



**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

13 Jan 2013

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

SUBJECT: Review Plan for the Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam Great Lakes and Ohio River Division (LRD) Approval Memorandum

1. The attached Review Plan (RP) for the Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam was distributed for review to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-209 "Civil Works Review" on 9 Nov 2012.
2. The Locks and Dams 52 and 53 Replacement Project is commonly referred to as the Olmsted Locks and Dam Project. It is located near Ohio River Mile 964.4 between Ballard County, Kentucky and Pulaski County, Illinois. The Olmsted Locks and Dam project is a navigation facility that will replace Ohio River Locks and Dams 52 and 53.
3. The facility will consist of twin 110-foot by 1,200 foot locks adjacent to the Illinois bank, five tainter gates, a right boat abutment, a 1,400 foot navigable pass, a left boat abutment and a fixed weir extending into the Kentucky bank. During low flow conditions, an upper pool having an elevation of 300 feet (ORD) at the dam would extend upstream a distance of 47 miles to the Smithland Locks and Dam. Open river conditions will exist from the dam site downstream a distance of approximately 17 miles to the mouth of the Ohio River. The lock construction is complete and the dam construction is ongoing. The total estimated cost of the project is \$3.1B.
4. The Feasibility Report for the project was completed in August 1985 and the project was authorized in 1988 WRDA, PL 100-676 Section 3(a) (6) dated 17 November 1988. The following documents have been prepared since the Feasibility Report
  - a. General Design Memorandum, March 1989
  - b. General Design Memorandum Supplement, April 1990
  - c. Lock Feature Design Memorandum, January 1993
  - d. Lock Feature Design Memorandum Supplement, January 1993
  - e. Post Authorization Change Report, April 2012
  - f. In-the-Dry Study, May 2012

CELRD-PDS-R

SUBJECT: Review Plan for Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam

g. Plans and Specifications for the various construction contracts that have been awarded.

5. The Review Plan (RP) is the key to ensuring credibility and accountability for the Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam 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; 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 Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam.

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 Dr. Hank Jarboe, CELRD-PDS-P, at (513) 684-6050.

Encls

1. PCXIN Memo, dated 19 Nov 2012
2. Review Plan

  
MARGARET W. BURCHAM  
Brigadier General, USA  
Commanding

**REVIEW PLAN**

**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT**

**OLMSTED LOCKS & DAM**

**IMPLEMENTATION REVIEW PLAN**

**LOUISVILLE DISTRICT**

**MSC Approval Date:** *13 January 2013*

**Last Revision Date:** *None*

Prepared 11 December 2012



**US Army Corps  
of Engineers®**

# IMPLEMENTATION REVIEW PLAN

## LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT

*Ballard Co., Ky and Pulaski Co., IL*

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## 1. PURPOSE AND REQUIREMENTS

**Purpose.** This Implementation Review Plan defines the scope and level of peer review for the Locks And Dams 52 And 53 Replacement Project, (Olmsted Locks & Dam Project), located at Ohio River mile 964.4 between Ballard Co., Ky and Pulaski Co., IL.

### a. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (5) Olmsted Locks & Dam Project Management Plan

**b. Requirements.** This review plan was developed in accordance with EC 1165-2-209, 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 1165-2-209) 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 Implementation Review Plan is CELRD Business Technical Division (BTD); Cincinnati, Ohio.

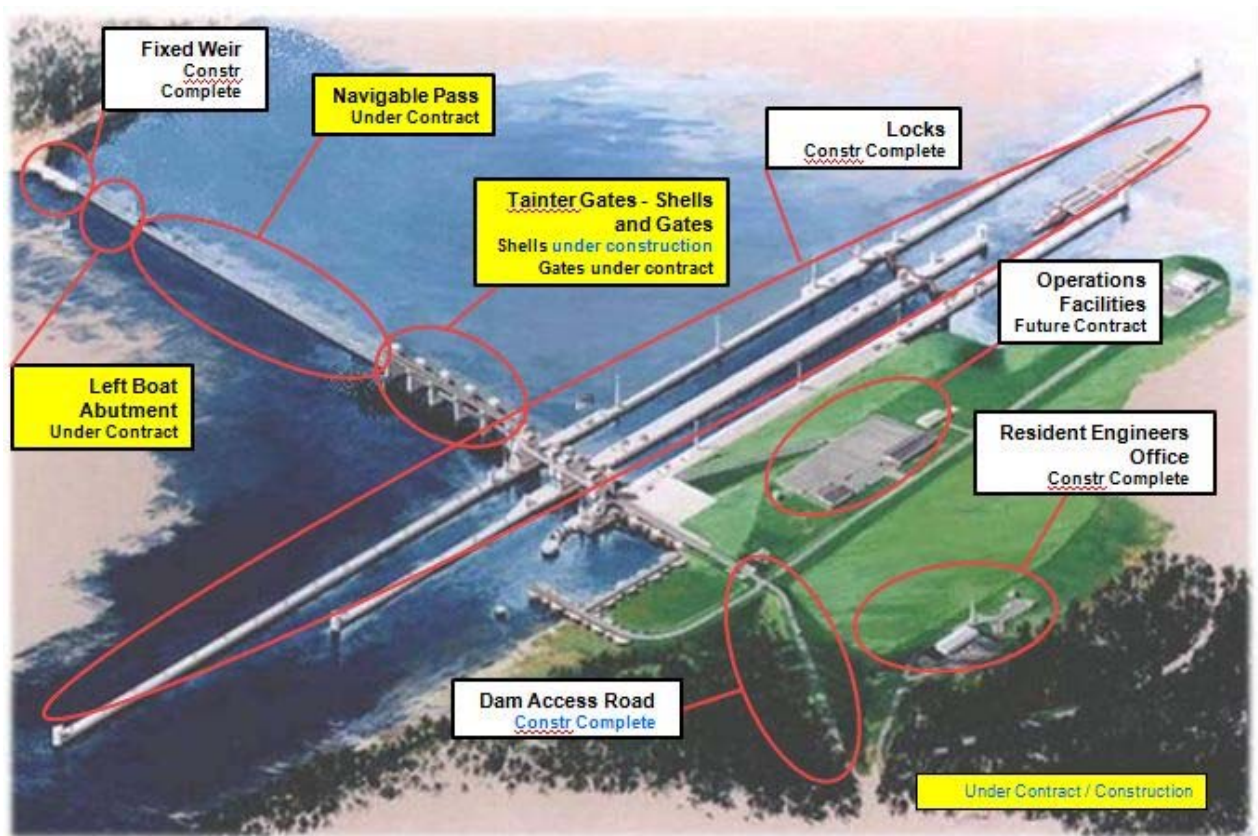
If required during the implementation phase the RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

## 3. STUDY INFORMATION

**Decision Document.** The Locks and Dam 52 and 53 Replacement Project is commonly known as the Olmsted Locks and Dam Project. It is located near Ohio River Mile 964.4 between Ballard County, KY and Pulaski County, IL. This document is the Implementation Review plan for the Olmsted Project which defines the scope and level of peer review in accordance with EC 1165-2-209, Civil Works Review Policy. This implementation review plan is for the project life cycle, that includes the remaining dam construction contract and the design & construction of the out year contracts. The out year contracts includes: lock master office, maintenance building, river dikes, demolition of L&D 52 and 53, final road paving, upstream mooring cells, locks rehabilitation, resident engineer office conversion, site restoration

and the wicket lifter barge. The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. Additional National Environmental Policy Act (NEPA) documentation is not required.

- a. **Study/Project Description.** The Olmsted Locks and Dam project provides for a navigation facility near Ohio River Mile 964.4 that will replace the existing Locks and Dams 52 and 53. The facility will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a right boat abutment, a 1,400-foot navigable pass, a left boat abutment and a fixed weir extending into the Kentucky bank. During low flow conditions, an upper pool having an elevation of 300 feet (ORD) at the dam would extend upstream a distance of 47 miles to the Smithland Locks and Dam. Open river conditions will exist from the dam site downstream a distance of approximately 17 miles to the mouth of the Ohio River. The lock construction is complete and the dam construction is ongoing (see rendering below). The total estimated cost of the project is \$3.1B.



- b. **Factors Affecting the Scope and Level of Review.** The Feasibility Report for the project was completed in August 1985, and the project was authorized in the 1988 WRDA, PL 100-676 Section 3(a) (6) dated 17 November 1988. The following documents have been prepared since the Feasibility Report following the review process in place at the time.
- General Design Memorandum, March 1989
  - General Design Memorandum Supplement, April 1990
  - Lock Feature Design Memorandum, January 1993
  - Lock Feature Design Memorandum Supplement, January 1993

- Post Authorization Change Report, April 2012
- In-The-Dry Study, May 2012
- P&S for the various construction contracts that have been awarded.

The construction of the Olmsted L&D project began in 1993 with the construction of the access road and resident engineer’s office. Since that time several contracts have been awarded and completed: lock cofferdam, dam prototype, Ballard Wildlife Management improvements, permanent operating equipment (700HP tender, wash down barge, 3,000HP towboat), boat ramp relocation, downstream mooring cells, twin 1,200 locks, lock approach walls, spare gate storage facility, and a storage building. Currently the dam is under construction, with a significant amount of work completed on the tainter gate section of the dam.

The following plans and specifications (P&S) will be prepared by LRL and reviews performed per the following below:

Engineering Product	Type of Review(s)	Tentative Schedule
Locks O&M Manual	DQC & ATR	FY-14
P&S after construction contract award	DQC	On-going
Demo L&D 52 P&S	DQC	FY-21
Demo L&D 53 P&S	DQC	FY-21
River Dikes P&S	DQC & ATR	FY-21
Lock Master & Maintenance Building P&S	DQC & ATR	FY-19
Wicket Lifter Barge P&S	DQC & ATR	FY-20
Dam O&M Manual	DQC & ATR	FY-20
Locks Rehab P&S	DQC & ATR	FY-15
Upstream Mooring Cells P&S	DQC & ATR	FY-22
Final County & Site Paving Road Paving P&S	DQC	FY-22
RE Office Conversion P&S	DQC & ATR	FY-22
Site Restoration P&S	DQC	FY-22

After a construction contract is awarded and it becomes necessary to changes the P&S a contract modification is issued. When the modification is prepared by In-House personnel an ITR is preformed by In-house personnel. When the modification is prepared by the A-E the A-E perform his QC review and then the COE does a QA review before issuing the change to the construction contractor.

The Olmsted L&D project is being constructed for navigation purposes. The ITR certification and the BCOE Certification for the dam can be found in Attachment 7. The project does not provide hurricane or storm protection, nor is it used for flood control. Given the fact that the dam when completed does not pose potential hazard or a threat to human life a Type II IEPR / SAR is not considered necessary thus a SAR is not being performed for the dam. See paragraph 6a for supporting documentation for this decision.

- c. **In-Kind Contributions.** No in-kind products are anticipated as part of the design and implementation phase.

#### 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). LRL will manage the DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of LRL and LRD.

- a. **Documentation of DQC.** LRD and LRL quality manuals (see attachment 6, LRL - QC/QA Processes for Study/Design Phase) prescribe specific procedures for conducting the DQC including documentation requirements and maintenance of associated records for internal audits to check proper DQC implementation.
- b. **Products to Undergo DQC.** See the table in paragraph 3.b above for the products to undergo DQC.
- c. **Required DQC Expertise.** For the out year contracts, experienced senior level engineers, and technicians will be assigned to carry out DQC checking and review of major draft and final products following review of those products. The specific expertise will be selected based on the product being reviewed. See attachment 1 for the list of potential disciplines that may be required and attachment 5 for the expertise for the specific discipline.

#### 5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision 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 of LRL 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 of LRD.

- a. **Products to Undergo ATR.** See the table in paragraph 3.b above for the products to undergo DQC.
- b. **Required ATR Team Expertise.** Individuals from the disciplines of construction, scheduling and cost estimating, as well as the engineering disciplines of structural, geotechnical, hydraulics, mechanical and electrical will be selected to participate in the ATR depending upon the scope of the contract being reviewed. Expertise in the area of navigation design will likely be required. See attachment 5 for the requirements of these experts. ATR team members will be selected at the appropriate time to execute the review. The RMO, in cooperation with the PDT, vertical team, and other appropriate centers of expertise, will determine the final make-up of the ATR team.
- 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 been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to 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, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either 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 AFB, draft report, and 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 1165-2-209, 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 1165-2-209.
- **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.** Two Type I IEPR's have been performed see paragraph 6b.

In accordance with Appendix E of EC 1165-2-209, the Olmsted L&D navigation project was evaluated for a Type II –IEPR, Safety Assurance Review. Documentation of the risk informed decision on whether an IEPR Type II will or will not be conducted for the implementation phase of the project is provided below.

The Olmsted L&D project is being constructed for navigation purposes. The project does not provide hurricane or storm protection, nor is it used for flood control. The lock construction is complete and the dam portion of the project is under construction. The dam includes five tainter gates and 1,400' of navigable pass. The tainter gate section is well underway and the navigable pass foundation work has begun. The dam construction does involve innovative construction techniques that may or may not change prevailing practices. The engineering of the dam is no different than if it was constructed using the traditional cofferdam method of construction. The project does not require redundancy, resiliency or robustness as the project is a low lift wicket dam providing navigation benefits. The project does not have unique construction sequencing or overlapping schedules. Given the fact that the dam when completed does not pose potential hazard or a threat to human life a Type II IEPR / SAR is not considered necessary thus a SAR is not being performed for the dam.

**b. Products to Undergo Type I IEPR.** A Type I IEPR, by a group from outside USACE, was performed on the PACR and the In-The-Dry Study. No other Type I IEPR's are planned.

**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 will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the LRD 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 Type I IEPR team (if required) and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX. The Cost Engineering DX certified the cost estimates for the PACR and the In-The-Dry Study.

## **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. Models.**

For the purposes of this paragraph, planning models are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision-making. It includes all models used for planning, regardless of their scope or source, as specified in the following sub-paragraphs.

The computational models employed in previous documents have either been developed by or for the USACE. Model certification and approval for all identified planning models have been coordinated through the Planning Center of Expertise for Inland Navigation (PCXIN) as needed. Project schedules and resources will be adjusted to address this process for certification and PCXIN coordination. Models used to date or that maybe used in the future are:

- a. Ohio River Navigation Investment Model (ORNIM) – Developed by the Center for Transportation Analysis (CTA) in cooperation with the Great Lakes and Ohio River Division of the Corps of Engineers (LRD), ORNIM is a three component model; the Waterway Supply and Demand Module (WSDM), the Lock Risk Module (LRM), and the Optimization Module. The three components of the ORNIM model determine shipper equilibrium, use a Monte Carlo simulation to determine closure probabilities, and optimize investments, respectively.
- b. Waterways Analysis Model (WAM) – The Waterways Analysis Model is used to estimate traffic/delay relationships, lock capacities, and simulating closure impacts on traffic. The WAM was certified on 15 August 2011.
- c. Barge Costing Model - The Barge Costing Model, which contains three modules; one-way general towing service, roundtrip general towing service, and a roundtrip dedicated towing service module, is used for rate estimation.

## 10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** See paragraph 3b for the tentative ATR schedule. The detailed schedule will be maintained in P2.
- b. **Type I IEPR Schedule and Cost.** Not Applicable
- c. **Model Certification/Approval Schedule and Cost.** For the implementation review process no additional models or approvals are expected to be necessary

## 11. PUBLIC PARTICIPATION

The private individuals, elected officials, agencies, and all levels of government have been publically involved in the development of the Olmsted Locks and Dam project. The primary vehicle for public involvement has been the process of complying with the National Environmental Policy Act and its provisions for public involvement. The 1985 and 1993 Environmental Impact Statements each had a 45-day comment period for the draft documents followed by a 30-day comment period for the final documents. The 2002 Environmental Assessment had a 30-day comment period.

Public involvement is also part of the permitting process whether for Section 401 water quality certification under the Clean Water Act or for some other law or regulation. For example, changes involving Historic/Cultural Mitigation issues resulted from coordination with consulting parties undertaken in accordance with the National Historic Preservation Act (NHPA). Changes involving cultural resources/archaeology sites resulted from coordination with the Illinois and Kentucky State Historic Preservation Officer and Native American tribes in accordance with NHPA and the Native American Graves Protection and Repatriation Act.

Public involvement and coordination was maintained with residents of local communities such as Paducah, KY and Olmsted, IL on Project features such as the disposition of L&D 52 and 53, construction of a new boat ramp for the Village of Olmsted, construction and operation of a contractor facility in Paducah, and purchase of mitigation lands in Ballard County, Kentucky.

## **12. REVIEW PLAN APPROVAL AND UPDATES**

The Great Lakes and Rivers Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. LRL 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 LRD 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 Louisville District's webpage. The latest Review Plan should also be provided to the RMO and LRD.

## **13. REVIEW PLAN POINTS OF CONTACT**

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

- a.) Project Delivery Team - The PDT is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in Appendix A.
- b.) Review Plan Points of Contact –
  - Louisville District Point of Contact PM: 502-315-6778
  - Great Lakes & Ohio River Division Point of Contact; Senior Regional Engineer: 513-684-3018 (Review Management Organization, RMO)
- c.) The points of contact for the DQC and the ATR will be available as the various P&S are developed and ready for review

d.) ATTACHMENT 1 - TEAM ROSTERS

**Olmsted L&D**

**Product Delivery Team**

<b>Functional Area</b>	<b>Name</b>	<b>Office</b>
Project Manager		CELRL-PM-C
Project Engineer/Navigation Design		CELRL-ED-T-C
Real Estate		CELRL-RE-C
Contracting		CELRL-CT-C
Public Affairs		CELRL-PM-C
Economics		CELRL-PM-P
Cost Engineering		CELRL-ED-C
Hydrology and Hydraulics		CELRL-ED-T-H
Architectural		CELRL-ED-D-A
Structural		CELRL-ED-
Geotechnical		CELRL-ED-T-G
Mechanical Engineer		CELRL-ED-D-M
Electrical Engineer		CELRL-ED-D-M
Engineering Management		CELRL-ED-M-A
Construction		CELRL-CD-O
Environmental		CELRL-PM-P
Civil		CELRL-ED-T-C

**LRL District Quality Control Team**

<b>Name</b>	<b>Discipline</b>	<b>Office</b>
	Civil Design	CELRL-ED-T-C
	Cost Engineering	CELRL-ED-C
	Hydrology and Hydraulics	CELRL-ED-T-H
	Geotechnical	CELRL-ED-T-G
	Architectural	CELRL-ED-D-A
	Structural	CELRL-ED-D-S
	Mechanical	CELRL-ED-D-M
	Electrical	CELRL-ED-M-A

## Agency Technical Review Team

Name	Discipline	Office
	Team Leader	TBD
	Civil Design	TBD
	Cost Engineering	TBD
	Hydrology and Hydraulics	TBD
	Geotechnical	TBD
	Structural	TBD
	Mechanical	TBD
	Electrical	TBD

**ATTACHMENT 2 - SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS**

**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the <type of product> for the Olmsted L&D. 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<sup>sm</sup>.

*SIGNATURE*

---

Name  
ATR Team Leader  
Office Symbol/Company

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Project Manager  
Office Symbol

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Review Management Office Representative  
Office Symbol

\_\_\_\_\_  
Date

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

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

*SIGNATURE*

---

Name  
Chief, Engineering Division  
Office Symbol

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Chief, Planning Division  
Office Symbol

\_\_\_\_\_  
Date

<sup>1</sup> Only needed if some portion of the ATR was contracted



**ATTACHMENT 3 - REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>
13 March 2010	Post Authorization Change Report (PACR) Review Plan	26
18 May 2012	Olmsted Dam In-the-Dry (ITD) Study Review Plan	46

**ATTACHMENT 4 - ACRONYMS AND ABBREVIATIONS**

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
ASA(CW)	Assistant Secretary of the Army for Civil Works	OEO	Outside Eligible Organization
ATR	Agency Technical Review	PCX	Planning Center of Expertise
DQC	District Quality Control/Quality Assurance	PCXIN	Planning Center of Expertise for Inland Navigation
DX	Directory of Expertise	PDT	Project Delivery Team
EA	Environmental Assessment	PACR	Post Authorization Change Report
EC	Engineer Circular	PMP	Project Management Plan
EIS	Environmental Impact Statement	QMP	Quality Management Plan
FY	Fiscal Year	QA	Quality Assurance
Home District/MSC	The District or MSC responsible for the preparation of the decision document	QC	Quality Control
HQUSACE	Headquarters, U.S. Army Corps of Engineers	QMP	Quality Management Plan
IEPR	Independent External Peer Review	QMS	Quality Management System
ITR	Independent Technical Review	RP	Review Plan
LRD	Lakes & Rivers Division	RMC	Risk Management Center
LRL	Louisville District	RMO	Review Management Organization
MSC	Major Subordinate Command	RTS	Regional Technical Specialist
NED	National Economic Development	SAR	Safety Assurance Review
NEPA	National Environmental Policy Act	SME	Subject Matter Expert
O&M	Operation and maintenance	USACE	U.S. Army Corps of Engineers
OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation	WRDA	Water Resources Development Act

**ATTACHMENT 5 - ATR & DQC TEAM EXPERTISE**

<b>Team Members/Disciplines</b>	<b>Expertise Required</b>
ATR Lead	The ATR lead should be a senior professional preferably with experience in preparing P&S and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as structural, civil, architectural, etc). The ATR Lead will be from outside the Louisville District but within the MSC.
Hydraulic & Hydraulics Engineering	The hydraulic engineering reviewer will be an expert in the field of hydraulics and hydrology and have a thorough understanding of river dynamics and/or computer modeling techniques.
Geotechnical Engineering	Recognized expert in the field of geotechnical engineering analysis, design and construction of dams, foundations with extensive experience in subsurface investigations, soil mechanics, seepage and embankment stability evaluations, construction, and foundation preparation. Should have design or construction experience evaluating seismic loads. The Geotechnical Engineer shall be a licensed professional engineer
Civil Engineer	Civil engineering design for dam sites and roadways. The Civil Engineer shall be a licensed professional engineer.
Cost Engineer	Engineering cost estimator will have experience working with estimating complex, phased costing of multi-year civil construction projects. Experience with the development of estimated construction costs and construction methods related to large civil works navigation projects. BS degree is required preferably in Civil or Construction Engineering and be a certified cost engineer or certified estimating professional. Familiar with all applicable USACE regulations which require extensive knowledge of Micro-Computer Aided Cost Engineering System (MCACES) 2nd Generation (MII), Civil Works Work Breakdown Structure (CWWBS) and critical path project scheduling.
Electrical Engineer	Electrical design and analysis experience with COE navigation structures as well as buildings. Experience design for industry codes standards and USACE design regulations. The Electrical Engineer shall be a licensed professional engineer.
Mechanical Engineer	Mechanical design and analysis will have experience with mechanical design for COE navigation structures (tainter gates, miter gates, etc) as well as support structures for the project. Experience with industry codes standards and USACE design regulations. The Mechanical Engineer shall be a licensed professional engineer.
Structural Engineer	Recognized expert in the field of structural engineering

	analysis, design, and construction, including evaluating dam structural elements. Education and design experience evaluating reinforced concrete structures with emphasis on seismic analysis and design for industry codes standards and USACE design regulations. The Structural Engineer shall be a licensed professional engineer.
Architect	Recognized expert in the field of architecture. Experience design for industry codes standards and USACE design regulations. The Architect shall be a registered architect.

**ATTACHMENT 6 –DISTRICT QUALITY CONTROL (DQC)CERTIFICATION SHEETS**

The following is the Quality Control statement and signatures by the A-E for the Dam portion of the project.

### CONTRACTOR STATEMENT OF TECHNICAL REVIEW

The Sverdrup/Gerwick Joint Venture has completed the Feature Design Memorandum (FDM) for the Olmsted Dam project. This Notice is hereby given that the work was done in compliance with the approved project Quality Control Plan, Revision 4, dated November 18, 1997. A Technical Advisory Committee was assembled and provided independent technical review at two different times during the development of the FDM, appropriate to the level of risk and complexity inherent in the project. Additionally, internal Document Coordination Reviews were held by the Joint Venture team members, at 60% and 90% completion stages. These activities along with detailed checking procedures have been appropriately documented. Said documentation is available for Corps of Engineers' review/inspection, if desired.

During the review processes, compliance with established policy, principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures and materials used in the analyses; alternatives evaluated; appropriateness of data used and level of data obtained; and reasonableness of results, including whether the product meets the Corps of Engineers' needs consistent with law and existing Corps policy.

  
Project Manager

July 20, 1999  
Date

  
Design Manager

July 20, 1999  
Date

  
QA-QC Manager

July 20, 1999  
Date

**ATTACHMENT 7 – DISTRICT QUALITY ASSURANCE (DQA) CERTIFICATION SHEETS**

The dam design was developed by the A-E, the A-E did the QC review and the District performed a QA review. The following are the signatures for the QA review for the dam documents.

**QUALITY ASSURANCE TEAM**

Quality Assurance Team Leader/Geotechnical	[Redacted] ED-TG
Materials	[Redacted] ED-TG
Structural	[Redacted] ED-D
Seismic	[Redacted] ED-DS
Structural Hydraulics	[Redacted] ED-TH
Navigation Hydraulics	[Redacted] CENWK-ED-HH
Cost Engineering	[Redacted] ED-C
Civil	[Redacted] ED
Architectural	[Redacted] ED-DA
Mechanical	[Redacted] ED-DM
Electrical	[Redacted] LRD-ET-EW
Maintenance	[Redacted] OP-TM
Navigation/Operations	[Redacted] OP-L-S
Construction	[Redacted] CD-O
Environmental	[Redacted] ED-R

*See next page for signatures*

\* See next page for signatures



The signatures below correspond to the \* on the previous page.

SENT BY: 7-20-99 10:29 OHIO RIVER DIVISION-  
JUL-20-1999 TUE 08:58 AM OLMSTED RESIDENT OFFICE FAX NO. 4 6257085: # 2 / 2  
JUL-20-99 TUE 07:58 OK FAX NO. 6257085 E. 01  
JUL-19-99 THU 07:22 FAX NO. 6257085 P. 03/03  
JUL-19-99 THU 07:22 FAX NO. 6257085 P. 03/03  
JUL-19-99 THU 15:09 OK FAX NO. 6257085 P. 01  
JUL-19-99 THU 15:09 OK FAX NO. 6257085 P. 03/03

QUALITY ASSURANCE TEAM

- Quality Assurance Team Leader/Coordinator [REDACTED]
- Materials [REDACTED]
- Excavated [REDACTED]
- Reinforced [REDACTED]
- Structural/Hydraulics [REDACTED]
- Navigation/Hydraulics [REDACTED]
- Cost Engineering [REDACTED]
- CR-R [REDACTED]
- Architectural [REDACTED]
- Mechanical [REDACTED]
- Electrical [REDACTED]
- Maintenance [REDACTED]
- Navigation/Operations [REDACTED]
- Construction [REDACTED]
- Environmental [REDACTED]

## **ATTACHMENT 8 - ITR/ATR CERTIFICATION SHEETS**

The Dam P&S for construction were completed in 2002, advertised in 2003 and a construction contract awarded in January 2004. Since that time funding has been limited and focused on dam construction. The requirement to perform an ATR is relatively new. The District has not developed any P&S since the dam that would require an ATR to be performed.

**ATTACHMENT 9 – BIDDABILITY, CONSTRUCTABILITY, OPERABILITY AND ENVIRONMENTAL (BCOE)  
CERTIFICATION SHEET**

The following is the signed BCOE certification for the Dam P&S.

**BCOE CERTIFICATION**

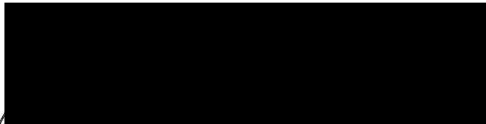
1. Subject: Olmsted Dam

2. References:

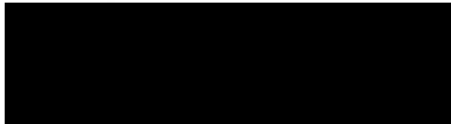
a. ER 415-1-11, dated 1 September 94, Biddability, Constructibility, Operability, and Environmental Review.

b. LRLR 1110-1-3, dated 1 June 1984, Biddability, Constructibility, and Operability.

3. The undersigned certify that all appropriate biddability, constructibility, operability and environmental comments received and reviewed by this office by (26 July 2002) have been incorporated into the subject plans and specifications, as required by referenced regulations. Feedback has been provided to reviewers for all comments.



Chief, Construction Division



Chief, Engineering Division

7/31/02  
DATE

8/6/02  
DATE

The following BCOE certification is related to a small follow on contract to the Storage building to repair the leaks.

### BCOE CERTIFICATION

1. Project: Olmsted Building C Repairs and Re-Roof Service Buildings P2: 112574
2. Reference: ER 415-1-11, dated 1 September 1994, Biddability, Constructability, Operability, and Environmental Review.
3. The undersigned certify that all appropriate biddability, constructability, operability, and environmental comments received and reviewed by these offices by 24 Aug 2012 have been incorporated into the subject bid package, as required by the referenced regulations. Feedback has been provided to reviewers for all comments.



Chief, Construction Division ✓



Chief, Engineering Division

24 AUG 12  
DATE

24 Aug 12  
DATE

**ATTACHMENT 10 – POST AUTHORIZATION CHANGE REPORT (PACR) REVIEW PLAN**



**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER  
CORPS OF ENGINEERS  
550 MAIN STREET ROOM 10-032  
CINCINNATI, OH 45202-3222

**MAR 13 2010**

CELRD-PDS P (1105)

MEMORANDUM FOR Commander, Louisville District, Attn: [REDACTED] (CELR-PM-P)

SUBJECT: Review Plan Approval for Locks and Dams 52 and 52 Replacement Project (Olmsted Locks and Dam) Post Authorization Change Report (PACR)

1. The enclosed Review Plan for the Olmsted PACR has been prepared in accordance with EC 1165-2-209 dated 31 January 2010. The Review Plan has been coordinated with the Planning Center of Expertise for Inland Navigation (PCXIN) which is the lead entity to execute this Review Plan. The Review Plan includes independent external peer review.
2. I hereby approve this Review Plan, which has been endorsed by the technical directors of the PCXIN. This Review Plan is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.
3. Questions may be directed to [REDACTED] at phone (513) 684-3598.

Encl

[REDACTED]  
Chief, Planning & Policy Division

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**REVIEW PLAN**

**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND  
DAM), IL & KY  
POST-AUTHORIZATION CHANGE REPORT**

**LOUISVILLE DISTRICT**

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**US Army Corps  
of Engineers®**

**FEBRUARY 2010**



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**REVIEW PLAN**  
**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND**  
**DAM), IL & KY**  
**POST-AUTHORIZATION CHANGE REPORT**  
**LOUISVILLE DISTRICT**

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**APPENDICES**

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Appendix A	Statement of Technical Review
Appendix B	Review Plan Teams
Appendix C	Acronyms and Abbreviations

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**REVIEW PLAN**  
**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND**  
**DAM), IL & KY**  
**POST-AUTHORIZATION CHANGE REPORT**  
**LOUISVILLE DISTRICT**

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## **1. PURPOSE AND REQUIREMENTS**

### ***A. Purpose.***

This document outlines the Review Plan for the Locks and Dams 52 and 53 Replacement Project (the construction of Olmsted Lock and Dam) Post-Authorization Change Report (PACR). EC 1165-2-209, *Civil Works Review Policy*, dated 31 January 2010, outlines the policy on review of decision documents, particularly with regards to Independent External Peer Review (IEPR) and Safety Assurance Review (SAR), which is also referred to as a Type II IEPR. As this is the most current guidance available on review policy, this review plan and the performance of the reviews described herein will conform to the formats, procedures and guidance laid down in EC 1165-2-209.

### ***B. Requirements.***

EC 1165-2-209 outlines the requirement of the three review approaches (DQC, ATR, and IEPR) and provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the approaches. This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate PCX. This Post-Authorization Change document deals with an existing Inland Navigation Project, and therefore falls under the purview of the Planning Center of Expertise for Inland Navigation (PCXIN).

(1) District Quality Control. DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the District and may be conducted by in-house staff as long as the reviewers are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan (QMP) providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before the approval by the District Commander. For the Study, non-PDT members and/or supervisory staff will conduct this review for major draft and final products following review of those products by the PDT. The Major Subordinate Command (MSC)/District are directly responsible for the QM and QC respectively, and to conduct and document this fundamental level of review. A Quality Control Plan (QCP) was included in the PMP for the subject study and addresses DQC by the MSC/District. DQC is not addressed further in this Review Plan.

(2) Agency Technical Review (ATR). The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of a project/product. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.) and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC. EC 1105-2-408 first established the requirement that DrChecks (<https://www.projnet.org/projnet/>) be used to document all ATR comments, responses, and associated resolution accomplished. An ATR of all work products, including review of all methodologies, assumptions and plans as well as policy review, has previously been accomplished for the L&D 52 and 53 Replacement Project Post Authorization Change Report, predating this Review Plan. As no changes to these assumptions, methods, or application of policy have occurred since the certification of ATR on 21 March 2008, this RP will focus instead on the Independent External Peer Review process. No further ATR is envisioned for this report.

(3) Independent External Peer Review. EC 1165-2-209 delineates the definition of IEPR, into Types I and II, the latter of which being synonymous with Safety Assurance Review. 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. Type I IEPR is managed by an outside eligible organization (OEO) that is described in the Internal Review Code Section 501(c)(3), is exempted from Federal tax under Section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. The IEPR will focus on the technical aspects of the project. This Review Plan outlines the planned approach to meeting this requirement for the Study. Type I IEPR is required for this study.

(4) Safety Assurance Review / Type II IEPR. In accordance with Section 2035 of WRDA 2007 and EC 1165-2-209, all projects addressing flooding or storm damage reduction are required to undergo a safety assurance review during design and construction. Per EC 1165-2-209, "A Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life." Safety assurance factors must be considered in all reviews for those studies. Type II IEPR / SAR is not required for this study.

(5) Policy and Legal Compliance Review. In addition to the technical reviews, decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level 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 Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-

2-100. Technical reviews described in EC 1165-2-209 are to augment and complement the policy review processes by addressing compliance with published Army policies pertinent to planning products, particularly policies on analytical methods and the presentation of findings in decision documents. DQC and ATR efforts are to include the necessary expertise to address compliance with published planning policy. Counsel will generally not participate on ATR teams, but may at the discretion of the district or as directed by higher authority. When policy and/or legal concerns arise during DQC or ATR efforts that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. An IEPR team should be given the flexibility to bring important issues to the attention of decision makers.

(6) Planning Center of Expertise (PCX) Coordination. EC 1165-2-209 outlines PCX coordination in conjunction with preparation of the Review Plan. This Review Plan is being coordinated with the PCX for Inland Navigation (PCXIN). The PCXIN is responsible for the accomplishment of IEPR for the Study. The DQC is the responsibility of the MSC/District. The PCXIN will manage the IEPR review to be conducted by others.

(7) Review Plan Approval and Posting. In order to ensure the Review Plan is in compliance with the principles of EC 1165-2-209 and the MSC's QMP, the Review Plan must be endorsed by the PCXIN and approved by the applicable MSC, in this case the Commander, Great Lakes and Ohio River Division (LRD). Once the Review Plan is approved, the District will post it to its district public website and notify LRD and the PCXIN.

## **2. STUDY INFORMATION**

### ***A. Decision Document.***

The Locks and Dams 52 and 53 Replacement Project Post Authorization Change Report is intended to recommend an increase in the maximum amount that the U.S. Army Corps of Engineers is authorized to spend to complete Olmsted Locks and Dam, and to document the reasons for the recommendation. The report is required because the current estimated cost of completing the Project exceeds the maximum cost limit, as defined in Section 902 of the Water Resources Development Act of 1988 ("Section 902 cost limit"). The authorized cost for the Olmsted Locks and Dam Project, as stated in the Water Resources Development Act of 1988, is \$775,000,000. The fully-funded cost was estimated at \$1,389,031,000. The Section 902 cost limit is currently \$1,544,031,000.

The current cost estimate, without inflation and at the October 2007 price level, is \$1,991,999,999, of which, \$867,842,000 are sunk costs through September 2007. The current cost estimate with inflation applied to the remaining cost to complete construction (i.e., fully-funded cost), at the October 2007 price level, is \$2,067,000,000. The \$2,067,000,000 figure exceeds the current Section 902 cost limit of \$1,554,031,000. The report documents the history

and background of project costs, and serves as a basis for requesting approval of an increase in the authorized cost.

### ***B. General Site Description.***

The Olmsted locks and dam project provides for a structure near the community of Olmsted, Illinois at Ohio River Mile 964.4 that will replace the existing Locks and Dams 52 and 53, located between Paducah, KY and Cairo, IL. The structure will consist of twin 110-foot-wide by 1,200-foot-long locks adjacent to the Illinois bank, five tainter gates, a 1,400-foot-wide navigable pass, and a fixed weir extending to the Kentucky bank. During low flow conditions, an upper pool having an elevation of 300 feet Ohio River Datum at the dam will extend upstream to the Smithland Locks and Dam, a distance of 47 miles. Open river conditions will exist from the Olmsted Locks and Dam site downstream to the mouth of the Ohio River, a distance of approximately 17 miles.

### ***C. Study Scope.***

Construction of Olmsted Locks and Dam is currently ongoing. Louisville District awarded the first construction contract on 19 November 1992 to construct the Access Road and Resident Engineer's Office. The major contracts that have been awarded and completed since then include the Locks Cofferdam, the Locks, the Approach Walls and the Operating and Maintenance Bulkheads contracts. Louisville District awarded the construction of the Dam on the 28<sup>th</sup> of January, 2004. Other contracts to be awarded in the future include the Operation Buildings, Demolition of Locks and Dams 52 and 53, and various equipment contracts.

The cost of this project is being equally shared by Congressional appropriation and the navigation industry. Industry pays a tax on diesel fuel, which goes to the Inland Waterways Trust Fund. The trust fund then pays 50 percent of the project cost. The fully funded cost estimate for the construction of the project exceeds the Section 902 cost limit, and approval of an increase will be required before the project can be completed.

The Post Authorization Change Report represents no change to the authorized scope or purpose of the Olmsted L&D / L&D 52 and 53 Replacement Project, as well as no change to local cooperation requirements or the location of the project. Design changes however have been made post-authorization (Feasibility Report), as well as changes to project costs and benefits.

### ***D. Problems and Opportunities.***

The continuing growth in demand for waterborne commerce on the Ohio River requires periodic improvements in the waterways transportation infrastructure. Locks and Dams No. 52 and 53 were completed in 1929, and temporary 1200-foot long lock chambers were added later. The antiquated design and age of these structures however make it impossible to meet current traffic demands without significant delays.

The strategic reach of the Ohio River where these projects are located provides a connection between the Ohio, Tennessee, Cumberland, and Mississippi rivers. Barge traffic moving

between the Mississippi River system and the Ohio, Tennessee, and Cumberland rivers must pass through this stretch of river. More tonnage passes this point than any other place in America's inland navigation system. The U.S. Army Corps of Engineers and the navigation industry, in a continuing effort to provide for the nation's future navigation needs, have undertaken to replace these aged facilities with the Olmsted Locks and Dam project, one of the largest civil works projects undertaken by the Corps.

The Corps of Engineers estimates that the Olmsted Locks and Dam project will produce average annual economic benefits to the nation of more than \$700 million. The new locks will operate more efficiently and will pass tows with fewer delays. Delays ultimately raise the price of commodities, which move on the waterways. Total lockage time will be reduced from approximately five hours through Locks and Dams No. 52 and 53 to less than one hour in the new project. The Corps estimates lockage wait times of 150 hours per tow by the year 2025 at Lock and Dam 52 without the new locks.

### **3. AGENCY TECHNICAL REVIEW (ATR)**

An ATR has previously been completed for the Olmsted Locks and Dams Project PACR, and the reviewed report products have not changed since the approval of this review. The ATR approval memorandum is included as Appendix A.

### **4. INDEPENDENT EXTERNAL PEER REVIEW PLAN**

The decision document will present the details of post-authorization changes during the course of design and construction of the Olmsted Locks and Dam project, including the cost increases above the Section 902 limit that have mandated the PACR. EC 1165-2-209 states thresholds that trigger an IEPR: "where there are public safety concerns, a high level of complexity, novel or precedent-setting approaches; where the Chief of Engineers determines that the project is controversial, has significant interagency interest, or has significant economic, environmental and social effects to the nation". IEPR is further mandatory in such cases as the total estimated project cost, including mitigation, exceeds \$45 million, or an EIS is required for the study.

Due to the size and complexity of the project, the Locks and Dams 52 and 53 Replacement Project has significant agency and public interest. Additionally the total fully-funded project cost exceeds the \$45 million (current fully-funded cost estimate, at Oct 2007 price levels, exceeds \$2 billion) threshold. An environmental impact statement was prepared in May of 1993, and a supplemental environmental assessment later completed in June 2002, to cover the alternative, in-the-wet construction techniques. The study does not however involve significant public safety concerns. In consideration of these factors, IEPR will be conducted. The cost of IEPR is currently estimated to be \$100,000. IEPR is a project cost. The IEPR panel review will be Federally-funded. In-house costs associated with obtaining the IEPR panel contract as well as responding to IEPR comments will be cost-shared expenses. It is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers.

### ***A. Project Magnitude.***

For reasons described in the preceding paragraphs, the magnitude of this project is determined as high.

### ***B. Project Risk.***

This project is considered to have moderate overall risk. The replacement Locks and Dam structure is at the date of this Review Plan roughly 50% complete, however the size and complexity are considered to contribute to overall project risk.

### ***C. Vertical Team Consensus.***

This Review Plan will serve as the coordination document to obtain vertical team consensus. Subsequent to PCX endorsement, the plan will be provide to the vertical team for approval. MSC approval of the plan will indicate vertical team consensus.

### ***D. Products for Review.***

The full IEPR panel will receive the entire Post Authorization Change Report for review. The District will draft a response to the IEPR final report and process it through the vertical team. The Corps will issue final response to the IEPR panel and notify the public.

Disciplines that are anticipated to undergo IEPR are economics and cost engineering. The economics review(s) will review the analysis and assumptions used by study economists to revise and update project benefits, including the Waterways Analysis Model (WAM), and revisions to the without-project condition, including an assumption that major rehab work could be done within the analysis period to address the risk of structural failure. In addition, time-sensitive model input data, such transportation rates and waterway traffic demand forecasts, were updated from the 1990 report, as were the cost-closure matrices. The cost engineering reviewer(s) will review the changes in project costs across all feature codes, and the underlying justifications for these increases.

IEPR panel members will be identified in Appendix B after they have been selected. Work undertaken as part of these technical disciplines is relevant to justification of the project cost, complexities of design, and other potentially controversial aspects of the project. Of the products that will undergo IEPR, all have previously been reviewed by the PDT and undergone ATR prior to submittal for IEPR. This includes all relevant contractor work products.

### ***E. Communication and Documentation.***

The communication plan for the IEPR is as follows:

(1) The panel will use DrChecks to document the IEPR process. The lead planner will facilitate the creation of a project portfolio in the system to allow access by all PDT and a

qualified Outside Eligible Organization (OEO). An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in MS Office compatible or Adobe Acrobat format at: <ftp://ftp.usace.army.mil/pub/> at least one business day prior to the start of the comment period.

The OEO will compile the comments of the IEPR panelists, enter them into DrChecks, and forwards the comments to the District. The District will consult the PDT and outside sources as necessary to develop a proposed response to each panel comment. The District will enter the proposed response into DrChecks, and then return the proposed response to the panel. The panel will reply to the proposed response through the OEO, again using DrChecks. This final panel reply may or may not concur with the District's proposed response and the panels final response will indicate concurrence or briefly explain what issue is blocking concurrence. There will be no final closeout iteration. The District will consult the vertical team and outside resources to prepare an agency response to each comment. The initial panel comments, the District's proposed response, the panel's reply to the District's proposed response, and the final agency response will all be tracked and archived in DrChecks for the administrative record. However, only the initial panel comments and the final agency responses will be posted.

(2) Each IEPR panel member shall download the appropriate documents.

(3) The lead planner shall inform the IEPR panel when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(4) A revised electronic version of the report and appendices with comments incorporated shall be posted at <ftp://ftp.usace.army.mil/pub/> for use during back checking of the comments.

(5) PDT shall contact the OEO for the IEPR as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(6) The IEPR panel shall produce a final Review Report to be provided to the PDT. This report shall be scoped as part of the effort to engage the IEPR panel. The District will draft a response report to the IEPR final report and process it through the vertical team. Upon satisfactorily resolving any relevant follow-on actions, the Corps will finalize its response to the IEPR Review Report and will post both the Review Report and the Corps final responses to the public website.

## ***F. Funding***

The PCXIN will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The District will provide funding to the IEPR panel.



## 5. MODEL CERTIFICATION

For the purposes of this RP section, planning models are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision-making. It includes all models used for planning, regardless of their scope or source, as specified in the following subparagraphs.

The computational models employed in the Study have either been developed by or for the USACE. Model certification and approval for all identified planning models will be coordinated through the PCXIN as needed. Project schedules and resources will be adjusted to address this process for certification and PCXIN coordination. Models used were:

1. Ohio River Navigation Investment Model (ORNIM) – Developed by the Center for Transportation Analysis (CTA) in cooperation with the Great Lakes and Ohio River Division of the Corps of Engineers (LRD), ORNIM is a three component model; the Waterway Supply and Demand Module (WSDM), the Lock Risk Module (LRM), and the Optimization Module. The three components of the ORNIM model determine shipper equilibrium, use a Monte Carlo simulation to determine closure probabilities, and optimize investments, respectively. *Certification of ORNIM is currently in progress.*
2. Waterways Analysis Model (WAM) – The Waterways Analysis Model is used to estimate traffic/delay relationships, lock capacities, and simulating closure impacts on traffic. *Certification of WAM is currently in Progress.*
3. Barge Costing Model – The Barge Costing Model, which contains three modules; one-way general towing service, roundtrip general towing service, and a roundtrip dedicated towing service module, is used for rate estimation. *Certification of the Barge Costing Model is in Progress.*

## 6. PUBLIC REVIEW

Private individuals, elected officials, agencies, and all levels of government have been publically involved in the development of the project. The primary vehicle for public involvement has been the process of complying with the National Environmental Policy Act and its provisions for public involvement. The 1985 and 1993 Environmental Impact Statements each had a 45-day comment period for the draft documents followed by a 30-day comment period for the final documents. The 2002 Environmental Assessment had a 30-day comment period.

Public involvement is also part of the permitting process whether for Section 401 water quality certification under the Clean Water Act or for some other law or regulation. For example, changes involving Historic/Cultural Mitigation issues resulted from coordination with consulting parties undertaken in accordance with the National Historic Preservation Act (NHPA). Changes involving cultural resources/archaeology sites resulted from coordination with the Illinois and

Kentucky State Historic Preservation Officer and Native American tribes in accordance with NHPA and the Native American Graves Protection and Repatriation Act.

Public involvement and coordination was maintained with residents of local communities such as Paducah, KY and Olmsted, IL on Project features such as the disposition of L&D 52 and 53, construction of a new boat ramp at Olmsted, construction and operation of a contractor facility in Paducah, and purchase of mitigation lands in Ballard County, Kentucky.

In addition, this Review Plan, The IEPR Review Report, and the Corps' final responses will be posted to a public website for review and comment.

## **7. POINTS OF CONTACT**

### ***A. Project Delivery Team.***

The PDT is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in Appendix B.

### ***B. Vertical Team.***

The Vertical Team includes District management, District Support Team (DST) and Regional Integration Team (RIT) staff as well as members of the Planning of Community of Practice (PCoP). Specific points of contact for the Vertical Team can be found in Appendix B.

### ***C. PCX.***

The appropriate PCX for this document is the Planning Center of Expertise for Inland Navigation, located in LRH. This Review Plan will be submitted to the PCXIN Program Manager for review and comment. Since an IEPR will be required, the PCX will be asked to manage the IEPR review. The approved Review Plan will be posted to the District's public website for public comment and consideration of public comments

### **D. Review Plan Points of Contact**

The Points of Contact for questions and comments to this Review Plan are as follows:

1. District Point of Contact: 502-315-6778
2. MSC Point of Contact: 513-684-3598
3. PCXIN Point of Contact: 304-399-6955

## **8. APPROVALS**

The PDT will carry out the Review Plan as described. The lead planner will submit the Review Plan to the PCXIN for review and recommendation for approval. After PCXIN review and

recommendation, the PDT District Planning Chief will forward the Review Plan to their respective MSC for commander approval. Formal coordination with PCX will occur through the PDT District Planning Chief.

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**REVIEW PLAN**  
**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND**  
**DAM), IL & KY**  
**POST-AUTHORIZATION CHANGE REPORT**  
**LOUISVILLE DISTRICT**

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**APPENDIX A**  
**STATEMENT OF TECHNICAL REVIEW**

**ITR CERTIFICATION OF DECISION DOCUMENT**

The Post Authorization Change Report for the Olmsted Locks and Dam, IL & KY, navigation project, and associated appendices have been reviewed in accordance with the requirements of ER 1105-2-100 for independent technical review of decision documents. All concerns resulting from independent technical review have been considered and addressed. Comments and resolutions are documented in the attachment.

[Redacted Signature]

*13 March 2008*  
(Date)

Project Manager for the Product Delivery Team, CELRL-PM-C

[Redacted Signature]

*12 March 2008*

Assistant District Counsel, CELRL-OC

[Redacted Signature]

*17 MAR 08*

Structural Engineer, CELRL-ED-D-S

[Redacted Signature]

*18 MAR 2008*

Asst. Chief, Construction Division, CELRL-CD

**DISTRICT CERTIFICATION OF POLICY COMPLIANCE**

I have reviewed the Post Authorization Change Report for the Olmsted Locks and Dam, IL & KY, navigation project and concur that it is in compliance with current Corps of Engineers policy and guidance.

[Redacted Signature]

*17 March 2008*

Chief, Planning Branch, CELRL-PM-P

**COMPLETION and CERTIFICATION OF LEGAL REVIEW**

The Post Authorization Change Report for the Olmsted Locks and Dam, IL & KY, navigation project has been full reviewed by the Office of Counsel, Louisville District, and is approved as legally sufficient.

[Redacted Signature]

*3/19/08*  
(Date)

District Counsel, CELRL-OC

**Olmsted Locks and Dam, Illinois and Kentucky  
Remaining Contract Cost Review**

**Completion of Remaining Contract Review**

The Walla Walla Cost Directory of Expertise performed a quality assurance review of the methodology used in determining contingency calculations for the Olmsted Dam Remaining Contract. The review analyzed the approach by the district in performing a risk assessment for remaining cost of the project. This is not to be considered an independent technical review of the cost and schedule data. The review did not assess the accuracy of the actual input data of the risk assessment.

[Redacted Signature]

3-6-08

(Signature)

(Date)

Cost Engineer, CENWW-EC-X

Certification  
Independent Technical Review  
Economic and Formulation  
of the Olmsted Locks and Dam Navigation Project  
Post Authorization Change Report  
dated March 2008

I hereby certify that I reviewed the Olmsted Post Authorization Change Report (PACR) from both an economic and plan formulation perspective and found the report and analysis to conform to Corps requirements and procedures. The computation of the Section 902 cost limit was done in accordance with the method specified in ER 1105-2-100, Appendix G. My comments and the responses from the Louisville District are attached.



Regional Technical Specialist in  
Inland Navigation Economics

21 MAR 08  
date

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**REVIEW PLAN**  
**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND**  
**DAM), IL & KY**  
**POST-AUTHORIZATION CHANGE REPORT**  
**LOUISVILLE DISTRICT**

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**APPENDIX B**  
**PROJECT DELIVERY TEAM**

Name	Discipline
	Project Manager
	Lead Planner
	Economics
	Environmental Resources
	Cultural Resources
	Floating Plant
	Engineering
	Cost Engineering
	Cost Closure Matrices
	Construction
	Operations
	Real Estate
	Legal

**INDEPENDENT TECHNICAL REVIEW TEAM**

Name	Discipline
	Economics
	Cost Engineering <sup>1</sup>

<sup>1</sup> The Walla Walla Cost Directory of Expertise performed a quality assurance review of the methodology used in determining contingency for the remaining contract. This is not to be considered an ITR of the cost and schedule data. The review did not assess the accuracy of input data for the risk assessment.

**INDEPENDENT EXTERNAL PEER REVIEW PANEL**

<b>Name</b>	<b>Discipline</b>
TBD	Economics
TBD	Cost Engineering

**VERTICAL TEAM**

<b>Name</b>	<b>Phone</b>	<b>Email</b>
	513-684-6899	@usace.army.mil
	513-684-3598	@usace.army.mil

**PLANNING CENTER OF EXPERTISE  
INLAND NAVIGATION**

<b>Name</b>	<b>Discipline</b>	<b>Phone</b>	<b>Email</b>
	Civil Engineer	304-399-6955	@usace.army.mil



**REVIEW PLAN**  
**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT (OLMSTED LOCK AND**  
**DAM), IL & KY**  
**POST-AUTHORIZATION CHANGE REPORT**  
**LOUISVILLE DISTRICT**

**APPENDIX C**  
**ACRONYMS AND ABBREVIATIONS**

<b><u>Term</u></b>	<b><u>Definition</u></b>	<b><u>Term</u></b>	<b><u>Definition</u></b>
ASA(CW)	Assistant Secretary of the Army for Civil Works	OEO	Outside Eligible Organization
ATR	Agency Technical Review	OMB	Office and Management and Budget
CELRL (LRD)	Corps of Engineers, Ohio River and Great Lakes Division	ORNIM	Ohio River Navigation Investment Model
CELRD (LRL)	Corps of Engineers, Louisville District	PACR	Post Authorization Change Report
CTA	Center for Transportation Analysis	PCoP	Planning Community of Practice
CWRB	Civil Works Review Board	PCX	Planning Center of Expertise
DQC	District Quality Control	PDT	Project Delivery Team
DX	Directory of Expertise	PPA	Project Partnership Agreement
EA	Environmental Assessment	QA	Quality Assurance
EC	Engineer Circular	QC	Quality Control
EIR	Environmental Impact Report	QMP	Quality Management Plan
EIS	Environmental Impact Statement	RIT	Regional Integration Team
EO	Executive Order	SAR	Safety Assurance Review
FDR	Flood Damage Reduction	WAM	Waterways Analysis Model
FRM	Flood Risk Management	WRDA	Water Resources Development Act
IEPR	Independent External Peer Review	WSDM	Waterway Supply and Demand Module
ITR	Independent Technical Review		
LRM	Lock Risk Module		
MSC	Major Subordinate Command		
NED	National Economic Development		
NEPA	National Environmental Policy Act		
O&M	Operation and maintenance		

**ATTACHMENT 11 – OLMSTED IN-THE-DRY (ITD) STUDY REVIEW PLAN**



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

CELRD-RBT

18 May 2012

MEMORANDUM FOR Commander, Louisville District

SUBJECT: Major Subordinate Command (MSC) Approval of the Review Plan (RP) for Locks and Dams 52 and 53 Replacement Project Olmsted Dam In-The-Dry Study

1. The attached Review Plan for the Olmsted Dam In-The-Dry Study has been prepared in accordance with EC 1165-2-209.
2. The Review Plan has been reviewed by the Business Technical Division, Great Lakes and Ohio Division, which is the Review Managing Office for the execution of this plan.
3. This report is a preliminary level study of in-the-dry construction methodologies for remaining and uncompleted features of the Ohio River 52 and 53 LDs Replacement Project, also known as the Olmsted Lock and Dam Project. It will develop preliminary design concepts, assess technical viability, establish construction costs and assess economic net benefits for the in-the-dry alternative. The study is not considered a decision or implementation document and is being prepared as a response to the requirements of the DCW that were set forth in a memorandum, dated 30 January 2012. The review plan includes DQC and ATR requirements but Type I and Type II Independent External Peer Review is not included for this study.
4. I hereby approve this RP, which is subject to change as circumstances require, consistent with study development under the Project Management Business Process. Should further studies be required for the purpose of determining future courses of action, a reconsideration of the IEPR actions is prudent. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.
5. The District is requested to post the Review Plan to its web site for review plans. Prior to posting, the names of individuals in the RP should be removed.
6. The Point of Contact for this effort is [REDACTED] (513) 684-3071 (CELRD-RBT).

[REDACTED]  
Chief, Planning and Policy Division  
Great Lakes and Ohio River Division

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**REVIEW PLAN**

**LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT  
OLMSTED DAM IN-THE-DRY STUDY**

**LOUISVILLE DISTRICT**

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**US Army Corps  
of Engineers®**

**MARCH 2012**

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**REVIEW PLAN  
LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT  
OLMSTED DAM IN-THE-DRY STUDY  
LOUISVILLE DISTRICT**

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**APPENDICES**

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- Appendix A Design Team
- Appendix B Agency Technical Review Team
- Appendix C Review Milestones

## **REVIEW PLAN**

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# **LOCKS AND DAMS 52 AND 53 REPLACEMENT PROJECT OLMSTED DAM IN-THE-DRY STUDY LOUISVILLE DISTRICT**

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## **1. PURPOSE**

The purpose of the Olmsted Dam In-The Dry Study is to develop near feasibility level designs and associated cost estimates for in-the-dry (i.e. within cofferdams) construction of the dam that can be compared to the current in-the-wet construction methods. The on-going in-the-wet construction activity has completed a significant portion of the tainter gate section of the dam. Therefore, it is considered appropriate to focus this study on in-the-dry completion of the remaining portions of the dam which are the right boat abutment, navigable pass and left boat abutment. The fixed weir of the dam was placed under a previous contract.

## **2. STUDY SCOPE**

To allow for comparison with in-the-wet methods, two cost estimates are required. One estimate will establish the costs for in-the-dry construction of the navigable pass and two boat abutments. The second estimate will calculate the overall cost for in-the-wet construction of the dam with the navigable pass and boat abutments deleted. The two estimates added together will represent the overall first cost of the in-the-dry alternative. The estimates will be completed in a format and presentation style similar to that of the Baseline Cost Estimate completed for the Olmsted L&D Post Authorization Change Request in October 2011. Completion of the cost estimates will require completion of an in-the-dry construction schedule.

Beyond the first costs of construction, the economics of the in-the-dry alternative will also be considered in the study. Net economic benefit for this alternative will be calculated in relation to a without-project alternative characterized by continued use of Locks and Dams 52 and 53 in a reactive maintenance fix-as-fails mode. Factors such as construction period length, online date, and delays during construction will be considered. The net economic benefit will be compared to that available for the in-the-wet alternative.

The design efforts will establish project features to be cost estimated, prove feasibility and create documentation of criteria, assumptions, analyses and drawing details. To maximize study efficiency, it is assumed that the current configuration of the dam will remain unchanged. The plan view shape, cross section and foundation support for the dam will be the same with no optimization undertaken on items such as piling. This is considered reasonable, given the relatively small size of the probable savings. The concrete shells of the in-the-wet method of construction contain a large amount of steel reinforcement. The shells are not required for the in-the-dry method. Therefore, optimization of the reinforcing steel will be undertaken. Reference Appendix A for a listing of the design team.

### **3. PROJECT DESCRIPTION**

The Olmsted Locks and Dam project provides for a navigation facility near Ohio River Mile 964.4 that would replace the existing Locks and Dams 52 and 53. The facility will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a right boat abutment, a 1,400-foot navigable pass, a left boat abutment and a fixed weir extending into the Kentucky bank. During low flow conditions, an upper pool having an elevation of 300 feet (ORD) at the dam would extend upstream a distance of 47 miles to the Smithland Locks and Dam. Open river conditions will exist from the dam site downstream a distance of approximately 17 miles to the mouth of the Ohio River.

The study effort includes all planning and design necessary to develop details sufficient to estimate construction of the right boat abutment, navigable pass with wickets, and left boat abutment utilizing an in-the-dry approach. Under this approach, the boat abutments will be reinforced concrete structures founded on steel pipe piles. The navigable pass sill will be founded on pipe piles and will be mass concrete with structural reinforcement steel at the pile heads and the wicket anchorages. The cofferdams will consist of sand filled circular sheet pile cells.

### **4. LEVELS OF REVIEW**

EC 1165-2-209, *Civil Works Review Policy*, dated 31 January 2010, outlines study review requirements including the three review approaches of DQC, ATR, and IEPR. Following is documentation of the risk-informed decisions on the applicability of each review approach. Note that this sub-feasibility level study will not make recommendations on the use of in-the-dry construction methods on the Olmsted Dam. It will only develop design concepts, determine technical viability, establish construction costs and assess economic net benefits for the in-the-dry alternative. Therefore, the study report is not considered a decision document or an implementation document.

(2) District Quality Control. DQC is the checking and review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the District and may be conducted by in-house staff as long as reviewers are not doing the work involved in the study. Basic quality control tools include a Quality Management Plan (QMP) providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. For this Study, experienced senior level engineers, technicians and economists from LRL, LRP, LRH, SAS and NWW were assigned to carry out DQC checking and review of major draft and final products following review of those products by the PDT. The Major Subordinate Command (MSC)/District are directly responsible for the QM and QC respectively, and to conduct and document this fundamental level of review. A Quality Control Plan (QCP) was included in the PMP for the subject study and addresses DQC by the MSC/District. DQC is not addressed further in this Review Plan.

(2) Agency Technical Review (ATR). The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of a project/product. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.) and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC. EC 1105-2-408 first established the requirement that DrChecks be used to document all ATR comments, responses, and associated resolutions accomplished. Given the size and complexity of this project, an ATR of the study is considered necessary. Reference paragraph 5 below for further discussion on the ATR process and the makeup of the ATR team.

(3) Independent External Peer Review. EC 1165-2-209 delineates the definition of IEPR, into Types I and II, the latter of which being synonymous with Safety Assurance Review. 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. Type I IEPR is managed by an outside eligible organization (OEO) that is described in the Internal Review Code Section 501(c)(3), is exempted from Federal tax under Section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of an IEPR review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. Given this work product is not a decision document, a Type I IEPR by a group from outside USACE is not considered appropriate or necessary.

(4) Safety Assurance Review / Type II IEPR. In accordance with Section 2035 of WRDA 2007 and EC 1165-2-209, all projects addressing flooding or storm damage reduction are required to undergo a safety assurance review during design and construction. Per EC 1165-2-209, "A Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life." Safety assurance factors must be considered in all reviews for those projects. Given this work product is not associated with such a project nor is an implementation document, a Type II IEPR / SAR is not considered necessary.

(5) Review Plan Approval and Posting. In order to ensure the Review Plan is in compliance with the principles of EC 1165-2-209 and the MSC's QMP, the Review Plan must be endorsed and approved by the applicable MSC, in this case the Commander, Great Lakes and Ohio River Division (LRD). Once the Review Plan is approved, the District will post it to its district public website and notify LRD.



## **5. AGENCY TECHNICAL REVIEW (ATR)**

Given the size and complexity of this project, an ATR of the study is considered necessary. Individuals from the disciplines of construction, scheduling and cost estimating, as well as the engineering disciplines of structural, geotechnical, hydraulics, mechanical and electrical should be involved. Expertise in the area of navigation design and costing is required. For the geotechnical and structural disciplines, expertise in the design and construction of circular sheet pile cell cofferdams is required. Reference Appendix B for a listing of the proposed ATR team. Note that a cost estimator from the Cost Engineering Directory of Expertise (DX) located in the Walla Walla District will be part of the ATR team and that the DX will certify the cost estimate. Following the guidance of EC 1165-2-209 and considering the fact the study report is not a decision document, Dam Safety modification report or Levee Safety modification report, the MSC will serve as the Review Management Organization.

The ATR team will conduct Concurrent Reviews and Milestone Progress Reviews. The Concurrent Review process is conducted seamlessly in accordance with the QC plan. Concurrent QC involves the review of sub-products and products as they are prepared. The Quality Control is performed in a proactive manner by the ATR team interacting throughout the entire planning and design process to take advantage of their collective experience. This review is in the form of formal and informal meetings, telephone conversations, and other forms of informal communication that may involve one or more review team members. The Milestone Progress Review (MPR) process is conducted in the traditional approach using complete milestone deliverables. It occurs during a specified period after design progress has reached a target milestone. Deliverables are reviewed, and written comments, prepared by reviewers, are provided. Design progress ceases during the review period. The comments and responses associated with all formal reviews will be managed and documented within DrChecks. Reference Appendix C for the proposed review schedule.

## **6. MODEL CERTIFICATION**

For the purposes of this paragraph, planning models are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision-making. It includes all models used for planning, regardless of their scope or source, as specified in the following subparagraphs.

The computational models employed in this study have either been developed by or for the USACE. Model certification and approval for all identified planning models will be coordinated through the Planning Center of Expertise for Inland Navigation (PCXIN) as needed. Project schedules and resources will be adjusted to address this process for certification and PCXIN coordination. Models to be used are:

- (1) Ohio River Navigation Investment Model (ORNIM) – Developed by the Center for Transportation Analysis (CTA) in cooperation with the Great Lakes and Ohio River Division of

the Corps of Engineers (LRD), ORNIM is a three component model; the Waterway Supply and Demand Module (WSDM), the Lock Risk Module (LRM), and the Optimization Module. The three components of the ORNIM model determine shipper equilibrium, use a Monte Carlo simulation to determine closure probabilities, and optimize investments, respectively. *Certification of ORNIM is currently in progress.*

(2) Waterways Analysis Model (WAM) – The Waterways Analysis Model is used to estimate traffic/delay relationships, lock capacities, and simulating closure impacts on traffic. The WAM was certified on 15 August 2011.

(3) Barge Costing Model – The Barge Costing Model, which contains three modules; one-way general towing service, roundtrip general towing service, and a roundtrip dedicated towing service module, is used for rate estimation. *Certification of the Barge Costing Model is in Progress.*

## **7. PUBLIC REVIEW**

The Private individuals, elected officials, agencies, and all levels of government have been publically involved in the development of the Olmsted project. The primary vehicle for public involvement has been the process of complying with the National Environmental Policy Act and its provisions for public involvement. The 1985 and 1993 Environmental Impact Statements each had a 45-day comment period for the draft documents followed by a 30-day comment period for the final documents. The 2002 Environmental Assessment had a 30-day comment period.

Public involvement is also part of the permitting process whether for Section 401 water quality certification under the Clean Water Act or for some other law or regulation. For example, changes involving Historic/Cultural Mitigation issues resulted from coordination with consulting parties undertaken in accordance with the National Historic Preservation Act (NHPA). Changes involving cultural resources/archaeology sites resulted from coordination with the Illinois and Kentucky State Historic Preservation Officer and Native American tribes in accordance with NHPA and the Native American Graves Protection and Repatriation Act.

Public involvement and coordination was maintained with residents of local communities such as Paducah, KY and Olmsted, IL on Project features such as the disposition of L&D 52 and 53, construction of a new boat ramp at Olmsted, construction and operation of a contractor facility in Paducah, and purchase of mitigation lands in Ballard County, Kentucky.

In addition, this Review Plan will be posted to a public website for review and comment.

## **8. POINTS OF CONTACT**

The Points of Contact for questions and comments on this Review Plan are as follows:

- (1) District Point of Contact: 502-315-6279

- (2) MSC Point of Contact: 513-684-3071
- (3) PCXIN Point of Contact: 304-399-6938



## APPENDIX A

### Olmsted Dam In-The-Dry Study Design Team

<u>DISCIPLINE</u>	<u>NAME</u>	<u>OFFICE SYMBOL</u>
Project Manager		CELRL-PM-C
Team Leader		CELRL-ED-DN
Structural Checker		CELRL-ED-DN CELRP-EC-NS
Civil Checker		CELRL-ED-TC CELRL-ED-TG
Geotechnical Checker		CELRL-ED-TG CELRL-ED-TG
Hydraulics Checker		CELRL-ED-TH CELRL-ED-TH
Mechanical Checker		CELRL-ED-DN CELRL-ED-DM
Electrical Checker		CELRL-ED-DM CELRL-ED-D
CADD Support Checker		CELRL-ED-DN CELRL-ED-DN
Cost Cost Checker Checker		CELRH-EC-TC CELRL-ED-MC CELRH-EC-TC CELRL-ED-MC
Construction Checker		CELRL-CD-O CELRL-CD-O
Scheduling Checker		Mgmt Solutions CESAS
Environmental		CELRL-PM-P

Economics  
Checker

CELRL-PM-P  
CELRH-NC

**APPENDIX B**

**Olmsted Dam In-The-Dry Study  
Agency Technical Review Team**

<b><u>DISCIPLINE</u></b>	<b><u>NAME</u></b>	<b><u>OFFICE SYMBOL</u></b>
Team Lead		CEMVS-EC-DA
Structural		CELRH-EC-DS
Geotechnical		CELRC-TS-DG
Hydraulics		CELRP-EC-DH
Mechanical		CELRH-EC-DE
Electrical		CELRP-EC-NT
Cost		CENWW-EC-X CELRH-EC-TC
Construction		CELRP-EC-CM

## APPENDIX C

### Olmsted Dam In-The-Dry Study Review Milestones

<u>MILESTONES</u>	<u>COMPLETION DATE</u>	<u>REVIEW METHOD</u>
Final Calc's and Drawings	17 April 2012	MPR
Final Compiled Report	11 May 2012	MPR
Cost Estimate	23 May 2012	MPR



**ATTACHMENT 12 - PCX-IN REVIEW PLAN ENDORSEMENT MEMORANDUM**



DEPARTMENT OF THE ARMY  
HUNTINGTON DISTRICT, CORPS OF ENGINEERS  
502 EIGHT STREET  
HUNTINGTON, WEST VIRGINIA 25701-2035

REPLY TO  
ATTENTION OF  
CELRH-NC

19 November 2012

MEMORANDUM FOR Commander, Louisville District

SUBJECT: Review Plan for the Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam, Ballard County, KY and Pulaski County, Illinois

1. The enclosed Review Plan (RP) has been presented to the Planning Center of Expertise for Inland Navigation (PCXIN) for its review and endorsement in accordance with EC1165-2-209 "Civil Works Review" dated 31 January 2010. This is an update of the previously approved Review Plan dated 08 November 2007.
2. The Olmsted Locks and Dam project provides for a navigation facility near Ohio River Mile 964.4 between Ballard County, KY and Pulaski County, IL. It will replace the existing Locks and Dams 52 and 53. The facility will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a right boat abutment, a 1,400-foot navigable pass, a left boat abutment and a fixed weir extending into the Kentucky bank.
3. PCXIN staff has reviewed the plan for technical sufficiency and policy compliance. A Type I IEPR, by a group from outside USACE, was performed on the PACK and the In-The-Dry Study. No other Type I IEPR's are planned. All of the Planning Models utilized in the development of the decision document are certified.
4. I concur with the findings of the PCXIN technical staff and endorse the enclosed review plan for the Locks and Dams 52 and 53 Replacement Project, Olmsted Locks and Dam. Following approval by the Great Lakes and Ohio River Division, the Louisville District is requested to post the RP to its web site and provide the link to the PCXIN for their use. Prior to posting, the names of the individuals in the RP should be removed.
5. If you have any questions or need additional information, please contact [REDACTED] of my staff at (304) 399-3848.

Encl

[REDACTED]  
Co-Technical Director  
PCX for Inland Navigation