date

ATR Team Leader
Kansas City District - CENWK-ED-GD

_____ 19 October 2012
Date

Project Manager
Louisville District – CELRL- PM-P-F

_____ _____
Date

Review Management Office Representative
Lakes and Rivers Division – CELRD

_____ _____
Date

Review Management Office Representative
Lakes and Rivers Division – CELRD

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns during the review and the explanation of the resolution are as follows:

1) *Concern*: Alternatives evaluated in PIR were founded on engineering estimations and judgment and not engineering analysis, which increased the likelihood of major changes during E&D.

Resolution: The PDT performed the necessary engineering analysis to fully back up the alternatives using all available information to include Record Drawings, design documents, reconnaissance level field surveys, and performance during the flood. This increased the confidence that the recommended plan will be close to the final plan developed in E&D. It is noted that the relief well analysis in the PIR (not a recommended alternative), due to extreme boundary conditions on this levee, has a mathematical anomaly that significantly under estimated the number of required wells. This will result in the relief wells being significantly more expensive than other alternatives, even though the cost estimate hasn't been fully updated to capture the change.

2) *Concern*: Statements that the recommended alternative of sand berms were required to be completely constructed of processed sand of a specific gradation to adequately perform were overly conservative and that semi-pervious berms were not considered sufficiently as an alternative.

Resolution: The PDT revised the report to remove the statement that sand berms had to be constructed of a processed sand of a specific gradation to perform, although still considered the material to be purchased. Additionally, the PDT considered semi-pervious berms constructed of local material as a fully developed alternative. The semi-pervious berms were found to be more economical than sand berms based on the PIR analysis, and the recommended alternative was revised in the PIR accordingly. This resulted in a significant reduction of anticipated construction costs.

3) *Concern*: The proposed schedule for E&D and Construction were too ambitious.

Resolution: Some revisions were made to the schedule and the PDT states that the revised schedule, while still ambitious, can be met.

4) *Concern*: The prime contractor was not assumed to perform 15% of the work in accordance with FAR requirements.

Resolution: The estimate was revised to assume the prime contractor self performs 15% of the work.

5) Concern: The 10% contingency, 6% E&D, and 6% S&A required by ER 500-1-1 would be inadequate for this project.

Resolution: The PDT stated that the E&D and S&A funding is sufficient for the project. The 10% contingency required by ER 500-1-1 still followed as required. However, this prevents cost certification.

6) *Concern:* The Total Project Cost Summary did not include Lands, Easements, Rights-of-Way, Relocations, and Disposal areas (LERRDS), as is typical for civil works projects

Resolution: The PDT clarified that LERRDS are 100% local sponsor cost and are not included in the project cost (per ER 500-1-1).

All comments in DR Checks have been fully addressed to the satisfaction of the ATR team. ATR comments and resolutions are attached.

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

_____ 10/19/12
Date

Chief, Engineering Division
Louisville District - CELRL-ED

_____ 10/19/12
Date

Chief, Planning Division[2]
Louisville District - CELRL-PM-P

[2]Decision Documents Only.

EC 1165-2-209 31 Jan 10

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Plans and Specifications for the 2011 flood PL 84-99 Rehabilitation for the Evansville Levee Unit in Louisville District. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks℠.

_____ *24 October 2012*
ATR Team Leader — Date
Kansas City District - CENWK-ED-GD

_____ 24 October 2012
Project Manager — Date
Louisville District –CELRL- PM-P-F

_____ _____
Review Management Office Representative — Date
Lakes and Rivers Division – CELRD

_____ _____
Review Management Office Representative — Date
Lakes and Rivers Division – CELRD

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

Significant concerns and resolutions during the review were:

1) *Concern*: Borrow access and details were unclear and unbiddable.

Resolution: Notes were added to the drawings to clarify.

2) *Concern*: All features that affect TRM placement were not called out, adding confusion to the drawings.

Resolution: Drawings were revised to clarify all features.

3) *Concern*: Tie in details of TRM at structures, gabion baskets, and at repair transitions were unclear on the drawings.

Resolution: Drawings were revised with notes and revisions to clarify.

4) *Concern*: It was uncertain if the cut into the pump station outlet slab would affect the structural integrity.

Resolution: The structural engineer clarified that the upper portion of the slab is unreinforced and was added to prevent uplift; the structural integrity is not threatened.

All ATR comments have been fully addressed to the satisfaction of the ATR team. ATR comments and resolutions are attached.

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

_____ 10/26/12

Chief, Engineering Division
Louisville District - CELRL-ED

Date

_____ 10/26/12

Chief, Planning Division[2]
Louisville District - CELRL-PM-P

Date

[2] Decision Documents Only.

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Project Information Report (PL 84-99 Rehabilitation) for the Paducah Levee Unit in Louisville District. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

_____ *22 August 2012*
Date

ATR Team Leader
Kansas City District - CENWK-ED-GD

_____ 22 August 2012
Date

Project Manager
Louisville District – CELRL- PM-P-F

_____ _____
Date

Review Management Office Representative
Lakes and Rivers Division – CELRD

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

Significant concerns and resolutions during the review were:

1) Concern that betterments or sponsor O&M were being performed under PL 84-99 rehabilitation by placing rock in certain areas was resolved by better documentation in the PIR about the damages that occurred and the need /justification for repairs,

2) Concerns that cost estimate assumptions conflict with FAR requirements by assuming 100% of the work is subcontracted were alleviated by revising cost estimates, and

3) Concerns that cost estimate production rates, unit prices, and construction assumptions were in correct have been resolved by revising the estimates or improving documentation in the PIR. Conflicts between ER 500-1-1 and cost engineering regulations regarding contingencies and S&A were resolved to the extent possible, but the cost estimate cannot be certified.

All comments in DR Checks have been fully addressed to the satisfaction of the ATR team. ATR comments and resolutions are attached.

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

8/22/12
Date

Chief, Engineering Division
CELRL-ED

8/23/12
Date

Chief, Planning Division[2]
Louisville District - CELRL-PM-P

[2] Decision Documents Only.

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Project Information Report (PL 84-99 Rehabilitation) for the Russell-Allison-Ambraw Levee Unit in Louisville District. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks™.

22 August 2012
Date

ATR Team Leader
Kansas City District - CENWK-ED-GD

22 August 2012
Date

Project Manager
Louisville District –CELRL- PM-P-F

4 October 2012
Date

Review Management Office Representative
Lakes and Rivers Division – CELRD

4 Oct 12
Date

Review Management Office Representative
Lakes and Rivers Division – CELRD

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

Significant concerns and resolutions during the review were:

1) Concern that the chosen repair method for placing bedding and riprap was less constructable and more costly than using quarry run rock was alleviated by ensuring local construction and engineering practices using bedding and riprap are feasible and cost effective,

2) Concerns that cost estimate assumptions conflict with FAR requirements by assuming 100% of the work is subcontracted were alleviated by revising cost estimates, and

3) Concerns that cost estimate production rates, unit prices, and construction assumptions were in correct have been resolved by revising the estimates or improving documentation in the PIR. Conflicts between ER 500-1-1 and cost engineering regulations regarding contingencies and S&A were resolved to the extent possible, but the cost estimate cannot be certified.

All ATR comments have been fully addressed to the satisfaction of the ATR team. ATR comments and resolutions are attached.

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

_____ 8/23/12

Chief, Engineering Division
CELRL-ED

Date

_____ 8/23/12

Chief, Planning Division[2]
Louisville District - CELRL-PM-P

Date

[2] Decision Documents Only.

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
Initial Review Plan		
10/24/12	Added ATR Team Members and ATR Certification for PIR's and Plans and Specifications	Page 16