

REVIEW PLAN

Prepared: 6 April 2022

Project Name: New Soo Lock Constuction, MI

P2 Number: 471310

Decision Document Type: Post Authorization Change Report (PACR)

Project Type: Single Purpose (Navigation)

District: Detroit (LRE)

District Contact:

Major Subordinate Command (MSC): LRD

MSC Contact:

Review Management Organization (RMO): Planning Center of Expertise – Inland Navigation

RMO Contact:

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: 3 May 2022

Date of MSC Approval of Review Plan: TBD

RP posted on District Website: 18 May 2022

Milestone Schedule

	<u>Scheduled</u>	<u>Actual</u>	<u>Complete</u>
Compose the PACR and NED Waiver	13 April 2022	19 April 2022	Yes
DQC PACR/NED Waiver	14 April 2022	29 April 2022	Yes
ATR PACR/NED Waiver	14 April 2022	12 May 2022	Yes
PACR/NED Waiver DE Sig	18 April 2022		
HQ PACR/NED Waiver Review	26 April 2022		

Fact Sheet

Federal Project Name: New Soo Lock Constuction, MI

Location: Sault Ste. Marie, Michigan

Authority: Sections and Laws that Authorized or Modified the Project:

- a. Resolution – Senate Committee on Public Works, 2 June 1969
- b. Resolution – Senate Committee on Public Works, 30 April 1976
- c. Water Resources Development Act of 1986 (PL 99-662, 17 Nov 1986), SEC. 1149. SAULT SAINTE MARIE, MICHIGAN, AMENDED BY SEC 3091, WRDA 2007
- d. Water Resources Development Act of 1990 (PL 101-640, 28 Nov 1990), SEC. 107. CONTINUATION OF AUTHORIZATION OF CERTAIN PROJECTS, REPEALED BY SEC 3091, WRDA 2007
- e. Water Resources Development Act of 1996 (PL 104-303, 12 Oct 1996), SEC. 330. SAULT SAINTE MARIE, CHIPPEWA COUNTY, MICHIGAN, REPEALED BY SEC 3091, WRDA 2007
- f. Water Resources Development Act of 1999 (PL 106-53, 17 Aug 1999), SEC. 330. SAULT SAINTE MARIE, CHIPPEWA COUNTY, MICHIGAN, REPEALED BY SEC 3091, WRDA 2007
- g. Water Resources Development Act of 2007 (PL 110-114, 8 Nov 2007), SEC. 3091. SAULT SAINTE MARIE, MICHIGAN.
- h. Water Resources Development Act of 2018 (PL -115-270, 23 Oct 2018), SEC. 1401. SAULT SAINTE MARIE, MICHIGAN.

Sponsor: NA

New Soo Lock Construction Post Authorization Change Report (PACR), Project Management Plan, ENTER DATE NA

District/MSC Quality Management Plan ENTER DATE NA

- **SMART Planning Status:** This study is compliant with SMART Planning Process (3x3x3). The study is complete and approved.

Review Management Organization: The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for the peer review effort described in this Review Plan is the PCX for Inland Navigation (PCXIN). The RMO will coordinate with the Civil Works Cost Engineering Mandatory Center of Expertise (MCX) as needed to ensure the appropriate level of review is conducted for the subject study. The RMO will also coordinate with the Inland Navigation Design Center (INDC) for the appropriate engineer review.

Project Area: The Soo Locks consist of two canals and four locks (**Figure 1**). The North Canal contains the Davis and Sabin locks and the South Canal, the MacArthur and Poe locks. The Sabin Lock was decommissioned in 2010 and a cofferdam was constructed at each end, and the Davis Lock is currently closed to ship traffic. Both the Davis and Sabin locks are obsolete due to their

functional depth of 23 ft. Today, ships draft 27 ft. which is the functional constraint on the Great Lakes Navigation System (GLNS). All cargo vessels moving through the St. Marys River transit either the Poe or the MacArthur lock. In 2021, the Poe Lock handled 88% of the total tonnage that transited the Soo Locks Complex.

The selected plan provides a replacement lock of nominal 1200-foot length by 110-foot width primarily aligned with the existing Sabin Lock chamber. The remaining construction was divided into 3 Phases. Phase I is the Upstream Channel Deepening, consisting removing 300,000 cubic yards of material to a depth of 30 feet. Phase II is the Upstream Approach Wall Rehabilitation, consisting of reconstruction of approximately 5,400 feet of existing 100-year-old approach wall. Phase III is the New Lock Chamber, consisting of three main features including: lock chamber, the new pump well, and downstream approach wall rehabilitation.



FIGURE 1: [Vicinity Map](#)

- Project Status - The Post Authorization Change Report (PACR) documents the project progress, costs expended to date, proposed plan for future construction activities, and presents an updated cost estimate for the project. There is no change to the plan formulation that resulted in the recommended new lock alternative. However, the latest estimate of project costs exceeds the maximum project cost limit pursuant to Section 902 of the Water Resources Development Act (WRDA) of 1986, as amended.

As required by Engineering Regulation (ER) 1110-2-1302, and Engineering Circular (EC) 11-2-210 project costs must be updated every two years. In December 2021 the Detroit District updated the expected cost for the Soo Locks Project. The cost FY22 cost estimate exceeds the 2018 Section 902 limit of \$922.4M. The increase in construction cost combined with 2018 project benefits results in a benefit cost ratio (BCR) of less than one. In March of 2022, the District presented updated project cost and requested concurrence from the District and Division Cost Control Boards (CCB(s)) on a strategy, which includes writing a PACR and a National Economic Development (NED) Waiver, that would allow the project to remain policy compliant and be reauthorized in the 2022 Water Resources and Development Act (WRDA). The submission deadline for inclusion in WRDA 2022 is 30 May 2022.

- Next P&LCR Engagement: MSC Concurrence with the District's path forward was provided during the joint District and Division CCB briefing held on 22 March 2022. The next milestone is a briefing of the HQUSACE CCB on 26 April 2022.

Problem Statement: The economic importance, the aging infrastructure, and the lack of redundancy has caused concerns about the future of the Soo Locks. Major concerns include reliability of the locks, the availability/viability of alternative modes of transportation, and the economic consequences of potential outages/closures to lock users. The Soo Locks represent the single node of failure for the Great Lake Navigation System (GLNS).

Federal Interest: Waterborne commerce and safe navigation is in the interest of the Federal Government.

Risk Identification:

General: The primary risk driver is the aggressive schedule. The schedule for the development, review and approval of the PACR and NED waiver is extremely condensed. Average production and review durations have been reduced from weeks to days. Possible consequences of the aggressive schedule are compromised quality or incomplete scoping.

The ATR is scaled to address the low risks associated with project cost, engineering, planning and economic benefits. The low risk to the 2022 cost estimate is substantiated by the reduced contingency from the 2018 to the 2022 cost estimate. There were no changes to design scope and the low risk determination for the 2022 design modifications resulted from a reduction in uncertainty about site conditions. The risk to the recommended plan of a New Soo Lock is moderate because the benefit cost ratio (BCR) for the NED account fell below unity. However, the navigation project is justified based on comprehensive benefits. Project benefits were validated in the 2018 Validation Study (VS). The risk to the economic benefits used in the 2022 PACR is low because the output from the models used in the 2018 VS study were reviewed and it was determined that they continue to be valid in 2022.

Project Delivery Team: Throughout the study, review, and comment resolution process, the PDT is delegated the ultimate responsibility for the production of a quality product. The key PDT members are listed in Attachment 1.

FACTORS AFFECTING THE LEVELS OF REVIEW

REVIEW EXECUTION PLAN

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

District Quality Control. All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfils the project quality requirements of the Project Management Plan. The DQC will be provided to the ATR team prior to the start of their review.

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

Cost Engineering Review. All decision documents shall be coordinated with the Cost Engineering Mandatory of Expertise (MCX). The MCX will provide a certified cost estimate.

Model Review and Approval/Certification. Not applicable.

Policy and Legal Review. All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H provides guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. These reviews are not further detailed in this section of the Review Plan.

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

Table 1: Levels of Review

FINAL DOCUMENT	District Quality Control	04/14/2022	04/29/2022	\$12k	Yes
FINAL DOCUMENT	ATR	04/18/2022	05/06/2022	\$25k	Yes/No

a. DISTRICT QUALITY CONTROL

The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see ER 1165-2-217). DQC will include quality control and quality assurance procedures required by ER 1110-1-12, Quality Management and in accordance with LRH – Design Quality Control (08504.02). The DQC Lead should prepare a DQC Plan and provide it to the RMO and MSC prior to starting DQC reviews. Table 2 identifies the required expertise for the DQC team.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in background in navigation economics and be familiar with lock and dam systems.
Navigation Economics	A senior economist with experience analyzing, developing, and evaluating economic benefits for large-scale inland navigation....
Civil Engineer	The Engineering reviewer should have 10-20 years of experience with mega projects (\$100 million and above) design and technical experience with inland navigation projects with an emphasis on new lock design requirements. The engineer should have a background in civil engineering with experience reviewing construction cost estimates and reliability components. Registered Professional Engineer preferred. CERCAP certification required.
Cost Engineering	Team member should be familiar with the most recent version of Micro-Computer Aided Cost Estimating System II (MCACES II) software and total project cost summary. The Cost Reviewer should be either Walla Walla Cost DX staff or Cost Professional Pre-certified by the Cost DX and is required to coordinate with the Cost DX for further cost engineering review and resulting certification.

PDT Reviews. All PDT members will be knowledgeable about the critical project elements of all their PDT counterparts and will understand how their assigned project elements and work relate and affect those requirements. PDT members will also be knowledgeable of the customer objectives and will understand how their work relates to and affects them. The PDT will review products to insure consistency and effective coordination across disciplines and verify the correct application of methods, validity of assumptions, adequacy of data, correctness of calculations, completeness of documentation, and compliance with guidance, standards and customer objectives.

Place-in-hand Review. At the end of product development, the PDT will conduct a final plan-in-hand review to verify all quality and customer objectives have been met. This review will be done to

verify the correct application of methods, validity of assumptions, completeness of documentation, and compliance with guidance, standards, and customer objectives.

Quality Control (QC) Reviews. Informal technical checks and reviews will be performed during product development. These reviews will include checking basic assumptions and calculations. DQC reviews will be performed by qualified personnel from each technical discipline involved with the work. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. All design computations will be checked in accordance with LRH - Design Quality Control (08504.02).

Biddability, Constructability, Operability, Environmental, & Sustainability Review (BCOES). Since the study is not a construction product, a BCOES is not required.

Documentation of DQC. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in ER 1165-2-217, on page 19 (see Figure F).

Documentation of completed DQC should be provided to the MSC, RMO and ATR Team leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews

b. AGENCY TECHNICAL REVIEW

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

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	A senior professional from outside the MSC, with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may serve as a reviewer for a specific discipline (such as planning or economics).
Planning	The planning reviewer should experience as a plan formulator who has worked with project teams to identify and evaluate navigation measures and alternatives using appropriate planning methodologies to address navigation studies in accordance with ER 1105-2-100, the Planning Guidance Notebook.
Economics	The Economics reviewer should have a background in developing economic simulation models and analysis for large, complex regional investigations, involving non-traditional project benefit determination. Should have extensive experience in analyzing navigation projects in accordance with ER 1105-2-100, the Planning Guidance Notebook.
Engineering	This will be a certified reviewer appointed by the INDC. The Civil Design reviewer should have experience in the design of lock and dam structures.
Cost Engineering	This will be a certified reviewer appointed by the INDC. Cost MCX Staff or Cost MCX Pre-Certified Professional as assigned by the Walla Walla Cost Engineering Mandatory Center of Expertise with experience preparing cost estimates for Section 204 cost estimates. Must be Certification and Access Program (CERCAP) certified

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

c. INDEPENDENT EXTERNAL PEER REVIEW

Type I IEPR. The project does exceed the \$200 million cost trigger for IEPR. However, it does not meet any other mandatory triggers: the Governor of Michigan has not requested peer review by independent experts and the Chief of Engineers has not determined that the project study is controversial due to significant public dispute over the size, nature, effects, or environmental costs or benefits of the project. Additionally, the project received an IEPR exclusion per the DCW on 12 February 2018. Although minor design changes have occurred, they are not significant enough to change the original basis for the exclusion. Based on the summary below and the previous exclusion the district do not recommend an IEPR.

Mandatory IEPR Triggers.

- Is the estimated total project cost, including mitigation, greater than \$200 million? **Yes,**
- Has the Governor of an affected state requested a peer review by independent experts? **No**
- Has the Chief of Engineers determined the project study is controversial due to significant public dispute over the size, nature or effects of the project or the economic or environmental costs or benefits of the project (including but not limited to projects requiring an Environmental Impact Statement)? **No**

Level and Scope of Review.

- Will the study likely be challenging? No, the study is a Cost PACR which does not require new plan formulation, modeling and environmental assessments.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks. The Schedule constraints are the primary risk driver and NED waiver
- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? This project is Inland Navigation which has minimal life safety risk.
- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? Since this is a Cost PACR new methods and techniques were not reconsidered as part of the analysis
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? The design had minimal changes, each of which were related to increased safety in operation. They extended the upstream approach wall to allow for safe transit based on a Ship Simulation Study with vessel captains they added ship arrestors, and they added hands free mooring within the lock chambers. In total, these features account for somewhere around 14% of the updated total project cost and qualified as minor design refinements.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? No, since this is a Cost PACR no additional assesemnts were required.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? No, since this is a Cost PACR no additional assessments were required.
- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? No, since this is a Cost PACR no additional assessments were required.

d. MODEL CERTIFICATION OR APPROVAL

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

Table 5: Planning Models. Additional modeling was not required.

Table 6: Engineering Models. Additional modeling was not required

e. POLICY AND LEGAL REVIEW

Policy and legal compliance reviews for draft and final planning decision documents are delegated to the MSC (see Director's Policy Memorandum 2018-05, paragraph 9).

(i) Policy Review.

The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The team is identified in Attachment 1 of this Review Plan. The makeup of the Policy Review team will be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

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

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

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

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Technical Discipline	Phone Number
	CELRE	Project Manager	
	CELRE	Plan Formulation	
	CRLRE	Economics	
	CEMVR	Cost Engineering	
	CEMVR	Civil Engineering	
	CELRH-PX	Economics	
	CELRE	Plan Formulation (CPR)	
	PCXIN	Economics	

DISTRICT QUALITY CONTROL TEAM			
Name	Office	Technical Discipline	Phone Number
	CELRE-PL	Plan Formulation	
	CELRE-EC	Civil Engineer	
	CELRB-PML-P	Regional Economist	
	CELRE-	Cost Engineering	

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
	CEMVP	ATR Lead/Plan Formulation	
	CEMVN	Economics	
	CEMVR	Engineering	
	PCXIN	Review Manager	
	CEMVP	CPR	

POLICY AND LEGAL COMPLIANCE REVIEW TEAM			
Name	Office	Position	Phone Number
	CELRD-PDP	Review Manager	
	CELRD	Economist	
	CELRD	Environmental	
	CELRD	Plan Formulation	
	CELRD	RIDM	
	CELRD	Real Estate	
	CELRD	Office of Counsel	
	CELRD-PD	CPR	
	CELRD-RBT	Cost Engineering	
	CELRD-RBT	Civil Engineering	