US Army Corps of Engineers®

Prepared by:

Rock Island District
Mississippi Valley Division

Brandon Road Interbasin Project

Review Plan

7/15/2021

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Last Revision Date: None

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Section 1
Introduction

1.1 Purpose

The purpose of this Review Plan (RP) for the Brandon Road Interbasin Project (P2 #482782) is to ensure a quality-engineering Project is developed by the Corps of Engineers in accordance with Engineering Regulation (ER) 1165-2-217, *Water Resources Policies and Authorities Civil Works Review Policy*, ER 415-1-11, *Biddability, Constructability, Operability, Environmental and Sustainability Reviews*" and District Quality Management Plan. As part of the Project Management Plan (PMP), this RP establishes an accountable, comprehensive life-cycle review strategy for Civil Works products, lays out a value-added process, and describes the scope of review for each increment of work. The guidance documents outline three levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Review. This RP will be coordinated with the Non-Federal Project Sponsor and provided to the Project Delivery Team (PDT), DQC, ATR, and BCOES Teams. The District Chief of Engineering has determined that the project does not pose significant life safety risks and a Type II IEPR (SAR) is not required. A signed memorandum with this exclusion determination is provided in Attachment 6. This RP is a stand-alone document and serves as an appendix to the PMP.

1.2 References

- ER 1165-2-217, Water Resources Policies and Authorities Civil Works Review Policy, 01 May 2021
- ER 110-1-12, Quality Management 30 Sep 06
- ER 1110-1-12, Change 2, Quality Management, 31 March 2011
- ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability Reviews, 1 January 2013
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 March 2014
- ER 1110-2-112, Required Visits to Construction Sites by Design Personnel, 15 April 1992
- ER 1180-1-6, Construction Quality Management, 30 September 1995
- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999

- Engineering Manual (EM) 1110-2-1913 Design, Construction, and Evaluation of Levees, 30 April 2000
- PMP for subject Project dated June 16, 2021
- Design Agreement (DA) Between the Department of the Army and the State of Illinois, 29 December 2020
- Report of the Chief of Engineers for the Brandon Road Project (Chiefs Report), May 2019
- District Quality Management Plan (Quality Management Plan (QMP) - 19990901.pdf)

a. Requirements. This RP was developed in accordance with ER 1165-2-217 and ER 415-1-11, which establish an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from design, biddability, construction, and Operation, Maintenance, Environmental, Sustainability, Repair, Replacement and Rehabilitation (OMRR&R). They provide the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and work products. The ER guidance documents outline three levels of review: District Quality Control, Agency Technical Review, and Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Review.

1) District Quality Control (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). Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. It is managed in the home district. 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. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. Additionally, the PDT is responsible for a complete reading of any reports and accompanying appendices prepared by or for the PDT to assure the overall coherence and integrity of the report, technical appendices, and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District Quality Management Plans address the conduct and documentation of this fundamental level of review. DQC is addressed later in this RP.

2) Agency Technical Review (ATR). 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 the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. 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, preferably recognized subject matter experts with the appropriate technical expertise such as Regional Technical Specialists, 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. The home MSC is both MVD and LRD and the team leads will not be from either of those MSCs.

3) Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) review is based on minimizing problems during the construction phase through effective checks performed by knowledgeable, experienced personnel prior to advertising for a contract. Biddability, constructability, operability, environmental, and sustainability requirements are to be emphasized throughout the planning and design processes for all phases of this project.

1.3 Review Management Organization

The Inland Navigation Design Center (INDC) is the Review Management Organization (RMO) for this Project. The RMO has provided the District with an endorsement for this RP.

The INDC will assure that ATR teams are assembled in accordance with the review plan. The RMO will review the ATR report and sign the accompanying completion statement at the completion of each final ATR review conducted.

1.4 Documents Distributed Outside the Government

For information distributed for review to non-governmental organizations, the following disclaimer shall be placed on documents, 'This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy.'

Section 2
Project Description

2.1 Project Description

Description

The U.S. Army Corps of Engineers completed feasibility study in 2019 that evaluated a large array of potential control options and technologies at Brandon Road Lock and Dam to prevent the upstream interbasin transfer of Aquatic Nuisance Species (ANS) while minimizing impacts to Illinois Waterway uses and users. The recommended plan in the feasibility study was authorized by congress for implementation.

Status

The Chief's Report recommending a National Ecosystem Restoration (NER) Plan was signed on 23 May 2019 and sent to Congress. The NER Plan is a federal risk management plan including a layered system of structural controls and non-structural measures. The NER plan includes managing the waterway below Brandon Road as 'population reduction zone' where monitoring and overfishing would occur. Non-structural measures will be implemented primarily by other federal agencies including USFWS & USGS and will begin upon appropriation. Non-structural measures include public education and outreach, nonstructural monitoring, integrated pest management, pesticides, manual or mechanical removal, research and development and two boat launches.

The Corps structural plan for the Brandon Road Interbasin Project includes the creation of a new control point at Brandon Road Lock and Dam in addition to the control point that is already provided by the electric dispersal barrier at Romeoville, Illinois. The Corps Structural plan includes the construction of technology alternatives to create a gauntlet of deterrent systems to maximize project efficacy in the effort of ANS management. This will include acoustic fish deterrent system, bubble curtain system, electric barrier system, an engineered channel, and flushing lock. The WRDA document allows for flexibility of the authorized plan to incorporate other technologies if they are proven to be more beneficial and advantageous to the control of ANS. The structural measures are described in more detail below.

Air Bubbler

Air bubble curtains are to be installed at the leading downstream edge of the engineered channel with a purpose of removing entrained fish located in the small gaps in between the barges. Measures to address barge entrainment increase the turbulence within the pool of water that forms between barges to remove the ANS from this area. ANS within these pools are protected from the influence ANS controls. The goal of the air bubble curtain is to remove the ANS from the pools of water forming between barges.

Acoustic Deterrent System (ADS)

Acoustic underwater speakers are to be installed in strategic arrays in two locations at both the entrance to the Engineered Channel and upstream of the Electric Barrier deterrent system. The acoustic deterrent system will create underwater sound in frequencies targeting invasive carp to deter upstream passage into the engineered channel and upstream of the electric barrier when the electric barrier is off to allow safe navigation transit into the lock chamber. The goal of the acoustic deterrent system is to create a behavior response in the targeted species to avoid a specific area.

Electric Barrier
The Electric Barrier measure will be installed across the engineered channel at its downstream end. The arrays of active electrodes will be contained within parasitic arrays for limiting stray currents at the electric barrier entrance and exit points within the engineered channel. The electric barrier is a proven technology with a high efficacy level and will be capable of being adjusted to meet onsite conditions to maximize effectiveness of the barrier. The in-water structures will not be an impediment to navigation as they are to be recessed below the engineered channel floor designed with adequate keel draft.

Engineered Channel
The Engineered Channel measure creates an engineered structure that completely lines the lower approach channel with concrete. The engineered channel within the feasibility report matches the 200 feet navigation width currently provided within the downstream approach channel but opportunities to optimize the size of the channel are to be explored during PED to meet the requirements of the deterrent system designs, navigation requirements and potential project cost savings. The downstream approach channel has a bottom that is cut into limestone bedrock. To create necessary depth for the concrete floor and new ANS controls within the floor, several feet of the existing channel bedrock will be excavated for the project. The structure would house the electric barrier, acoustic fish deterrent, and air bubble curtain structural measures. The engineered channel will provide space for future adaptive management measures. Site development of the adjoining private land to the channel is included within this section as it is closely tied to channel excavation materials and work areas required for construction of the engineered channel.

Flushing Lock
The Flushing Lock measure was developed to reduce the risk of the upstream transfer of floaters by displacing the tailwater, which may contain floating ANS, with pool water within the lock chamber. The flushing lock design was constrained by navigation safety, water supply, and navigation delays due to operational duration. The term flushing lock should not be misconstrued as creating a velocity to remove any swimming ANS within the lock chamber but instead interpreted as water volume exchange within the lock chamber. The desired water volume exchange requires water upstream of the lock to replace as much water as feasible within the lock after any lockage involving operation of the lower lock gates which results in downstream ANS contaminated water entering the lock chamber. The goal of this measure is to reduce the risk of any aquatic nuisance species, to include fish eggs and larvae, from floating or being carried via barge movement to the upstream pool through the lock.

Boat Launches
Boat launches would be constructed upstream and downstream of the lock to reduce reaction time and increase the efficiency of non-structural measure response crews

around Brandon Road Lock and Dam. The boat launches would also be used to facilitate OMRR&R and responses to safety incidents at Brandon Road Lock and Dam.

This plan meets the project objective by reducing the risk of Mississippi River Basin ANS establishment in the Great Lakes Basin to the maximum extent possible, and provides for continued navigation and minimization of impacts to other waterway users and uses.

Location
Brandon Road Lock and Dam, Joliet, Illinois, Des Plaines River. The location and physical orientation of the Brandon Road Lock and Dam site are shown on (Figure 2.1). Project specific advantages identified for constructing the project at this location include:

- The physical configuration of the Brandon Road Dam prevents the upstream transfer of Mississippi River (MR) ANS. There is a minimum 25-foot difference in water elevation from the downstream side of the dam to the upstream side of the dam, which effectively limits upstream transfer. Operation of the lock currently provides the only known aquatic pathway that allows transfer of MR ANS to the Great Lakes (GL).

- The approach channel and lock provide a unique opportunity to control upstream ANS transfer in a relatively small section of the river that is not free flowing. These conditions provide the opportunity to optimize the operational characteristics of the ANS controls, maximize the efficiency of applied technologies, and minimize the associated costs for implementation and operation.

- Establishing the control point at Brandon Road for upstream transfer of MR ANS does not adversely impact flood risk or water quality of the Chicago Area Waterway System (CAWS) and provides for additional defense-in-depth for particular species of concern, Invasive carp, when combined with the current electric barrier dispersal system located in Romeoville, IL.

- The Brandon Road site is located south (downstream) of the confluence of the Des Plaines River and the Chicago Sanitary and Ship Canal (CSSC). Previous investigations under the Efficacy Study have indicated that a potential hydrologic bypass can occur during periods of high precipitation from the Des Plaines River to the CSSC. A one-way control point at the Brandon Road site minimizes the likelihood of bypass of MR Basin ANS into the GL Basin during flood events.

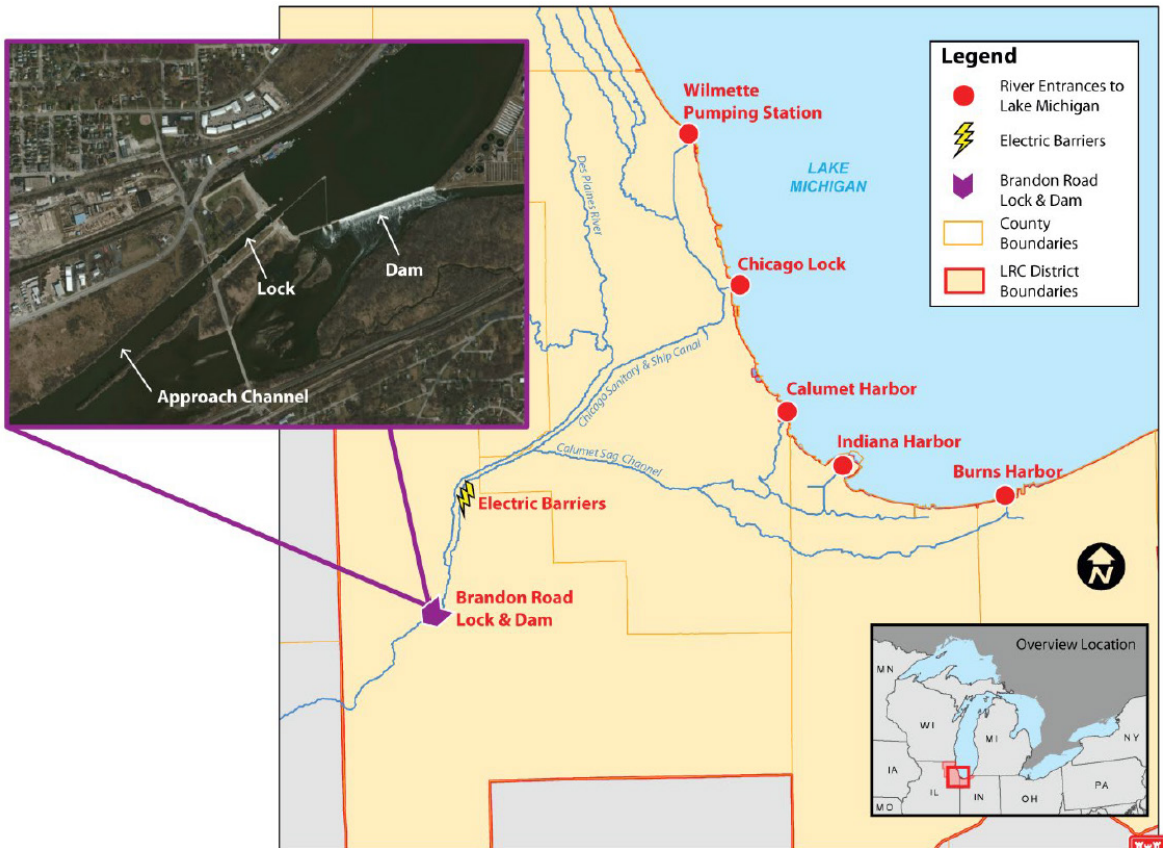

Figure 2.1. Brandon Road Lock and Dam Location

Project Increments

An incremental project implementation strategy will be utilized to separate the project into different construction contracts based upon the outline provided in the Chief of Engineers Report for the Brandon Road Project (Chiefs Report), May 2019 and appropriation of funding. The structural measures as described above will be designed and constructed as part of the phased increments to achieve total project operability. Section 402 WRDA 2020 allows for the addition or substitution of technologies or measures not described in the report, as the Secretary determines to be advisable. The PDT will make adjustments to the project implementation strategy if adaptive management technologies are identified for use. PED activities for all increments will be conducted concurrently to the 35% level. PED for the increments at the 65% and 95% milestone levels will be staggered to varying levels of completion during the multi-year project implementation. This will allow separable project features to be designed, awarded and constructed while ensuring overall project functionality through a risk-informed decision making process. The State of Illinois is the Non-Federal project sponsor. The Sponsor's proposed Work-In-Kind includes a portion of design activities including but not limited to; negotiation of Rights of Entry for exploration on the private lands (Midwest Generation - owner's) property, Phase II HTRW of the Midwest Generation property, geotechnical investigation of the Midwest Generation property, surveying and mapping for portions of the site plan development, design support for

project building facilities, and boat launches. The State of Illinois has in-house engineering capability to support the Work-In-Kind activities and is integrated within the USACE PDT for all PED activities and working within USACE established schedules and milestones.

Physical and numerical model studies will be prepared for the flushing lock and engineered channel. The models will then be evaluated to assess impacts to arrive at the optimal performance arrangement. The preferred design arrangement for the flushing lock and engineered channel with deterrents and a final design solution will be adopted for implementation.

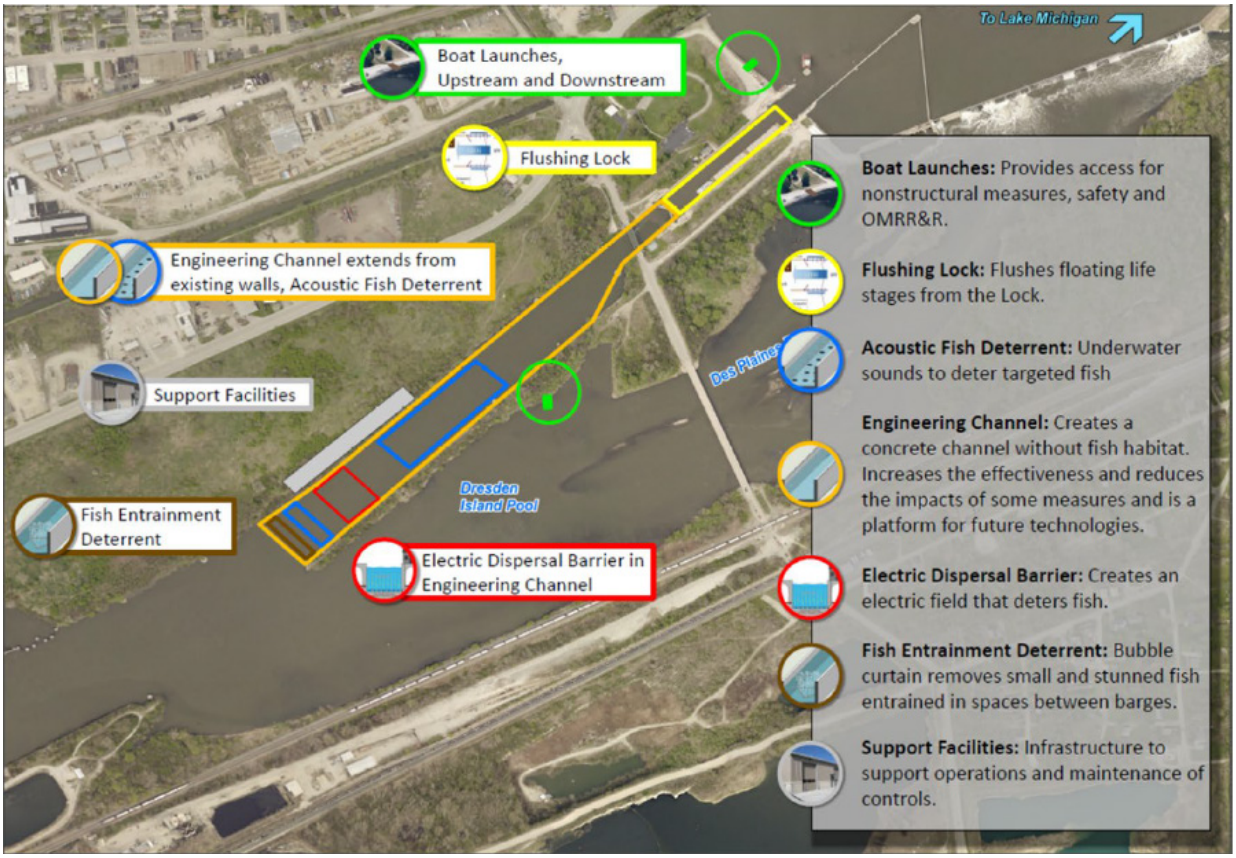

Figure 2.2. All Brandon Road Project Features

Increment 1. The combined technology measures identified for the first increment contract include installation of an air bubble curtain, a narrow speaker array for the acoustic fish deterrent, a portion of the engineered channel, and an upstream boat ramp. Excavation and rock removal of the entire engineered channel would be completed during this time to minimize navigation impacts from this activity. The property along the right descending bank would also be prepared to store and process excavated materials. The facility support building would be constructed, and a temporary building would be constructed to house the utilities and equipment necessary to operate the acoustic fish deterrent and air bubble curtain. The air bubble curtain

addresses fish entrainment, and the acoustic array deters swimming fish. These features would be at the end of the channel to deflect fish from entering the channel and instead direct them to the dam. Figure 2.3 shows Increment I features, cost, and schedule estimates.

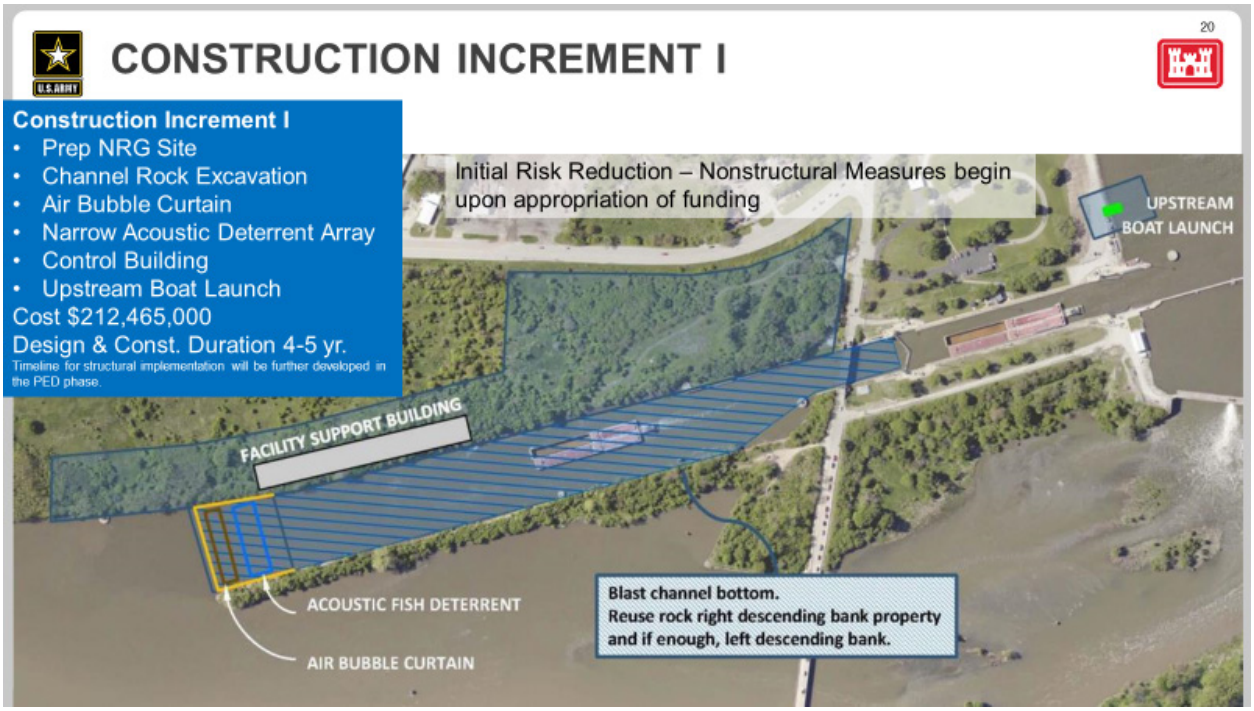

Figure 2.3. Brandon Road Lock and Dam Increment I

Increment 2. The second increment contract of technology measures would include installation of the electric barrier, a wide speaker array for the acoustic fish deterrent, the engineered channel to house these measures, the downstream boat launch and a flushing lock. The engineered channel right descending bank wall would be extended to connect the completed engineered channel that houses the ANS control measures with the downstream end of the right-descending bank lock long wall. The electric barrier and wide speaker array are swimmer deterrents. The flushing lock deters floaters by replacing water from the lower pool within the lock with water from the upper pool. The facilities within the support building would be completed to allow operation of these features. The electric barrier, wide speaker array and flushing lock would be made operable after an in-water evaluation was conducted in conjunction with the United States Coast Guard (USCG) for SOP development and assessment of navigation safety. Figure 2.4 shows Increment II features, cost and schedule estimates.

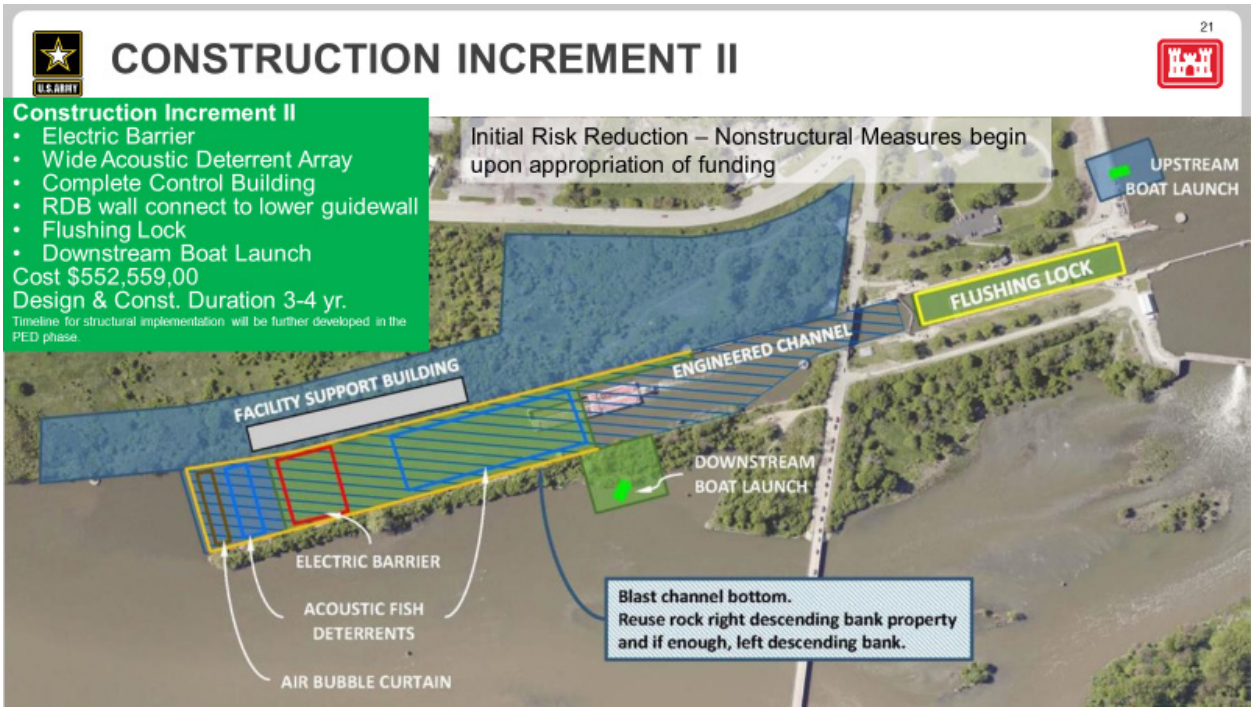

Figure 2.4. Brandon Road Lock and Dam Increment II

Increment 3. The third increment completes the engineered channel. The left descending bank wall would be constructed to extend to the end of the lock's short left descending bank wall. The floor of the engineered channel upstream of the wide acoustic speaker array would also be completed in this increment. The engineered channel increases the efficiency of monitoring for project effectiveness and fish clearing and provides an area for future ANS testing and possible installation. Figure 2.5 shows Increment III features, cost and schedule estimates.

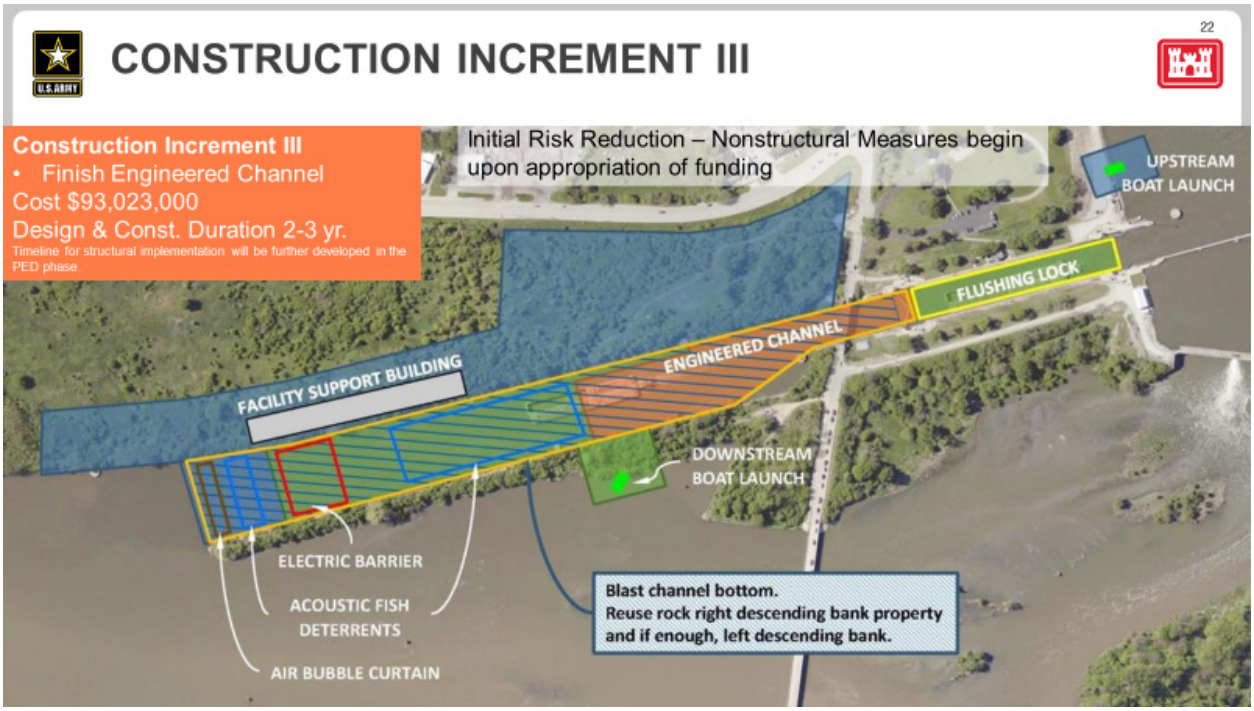

Figure 2.5. Brandon Road Lock and Dam Increment III

2.2 Project Sponsor

The State of Illinois is the non-federal project sponsor. The state of Illinois has coordinated a third-party agreement with the state of Michigan to cost share the non-federal expenses for Pre-construction Engineering and Design (PED). PED activities are estimated to take 3 years to complete and are subject to the availability of funds. The products and analyses provided by the State as in-kind services will undergo District Quality Assurance and verification. The State sponsor has engineering services capability within their own organization and their engineering team members are integrated into the makeup of the PDT and senior management governance structure shown in Figure 2.6 below. Any engineering products to be produced by the sponsor, and contracted for construction, are anticipated to be part of the contract increments I through III shown in Paragraph 2.1 which will undergo DQC, ATR, and BCOES reviews. The State will be providing in-kind services as outlined in Section 10.

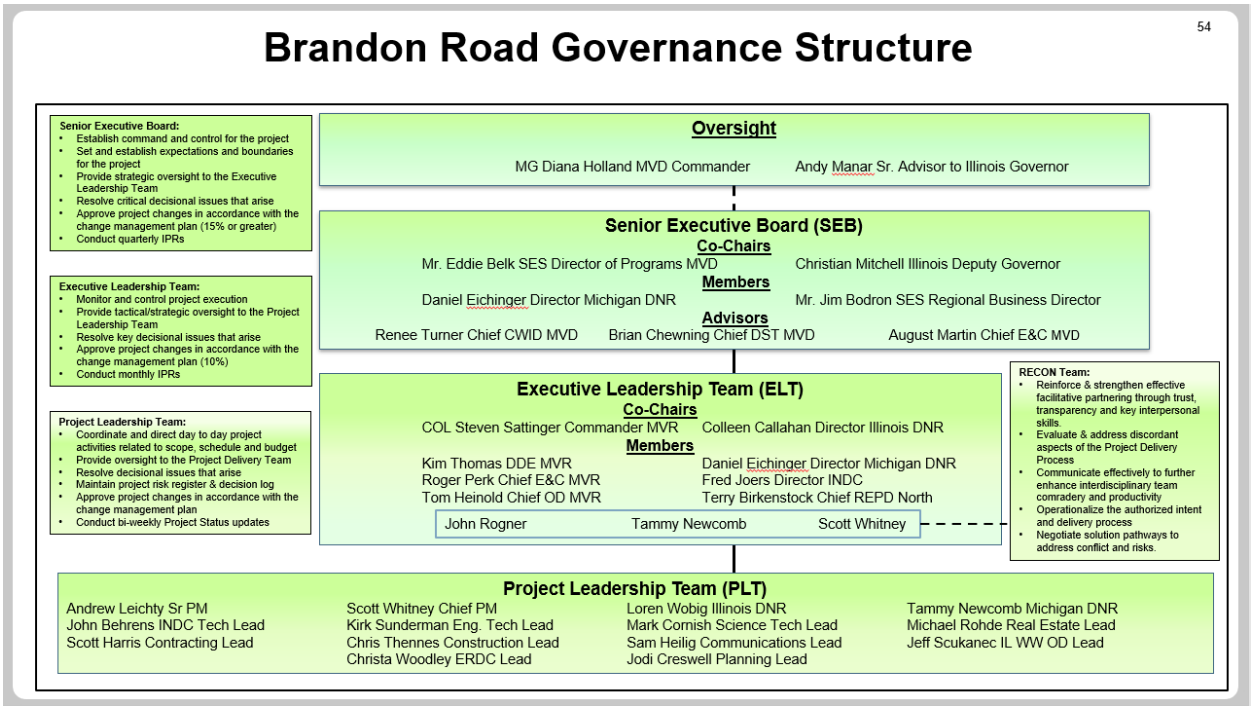

Figure 2.6. Brandon Road Governance Structure and Local Sponsor Involvement

Section 3

Risk Informed Decisions on Appropriate Reviews

Risk assessments during design will be performed in accordance with ECB 2019-15. The PDT will create a risk register to periodically assess the risks associated with project design, PED schedule, construction schedule, navigation, construction cost and sponsor requirements to recognize, accept, mitigate or elevate those risks within the governance structure to make risk informed project decisions. The inclusion of risk assessments during the design and construction phases is the natural progression of risk-informed policies and will aid in more comprehensively achieving project objectives within the limits of the authorized project. The risk assessment evaluation team for PED activities will comprise of key PDT members from MVR PM, INDC, EC, State of Illinois and other USACE expertise depending upon the risks being evaluated.

A construction risk assessment will be completed separately by the PDT design team for each increment phase of construction and included as part of a full risk assessment during the ATR reviews. A consequence specialist may be included on the ATR teams to assist with the risk assessment reviews of each product. The same review teams will

be used for the risk assessment, design, and construction documents to the maximum extent possible.

Section 4
District Quality Control

4.1 Requirements

District Quality Control/Quality Assurance (DQC/QA). All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) and risk assessment reports shall undergo DQC/DQA in accordance with ER 1165-2-217. DQC/DQA will be performed on all early release decision information (i.e., hydraulic conditions, geotechnical parameters, loading conditions, etc.) and certified complete down to the component or sub-component level prior to incorporation into the design. .

The following disciplines will be represented during the DQC process: DQC Lead, Hydraulic Engineer, HTRW Specialist, Mechanical Engineer, Electrical Engineer, Structural Engineer, Civil Engineer, Geotechnical Engineer, Architect, Environmental Engineer, Environmental Planner, Cost Engineer, Specifications Writers, other researchers, scientists and personnel as deemed appropriate.

a) Level of DQC Review. Based on the level of risk and complexity of the design, the following quality review processes will be utilized: DQC checklist, design check review, and/or formal DQC review, as determined by the TL and approved by the Chief of Engineering and Construction.

b) In accordance with the MVR Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038), approved and vetted by MVD, a DQC Review Lead will be named in the project RP for the DQC Review. The lead will verify the team members for each type of review and verify that the reviewers are qualified. The DQC Review will follow this approved process. The DQC Review Lead will be different than the TL.

Design Documentation Reports, Risk Assessments, Plans and Specifications, and Operations and Maintenance manuals will undergo formal DQC at the 35%, 65% and 95% level in accordance with the Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038) and ER 1165-2-217.

Products produced by Architect-Engineers (A/E) are anticipated to include geotechnical exploration, remote Dam Operation, Power utility service extension, and construction scheduling. These products will undergo DQA review in addition to the quality review process performed by the A/E. The A/E quality review includes checking of all

computations by an independent source and over the shoulder review by senior staff. USACE will review the comments from the A/E to insure they are complying with their own QC process. DQC Lead, reviewers, and reviewers' disciplines for all stages of work are listed in Section 13, Table 15 below.

4.2 Documentation

The Rock Island District will manage the DQC Reviews. All reviews will be performed and documented in accordance with ER 1165-2-217 and the district's quality manual. All comments and their resolutions from all DQC Reviews will be provided to the ATR teams so that the ATR teams can determine whether an adequate DQC was performed. The DQC Reviews will consist of Informal Quality Checks and more formal Milestone Reviews.

DQC certifications will be filled out after completion of each design package. The DQC certification process will be completed prior to submission for ATR Technical Review Certification. The "Certification of District Quality Control" will be prepared by the MVR Quality Control/Technical Lead and signed by the DQC reviewers, Project Manager, Discipline Lead Project Engineer(s) and their Supervisor(s). Documents that will undergo DQC include:

- Design Documentation Reports
- Plans and Specifications
- Project Risk Assessment Report
- Construction Schedule Estimates
- Operations Manuals

a) **DQC Checklist (Rock Island District).** The DQC checklist is used by the Technical Lead to verify the quality and completeness of the design. The items that have been reviewed and verified will be initialed. The timing and execution of the DQC checklist will be conducted around the time of the 95% BCOES review. Depending on the scope of the project and level of complexity, the TL can choose to execute the DQC Checklist alone or establish a DQC team of reviewers to complete the checklist. The DQC reviewers will be selected in accordance with the MVR - Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038).

b) **Design Check Review (INDC).** A design check is a detailed evaluation of the engineering analysis and contract documents prepared by each engineering discipline. The checker will be a Technical Manager or Subject Matter Expert within the INDC, or an expert within Rock Island District appointed by the INDC Director. The checker will be qualified to originate the document that is being checked. The checked documents such as drawings, computations, quantity estimates, and analyses will be annotated to show the initials of the

designer and the checker and the date of action. The design check will include a comprehensive evaluation of at least the following:

1) appropriate period of performance, considering holidays/events/restrictions
2) lessons learned incorporated (if applicable)
3) correct application of methods
4) adequacy of basic data and assumptions
5) correctness of calculations
6) quantity estimates
7) completeness of documentation
8) testing, modeling, assumptions, calculations, text, and graphic presentations in all documents are complete, satisfy appropriate design criteria, and utilize sound engineering practice.
9) Compliance with guidance, standards, regulations, and laws
10) Biddability, constructability, operability, environmental and sustainability issues

c) **Informal Quality Checks.** The Informal Quality Checks will be performed by peers not actively involved with project delivery. The Informal Quality Checks reviews will not have a formal schedule or a formal team but will be certified and documented. These Informal Quality Checks will be performed throughout the life of the project, specifically at key decisions/milestones. At a minimum, for this project, the following will be certified complete before follow-on work is started: Flushing Lock Physical Model Report, Downstream Approach Channel Physical Model Report, Electric Barrier Numeric Modeling results, Engineered Channel Evaluation Report, Geotechnical Exploration Report, Water Control Manual Amendment, Increment I P&S, Increment II P&S, Increment III P&S, Construction Cost Recertification, Construction Schedule Revisions. The sample certification sheet found in ER 1165-2-217 will be used to certify the Informal Quality Checks reviews.

d) **Formal DQC Review (Rock Island District).** A DQC review of each construction increment solicitation package will be done within the Rock Island District to ensure that the design conforms to proper criteria, that appropriate design methods have been followed and that an internal check of the design has been completed for the drawings and computation sheets. The DQC review will also confirm that all documentation is complete within the DDR. Comments from the DQC team will be inserted into DrChecks and reviewed according to ER 1165-2-217. The DQC reviewers will be selected in accordance with the MVR - Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038).

e) **Plan-In-Hand (PIH) Review.** On-site review to ensure all visible and known existing characteristics of the site described in the project design and acquisition documents are included, accurate and supportive of the project's

successful acquisition and construction. PIH reviews will be conducted in accordance with ER 415-1-1. The plan-in-hand review will be performed at the 65% BCOES Review milestones for each increment P&S package. If a project is halted after the performance of the PIH, an additional PIH can be held based on engineering judgment of the Area/Resident Engineer staff conducting the PIH review and approved by the Chief of Engineering and Construction. PIH reviewers will be members of Area/Resident Engineer staff with PDT, Local Sponsor, Operations, and other select individual experts or stakeholders participating as necessary to enhance the review effort and product quality.

f) **Milestone Reviews.** The Milestone Reviews will be performed as shown in the schedules provided in Section 4.3, Tables 3-11.. DrChecks comments and resolutions to the comments will serve as documentation for the DQC, ATR and BCOES Milestone Reviews. Milestone Reviews will consist of Project Delivery Team (PDT) reviews, DQC Reviews, ATR Reviews and BCOES Reviews.

1) PDT Reviews. Informal PDT Reviews will be performed by team members actively involved in project delivery throughout the design of the project and ahead of the Milestone Reviews for DQC, ATR and BCOES. The PDT has assigned a Technical Lead in accordance with ER 5-1-11. The PDT members and disciplines are shown in Section 13, Table 15.

2) Independent DQC Reviews. The Independent DQC Reviews will be performed by reviewers NOT actively involved in the project delivery. The Independent DQC team has been assigned a DQC Review Lead in accordance with ER 1165-2-217. The Independent DQC reviewers and disciplines are shown in Section 13, Table 15.

g) **Supervisory Review (Final Routing).** Supervisory review will be performed to ensure that all reviews have been completed and backchecked, all files are properly labeled as dictated by project milestone and filed in ProjectWise, and packages are ready for advertisement. The Initial Supervisory Reviewers will review the design package prior to 65% and 95% BCOES. Once the 95% reviews are complete for each P&S package the products will be routed for Final Supervisory review and approval. A focus of these reviews will be to ensure all major design elements are addressed, review documentation is complete, necessary permitting is acquired, funding is available and in place, project objectives have been satisfied, and information is available to define Current Working Estimates (CWEs) accurately. Once the Certified Final

package has been reviewed by all supervisors, it will be labeled Ready to Advertise. This Supervisory Review will include the following:

- Engineering Considerations and Instructions for Field Personnel (ECIFP) (at 95% BCOES only)
- Plans and Specifications
- Draft front end (at 95% BCOES only)
- CWE

The Supervisory reviewers are as follows. The initial supervisory design review will be completed by Rock Island District with collaborative supervisory review completed by the local sponsor Table 1. Final supervisory review will be completed as shown in Tables 2.

Table 1. Initial Supervisory Reviewers

Name	Functional Discipline	Phone
Tom Mack	Design Branch	[redacted]
Matt Stewart	Geotechnical Branch	
Kevin Landwehr	Hydrology and Hydraulics Branch	
Ron Mott	Technical Services Branch	
Scott Whitney	Project Management	
Jodi Creswell	Environmental Branch	
Chief of Construction	Construction Branch	
John Rogner	Assistant Director, IL DNR	

Table 2. Final Supervisory Routing Reviewers:

Name	Functional Discipline	Phone
COL Jesse Curry	District Commander	[redacted]
Roger Perk	Division Chief, Engineering and Construction	
Andrew Barnes	Director, INDC	
Colleen Callahan	Director, Illinois DNR	
Daniel Eichinger	Director, Michigan DNR	

4.3 DQC Schedule and Estimated Cost

DQC Review Schedules are outlined in Tables 3 thru 12. The cost for the DQC is approximately $1,330,000.

Table 3. Engineered Channel Evaluation Report PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	01/03/22	02/07/22	$50,000	• Report • DDR
95% DQC Review	01/03/22	02/07/22	$50,000	

Table 4. Flushing Lock Physical Model Report PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	01/02/23	2/10/23	$50,000	• Report • DDR
95% DQC Review	01/02/23	2/10/23	$50,000	

Table 5. Downstream Channel Physical Model Report PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	11/14/22	12/23/22	$50,000	• Report • DDR
95% DQC Review	11/14/22	12/23/22	$50,000	

Table 6. Electric Barrier Numeric Model Report PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	07/21/22	08/31/22	$50,000	• Report • DDR
95% DQC Review	07/21/22	08/31/22	$50,000	

Table 7. Geotechnical Investigation Report PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	08/01/22	08/31/22	$50,000	• Report • DDR
95% DQC Review	08/01/22	08/31/22	$50,000	

Table 8. Water Control Manual Amendment PDT/DQC Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
95% PDT Review	05/22/23	06/26/23	$50,000	• Manual • DDR
95% DQC Review	05/22/23	06/26/23	$50,000	

Table 9. Increment I, II, & III – Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
35% Design – DQC, BCOES, ATR	6/12/23	7/28/23	$190,000	• Plans and Specs • DDR

Table 10. Increment I – Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
65% Design - DQC BCOES, ATR	12/04/23	01/19/24	$190,000	• Plans and Specs • DDR
95% Design - DQC & BCOES	5/27/24	7/12/24	$110,000	• Plans and Specs • DDR
95% Design – ATR (Certifies All Reviews)	7/15/24	8/30/24	$80,000	• ECIFP • O&M Manual

Table 11. Increment II– Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
65% Design - DQC BCOES, ATR	03/03/25	4/18/25	$190,000	• Plans and Specs • DDR
95% Design - DQC & BCOES	8/25/25	10/10/25	$110,000	• Plans and Specs • DDR
95% Design – ATR (Certifies All Reviews)	10/13/25	11/28/25	$80,000	• ECIFP • O&M Manual

Table 12. Increment III– Review Schedule and Budget

Review	Start Date	Finish Date	Budget	Documents
65% Design - DQC BCOES, ATR	6/1/26	7/17/26	$190,000	• Plans and Specs • DDR
95% Design - DQC & BCOES	11/23/26	1/8/27	$110,000	• Plans and Specs • DDR
95% Design – ATR (Certifies All Reviews)	1/11/27	2/26/27	$80,000	• ECIFP

Section 5
Local Sponsor Technical Review

5.1 Requirements

The Local Sponsor, the State of Illinois, will perform a portion of the PED activities as work in kind and will perform a quality control review of their products commensurate with the USACE DQC review process. All engineering documents produced by the Local Sponsor to be included in the USACE construction increment contracts will have reviews conducted by both the Local Sponsor and Rock Island District for DQC, ATR and BCOES. These reviews will follow the same review intervals as the DQCR, ATR and BCOES reviews currently identified for 35%, 65%, 95% milestone reviews.

5.2 Documentation

Documentation of Sponsor Technical Review activities will be accomplished through DrChecks in accordance with the MVR - Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038). Documents that will undergo review include Plans and Specifications and Design Documents.

Section 6
Agency Technical Review

6.1 Requirements

All implementation documents shall undergo ATR in accordance ER 1165-2-217. ATRs will occur seamlessly, including early involvement of the ATR team for validation of key design decisions, and at the scheduled milestones for the contract increments. The schedule and costs for ATR review are listed in Tables 9, 10, 11 and 12 shown above. A site visit will be scheduled for the ATR Team in 3rd Q 2023.

1) **General.** ATR will be managed by the INDC and reviewers will be identified outside of Rock Island District. ATRs will be conducted in accordance with the governing guidance as outlined in ER 1165-2-217 and ER 1110-1-8168. The INDC will serve as the RMO for the project to manage the overall review requirements. INDC will ensure that independent reviews are maintained while acting as both the DOR and the RMO. As required within the guidance there will be appropriate coordination and processing through CoPs and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished. The ATR shall ensure that the product is consistent 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 documents explain the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the Rock Island District and will be CERCAP certified. The ATR lead will be from outside the Mississippi Valley Division.

6.2 Documentation of ATR

(1) Documentation of ATR activities will be accomplished through DrChecks. ATR certifications will be filled out at the completion of each design package in accordance with ER 1165-2-217. 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, ASA (CW)/USACE 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 design P&S, efficiency (cost), schedule, effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability.
4) The probable specific action needed to resolve the concern – identify the action(s) that must be taken 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, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation.

- ATR may be certified when all ATR concerns are resolved. Unresolved issues will be elevated through the vertical team for resolution. Certification of ATR should be completed, based on work reviewed to date, for the DDR and Plans and Specifications.

6.3 Products to Undergo ATR

- Design Documentation Reports
- Plans and Specifications
- O&M Manuals

6.4 Required Team Expertise and Requirements

The ATR team has been established in accordance with ER 1165-2-217 and will include the disciplines and expertise as outlined below. All members will be professionally registered, or have relevant prior experience. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists, etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATR team will reflect the significant disciplines involved in the planning, engineering, design, and construction effort. This project will require review by civil, structural, mechanical, electrical, geotechnical, construction, hydraulic engineers, geology, cost, materials, environmental, and operations. In addition, specialized materials & fabrication experts along with other professionals may be included to bolster the ATR team expertise. Specifically, the ATR team shall have expertise related to design of navigation lock components such as locks walls, foundations, hydraulic steel structures (HSS), electrical medium to high voltage power distribution, facility buildings, operating machinery lock operating controls/interlocks, lock support equipment. In addition, considering the complexity and

special equipment requirements for this project there will be a need to identify unique skill sets to include electric fish barriers, compressed air systems, underwater acoustics, underwater rock excavation. To assure independence, the leader of the ATR team will be outside of the MSC. The home MSC is both MVD and LRD and the ATR team leads will not be from either of those MSCs. A list of the ATR members and disciplines is provided below. The chief criterion for being a member of the ATR team is knowledge of the technical discipline.

Table 13. ATR Technical Discipline(s) and Expertise

Contract	**Design Responsibility**
Technical Discipline	Expertise Required
ATR Lead (All increments)	Will be from outside the MSC. Will possess the necessary skills and experience to lead a virtual team through the ATR process. Will be a member of the Inland Navigation Design CoP. Will possess a minimum 20 years of experience in Navigation projects. The member shall be a registered Professional Engineer (PE) or have equivalent qualifying experience.
Hydraulics (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum of 15 years of experience with Navigation hydraulics, specifically approach conditions and filling and emptying systems. The member shall be a registered PE or have equivalent qualifying experience.
Civil (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in design of Navigation projects. Specifically, site layout, spoil site configurations, haul roads, survey control, cross-section development, etc. The member(s) shall be a registered PE, or have equivalent qualifying experience.
Structural – HSS (Increments 2 and 3)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in design of HSS. The member(s) shall be a registered PE, or have equivalent qualifying experience.
Structural – Fabrication/Welding (Increments 2 and 3)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in design of HSS, specifically the fabrication of large steel structures (miter gates, etc.). The member(s) shall be a registered PE, or have equivalent qualifying experience.
Structural (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in design of Navigation structures. Specifically, reinforced concrete monoliths, cellular cofferdams and damming structures. The member(s) shall be a registered PE, or have equivalent qualifying experience.

Electrical (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in electrical design for Navigation structures. Specifically, power distribution, power, lighting and controls for new or rehabilitated Lock projects. The reviewer will have some knowledge of electrical fish barriers and air bubbler systems. The member(s) shall be a registered PE, or have equivalent qualifying experience.
Mechanical (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in mechanical design for Navigation structures. Specifically, building utilities, building HVAC, design of machinery for miter gates and culvert valves as well as hydraulic systems. The reviewer will have some knowledge of air bubbler systems. The member(s) shall be a registered PE, or have equivalent qualifying experience.
Geotechnical (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in design of Navigation projects. Specifically, parameters for a variety of monolith foundations, cellular cofferdams, and materials. The member(s) shall be a registered PE.
Geology (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 15 years of experience in engineering geology/rock mechanics. The member(s) shall be a registered Professional Geologist (PG), or have equivalent qualifying experience.
Cost (All increments)	Will be a member of the Cost CoP and approved by the Cost Center of Expertise in Walla Walla District and have relevant prior experience.
Materials (All increments)	Will be a member of the Inland Navigation Design CoP. Will possess a minimum 10 years of relevant experience in materials to include aggregate testing, concrete mix designs, thermal properties of the materials and analysis. The member(s) shall be a registered Professional Geologist (PG) or PE, or have equivalent qualifying experience.
Environmental (All increments)	Will possess a minimum 15 years of relevant experience in environmental design/permitting/NEPA compliance.
Construction (All increments)	Will be a member of the Construction CoP. Will possess a minimum 15 years of relevant experience to include construction, quality control & quality assurance, and construction contract administration.
Operation (All increments)	Will possess a minimum 15 years of relevant experience in lock maintenance and operation.
Economist (All increments)	Will possess the necessary skills and relevant experience.
Corrosion Expert (Increments 2 and 3)	Will be a member of the Corrosion Control and Cathodic Protection Systems Technical Center of Expertise.

6.5 Statement of Technical Review Report

An ATR report will be completed for each formal ATR in accordance with ER 1165-2-217. At the end of the project, the team will prepare an ATR completion certification memo. A template as provided in Attachment 4 will be used with the ATR Completion of Agency Technical Review.

6.6 ATR Schedule and Estimated Cost

The preliminary ATR milestone schedule and approximate cost per contract are listed in Tables 9,10, 11 and 12.

Section 7
Safety Assurance Review

7.1 Type II Independent External Peer Review (IEPR), Safety Assurance Review (SAR)

The District Chief of Engineering has determined that the project does not pose significant life safety risks and a Type II IEPR (SAR) is not required. A signed memorandum with this exclusion determination is provided in Attachment 6.

Section 8
Value Engineering

8.1 Value Engineering

The total project costs are currently estimated to exceed $888M; therefore, a VE Study is required using a certified VE specialist. Multiple value engineering-based design charrettes will be conducted during the initial design phase for the Brandon Road Interbasin Project to incorporate the multiple features that make up this large project. Information from these charrettes and the value engineering reports will be shared and stored in ProjectWise. Design Charrettes are to be held to help define the construction SOW with constraints and design objectives identified. Engineers, operations personnel, construction and experts from the INDC, ERDC, Rock Island District, State of Illinois, and State of Michigan will participate in the charrettes. The value-based design charrettes will identify design proposals with potential cost and schedule savings for

consideration in the final design of the structural measures associated with the Brandon Road project. The charrettes will also focus on defining the primary construction elements, possible repair options, O&M requirements and a probable sequence of events for construction. Proposals developed during the value engineering-based design charrettes will be presented to the team and other individuals such as the Chief of EC as the PDT chooses. Value Engineering proposals accepted by the PDT will be evaluated for implementation and adopted based upon risk informed decision making processes. An Engineering Evaluation Report will be created with a weighted decision matrix that analyzes the various value based design charrette proposals for the Engineered Channel and ANS deterrent systems. Results and information from the decision matrix will be used to define the parameters applied to the physical and numerical model studies. The models will then be evaluated to assess impacts to arrive at the optimal performance arrangement. Upon completion of the modeling studies a final risk evaluation will be completed to select the preferred design arrangement for the engineered channel with deterrents and a final design solution will be adopted for implementation.. Proposals excluded by the PDT or proposals proven to have undesirable physical modeling performance, that would save more than $1 million dollars, will be documented within the decision matrix process or by writeup within the Engineering Evaluation Report. All proposals with potential savings over $1 million that are not accepted must be reviewed and approved by the MSC.

The first of these Value Based Design Charrettes (VBDC) was conducted 20-22 Apr 2021 and covered Value Engineering and the entire project.

The second VBDC was conducted 21-25 June 2021 and covered the Engineered Channel.

The third VBDC is tentatively scheduled for 31 August till 1 September 2021 and will cover the Flushing Lock.

The fourth VBDC is scheduled for 25 October till 29 October 2021 and will cover the combined ANS deterrent systems.

The fifth VBDC is scheduled for December 2021 and will address the support structure building and facilities infrastructure.

Section 9
Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Review

9.1 Reviews

BCOES Reviews assure solicitation documents are readily understood; the product can be bid, built, operated and maintained efficiently; environmental concerns are protected, and sustainability is addressed. The BCOES reviews will be completed in accordance with ER 415-1-11. A 35% BCOES, 65% BCOES and 95% BCOES review will be conducted for each increment of this project. Design team members will conduct the BCOES reviews utilizing DrChecks. All DrChecks comments must be resolved and closed out by the reviewer.

Prior to the start of the BCOES Review, the Technical Lead (TL) will contact each office element to ascertain the name(s) of their representative(s) participating in the review. The TL should also determine from each office element listed above how many reviewers will need Certified Final Submittals – BCOES Review Plans and Specifications for the review. The plans and specifications shall be distributed to the office elements by memorandum or email link to the appropriate ProjectWise folder. As a minimum, the memorandum should state:

1) Who the plans and specs were prepared by (ex. in-house, local sponsor or by an A-E)
2) Start and end dates for the Review
3) Review Comments will be entered into DrChecks
4) Project Review Name in DrChecks
5) Labor Cost Codes and amounts (Provided by PM)
6) BCOES Discipline(s) and Expertise, in accordance with the MVR - Design Quality Control (QC) and Review Process (Qualtrax Document ID: 51038), approved and vetted by MVD.

1) **35% BCOES.** During the 35% BCOES, the 35% plans and 35% DDR will be reviewed and comments will be entered and resolved in Dr. Checks.

2) **65% BCOES.** During the 65% BCOES, the 65% plans and specifications, 65% DDR and other documents defined as being required during the 35% BCOES will be reviewed and commented on. The 65% BCOES review meeting will be held on site and include a Plan-In-Hand review. A 65% CWE will be created and major construction items will be defined for the follow-up CWE meeting that will be scheduled during this meeting. Prior to the meeting,

the TL's supervisor will review the package and quantities will be forwarded to the cost estimator for 65% CWE development. Risks will be analyzed during 65% BCOES. Items that need to be investigated during the Plan-In-Hand will be identified. The major items that need to be included in the ECIFP will be discussed. The Chief of EC and local sponsor counterparts will be invited to this meeting.

3) **95% BCOES.** The TL's supervisor and the PM's supervisor will have reviewed the 95% solicitation package prior to dissemination to the team. The design team will review the entire solicitation package including the front end, plans and specifications, ECIFP, 95% CWE. A follow-up backcheck meeting will be discussed as whether it will be required and scheduled, if necessary. CWE will be discussed and potential risks will be discussed and mitigation efforts will be defined. Chiefs of EC, Local Sponsor, and INDC Technical Leads will be invited to this meeting.

Section 10

In-Kind Contribution by Sponsor

The State of Illinois is the project sponsor. The Sponsor's proposed Work-In-Kind includes a portion of design activities including but not limited to: negotiation of Rights of Entry for exploration on the Midwest Generation property, Phase II HTRW of the Midwest Generation property, geotechnical investigation of the Midwest Generation property, surveying and mapping and portions of increment I, II, III plans & specifications for site plan, support facilities, boat launches and other features as assigned. The State of Illinois has in-house engineering capability to support the Work-In-Kind activities and is integrated within the USACE PDT for all PED activities and working within USACE established schedules and milestones. Please see paragraph 2.2 above for further information about In-Kind Contribution work by the sponsor.

Section 11

MSC Approval

The Mississippi Valley Division is responsible for approving the RP. This review plan will be approved by the MSC Commander or a designated official. It will have the endorsement of the district, the RMO, and the MVD Engineering and Construction Division Chief prior to being submitted for approval. The commander's approval should reflect vertical team input (involving district and MSC members) as to the appropriate scope and level of review for the project. Like the PMP, the RP is a living document and may change as the project progresses. Minor revisions will not require reapproval and will be documented using the table in Attachment 1. If major revisions such as a change

in scope of the project or change in the review levels are necessary, the review plan will be submitted for reapproval. The RP must be updated and approved by the MSC throughout the PED phase (and the construction Phase, as applicable). Changes to the RP will be approved by following the process used for initially approving the plan. MSCs will review the changes and the appropriate level of review as they relate to project updates.

Section 12
Review Plan Points of Contact

Questions and/or comments on this RP can be directed to the individuals.

Table 14. Points of Contact

Function/Discipline	Name	Phone
Project Manager	Andy Leichty	[redacted]
Technical Manager/Technical Lead	John Behrens	
Technical Manager/Technical Lead	Kirk Sunderman	
Technical Manager/Civil Engineer	Mahmoud Alafif	

Section 13
Team Members

Table 15. Team Members

PDT		
Function/Discipline	**Name**	**Office**
Water Resources Director	Loren Wobig	Illinois
Design and Construction	Ted Montrey	Illinois
Capital Programs	Rick Pohlman	Illinois
Real Estate	Bob Spencer	Illinois
Design and Engineering	Lindell Loy	Illinois
Land Surveyor	Don Moles	Illinois
Technical Manager/Mechanical Engineer	John Behrens	INDC
Technical Manager/Technical Lead	Kirk Sunderman	INDC
Project Manager	Andy Leichty	MVR
Project Management Specialist	Marisa Lack	MVR
Project Manager	John Menard	MVR
Technical Manager/Civil Engineer	Mahmoud Alafif	MVR
Technical Manager/Project Engineer	Ross Tuttle	MVR
Technical Manager/Civil Engineer	Valerie Chambers	MVR

Technical Manager/Civil Engineer	Amanda Patterson	MVR
Technical Manager/Civil Engineer	Heather Bishop	MVR
Hydraulic Engineer	Tom Gambucci	MVR
CADD Technician	Ed Cantu	MVR
HTRW Specialist	Steve Gustafson	MVR
Mechanical Engineer	Austin Unertl	MVR
Electrical Engineer	Kent Rockow	MVR
Structural Engineer	Eric Johnson	MVR
Environmental Planning	Mark Cornish	RPEDN
Environmental Engineer	Kara Mitvalsky	MVR
Geotechnical Engineer	Jarin Rudsell	MVR
Architect	Feyi Aduroja	MVR
Cost Engineer	Sarah Auvenshine	MVR
Real Estate Specialist	Michael Rohde	LRC
Office of Counsel	Rian Hancks	MVR
DQC REVIEWERS		
Function/Discipline	**Name**	**Office**
DQC Lead	Jon Fleischman	MVR
Hydraulic Engineer	Kevin Landwehr	MVR
HTRW Specialist	Anthony Heddlesten	MVR
Mechanical Engineer	Jim Bartek	MVR
Electrical Engineer	Bryan Radtke	MVR
Structural Engineer	Brant Jones	MVR
Civil Engineer	Rick Nickel	MVR
Geotechnical Engineer	Matt Stewart	MVR
Architect	Cathy Tillberg	MVR
Environmental Engineer	Rachel Fellman	MVR
Environmental Planner	Bethany Hoster	RPEDN
Cost Engineer	Chuck Van Laarhoven	MVR
Real Estate	Brett Scharlow	LRC
Specifications Writer	Jody Schmitz	MVR
BCOES REVIEWERS		
Function/Discipline	**Name**	**Office**
Biddability	*TBD*	*TBD*
Constructability	*TBD*	*TBD*
Operability	*TBD*	*TBD*
Environmental	*TBD*	*TBD*
Sustainability	*TBD*	*TBD*
Contracting	*TBD*	*TBD*
Office of Counsel	*TBD*	*TBD*
ATR REVIEWERS		
Function/Discipline	**Name**	**Office**
ATR Lead	*TBD*	*TBD*

Hydraulics	*TBD*	*TBD*
Civil	*TBD*	*TBD*
Structural – HSS	*TBD*	*TBD*
Structural – Fabrication/Welding	*TBD*	*TBD*
Structural	*TBD*	*TBD*
Electrical	*TBD*	*TBD*
Mechanical	*TBD*	*TBD*
Geotechnical	*TBD*	*TBD*
Geology	*TBD*	*TBD*
Cost	*TBD*	*TBD*
Materials	*TBD*	*TBD*
Environmental	*TBD*	*TBD*
Construction	*TBD*	*TBD*
Operation	*TBD*	*TBD*
Economist	*TBD*	*TBD*
Corrosion Expert	*TBD*	*TBD*

ATTACHMENT 1: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 2: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CAP	Continuing Authorities Program	O&M	Operation and maintenance
CSDR	Coastal Storm Damage Reduction	OMB	Office and Management and Budget
DPR	Detailed Project Report	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OEO	Outside Eligible Organization
DX	Directory of Expertise	OSE	Other Social Effects
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
EIS	Environmental Impact Statement	PAC	Post Authorization Change
EO	Executive Order	PMP	Project Management Plan
ER	Ecosystem Restoration	PL	Public Law
FDR	Flood Damage Reduction	QMP	Quality Management Plan
FEMA	Federal Emergency Management Agency	QA	Quality Assurance
FRM	Flood Risk Management	QC	Quality Control
FSM	Feasibility Scoping Meeting	RED	Regional Economic Development
GRR	General Reevaluation Report	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act

ATTACHMENT 3: SAMPLE CERTIFICATION FOR DISTRICT QUALITY CONTROL

Certification of District Quality Control (DQC)

CEMVR DATE

MEMORANDUM FOR RECORD

SUBJECT: Brandon Road Interbasin Project - Increment I

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

    a. Describe any concerns
    b. Provide explanation of resolution

2. List all DQC efforts with information on who conducted them and what was performed, such as DrChecks reviews. Identify level of DQC that performed, i.e., DQC checklist, design checks and/or formal DQC review.

3. All concerns resulting from DQC review of the project have been considered and resolved.

_____
Chief, Engineering & Construction Office

ATTACHMENT 4: 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 *<project name and location>*. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of ER 1165-2-217. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ _____

Name Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Name Date
Project Manager (home district)
Office Symbol

SIGNATURE _____ _____

Name Date
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ _____

Name Date
Review Management Office Representative

SIGNATURE

Name Date
Local Sponsor
Office Symbol, location

[1] Only needed if some portion of the ATR was contracted

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 Date

Chief, Engineering Division (home district)

Office Symbol

ATTACHMENT 5: SAMPLE BCOES CERTIFICATION

ER 415-1-11

Date

BCOES Certification

Name of Project: Brandon Road Interbasin Project

Scope of Work: USACE's purpose and need for the BR project are to evaluate structural and nonstructural options and technologies near the Brandon Road Lock and Dam (BRLD) site to prevent the upstream transfer of ANS from the MRB into the GLB via aquatic pathways, while minimizing impacts on existing waterway uses and users. USACE has defined the term "prevent" to mean the reduction of risk to the maximum extent possible, because it may not be technologically feasible to achieve an absolute solution.

The Bid Package has been reviewed for Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) in accordance with ER 415-1-11. All appropriate BCOES comments have either been incorporated into the Bid Package or otherwise satisfactorily resolved. Comments, evaluations, and backchecks have been documented in DrChecks and are attached.

_____

Chief, Engineering and Construction (Date)

_____

Chief, Real Estate (Date)

_____

Chief, Environmental Analysis Branch (Date)

_____

Chief ,Operations (Date)

_____

Chief, Contracting (Date)

_____

State of Illinois (Sponsor) (Date)

ATTACHMENT 6: TYPE II IEPR (SAR) EXCLUSION DETERMINATION

Type II IEPR (SAR) Exclusion Determination

Per ER 1165-2-217, two factors mandate an SAR and three additional factors should be considered in determining whether or not an SAR should be conducted. Table 1 discusses these factors and their relevance to the projects listed in table 2. If there is any concern regarding the rationale presented, a vertical team should be assembled upon request.

Table 1: Factors and project specific relevance

Factor		Relevant to This Project
1) Is the project justified by life safety?	Mandate	No. The project is based to limit the upstream travel of aquatic nuisance species (ANS)
2) pose a significant threat to human life?	Mandate	No.
3) Does the project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices?	Consider	The design uses current technology however the technologies are being used in a different application to help control ANS.
4) Does the project design require redundancy, resiliency, or robustness?	Consider	The project design has redundancy applied in a biological aspect to help control ANS.
5) Does the project have unique construction sequencing or a reduced or overlapping design construction schedule?	Consider	The construction is routine using proven construction methods.

Type II IEPR (SAR) Exclusion Determination

Per ER 1165-2-217, two factors mandate an SAR and three additional factors should be considered in determining whether or not an SAR should be conducted. Table 1 discusses these factors and their relevance to the projects listed in table 2. If there is any concern regarding the rationale presented, a vertical team should be assembled upon request.

Table 1: Factors and project specific relevance

Factor		Relevant to This Project
1) Is the project justified by life safety?	Mandate	No. The project is based to limit the upstream travel of aquatic nuisance species (ANS)
2) Would the project's failure pose a significant threat to human life?	Mandate	No.
3) Does the project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices?	Consider	The design uses current technology however the technologies are being used in a different application to help control ANS.
4) Does the project design require redundancy, resiliency, or robustness?	Consider	The project design has redundancy applied in a biological aspect to help control ANS.
5) Does the project have unique construction sequencing or a reduced or overlapping design construction schedule?	Consider	The construction is routine using proven construction methods.

Background Information:
The Chiefs report for Brandon Road project consists of construction of a concrete U-shaped channel in the downstream approach to the Brandon Road lock in place of the existing bedrock and earth banks. The concrete channel will house the ANS deterrents of an air bubble screen, air bubbler flush, acoustic arrays, and an electric barrier. The plan also includes a "flushing lock" that will consist of modifying the existing side port lock filling emptying system to a more standard layout that will allow for a more efficient filling /empty system that will help in the removal of floating ANS.

The Brandon Road ANS project includes the use of an electric barrier deterrent system to control upstream movement of ANS through the Brandon Road project. This deterrent system is similar to the electric barrier currently in position in Romeoville, IL. The Feasibility Study Report conservatively assumes the electric barrier will be turned "OFF" when vessels are in the process of locking through. All operational procedures related to when the deterrent systems will be allowed to be "ON" will be evaluated and regulated by the USCG after construction is complete. Given the known operation assumptions of the deterrent and safety requirements/restrictions to be mandated by the USCG it is the determination the Brandon Road project does not represent a significant threat to human life or public safety. Current technologies will be utilized for application at a navigation lock to control ANS movement and will not involve the use of innovative materials or techniques, the need for design redundancy, resiliency, and robustness; or the use of unique construction sequencing or overlapping design construction sequencing.

Additionally, the below requirements will be met:

1. All electrical systems will be in accordance with Federal, State, and local electrical codes. Supplemental safety protection will be incorporated into the design where increased risk is identified to ensure safe and reliable systems.

2. Stray currents: It is the design intent to incorporate insulative materials into the design of the engineered channel to limit the extent of stray current influence to surrounding infrastructure. The PDT is also considering incorporating 'zero potential' parasitic electrodes that will be designed and located to control stray current propagation. These measures are being designed to keep electrical voltage contained within the electric barrier engineered channel.

3. Surge protection: Electric Power surges will be controlled. Normal and supplemental surge protection will be designed on the incoming electric power distribution services as well as all electric power distribution sub-systems.

These factors support the determination that an IEPR Type II SAR is not required for the project.

Discussion on Analyses and Failure Modes Considered: All the deterrents are being model tested before the Brandon Road design starts. The construction of this project and the ANS deterrents do not change any failure modes for the lock and dam. Any failure of this project may have a biological effect to allow ANS to move to an undesired area, but no life safety issues.

Recommendation Regarding Type II IEPR (SAR): The Brandon Road ANS project does not represent a significant threat to human life or public safety, nor does it involve the use of innovative materials or techniques; the need for design redundancy, resiliency, and robustness; or the use of unique construction sequencing or overlapping design construction sequencing. These factors support the determination that an IEPR Type II SAR is not required for this project.

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