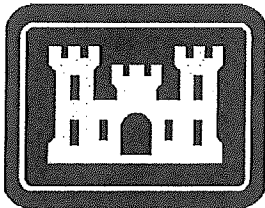


**Review Plan
U.S. Army Corps of Engineers
Baltimore District**

**Poplar Island Expansion
Design Documentation Report
(DDR)**

MSC Approval: 20 October 2014



**US Army Corps
of Engineers®**

5 September 2014

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1. Introduction

a. Purpose

This Review Plan is intended to ensure a quality-engineering Design Documentation Report (DDR) for the Poplar Island Expansion Project. This Review Plan was prepared in accordance with EC 1165-2-214, "Civil Works Review", and will be used to support preparation of the contract documents (plans and specifications) for construction of the proposed expansion facilities.

b. Project Description and Information

Details of the project are included in the General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS), completed in August 2005.

For reference, the following is a photo of the existing Poplar Island project and a general plan of the existing project showing the proposed expansion features.



Figure 1: Existing Poplar Island Project (2013)

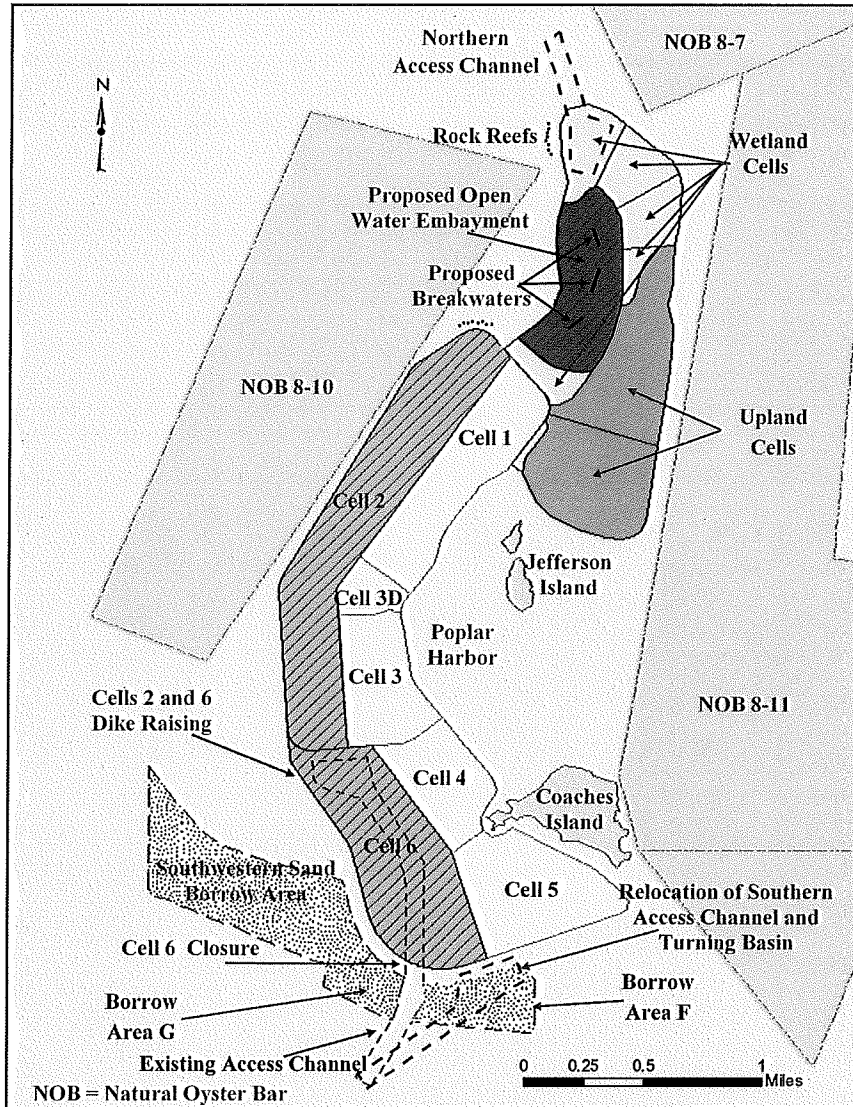


Figure 2: Existing Poplar Island including Proposed Expansion Features

Project Background

The Poplar Island Expansion encompasses the addition of 575 acres to the existing 1170 acres of Poplar Island and raises the existing upland Cell 2 and Cell 6 seven (7) feet and five (5) feet to a temporary 30' elevation. The Poplar Island Expansion supporting documents are comprised of the combined Feasibility Study and Environmental Impact Statement and the General Re-evaluation Report (GRR). This review process will detail the assumptions, calculations and conclusions necessary for construction of:

1. The perimeter dikes and supporting structures for the proposed additional 575 acres which will connect to the north end of the existing Poplar Island.
2. The raising of existing cell 2 and cell 6 dike elevations to 30'.
3. The embayment breakwaters/dikes and erosion protection.
4. The dredging a borrow area and placement a borrow area into a stockpile area.

Risk Assessment Background.

A risk based assessment has determined that neither Poplar Island or the Poplar Island Expansion present a risk for loss of human life or unsafe condition should a dike failure occurs. Should a perimeter dike fails there may be environmental impacts.

c. Levels of Review

Reviews shall include:

- District Quality Control (DQC) – All work products shall undergo DQC.
- Agency Technical Review (ATR) – All implementation documents shall undergo ATR review.
- Independent External Peer Review (IEPR) – A Type I IEPR is not appropriate since the Poplar Island Expansion DDR is an implementation document. A Type II IEPR is not required due to the following justification:

Within Appendix E of EC 1165-2-214, there are four factors listed to determine whether a Type II review is appropriate. Table 1 summarizes these factors and a discussion of each is below.

Table 1. Risk Informed Decision Factors Requiring a Type II IEPR SAR

<u>Factor for Consideration</u>	<u>Yes</u>	<u>No</u>
Significant Threat to Human Life (Public Safety)		X
Use of Innovative Material or Techniques		X
Project Design Requires Redundancy, Resiliency, and Robustness		X
Unique Construction Sequencing or Reduced or Overlapping Design Construction Schedule		X

(1) Significant threat to human life (public safety):

Hazards resulting from a failure at Poplar Island would not affect any populated areas and therefore does not pose a threat to human life or public safety. Personnel operating on the Island will have sufficient advance warning of any storm of sufficient magnitude to cause a failure, and would be evacuated and therefore not at risk.

(2) 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:

The expansion of Poplar Island is a continuation of the existing project and is therefore not considered to use innovative materials or techniques.

(3) Project design requires redundancy, resiliency, and robustness:

(a) Redundancy: The containment dikes for the expansion of Poplar Island are the critical components of the system and a backup or fail-safe system is not practicable and will not be constructed.

(b) Resiliency: The containment dikes for the expansion of Poplar Island were designed to withstand certain levels of storm events. It is possible to have a storm event more severe than was designed for, at which point the project would likely fail or have significant damages. Therefore, the project was not designed to avoid, minimize, withstand, and recover from the effects of adversity under all circumstances.

(c) Robustness: The design of the expansion of Poplar Island did consider a wide range of operational conditions (i.e. various magnitudes of storm events). Selection of the final design configuration was based on a combination of reducing likelihood of damages from certain storm events and reducing the cost of repairs from overtopping of the containment dikes. However, the project is not designed to fail gracefully outside the design conditions.

(4) Unique construction sequencing or a reduced or overlapping design construction schedule:

The expansion of Poplar Island is a continuation of the existing project and will utilize a similar construction sequence as the first two phases. The construction will not be executed using the Design-Build or Early Contractor Involvement delivery systems.

Consequences resulting in failure from conditions exceeding the design are less significant than traditional Civil Works projects (e.g. dams and levees). Due to the isolated nature of the island project and lack of downstream populations or development, there are very low life-safety or economic risks should any type of failure occur. A Type II IEPR SAR is not appropriate due to the low risk involved with the expansion of Poplar Island.

d. Review Team

Review Management Office (RMO): The USACE North Atlantic Division is the Review Management Organization for this related work. The NAD POC is Ralph LaMoglia 347-370-4599.

Agency Technical Review Team: The primary specialties for this review will be Geotechnical, Civil, Coastal and Structural Engineers.

Required ATR Team Expertise: The ATR team will be chosen based on each individual's qualifications and experience with similar projects.

ATR Lead: The ATR Team Lead will be a senior professional with extensive experience in preparing Civil Works documents and conducting ATRs (or ITRs). The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline, in this case, Civil, Coastal, or Geotechnical Engineering.

Geotechnical Engineer - shall have experience in the field of geotechnical engineering including the design of stone armored earth embankments constructed in an open water setting with depths up to approximately 12 feet. The geotechnical engineer shall have experience in subsurface investigations, soil mechanics, seepage and piping evaluation, slope stability evaluations, filter design, earthwork construction, and the design and construction of armor stone slope protection. Specific experience applicable to the Poplar Island project would include the use of dredged sand borrow sources to construct earth embankments in water up to 12 feet in depth, and design considerations associated with the containment of dredged materials.

Civil Engineer - shall have experience in design, layout, and construction of embankments. Preferred project experience in dredging and use of dredged borrow material to construct containment dikes.

Hydraulic Engineer – shall understand the fundamental principles of wave theory and ocean wave generation through the process of wave transformation as the wave form approaches and reacts with the shore. They will understand the principles of long-shore and cross-shore transport, geomorphology, and morphodynamic processes on sandy shores. They will have experience in the analysis and design of shore protection structures, plus coastal and marine structures related to dikes, revetments, and breakwaters. The coastal engineer shall be experienced in calculating wave loads on said structures in addition to other structures such as temporary sheet pile and hydraulic structures such as spillways. They will have the ability to size armor stone, and design stone gradations based on the wave climate to which the project will be subject. Working knowledge of standard Corps coastal computer models such as ADCIRC – ADvanced CIRCulation Model, SMS – Surface-water Modeling System, and CMS – Coastal Modeling System (CMS-Flow, CMS-Wave) together with the understanding how to model resiliency such as storm surge, oceanographic, and/or tidal hydraulics

modeling, wave generation and propagation modeling, and/or coastal sediment transport and morphology modeling is desired.

Mechanical Engineer – shall have design experience in selecting and specifying gates for spillway structures

Structural Engineer – Shall have experience and be proficient in performing stability analysis; including gravity force design, lateral force resistance, and hydraulic loading design. The structural engineer shall have specialized experience in the design, construction, analysis, and rehabilitation of hydraulic steel structures, tidal culvert structures and drainage structures. Additionally, the structural engineer shall have specific experience with MSE (mechanically stabilized earth) structures in a tidal setting, precast concrete box culverts, concrete mat foundations located in tidal inlets and steel sheet piling walls subject to tidal loading.

Environmental Resources – The Environmental Resources reviewer should be a senior biologist/ecologist with experience evaluating environmental benefits and effects of beneficial use of dredged material projects.

2. Requirements

a. Reviews

The review of all work products will be in accordance with the requirements of EC 1165-2-214 by following the guidelines established within this review plan. All engineering and design products will undergo District Quality Control Reviews.

i. District Quality Control (DQC)

DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements. DQC will be performed for all district engineering products by staff not involved in the work and/or study. Basic quality control tools include a plan providing for seamless review, quality checks and reviews, supervisory reviews, etc.

ii. 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 assure that all the parts fit together as a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists, etc.), and may be supplemented by outside experts as

appropriate. To assure independence, the leader of the ATR team shall be from outside the home Major Subordinate Command (MSC).

iii. Independent External Peer Review (IEPR)

IEPR is the most independent level of review, and is applied in cases that meet certain criteria.) A type II IEPR is not required for this DDR.

iv. Policy and Legal Compliance Review

Policy and Legal Compliance Review is required for decision documents. This DDR is not a decision document it does not require a Policy and Legal Compliance Review.

b. Approvals

i. Review Plan Approval and Updates

The MSC for this DDR is the North Atlantic Division (NAD). The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the Baltimore District and MSC members) as to the appropriate scope and level of review for the study. Like the PMP, the Review Plan is a living document and may change as the study progresses. The District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in an Attachment to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) will be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage.

ii. Design Document Report (DDR)

The DDR shall undergo a DQC and formal ATR review. The district presents the DDR findings, conclusions, and recommendations for review. The USACE North Atlantic Division (MSC DSO) will approve the final DDR after all comments are resolved.

3. Guidance and Policy References

- ER 5-1-11, USACE Business Process
- EC 1165-2-214, Civil Works Review, 15 Dec 2012
- ER 1110-1-12, Quality Management, 31 Mar 2011

4. Summary of Required Levels of Review

The MSC will be the review management office (RMO) for the ATR. The district will present the DDR assessment, findings, conclusions, and recommendations for review.

5. Review Schedule

Project Phase / Submittal	Review Start	Review Complete
DQC Final Review	19 Jun 2014	31 Jul 2014
DQC Backcheck Review	20 Aug 2014	2 Sep 2014
Value Engineering Study	15 Sep 2014	10 Dec 2014
ATR Final Review	9 Dec 2014	7 Jan 2015
ATR Backcheck Review	17 Feb 2015	9 Mar 2015
Report Completed		26 Mar 2015
Submit Report for file		26 Mar 2015

6. Public Participation

Public participation will not take place until after the DDR is completed. Public and stakeholder coordination has been performed to inform interested parties about the DDR. The Sponsor shall participate in the DQC certification and the VE Study. Findings of the Final ATR will also be shared with the sponsor.

7. Cost Estimate

Task Description	Review Start	Review Cost
DQC Review	19 Jun 2014	\$23,000
ATR Review	18 Dec 2014	\$25,000

8. Execution Plan

Reviews will be documented using Dr.Checks.

a. District Quality Control

i. General

DQC will be conducted after completion of the draft team review. DQC requires both supervisory oversight and District technical experts. The district will conduct a robust DQC in accordance with EC 1165-2-214, Civil Works Review, the District’s Quality Management Plan, and ER 1110-2-12, Quality Management. Documentation of DQC activities is required and will be in accordance with the District and MSC Quality

manuals. The DQC and ATR will not be concurrent. Comments and responses from DQC will be available for the ATR team to review through ProjNet DrChecks.

ii. DQC Review and Control

The District Project Manager will schedule DQC review meetings. The in progress review meetings should include PDT members from Geotechnical, Hydrology & Hydraulics, Structures, Mechanical, and Civil as applicable. DQC Review will be conducted on the completed draft Team review including all Sections and Appendices and will include comments, backcheck and revisions. ProjNet DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product.

b. Agency Technical Review

i. General

The ATR Lead in cooperation with the PDT, MSC, and vertical team will determine the final make-up of the ATR team.

ii. ATR Review and Control

Reviews will be conducted in a fashion which promotes dialogue regarding the quality and adequacy of the ATR. The ATR team will review the DDR report which includes stability analysis documentation. Therefore, the level of effort for each ATR reviewer is expected to be between 16 and 40 hours. DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product. The MSC will prepare the charge to the reviewers, containing instructions regarding the objective of the review and the specific advice sought. A kick off meeting will be held with the ATR team to familiarize reviewers with the details of the project.

The four key parts of a review comment will normally include:

- (1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures.
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed.
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability.

(4) The probable specific action needed to resolve the concern – identify the action(s) that the PDT must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist. The ATR documentation in Dr. Checks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, 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 and shall also:

- a. Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.
- b. Describe the nature of their review and their findings and conclusions.
- c. Include a copy of each reviewer's comments and the PDT's responses.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the final report. A draft certification is included in Attachment 1.

9. Review Plan Points of Contact

Name/Title	Organization	Email/Phone
Thomas Myrah, DM	NAB	<u>Thomas.p.myrah@usace.army.mil</u> 410-962-6757
Justin Callahan, PM	NAB	<u>Justin.Callahan@usace.army.mil</u> 410-962-6693
Sean Dawson	NAB	<u>Sean.Dawson@usace.army.mil</u> 410-962-6156

ATTACHMENT 1

COMPLETION OF AGENCY TECHNICAL REVIEW

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

<u>Name</u>	Date
ATR Team Leader	
<u>Office Symbol/Company</u>	

Thomas Myrah	Date
Design Manager	
<u>CENAB-EN-WC</u>	

Justin Callahan	Date
Project Manager	
<u>CENAB-PP-C</u>	

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.

Ronald J. Maj, PE	Date
Chief, Engineering Division	
<u>CENAB-EN</u>	

ATTACHMENT 2: TEAM ROSTERS

Include rosters and contact information for the current PDT, DQC team and ATR team points of contact.

PDT (Original)

Discipline	NAB PDT Member	Email/Phone #
Project Manager	Justin Callahan	Justin.Callahan@usace.army.mil 410-962-6693
Design Manager	Thomas Myrah	Thomas.P.Myrah@usace.army.mil 410-962-6757
District Lead Engineer	Michael Snyder	Michael.R.Snyder2@usace.army.mil 410-962-4314
Lead Author	Michael Snyder	Michael.R.Snyder2@usace.army.mil 410-962-4314
Geotechnical Engineering	Michael Snyder,	Michael.R.Snyder2@usace.army.mil 410-962-4314
	Nicole Walsh	Nicole.Walsh@usace.army.mil 410-962-4772
Structural Engineering	Preston Jacka,	Preston.Jacka@usace.army.mil 410-962-4887
	Cathleen Barry	Cathleen.J.Barry@usace.army.mil 410-962-3002
Hydraulic/Coastal Engineering	Thomas Laczo	Thomas.D.Laczo@usace.army.mil (410) 962-6773
Mechanical Engineering	William Bonenberger	William.J.Bonenberger@usace.army.mil 410-962-6709
Cost Engineering	Luan Ngo	Luan.T.Ngo@usace.army.mil 410-962-3322
Environmental Resources	Robin Armetta,	Robin.E.Armetta@usace.army.mil 410-962-6100
	Mark Mendelsohn	Mark.Mendelsohn@usace.army.mil 410-962-9499
Civil Engineering	Trevor Kough	Trevor.V.Kough@usace.army.mil 410-962-3774
OPs Navigation Manager	Kevin Brennan	Kevin.M.Brennan@usace.army.mil 410-962-6113
Maryland Port Authority Project Manager	Steve Storms	sstorms@marylandports.com

<u>DQC Review Team Member</u>	<u>Organization</u>	<u>Technical Role</u>
Chuck Frey, PE	Foundations & Dams Section, Geotechnical Branch	Geotechnical Engineer
Joshua Toepfer	Water Resources Section, Civil Works Branch	Hydrology & Hydraulics Engineer
Yohannes Assefa, PE	Chief, Structural Section, Military Branch	Structural Engineer
Benjamin Fedor	Civil Engineering Section, Civil Works Branch	Civil Engineer
Donald Ruhl	Mechanical Section, Military Branch	Mechanical Engineer
Michele Gomez	Planning Division	Environmental Resources
Cedric Bland	Technical Support Section, Military Branch	Cost Engineering

<u>ATR Review Team Member</u>	<u>Organization</u>	<u>Technical Role</u>
TBD	TBD	ATR Team Leader
TBD	TBD	Geotechnical Engineering Reviewer
TBD	TBD	Civil Engineering Reviewer
TBD	TBD	Hydraulic/Coastal Engineering Reviewer
TBD	TBD	Mechanical Engineering Reviewer
TBD	TBD	Structural Engineering Reviewer
TBD	TBD	Environmental Resources Reviewer



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE MD 21203-1715

AUG 15 2014

CENAB-EN-WC

MEMORANDUM FOR Commander, U.S. Army Engineer Division, North Atlantic, Fort Hamilton Military Community (ATTN: CENAD-~~RB~~-T), 302 General Lee Avenue, Brooklyn, NY 11252

SUBJECT: Approval of the Design Document Report (DDR) for the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island Expansion (CWIS 031001)

1. Enclosed is a copy of the subject project Review Plan for review and approval by CENAD.
2. This is the initial Review Plan for approval. The Review Plan will be updated after CENAD has chosen an ATR Review Team.
3. CENAB would like to recommend the ATR Team Lead as Mr. Raymond Dridge at CENAO District. Mr. Dridge has an enormous amount of geotechnical experience related to the type of design and construction of the Poplar Island Expansion.
4. Questions regarding this submittal should be directed to Thomas Myrah, at (410) 962-6757.

JORDAN.JOSEPH.RI
CHARD.1036292780

Digitally signed by
JORDAN.JOSEPH.RICHARD.1036292780
DN: c=US, o=U.S. Government, ou=DoD,
ou=PKI, ou=USA,
cn=JORDAN.JOSEPH.RICHARD.1036292780
Date: 2014.08.15 08:46:09 -04'00'

Encl

J. RICHARD JORDAN, III
COL, EN
Commanding