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U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
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CELRD-PD-S

21 March 2018

MEMORANDUM FOR Commander, U.S. Army Engineer District, Chicago, (ATTN: CELRC-PM-PL/Susanne Davis), 231 S. LaSalle St., Suite 1500, Chicago, IL 60604-1437

SUBJECT: Waukegan Harbor, Waukegan, Illinois CAP 107 Feasibility Study – LRD Approval

1. Reference CELRC-PMD-EP Memorandum, dated 31 JAN 2018, Subject: Waukegan Harbor, Waukegan, Illinois CAP 107 Feasibility Study – Review Plan.
2. The subject Feasibility Study Review Plan (RP) was presented to the Great Lakes and Ohio River Division for approval in accordance with Engineering Circular (EC) 1164-2-214 “Civil Works Review” dated 15 Dec 12. LRD received the review plan on 31 January 2018. The RP addresses the technical and policy review requirements for the feasibility study, which will investigate structural or operational harbor modifications to address a recent increase in the incoming sediment load to the Federal channel leading to increased shoaling.
3. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes an appropriate scope and level of review. The RP satisfies peer review policy requirements described in EC 1165-2-214, and adequately defines the scope and level of peer review for the activities to be performed for the subject project phase. The size of the review team has been appropriately scaled based upon consideration of relative risk of the respective disciplines.
4. I concur with the recommendations of the RMO and approve the enclosed RP. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP and the dollar values of all project costs should be removed.
5. The LRD POC for this action is Mr. Matthew Shanks, CELRD-PD-S, who can be reached at (513) 684-6240, or email at Matthew.R.Shanks@usace.army.mil.

BUILDING STRONG and Taking Care of People!

Encl

R. MARK TOY
Brigadier General, USA
Commanding

DECISION DOCUMENT REVIEW PLAN

**Waukegan Harbor, Waukegan, IL
Continuing Authority Program Section 107 Feasibility Study
Detailed Project Report**

Chicago District

LRD Commander Approval Date: TBD

Last Revision Date: 15 MAR 2018



**US Army Corps
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I. PURPOSE AND REQUIREMENTS

A. Purpose

This Review Plan defines the scope and level of peer review for the Waukegan Harbor, Waukegan, Illinois, Small Navigation Improvements, Section 107 of the Continuing Authority Program project decision document.

Section 107 of River and Harbor Act of 1960, as amended, authorizes the Corps to study, adopt, construct and maintain navigation projects. This is a Continuing Authorities Program (CAP), which focuses on water resource related projects of relatively smaller scope, cost and complexity. Unlike the traditional Corps' civil works projects that are of wider scope and complexity, the CAP is a delegated authority to plan, design, and construct certain types of water resource and environmental restoration projects without specific Congressional authorization.

B. Applicability

This review plan is based on the Great Lakes and Ohio River Division (LRD) CAP Programmatic Review Plan Model, which includes the GLFER Section 506 and Lake Michigan Waterfront Section 125 programs. It also accounts for CAP Section 103 and Section 205 projects, which require case-by-case determination on the appropriateness of Type I Independent External Peer Review (IEPR). The LRD CAP Programmatic Review Plan Model **is not approved** for use on any CAP, GLFER or Lake Michigan Waterfront projects where:

- A significant threat to human life/safety assurance exists;
- Total Project Cost is likely to exceed the limits established for the applicable Section in law.
- The Governor of an affected state has requested a peer review by independent experts;
- An Environmental Impact Statement (EIS) is required;
- Significant public dispute is likely due to the size, nature, or effects of the project;
- Significant public dispute is likely due to the economic or environmental cost or benefit of the project;
- Complex challenges will likely require use of novel methods, innovative materials, new techniques, precedent-setting methods or models, or result in conclusions that are likely to change prevailing practices;
- Redundancy, resiliency, and/or robustness are required or unique construction sequencing, or a reduced or overlapping design construction schedule will likely be required; or
- The Chief of Engineers or Director of Civil Works is likely to determine Type I IEPR is warranted.

If any of the circumstances above exist on the subject project, the LRD CAP Programmatic Review Plan Model is not applicable and a study specific review plan must be prepared by the home district, coordinated with the appropriate Planning Center of Expertise (PCX) and approved by LRD in accordance with EC 1165-2-214.

Applicability of the LRD CAP Programmatic Review Plan Model for a specific project is initially determined by the Chicago District and subsequently reviewed and approved by the LRD Commander. If the LRD determines that the model plan is applicable for a specific study, the LRD Commander may approve the plan (including exclusion from IEPR) without additional coordination with a PCX or Headquarters, USACE. The initial decision as to the applicability of the model plan shall be made no later than the Federal Interest Determination (FID) milestone (as defined in Appendix F of ER 1105-2-100, F-10.e.1) during the feasibility phase of the project. A review plan for the project will subsequently be developed and approved prior to execution of the Feasibility Cost Sharing Agreement (FCSA) for the study. In addition, per EC 1165-2-214, the home district and LRD shall assess at the MSC Decision Meeting (MDM) whether the initial decision on Type I IEPR is still valid based on new information. If the decision on Type I IEPR has changed, the District and LRD shall promptly begin coordination with the appropriate PCX.

After approval of the project decision document and prior to execution of a Project Partnership Agreement with the non-federal sponsor to implement the Waukegan Harbor project, this review plan shall be updated and revised for the Implementation Phase by the Chicago District, and subsequently reviewed by the LRD staff and approved by the LRD Commander. The revised and approved review plan shall specify the Design and Implementation phase products to be reviewed and the associated level of peer review of each, including the appropriateness of a Type II IEPR (Safety Assurance Review).

C. References

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 2012
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2010
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix F, Continuing Authorities Program, Amendment #2, 31 Jan 2007
- (5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (6) LRD Continuing Authority Program Management Plan and Standard Operation Procedures, 1 Oct 2015.
- (7) ISO Process; Document ID:14610 Great Lakes and Ohio River Division, Preparation and Approval of Civil Works Review Plans, 22 Sept 2011
- (8) Waukegan CAP 107 Project Management Plan (PMP), Revised August 14, 2017

D. Requirements

This review plan was developed from the LRD CAP Programmatic Review Plan Model. It was developed in accordance with EC 1165-2-214 and establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality

Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Major Subordinate Command (MSC) Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214). Additionally, it ensures that planning models and analysis are compliant with Corps policy, theoretically sound, computationally accurate, transparent, described to address any limitations of the model or its use, and documented in study reports (per EC 1105-2-412).

II. REVIEW MANAGEMENT ORGANIZATION (RMO)

The Review Management Organization (RMO) is responsible for managing the overall peer review effort described in this review plan. The RMO for CAP Section 107 decision documents is typically LRD, because the LRD Commander is responsible for approving the Review Plan and the decision to implement projects under this authority. However, an appropriate National Planning Center of Expertise (PCX) may also serve as the RMO if deemed appropriate.

The information presented in Section 3 below provides the basis for the determination that LRD will serve as the RMO for the Feasibility Phase of the Waukegan Harbor Project.

III. STUDY INFORMATION

A. Decision Document

The Waukegan Harbor, Waukegan, Illinois CAP Section 107 decision document will be prepared in accordance with ER 1105-2-100, Appendix F. The preferred decision document format is contained in the Detailed Project Report (DPR) template in the LRD CAP Program Management Plan/Standard Operating Procedures, which integrates the environmental documentation required under NEPA and other relevant environmental statutes into the project decision document. The purpose of a DPR is to document the basis for a recommendation to invest Federal and non-Federal resources to address a local water resource problem or opportunity of significance to the Nation. The approval level of the decision document is the LRD Commander.

B. Study/Project Description.

Waukegan Harbor is an authorized Federal navigation project located in Waukegan, Lake County, Illinois, on the western shore of Lake Michigan and is one of seven navigation projects maintained by the USACE Chicago District. The harbor is located approximately 40 miles north of downtown Chicago, Illinois and 10 miles south of the Illinois-Wisconsin state line. Figure 1 shows the location of Waukegan Harbor.

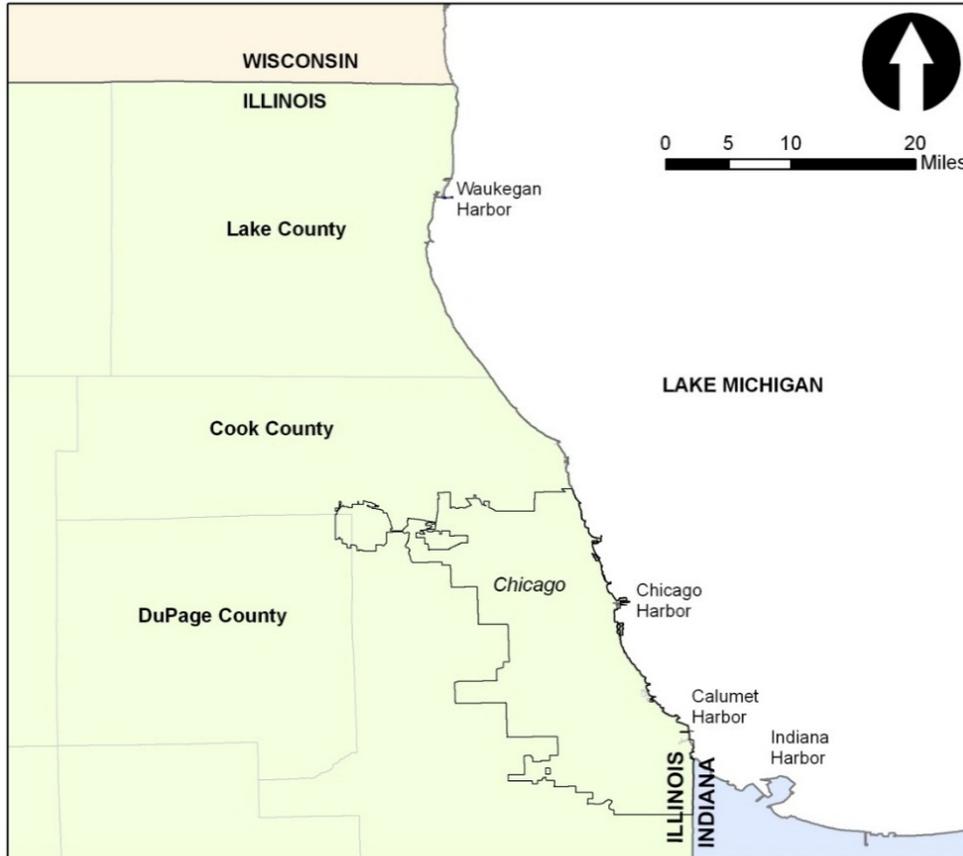


Figure 1: Waukegan Harbor Location.

The Federal navigation project at Waukegan Harbor has interrupted southerly littoral transport of sand along the Illinois northern coast of Lake Michigan, resulting in several million cubic yards of sediment accumulating updrift of the harbor since its construction in the late 1800s. Over the past decade, the updrift fillet beach has reached its maximum capacity, attaining a state of dynamic equilibrium. As a result, the sediment load entering the approach channel has significantly increased, resulting in substantial shoaling, impacting the harbor's ability to reliably provide sufficient depths for commercial navigation.

The significant increase in the rate of channel shoaling has proportionately increased annual maintenance dredging requirements for this harbor. The increased costs required to maintain the harbor may not be sustainable over the long-term, as Waukegan is a relatively small harbor with cargo movements less than 1 million tons annually. The average annual funding received to dredge Waukegan Harbor over the past decade has proven to be insufficient to adequately maintain the approach channel and harbor for commercial navigation. Commercial tonnage received at the harbor has been significantly reduced as a result of increased shoaling and unreliable navigation channel depths within the approach channel. Reducing required maintenance dredging expenses to a more sustainable level will help to ensure the continued viability of Waukegan Harbor as an active commercial port.

The Waukegan Harbor, Waukegan, Illinois CAP Sec 107 Federal interested Determination (FID) was approved Mar 24, 2016. As part of the FID, three preliminary alternatives were formulated to address the problem of persistent and increasing shoaling in Waukegan Harbor's approach channel, including Alternative 1: Excavation of the updrift fillet beach; Alternative 2: A structural breakwater modification to increase sediment trapping capacity; and Alternative 3: Installation of an updrift perpendicular groin sediment trap. Each of these alternatives aim to trap littoral sediments before they enter the approach channel. As such, each plan also includes a projected maintenance dredging schedule necessary to maintain the long-term sediment trapping effectiveness. An economic evaluation of the alternatives was conducted and included both implementation costs and ongoing maintenance dredging costs over a 20-year period of analysis beginning in 2019.

Currently, ongoing Federal investment in conducting annual maintenance dredging operations at Waukegan Harbor provides positive net benefits. However, the recent increase in channel shoaling has significantly hindered the harbor's reliability for commercial navigation, resulting in drastically reduced harbor use. The increased rate of shoaling within the approach channel also requires greater dredging volumes in order to maintain the channel for navigation, which may also threaten the long-term viability of the harbor. Long-term cost savings and increased benefits for commercial navigation may be achievable through a structural modification of the Federal navigation project. Three potential navigation improvements were formulated to improve reliability of Waukegan Harbor and available channel depths for commercial navigation during shipping season. Through a preliminary economic analysis, all three alternatives were determined to be economically justified. While each formulated alternative have potential environmental and permitting challenges to implementation that will need to be further evaluated, Federal interest exists in conducting a cost- shared feasibility study because at least one feasible (economic, environmental, engineering) alternative was identified.

Alternative 2 was identified in the FID as the most likely recommended plan because it poses the least number of unknowns and challenges associated with implementation. A rubble mound extension to the existing outer breakwater could be designed and implemented relatively quickly. This type of breakwater is common and has been successfully constructed by USACE at numerous harbors on the Great Lakes. In addition, maintenance and repair of the structure can be done using USACE in-house crews. Projected sediment trapping effectiveness for this type of structure would also be easier to model than the other two alternatives.

As part of the feasibility study, numerical modeling study will be carried out in two phases to confirm the efficacy of and refine the design of proposed measures to be implemented. In Phase 1, the modeling will focus on investigation of two variations of Alternative 2 (defined as Alternatives 4 and 5). The effectiveness of these near-field modifications will be evaluated for protecting the approach channel and outer harbor areas from the combined effects of waves, currents, and sedimentation. The extent of protection will be quantified in terms of reduction of waves and currents and resulting shoaling in the approach channel and outer harbor of Waukegan Harbor. Short- and long-term numerical simulations

will be performed to determine the merits of these modifications for navigation improvement (e.g., increase of vessels transits) into Waukegan Harbor during normal operational conditions and following the storms. The modeling will use the latest bathymetry, wind, wave, and water level data available. Quantified benefits of the alternatives (modifications) will include changes in waves, water levels and sediment volumes in the approach channel and outer harbor relative to the existing “as is” harbor configuration (Alt 0). The Phase 2 study will be considered depending on the findings of the Phase 1 study.

The three alternatives (Alt 1, Alt 2, Alt 3) proposed by LRC will be investigated in the Phase 2 of the coastal modeling study. The methodology and data used in Phase 1 will be applied to evaluate these alternatives. All five alternatives will be compared and ranked according to reduction of the wave energy and sedimentation in the approach channel and outer harbor.

Figure 2 highlights the study area, preliminary measures to address shoaling detailed in the FID, and approximate extents of coastal modeling to be performed for the study.

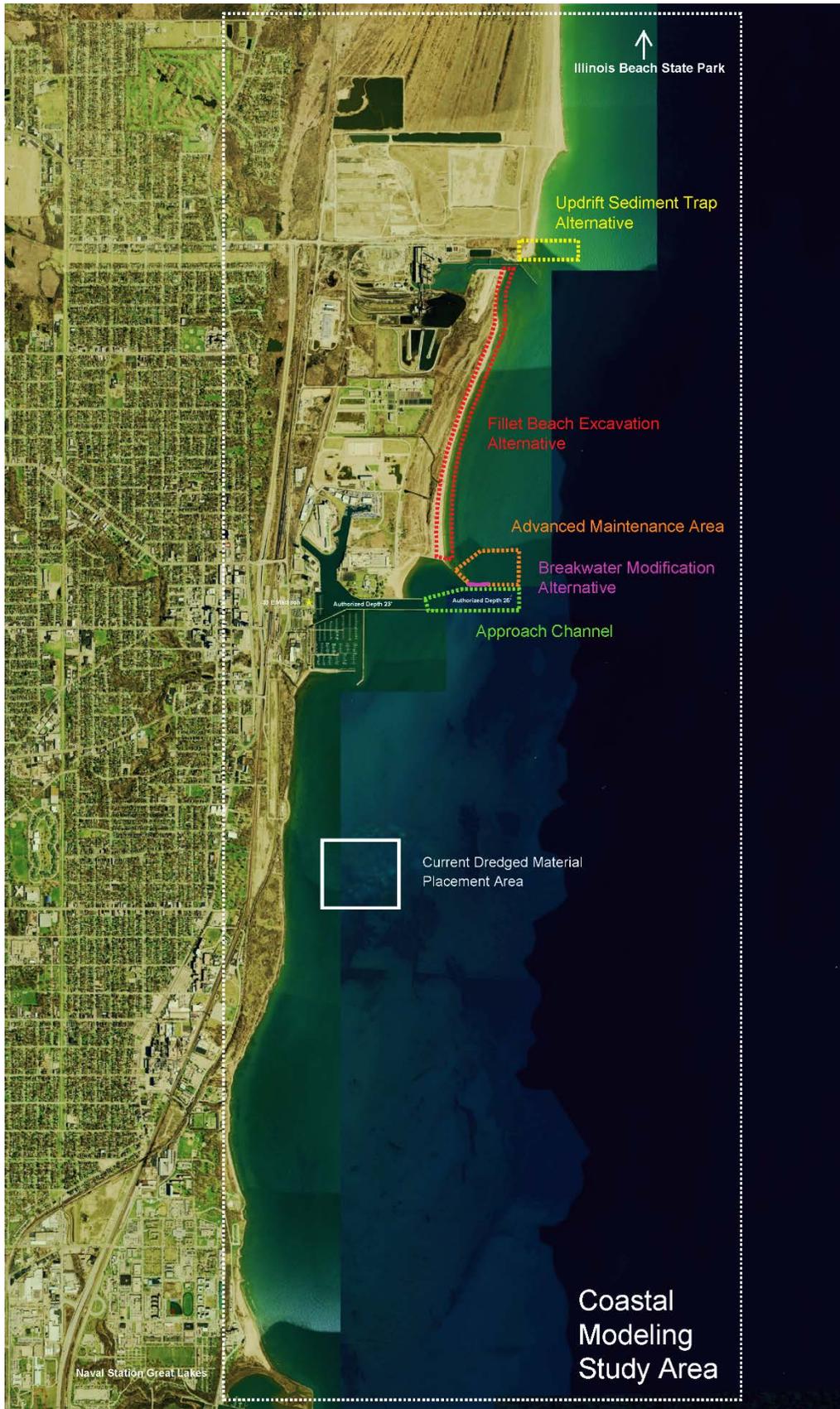


Figure 2: Waukegan Harbor, Waukegan, IL CAP Section 107 Study Area.

C. Factors Affecting the Scope and Level of Review.

Technical Complexity: The anticipated project design will take advantage of prevailing practices and methodologies. It is not expected to be based on novel methods or involve the use of innovative techniques, or present complex challenges for interpretation. The structural alternatives proposed must meet specific design standards and comply with local coastal management permitting policies, however, the measures involved in the project are not expected to generate significant technical, institutional, or social challenges.

Controversy: The project/study is not anticipated to be controversial nor result in significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project.

Project Risks:

A risk assessment was performed at the beginning of the project taking into consideration scope, quality, schedule, safety and health risk, cost, and security. The overall project risk was determined to be low.

Major risks include delays to the project schedule due to resourcing issues and data input availability for coastal modeling, regulatory coordination delays, and existing environmental issues requiring mitigation prior to implementation of measures. In addition, impacts of dynamic coastal processes that are not known prior to completion of modeling may cause the project to not perform as expected.

The following risks were identified for this project.

Risk	Risk Event Description	Triggers	Maximum Potential Impact
Schedule	PDT delays	Project competing with other projects/resources Weather-related survey delays	Schedule growth 20%
Schedule	Non-Federal Sponsor delays	Funding availability WIK data collection for modelling	Schedule growth 20%
Schedule	Regulatory Coordination delays	Project site adjacent to and contained within Coastal Zone Management Area, Habitat for T&E Species, Legacy Contamination, and Illinois Coastal Management Program	Schedule growth 20%

Cost	Budget exceeded	Inaccurate estimate from PDT	Cost growth 10%
Scope	Environmental Issues, Mitigation may be required	Project borders two Superfund sites, presence of endangered species	Schedule growth 25%

Each risk will be evaluated and analyzed, should it occur. The appropriate probability rating and severity rating (should the risk event occur) will then be determined. Judgment on how to eliminate or reduce risks to lessen the overall project impacts is inherent in the risk assessment process. The risk probabilities and severities will be described, along with the degree of impact on the project’s baseline scope, quality, budget and schedule. Decisions to accept risks must be made at a team or management level that is equal to the degree of risk. Project and Program Managers, Commanders, and the Executive PRB may be required to weigh certain risks against the benefits of performing an activity. Action(s) required for reducing or eliminating risks will be determined and documented, should they occur.

If throughout the implementation of the project there is a significant change in risk factors, the risk shall be reassessed. If at any time the overall project risk receives a rating of extremely high, the Great Lakes and Ohio River Division Commander shall be notified. The District Commander shall be notified if the project risk receives a rating of high. Risk Management shall continue through the life of the project during implementation of 03511 LRD - Project Change Management.

Requested External Review: The Governor of Illinois has not requested peer review by independent experts.

Life Safety: The project will neither be justified by life safety nor will it involve significant threat to human life/safety assurance. There is no reason to believe that any measures involved in the project are associated with a significant threat to human life. In accordance with EC 1165-2-214 (Appendix B, Section 4.a), the District Chief of the Technical Services Division, which includes the Engineering and Construction and Operations Branches, has determined that there are no life-safety concerns associated with the study.

D. In-Kind Contributions.

Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC and ATR, similar to any products developed by USACE. In-kind products to be provided by the sponsor include coastal topographic, bathymetric, and metocean data. Collection and processing of these products is overseen by a coastal geologist with the Illinois State Geological Survey. Products provided as work in-kind will be reviewed by Chicago District PDT with DQC, as well as ERDC-CHL subject matter experts performing coastal modeling for the study. USACE will not expend Federal funds on the study in excess of available non-federal cash on hand and already accepted in-kind services to ensure study costs do not exceed those explicitly agreed-to by the non-Federal sponsors. In-kind contributions will be negotiated as a part of the FCSA.

IV. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the District and LRD QMS procedures. Attachment 1 lists the DQC team members according to each significant area of expertise needed to accomplish the feasibility study objectives.

A. Products to Undergo DQC.

All documents prepared by the District will be checked for completeness and accuracy. Formally documented DQC will, at a minimum, be completed for the Draft DPR, the Final DPR, and all supporting documents.

B. Required DQC Expertise.

While DQC will be conducted by PDT members and their supervisors throughout the product development process, a final DQC review will be conducted by a team that is independent of the PDT. At a minimum this team will include representatives from Planning and Design Branches.

C. Documentation of DQC.

DQC will be conducted in accordance with the Chicago District Process for Feasibility Phase District Quality Control/Quality Assurance. DQC will be documented in a summary report completed prior to each submittal. This documentation will be provided to the ATR Lead as part of the review submittal.

V. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside LRD. At a minimum, the name of the ATR lead will be provided at the time of initial decision document review plan submission. Remaining ATR team members will be selected and identified in a revised review plan (Attachment 1) once the study funds are obtained.

A. Products to Undergo ATR.

ATR will be performed throughout the study in accordance with the EC 1165-2-214 (Appendix C: District Quality Control and Agency Technical Review). The ATR shall be documented and discussed at the MSC

Decision Milestone (MDM). Certification of the ATR will be provided prior to the District Commander signing the final report. An ATR of the MDM Draft DPR, including NEPA and supporting documentation, will be completed prior to submittal to LRD for review. A targeted review of the Final Report will include review of any technical products that are substantially revised after completion of the draft report. The study team may also coordinate key decisions with ATR team members to solicit feedback early in the process.

B. Required ATR Team Expertise.

The Table below lists the technical disciplines and requisite expertise deemed appropriate to successful accomplishment of the subject feasibility study objectives. The selected ATR members are listed according to discipline in Attachment 1.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional preferably with experience in preparing Section 107 decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc). The ATR Lead MUST be from outside LRD.
Planning	The planning reviewer should be a senior water resources planner with experience in CAP Sec 107 projects.
Economics	The economics reviewer will have a strong understanding of economic models and studies related to inland navigation. The economics reviewer will have strong knowledge of current planning policies and guidance and extensive experience with estimating economic costs and benefits.
NEPA Compliance	Team member will be experienced in the NEPA process and analysis, and have an environmental background that is familiar with the project area. Team member should be familiar with cultural/historic resource and CAP Sec 107 projects. They should also be experienced in analysis of impacts as required by the National Environmental Policy Act (NEPA) and other applicable laws, regulations, and executive orders.
Operations/ Dredging	The operations reviewer should be experienced in dredging and small harbor improvements projects.
Cost Engineering	Cost MCX Staff or Cost MCX Pre-Certified Professional as assigned by the Walla Walla Cost Engineering Mandatory Center of Expertise with experience preparing cost estimates for dredging and CAP Sec 107 projects.
Hydrology and Hydraulics / Coastal Engineering / Inland Hydrology Climate Change	The hydrology and hydraulics/coastal engineering reviewer should have a thorough understanding of sediment transport and coastal processes as they relate to navigation. They should also have experience reviewing hydrodynamic models -- specifically,

	<p>experience with the Surface-Water Management System model. The reviewer should possess an understanding of coastal structure design modeling techniques, especially with respect to jetty construction. This reviewer should be capable of determining system non-stationarity and assessing system climate change vulnerability (be an approved reviewer for inland hydrology climate change), adaptability, and resilience.</p>
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C. Documentation of ATR.

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

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

In some situations, especially those addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist. The ATR documentation in DrChecksSM will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, LRD, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either EC 1165-2-214 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecksSM with a notation in the ATR Summary Report and the DrChecks comment evaluation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare an ATR Summary Report, which will be an integral part of the ATR documentation and shall:

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

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

VI. Independent External Peer Review

While CAP projects are generally smaller and less technically complicated than specifically authorized feasibility studies, IEPR may be required for CAP decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. Where designated, IEPR panels will consist of independent, recognized technical experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for planning, design and construction of a Civil Works project. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project feasibility studies, which upon approval, serve as a federal decision document. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR covers the entire decision document, including key component actions taken to address the underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II

IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

Section 506, 125, and CAP project decision documents are generally excluded from Type I Independent External Peer Review (IEPR) except those under Section 103 and Section 205. The exceptions are any project that requires an EIS or any project that meets the mandatory triggers stated in Appendix D of EC 1165-2-214. Due to the nature of flood risks, Section 103 and Section 205 decision documents require a case-by-case risk informed decision to conduct a Type I IEPR, which may be prepared using the LRD CAP Programmatic Review Plan Model or prepared as a project specific Review Plan that meets the requirements of EC 1165-2-214. Section VI.A below specifies the project specific circumstances and rationale for adopting or excluding Type I IEPR of the Waukegan Harbor, Waukegan, Illinois CAP 107 decision document.

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

The risk informed decision on whether Type I and/or II IEPR will be required is documented below.

A. Decision on IEPR.

EC 1165-2-214 exempts CAP Section 107 projects from Type I IEPR, and based on the consideration of project specific factors presented in Section III.C relative to the criteria in Paragraph I.B above, the level of risk of the Waukegan Harbor, Waukegan, Illinois CAP 107 project does not warrant a Type I IEPR of the project decision documents.

B. Products to Undergo Type I IEPR.

Not Applicable.

C. Required Type I IEPR Panel Expertise.

Not Applicable.

D. Documentation of Type I IEPR.

Not Applicable.

VII. POLICY AND LEGAL COMPLIANCE REVIEW

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

VIII. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

The home District, in conjunction with the RMO, is responsible for coordinating with the Cost Engineering MCX located in the Walla Walla District for review of the cost estimate for all CAP decision documents. For decision documents prepared under the LRD CAP Programmatic Review Plan Model, regional cost personnel that are pre-certified by the MCX, and assigned by the Cost Engineering MCX, will conduct the cost engineering ATR. The MCX will provide the Cost Engineering MCX certification. Either the designated ATR Lead or the Cost Engineering MCX shall make the selection of the cost engineering ATR team member.

IX. MODEL CERTIFICATION AND APPROVAL

The approval of planning models under EC 1105-2-412 is not required for CAP projects. MSC Commanders are responsible for assuring models for all planning activities are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Therefore, the use of a certified/approved planning model is highly recommended and should be used whenever appropriate. Planning models are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC and ATR.

The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and

these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC and ATR.

A. Planning Models.

The following planning models may be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Great Lakes Systems Analysis of Navigation Depths (GL-SAND)	The (GL-SAND) model will be used in the calculation of benefits for the project. GL-SAND, developed in conjunction with PCX-IN, is a regional model developed to measure navigation project performance in the Great Lakes. The model assesses economic benefits of maintaining harbor channels based on transportation cost differences using current harbor shipping data. Information incorporated into the analysis includes shoaling rates, variable lake levels, vessel characteristics, vessel costs, and the depths of harbors, locks and connecting channels. Cost savings are determined by simulating shipping costs associated with the shipping costs associated with the most recent yearly waterborne shipments at varying hypothetical constrained port channel depths. The program will be used in the calculation of benefits of continued harbor maintenance.	Certified

B. Engineering Models.

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

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
MII	MII is the second generation of the Micro-Computer Aided Cost Estimating System (MCACES). It is a detailed cost estimating software application that was developed in conjunction with Project Time & Cost LLC. MII provides an integrated cost estimating system (software and databases)	Enterprise Model

	that meets the U.S. Army Corps of Engineers (USACE) requirements for preparing cost estimates.	
Surface-Water Modeling System (SMS)	The Surface Water Modeling System (SMS) is a comprehensive environment for one- and two-dimensional models dealing with surface water applications. Hydrodynamic models include CMS-Flow, TABS (RMA2, RMA4), FESWMS, ADCIRC, and TUFLOW. The hydrodynamic models cover a range of applications including river flow analysis, rural and urban flooding, estuary and inlet modeling, and modeling of large coastal domains. Additional functionalities include advection/diffusion (RMA4) and sediment transport (FESWMS). Wave models in SMS include CMS-Wave, STWAVE, BOUSS2D, and CGWAVE and include both spectral and wave transformational models. The Particle Tracking Model (PTM) tracks particles added to the water column to help evaluate sediment transport and environmental impacts. This model will help determine measures to prevent shoaling in the federal channel based on existing data.	Approved, CoP Preferred
CMS-Wave - Wave Model	A spectral wave model based on wave-action balance equation that includes wave diffraction, reflection, breaking, and dissipation. It is a two-dimensional spectral wave model formulated from a parabolic approximation equation (Mase et al. 2005a) with energy dissipation and diffraction terms to simulate a steady-state spectral transformation of directional random waves co-existing with ambient currents in the coastal zone.	Approved, Classified as CoP Preferred (Preferred Software Option - Recommended)

X. REVIEW SCHEDULES AND COSTS

A. ATR Schedule and Cost.

ATR will be conducted during completion of the study. This will include (1) before submittal of the MDM Draft DPR, currently scheduled for spring of 2019, and (2) before submittal of the Draft Final DPR, to include final cost certification and a targeted review of any significant changes to the report. The review is expected to have a duration of approximately six weeks, including preparation of comments, responses, and backcheck review. The total review cost is expected to be approximately \$15,000.

B. Type I IEPR Schedule and Cost.

Not Applicable.

C. Model Review Schedule and Cost.

For decision documents prepared under the LRD CAP Programmatic Review Plan Model, use of existing certified or approved planning models is encouraged. Where uncertified or unapproved models are used, review of the model for use will be accomplished through the ATR process. The ATR team should apply the principles of EC 1105-2-412 during the ATR to ensure the model is theoretically and computationally sound, consistent with USACE policies, and adequately documented. If specific uncertified models are identified for repetitive use within a specific district or region, the appropriate PCX, MSC(s), and home District(s) will identify a unified approach to seek certification of these models.

XI. PUBLIC PARTICIPATION

State and Federal resource agencies may be invited to participate in the study covered by this review plan as partner agencies or as technical members of the PDT, as appropriate. Agencies with regulatory review responsibilities will be contacted for coordination as required by applicable laws and procedures. The ATR team will be provided copies of public and agency comments. In accordance with the National Environmental Policy Act (NEPA), opportunities for public comment will be provided during an initial scoping period at the start of the study and once a tentatively selected plan has been identified.

XII. REVIEW PLAN APPROVAL AND UPDATES

The LRD Commander is responsible for approving this review plan and ensuring that use of the LRD CAP Programmatic Review Plan Model is appropriate for the specific project covered by the plan. The review plan is a living document and may change as the study progresses. The home district is responsible for keeping the review plan up to date. Minor changes to the review plan since the last LRD Commander approval are documented in Attachment 3. Significant changes to the review plan (such as changes to the scope and/or level of review) should be re-approved by the LRD Commander following the process used for initially approving the plan. Significant changes may result in the MSC Commander determining that use of the LRD CAP Programmatic Review Plan Model is no longer appropriate. In these cases, a project specific review plan will be prepared and approved in accordance with EC 1165-2-214 and Director of Civil Works' Policy Memorandum #1. The Commander Approved Review Plan, along with the Commanders' approval memorandum, will be posted on the home district's webpage.

XIII. REVIEW PLAN POINTS OF CONTACT

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

- Project Manager, 312-846-5591
- Chief of Planning, 312-846-5580

ATTACHMENT: TEAM ROSTERS.

Project Delivery Team

Technical Discipline	Team Member	District
Project Manager	[REDACTED]	LRC
Lead Planner	[REDACTED]	LRC
Coastal Modeling	[REDACTED]	ERD-CHL
Economist	[REDACTED]	LRC
Coastal/H&H Engineer	[REDACTED]	LRC
Surveyor	[REDACTED]	LRC
Environmental Engineer	[REDACTED]	LRC
Civil Engineer	[REDACTED]	LRC
Cost Engineer	[REDACTED]	LRC
Geotechnical Engineer	[REDACTED]	LRC
Real Estate	[REDACTED]	LRE@LRC
Operations	[REDACTED]	LRC
Resource Manager	[REDACTED]	LRC

District Quality Control Team

Technical Discipline	Team Member	District
Planner	[REDACTED]	LRC
Coastal/H&H	[REDACTED]	LRC
Civil Design	[REDACTED]	LRC
Environmental	[REDACTED]	LRC
Operations/Dredging	[REDACTED]	LRC
Real Estate	[REDACTED]	LRE@LRC

Agency Technical Review Team*

Technical Discipline	Team Member	District	Credentials	Years Experience
ATR Lead	[REDACTED]	NAN		
Planning	[REDACTED]			
Economics	[REDACTED]			
NEPA/Environmental Resources/Cultural Resources	[REDACTED]	LRB		
Cost Engineering	[REDACTED]			
Hydrology and Hydraulics / Coastal Engineering / Inland Hydrology Climate Change	[REDACTED]			
Operations/Dredging	[REDACTED]			

*LRC is coordinating with LRB to determine the remaining composition of the ATR Team

Vertical Team

Technical Discipline	Team Member	District	Credentials	Years Experience
LRD District Liaison	TBD	LRD		

ATTACHMENT 1: 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 and brief description of it> for <project name and location>. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. 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 DrChecksSM.

SIGNATURE

Name

Date

ATR Team Leader

Office Symbol/Company

SIGNATURE

Name

Date

Project Manager (home district)

Office Symbol

SIGNATURE

Name

Date

Architect Engineer Project Manager¹

Company, location

SIGNATURE

Name

Date

Review Management Office Representative

Office Symbol

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

SIGNATURE

Name

Date

Chief, Planning Division (home district)

Office Symbol

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 2: REVIEW PLAN REVISIONS LOG

Revision Date	Description of Change	Page / Paragraph Number
31 Jan 2018	Initial version	
09 Mar 2018	Populated Team Rosters with necessary ATR Disciplines and DQC Disciplines that were not entered in the initial draft	ATTACHMENT: TEAM ROSTERS
15 Mar 2018	Removed Real Estate ATR Discipline, added Operations/Dredging DQC Team Member, and changed Real Estate DQC Team Member. Remove Real Estate entry from Table B of Section V	Section V, Table B; ATTACHMENT: TEAM ROSTERS

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
ASA(CW)	Assistant Secretary of the Army for Civil Works	NED	National Economic Development
ATR	Agency Technical Review	NER	National Ecosystem Restoration
CAP	Continuing Authorities Program	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMS	Quality Management System
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RED	Regional Economic Development
IEPR	Independent External Peer Review	RMC	Risk Management Center
LERRDs	Lands, Easements, Rights-of-Way, Relocations, Disposal/borrow areas	RMO	Review Management Organization
MCX	Mandatory Center of Expertise	RTS	Regional Technical Specialist
MDM	MSC Decision Meeting	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act