



**DEPARTMENT OF THE ARMY**

US ARMY CORPS OF ENGINEERS  
SOUTH ATLANTIC DIVISION  
60 FORSYTH ST, SW, ROOM 10M15  
ATLANTA, GEORGIA 30303-3490

REPLY TO  
ATTENTION OF:

CESAD-PDP

107 JUN 2016

MEMORANDUM FOR Commander, Mobile District (CESAM-PD-FM/Mr. Curtis Flakes)

SUBJECT: Project Review Plan (RP)—Mobile Harbor, Alabama, General Reevaluation Report (GRR)

1. Reference memorandum, CESAM-PD-FP, 11 March 2016, subject as above.
2. South Atlantic Division staff reviewed the Review Plan for the Mobile Harbor General Reevaluation Report (GRR). Mobile District coordinated the Review Plan with the National Deep Draft Navigation Planning Center of Expertise. The Review Plan indicates that the District will arrange for the performance of Type 1 Independent External Peer Review. The Review Plan demonstrates compliance with Civil Works Planning policy for review of post authorization decision documents.
3. SAD approves the Review Plan for the Mobile Harbor GRR. Mobile District shall post the approved Review Plan on the District's website.
4. The point of contact for this action is Mr. David Bauman at (404) 562-5202.

C. DT

C. DAVID TURNER  
Brigadier General, USA  
Commanding

# **REVIEW PLAN**

**Mobile Harbor, Alabama, General Reevaluation Report (GRR)**

**Mobile District**

June 2016

P2: 353199

**MSC Approval Date: 07 June 2016**

**Last Revision Date: 02 June 2016**



**US Army Corps  
of Engineers®**

## REVIEW PLAN

### Mobile Harbor, Alabama, General Reevaluation Report (GRR)

#### TABLE OF CONTENTS

1.	PURPOSE AND REQUIREMENTS.....	3
2.	REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION .....	3
3.	STUDY INFORMATION.....	3
4.	DISTRICT QUALITY CONTROL (DQC).....	9
5.	AGENCY TECHNICAL REVIEW (ATR) .....	10
6.	INDEPENDENT EXTERNAL PEER REVIEW (IEPR).....	13
7.	POLICY AND LEGAL COMPLIANCE REVIEW .....	15
8.	COST ENGINEERING AND ATR COST MCX REVIEW AND CERTIFICATION .....	15
9.	MODEL CERTIFICATION AND APPROVAL.....	15
10.	REVIEW SCHEDULES AND COSTS .....	21
11.	PUBLIC PARTICIPATION .....	21
12.	REVIEW PLAN APPROVAL AND UPDATES.....	22
13.	REVIEW PLAN POINTS OF CONTACT .....	22
	ATTACHMENT 1: TEAM ROSTERS.....	23
	ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS.....	25
	ATTACHMENT 3: REVIEW PLAN REVISIONS.....	26

## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Mobile Harbor, Alabama General Reevaluation Report (GRR). This Review Plan is being developed as part of the Project Management Plan (PMP) for the Mobile Harbor GRR, dated February 2016.

### b. References

- (1) Engineer Circular (EC) 1165-2-214, Water Resources Policies and Authorities, Civil Works Review, 15 Dec 2012
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (3) Engineer Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (5) Mobile Harbor, Alabama GRR Project Management Plan, February 2016
- (6) Review of Civil Works Projects, Planning SMART Guide, 31 May 2012
- (7) ECB 2007-6 "Model Certification Issues for Engineering Software in Planning Studies" dated 10 April 2007
- (8) EM 1110-2-1613, Hydraulic Design of Deep Draft Navigation Projects, 31 May 2006.
- (9) Mobile District Quality Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

## 2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the National Deep Draft Navigation Planning Center of Expertise (DDNPCX).

The RMO will coordinate with the Cost Engineering and Mandatory Center of Expertise (Cost MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

## 3. STUDY INFORMATION

a. **Decision Document.** The objective of the GRR is to document the results of an updated analysis of the Survey Report on Mobile Harbor completed in 1980. The GRR will provide an evaluation of the economics and environmental effects based on current policies, criteria, and guidelines. A

Supplemental Environmental Impact Statement (SEIS) will be prepared in accordance with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) to analyze potential impacts from the improvements to Federal navigation channel and subsequent placement of dredged material.

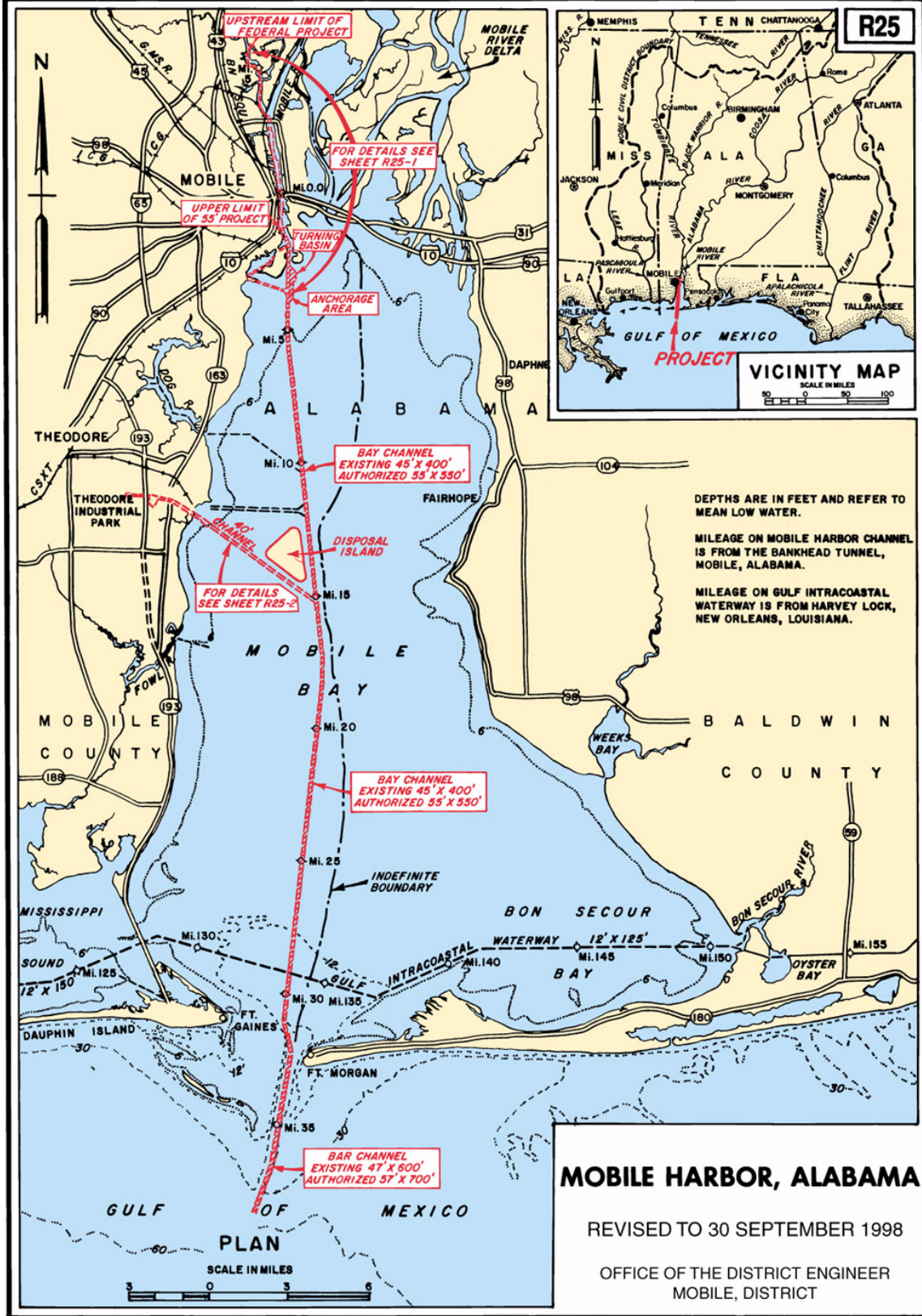
The GRR, together with the 1981 Chief's Report on Mobile Harbor, will provide the factual basis for entering into a Project Partnership Agreement (PPA). A PPA is a legally binding agreement between the Federal government and the non-Federal sponsor, the Alabama State Port Authority (ASPA), for construction of a navigation project. It describes the project and describes the responsibilities of the Government and non-Federal sponsor in cost-sharing and execution of project work. The Mobile Harbor GRR outlines the cost-sharing for design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R) during the 50 year period of analysis. After the GRR is approved by HQ, a PPA will be prepared for execution between the Corps and the non-Federal sponsor, the ASPA.

- b. Study/Project Description.** The Mobile Harbor Federal navigation project is located in southwest Alabama. The port of Mobile is the 12th largest port in terms of tonnage in the United States. Its primary commodities have been coal, crude oil, and petroleum products; however, the port has seen a large increase in steel commodities due to the recently completed \$4.6 billion steel facility that was constructed just north of Mobile. In addition, the port also expects to see increased container ship traffic in 2016 when the airbus assembly plant begins production.

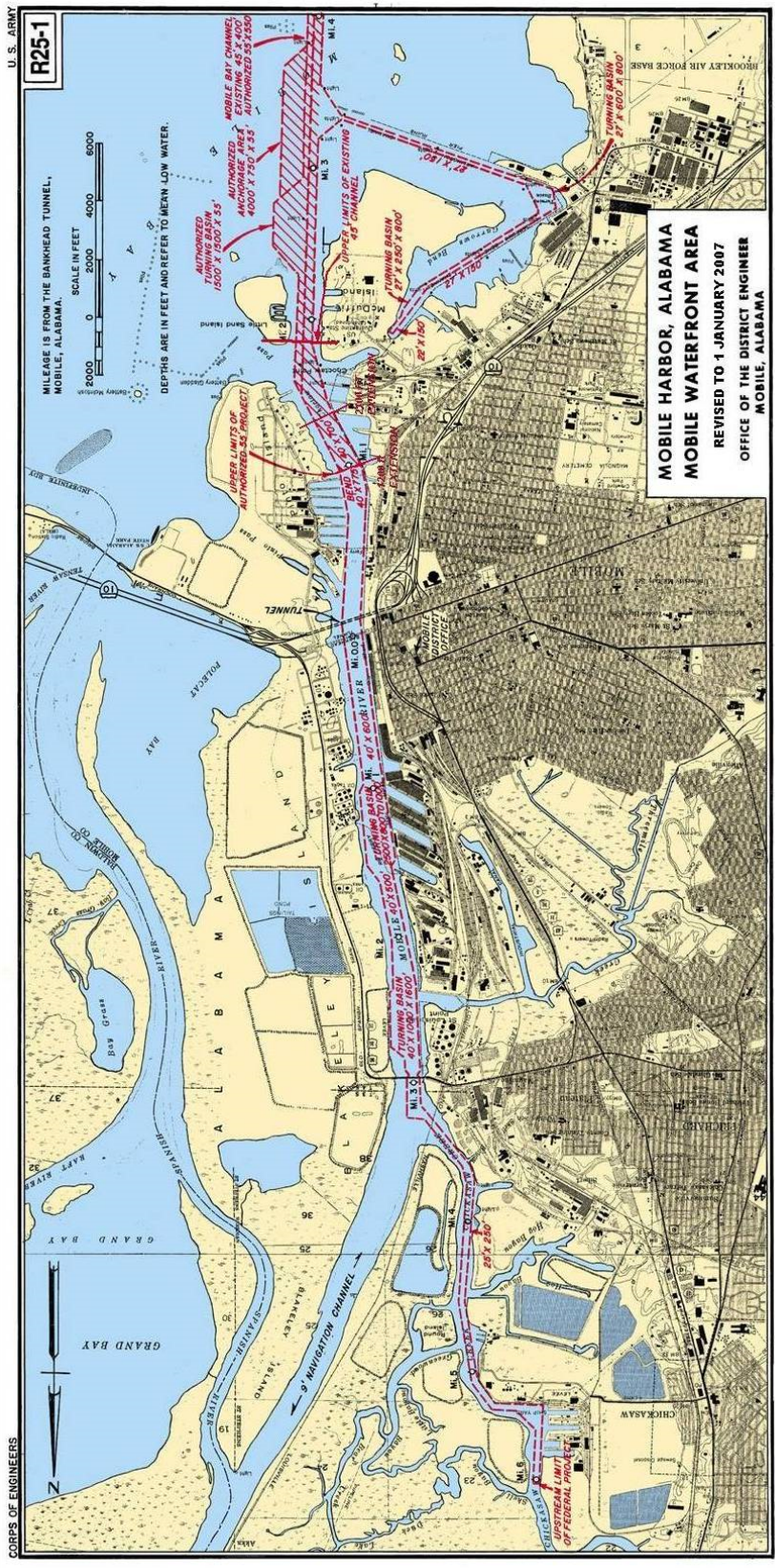
The Chief's Report on Mobile Harbor, Alabama was approved on 18 November 1981. The Report included deepening and widening of the channel, an anchorage and turning basin, and a dredged material placement site.

Based on the sponsor's request to pursue channel widening and deepening in Mobile Harbor within the limits of the original authorization and because of the changed conditions since the 1980 Survey Report, Mobile District has determined an update is needed to the Report. The update will provide reevaluation of the economics and environmental effects against current policies, criteria, and guidelines. This report will also ensure that the design will accommodate current ship sizes and that adequate capacity for dredged material placement is available. This project was authorized by Section 201 of the 1986 Water Resources Development Act (WRDA). No additional Congressional authorization will be needed in order to implement the GRR. This is a single purpose navigation project that will be approved by HQ USACE, with an estimated cost ranging from \$10M to \$500M.

**Figures R25 and Figure R25-1** show the authorized limits of the Mobile Harbor Federal Navigation Channel.







**c. Factors Affecting the Scope and Level of Review.**

This section discusses the factors affecting the risk informed decisions on the appropriate scope and level of review. The discussion is intended to be detailed enough to assess the level and focus of review and support the PDT, PCX, and vertical team decisions. Factors affecting the risk informed decisions on the appropriate scope and level of review include the following:

- *If parts of the study will likely be challenging (with some discussion as to why or why not and, if so, in what ways – consider technical, institutional, and social challenges, etc.);*

This GRR is an update of an authorized Survey Report. The report will include a reevaluation of the economics and environmental aspects of the project to ensure that it meets current policies, criteria, and guidelines. The report will also ensure that the design will accommodate current and forecasted ship sizes and that environmental impacts associated with the improvement project are analyzed in accordance with NEPA. The updated document will then serve to support a PPA by outlining the construction and cost-sharing requirements. Historically, Dauphin Island residents have raised concerns with the Federal navigation project’s potential disruption of the natural sediment transport along the Alabama coast and have previously requested that sandy dredge material be placed directly on the beach. The SEIS will analyze channel widening and deepening impacts to the estuarine and coastal sediment transport processes. In addition, the SEIS will address the suitability of the dredged material to meet ocean disposal criteria and for other beneficial uses.

- *A preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be (e.g., what are the uncertainties and how might they affect the success of the project);*

Project risks include potential changes to the estuarine and coastal sediment transport processes, water quality changes, suitability of dredged material per the Marine Research Protection and Sanctuaries Act criteria to be disposed offshore, insufficient ship traffic to economically justify the project, and OMRR&R costs. These risks could impact the ability to implement the proposed work.

- *If there is a request by the Governor of an affected state for a peer review by independent experts;*

The Governor of Alabama has not requested peer review by independent experts nor is it expected that such a request will be made; however, the District is not pursuing an exemption from Type I IEPR.

- *If the project is likely to have significant economic, environmental, and/or social effects to the Nation (with some discussion as to why or why not and, if so, in what ways);*

The widening and deepening of the channel will provide beneficial economic effects to the Nation by reducing shipping time and cost because larger ships will not be required to wait at dock or offshore while another ship is in the channel. Local concern of the existing Federal channel’s effects on littoral sand transport along the Alabama Coast, potential water quality changes, and suitability of dredge material as well as dredged material placement options will be addressed. Past studies, such as the *Survey Report on Mobile Harbor including the Final*



*Environmental Impact Statement (1980) and the ERDC/CHL TR10-8 Channel Dredging and Geomorphic Response at and Adjacent to Mobile Pass, Alabama (2010), have characterized natural sediment transport and budgets within the project area. Based on existing legal agreements, if the dredge material contains suitable sandy material, it will be placed within an existing dredged material placement area known as the Sand Island Beneficial Use Area. All other dredged material will be disposed in other approved areas.*

- *If the project likely involves significant threat to human life/safety assurance (with some discussion as to why or why not and, if so, in what ways – consider at minimum the safety assurance factors described in EC 1165-2-214 including, but not necessarily limited to, the consequences of non-performance on project economics, the environmental and social well-being [public safety and social justice; residual risk; uncertainty due to climate variability, etc.];*

This project does not add significant threat to human life/safety assurance as standard dredging and disposal activities are planned. This project only considers the widening and deepening of an existing navigation channel. All work currently performed during operations will remain the same with only an increase in the volume of dredging and maintenance.

- *If the project/study is likely to have significant interagency interest (with some discussion as to why or why not and, if so, in what ways);*

The project will have significant interagency interest because of the potential for environmental impacts on salinity and various natural resources due to the increased channel dimensions. The GRR will be coordinated with the appropriate agencies which will include organizing Interagency Working Group meetings on a regular basis to discuss agency concerns and potential mitigation requirements. Formal agency consultations will also be conducted to assure the project meets all of the applicable environmental laws and regulations.

- *If the project/study will be highly controversial (with some discussion as to why or why not and, if so, in what ways);*

This project considers the widening and deepening of the existing ship channel. All work currently performed during operations will remain the same but with an increase in the volume of dredging and maintenance. As noted above, there is local concern that the existing Federal channel has affected littoral transport of sand and has impacted nearby Dauphin Island.

- *If the project report is likely to contain influential scientific information or be a highly influential scientific assessment (with some discussion as to why or why not and, if so, in what ways);*

The project report does not contain influential scientific information and is not a highly influential scientific assessment.

- *If the information in the decision document or proposed project design will likely be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices (with some discussion as to why or why not and, if so, in what ways);*

The information in the GRR is not based on novel methods, does not use innovative materials or techniques, does not present complex challenges, is not precedent setting, and is not likely to change prevailing practices. The project is a typical channel improvement project involving traditional methods of dredging and traditional placement of dredged material, including potential for beneficial use. Standard engineering, economic, and environmental analyses are planned. Novel methods will not be used and methods, models, and conclusions will not be precedent setting or likely to change policy decisions.

- *If the proposed project design will require redundancy, resiliency, and/or robustness (with some discussion as to why or why not and, if so, in what ways – see EC 1165-2-214, Appendix E, Paragraph 2 for more information about redundancy, resiliency, and robustness); and*

The project design is not expected to require any additional redundancy, resilience, or robustness.

- *If the proposed project has unique construction sequencing or a reduced or overlapping design construction schedule (with some discussion as to why or why not and, if so, in what ways).*

The construction schedule and sequencing is unknown at this time. There is potential for unique construction sequencing or construction schedule due to environmental or construction constraints.

- d. In-Kind Contributions.** Products and analyses provided by the non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR.

No in-kind products to be provided by the Non-Federal sponsor are expected at this time. However, if any Lands, Easements, Rights-of-Way, Relocations (LERR) are to be provided by the Non-Federal sponsor in conjunction with the project, in-kind credits may be allowable.

#### **4. DISTRICT QUALITY CONTROL (DQC)**

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

- a. Documentation of DQC.** All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC will be conducted by the SAM Mobile Harbor GRR PDT, SAM independent reviewers, as well as chiefs of relevant key disciplines, where each of the reviewers will review the documents for accuracy. SAM will engage the appropriate regional CoPs to ensure reviews are done in a timely manner by qualified experts. All reviewers are listed in Attachment 1. All DQC comments and responses will be documented in Dr. Checks. The comment and response package, along with the DQC signature sheet, will be part of the report's transmittal package under the "Peer Review" section, and will be provided to the Agency Technical Review Team prior to the beginning of that review.

- b. Products to Undergo DQC.** The GRR and SEIS will undergo DQC at draft report and final report stage.
- c. Required DQC Expertise.** The SAM Mobile PDT consists of key disciplines relevant to Deep Draft Navigation Planning: Operations, Geotechnical, Hydraulics, Environmental, Navigation Plan Formulation, Legal, Cost, Real Estate, and Economics. DQC reviewers consist of non-PDT experts and experts in the supervisory chain of the same disciplines.

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

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside 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 the home MSC.

- a. Products to Undergo ATR.** The GRR and SEIS will undergo ATR at the draft and final report stage. The Cost Appendix and all associated materials will be provided to the cost reviewer. All ATR reviewers will be listed in Attachment 1.
- b. Required ATR Team Expertise.** It is expected that the ATR Team would generally reflect the major technical disciplines of the Mobile Harbor GRR PDT. As such, it is expected that the ATR team would consist of the following disciplines: Plan Formulation, Navigation Operations, Geotechnical, Hydraulics, Environmental, Cost, Real Estate, and Economics.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as the reviewer for another discipline. The ATR Lead will be from a District outside the MSC.
Plan Formulator	The plan formulator should be a senior water resources planner with experience in navigation projects and associated planning reports and documents.
Economics	Expertise in economics appropriate for a GRR level to verify trends and commodities within the affected Port. Knowledge of procedures for deep draft navigation and containership analysis. Knowledge of tools employed for economic analysis, including HarborSym, risk analysis and multiport analysis.
Environmental Resources	Expertise in NEPA compliance. Knowledge of all applicable environmental laws and regulations. Expert in coastal and estuarine habitats and associated natural and cultural resources and environmental impacts of harbor deepening, as well as, familiarity with dredged material disposal and offshore dredge material disposal sites.
Geotechnical Engineering	Expertise in geotechnical considerations and USACE guidance related to the classification, dredging, and disposal of material for deep draft navigation projects.
Hydraulic Engineering	The hydraulic reviewer should have knowledge of USACE guidance related to engineering requirements for the deep draft navigation studies. In addition the reviewer should have expertise in conducting hydrodynamic model studies of navigable waterways to assess whether or not hydrodynamic modeling analyses and conclusions are reasonable. The reviewer should be experienced with ADCIRC, STWAVE, CE-QUAL-ICM, SEDZLJ, MPFATE, STFATE, LTFATE, DELFT3D and/or similar models.
Cost Engineering	Expertise in cost engineering requirements for deep draft navigation studies include the development of parametric (Class 4) estimates, construction costs (i.e. MCACES costs) using MII Cost Estimating Software (Class 3), dredging costs using Corps of Engineers Dredge Estimating Program (CEDEP), Corps issued Total Project Cost Summary (TPCS) , and formal cost risk analyses using Abbreviated Risk Analysis (ARA) or the Crystal Ball software for projects over \$40,000,000.
Navigation Construction/Operations	Expertise in O&M requirements associated with deep draft navigation projects.
Real Estate	Expertise in implementation of deep draft navigation projects. Specifically navigational servitude and non-federal sponsor acquisition of beneficial use sites, facility/utility relocation.

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

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

In some situations, especially where there appears to be incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the District, RMO, and MSC), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

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

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work



reviewed to date, for the draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

## **6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)**

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- **Type I IEPR.** Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.
- **Type II IEPR.** Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

### **a. Decision on IEPR.**

After a preliminary assessment, it has been determined that a Type I IEPR will need to be performed for the GRR decision document for the following reasons:

(1) Several mandatory triggers appear to be met, including:

- The estimated cost of the project could exceed the \$200M ceiling. The cost is expected to range between \$100M and \$500M.
- A Supplemental Environmental Impact Statement (SEIS) will be performed.
- As is typical for a project study of this nature and scope, it is anticipated that there may be a public dispute involving some stakeholders regarding the size, nature, or effects of the Project, or regarding the economic or environmental cost or benefits of the Project.

(2) There has been no request from a head of a Federal or state agency charged with reviewing the project to conduct Type I IEPR, nor is such a request anticipated.

- b. Products to Undergo Type I IEPR.** Draft Report and SEIS will undergo Type I IEPR. Public comments will also be provided to the IEPR Panel for its consideration.
- c. Required Type I IEPR Panel Expertise.** The following provides a description of the proposed panel members and expertise. The proposed five discipline panel includes the necessary expertise to assess the planning, engineering, environmental, and economic adequacy of the decision document, as required by EC 1165-2-214, Appendix D. The Outside Eligible Organization (OEO) will determine the final participants on the panel. The following table lists the suggested types of disciplines that might be included on the panel. The following disciplines are recommended based on the high risk factors as described in the risk register. USACE will not nominate candidates for the IEPR Panel.

<b>IEPR Panel Members/Disciplines</b>	<b>Expertise Required</b>
Plan Formulation	This individual will be a scientist from academia, public agency, non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum 10 years demonstrated experience in evaluating and comparing alternative plans for USACE deep draft navigation studies.
Economics	The Economics Panel Member will have experience directly related to USACE economic evaluations of deep draft navigation projects, including containership analyses. Knowledge of tools employed for economic analysis, including HarborSym, risk analysis, multiport analysis and trade forecasts is required.
Environmental	The Panel members will have significant experience with USACE deep draft navigation projects and applicable environmental laws and regulations in coastal and estuarine habitats and associated natural resources. Significant experience will also include assessment of the environmental impacts of harbor deepening as well as a familiarity with dredged material disposal and Offshore Dredge Material Disposal Sites.
Engineering	<p>Hydraulic Engineer – Knowledge of USACE guidance related to engineering requirements for the deep draft navigation studies. Panel member will have significant experience with evaluations of coastal processes used to evaluate the impacts of deepening and/or widening the navigation channel on hydrodynamics, water quality, sediment transport, shipwake induced erosion, and channel design. In addition, the panel member will be experienced with ADCIRC, STWAVE, CE-QUAL-ICM, SEDZLJ, MPFATE, STFATE, LTFATE, DELFT3D and/or similar models.</p> <p>Geotechnical Engineer - Panel members will have significant experience with evaluating the behavior of aquifers and soils, as well as the classification, dredging, and disposal of material for deep draft navigation projects.</p>

**d. Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO), per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO, documented in DrChecks, and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 5.c above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

## **7. POLICY AND LEGAL COMPLIANCE REVIEW**

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

## **8. COST ENGINEERING AND ATR MANDATORY CENTER OF EXPERTISE (Cost MCX) REVIEW AND CERTIFICATION**

All decision documents shall be coordinated with the Cost MCX, located in the Walla Walla District. The Cost MCX will assist in determining the expertise needed on the ATR team in the development of the review charge. The Cost MCX will also provide the Cost Engineering certification. The RMO is responsible for coordination with the Cost MCX.

## **9. MODEL CERTIFICATION AND APPROVAL**

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and

opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models will be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

- a. **Planning Models.** The following planning 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	Certification / Approval Status
Regional Economic System (RECONS)	RECONS is a modeling tool that estimates jobs, income, sales and value added associated with Corps Civil Works and ARRA spending, as well as stemming from effects of additional economic activities.	Certified
HarborSym	HarborSym is a planning level simulation model designed to assist in economic analyses of coastal harbors. With user-provided input data, the model calculates vessel interactions within the harbor and cost associated with the ocean voyage of vessels.	Certified

- b. **Engineering Models.** Ship simulation modeling will be conducted at ERDC. Cost Estimating Dredge Estimating Program (CEDEP) will be utilized.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Corps' Scientific and Engineering Technology Listing
MDFATE/MPFATE - Multiple Placement Fate of Dredged Material	MPFATE was developed under the Corps' Dredging Research Program (DRP) (Hales 1995) and was formerly known as Open Water Disposal Area Management Simulation (ODAMS) program (Moritz and Randall 1995). MPFATE is a site management tool that bridges the gap between the Short Term FATE of dredged material (STFATE) model and the Long Term FATE of dredged material (LTFATE). It will be used to study the disposal of material in the ODMDS.	Allowed

<p>STFATE – Short Term Fate of Dredged Material</p>	<p>STFATE simulates the placement of a single load of dredged material STFATE models conventional placement (bottom dumping) where the vast majority of the dredged material released from a barge or hopper dredge descends rapidly to the bottom in a relatively high density jet known as the convective descent phase. The dynamic collapse phase begins when the jet impacts the bottom. The more dense material immediately deposits, while the less dense particles are spread outward as a density flow when the vertical energy is transferred into horizontal momentum. Over time the less dense material also deposits. It will be used to study the disposal of material in the ODMDS.</p>	<p>Allowed</p>
<p>LTFATE – Long Term Fate of Dredged Material / Geophysical Scale Transport Modeling System (GSMB)</p>	<p>The SEDZLJ module within LTFATE and the GSMB predicts the long term stability (days to years) of dredged material mounds. The LTFATE model combines hydrodynamics (waves, currents, and tides) and sediment transport algorithms from SEDZLJ to predict the stability of dredged material mounds. It is a multi-grain (sand, silt, clay) transport model that includes a three-dimensional representation of the sediment bed. It will be used to study the disposal of material in the ODMDS and to evaluate changes sediment transport within the Navigation channel and surrounding Mobile Bay due to channel modifications.</p>	<p>Allowed</p>
<p>Delft 3D</p>	<p>Delft 3D is a multi-dimensional suite of hydrodynamic, sediment transport, and morphologic modules for estuarine and coastal environments.</p> <p>The FLOW module of Delft3D is a multi-dimensional hydrodynamic and transport simulation program which calculates non-steady flow and transport phenomena resulting from tidal and meteorological forcing on a curvilinear, boundary fitted grid or spherical coordinates. The MOR module computes sediment transport (both suspended and</p>	<p>Allowed</p>



	<p>bed total load) and morphological changes for an arbitrary number of cohesive and non-cohesive fractions. Both currents and waves act as driving forces. An essential feature of the MOR module is the dynamic feedback with the FLOW and WAVE modules, which allow the flows and waves to adjust themselves to the local bathymetry and allows for simulations on any time scale from days (storm impact) to centuries (system dynamics). It will be used to evaluate shoaling due to littoral transport and to assess the potential changes to the transport system due to channel modifications.</p>	
<p>Advance Circulation Model (ADCIRC) 2DDI (2003)</p>	<p>Finite element 2-D hydrodynamic model; the version 2DDI is vertically-integrated and solves a vertically-integrated continuity equation for water surface elevation; no storm or hurricane windfield models or statistical analysis tools are included with model, they must be acquired separately; ADCIRC performs well using Vince Cardone's planetary boundary layer model windfields; statistical analyses using ADCIRC model storm surge simulations are compatible with the USACE Empirical Simulation Technique (EST) as well as joint probability methods. It will used to assess changes to the storm surge due to the deepening of the entrance channel.</p>	<p>CoP Preferred</p>
<p>CH3D-WES-Multi-block Hydrodynamic Model (CH3D-WS-MB)</p>	<p>CH3D-WES-MB is a 3-D, multi-block hydrodynamic module of the GSMB. The model performs baroclinic hydrodynamic computations on a non-orthogonal curvilinear or boundary-fitted grid. Physical processes impacting circulation and vertical mixing that are modeled include tides, wind, wave radiation stress gradients, density effects (salinity and temperature), freshwater inflows, turbulence, and the effect of the earth's rotation. The boundary-fitted coordinate feature of the model provides grid resolution enhancement necessary to adequately represent the deep</p>	<p>Allowed</p>

	navigation channels and irregular shoreline configurations of the flow system. It will be utilized to simulate current and elevation within Mobile Bay and will provide forcing to the sediment transport and water quality models for assessment of changes due to the channel modifications.	
Adaptive Hydraulic Modeling (ADH)	ADH is a state-of-the-art Adaptive Hydraulics Modeling system. It is capable of handling both saturated and unsaturated groundwater, overland flow, three-dimensional Navier-Stokes flow, and two- or three-dimensional shallow water problems. ADH contains other essential features such as wetting and drying and wind effects. It will be used to provide model forcing in the Ship/Tow Simulator to evaluate the safety of ship maneuverability of the alternatives.	Allowed
STWAVE – Steady State spectral WAVE	STWAVE simulates depth-induced wave refraction and shoaling, current-induced refraction and shoaling, depth- and steepness-induced wave breaking, diffraction, parametric wave growth because of wind input, and wave-wave interaction and white capping that redistribute and dissipate energy in a growing wave field. It will be used to provide model forcing in the sediment transport, water quality and Ship/Tow Simulator models.	CoP Preferred
CE-QUAL-ICM	State-of-the-art hydrodynamic model used to simulate aquatic systems. The GSMB WQ module CE-QUAL-ICM is a multi-dimensional, time variable eutrophication and water quality model developed by the US Army Engineer Research and Development Center. CEQUAL-ICM uses an unstructured grid, finite volume modeling approach, within which mass is conserved. The model contains a suite of over 30 individually activated water quality constituents including multiple forms of nitrogen, phosphorus, organic carbon, algae and benthic algae.	Allowed

	It will be used to investigate eutrophication and living resources water quality changes within the estuary due to the channel modifications.	
ERDC Ship/Tow Simulator	The Ship/Tow Simulator features two bridges set up for real-time ship maneuvering, and were specifically developed for evaluating navigation channel designs, modifications, and safety issues. Located at the U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory, the accurately portray currents, wind and wave conditions, shallow water effects, bank forces, ship handling, ship to ship interaction (in a meeting and passing or overtaking and passing situation), fender forces, anchor forces, and tug assistance. It will be used to evaluate the safety of ship maneuverability of the alternatives.	Allowed
Channel Design and Evaluation Tool (CADET)	Probabilistic risk analysis techniques to evaluate the accessibility of channel reaches for multiple vessel geometries, loading, and wave conditions.	CoP Preferred
Microcomputer Aided Cost Engineering System (MCACES), MII	Microcomputer Aided Cost Engineering System (MCACES) is the cost estimating software program tools used by cost engineering to develop and prepare Class 3 Civil Works cost estimates.	Civil Works Cost Engineering and Agency Technical Review MCX mandatory
Abbreviated Risk Analysis, Cost Schedule Risk Analysis	<p>Cost risk analyses identify the amount of contingency that must be added to a project cost estimate and define the high risk drivers. The analyses will include a narrative identifying the risks or uncertainties.</p> <p>During the alternatives evaluation, the PDT will assist the cost engineer in defining confidence/risk levels associated with the project features within the abbreviated risk analysis. For the Class 3 estimate, an evaluation of risks will be performed using Crystal Ball Cost Schedule Risk Analysis for construction costs over \$40 million or the Abbreviated Risk Analysis for projects under \$40 million.</p>	Civil Works Cost Engineering and Agency Technical Review MCX mandatory

<p>Total Project Cost Summary (TPCS)</p>	<p>The TPCS is the required cost estimate document that will be submitted for either division or HQUSACE approval. The Total Project Cost for each Civil Works project includes all Federal and authorized non-Federal costs represented by the Civil Works Work Breakdown Structure features and respective estimates and schedules, including the lands and damages, relocations, project construction costs, construction schedules, construction contingencies, planning and engineering costs, design contingencies, construction management costs, and management contingencies.</p>	<p>Civil Works Cost Engineering and Agency Technical Review MCX mandatory</p>
<p>Corps of Engineers Dredge Estimating Program (CEDEP)</p>	<p>CEDEP is the required software program that will be used for dredging estimates using floating plants. CEDEP contains a narrative documenting reasons for decisions and selections made by the cost engineer. Software distribution is restricted because it's considered proprietary to the Government.</p>	<p>Civil Works Cost Engineering and Agency Technical Review MCX mandatory</p>

**10. REVIEW SCHEDULES AND COSTS**

- a. **ATR Schedule and Cost.** ATR of the draft document is planned for July 2018 and the final report in February 2019. The estimated cost for this effort is \$95,000.
- b. **Type I IEPR Schedule and Cost.** Type I IEPR of the GRR and SEIS is planned for July 2018. It is estimated to cost \$225,000.
- c. **Model Certification/Approval Schedule and Cost.** All models to be used have been certified in accordance with EC 1105-2-412, Planning: Assuring Quality of Planning Models, and Enterprise Standard (ES)-08101, Software Validation for the Hydrology, Hydraulics, and Coastal Community of Practice.

**11. PUBLIC PARTICIPATION**

A NEPA/Scoping Meeting was held 12 January, 2016. The public will be invited to comment on the Draft SEIS during the public review period in accordance with NEPA and the Coastal Zone Management Program. The public comment period for the Draft SEIS is currently scheduled from 19 July 2018 to 04 September 2018. These comments, along with ATR, IEPR, and MSC comments, will be incorporated before finalizing the SEIS. The IEPR Panel will be provided public comments during its review of draft report documents.

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

The South Atlantic Division Commander is responsible for approving this Review Plan. The SAD Commander's approval reflects vertical team input (involving District, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the work product. Like the PMP, the Review Plan is a living document and may change as the study progresses. Mobile District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last SAD Commander approval will be documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) must 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 SAD Commander's approval memorandum, should be posted on the Mobile District's webpage. The latest Review Plan should also be provided to the RMO and SAD.

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

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

- Mobile District Project Manager (251) 690-2328
- Review Management Organization, DDNPCX (251) 694-3842
- South Atlantic Division Senior Plan Formulator (404)562-5226



**ATTACHMENT 1: TEAM ROSTERS**

**PROJECT DELIVERY TEAM (PDT)**

<b>Discipline</b>	<b>Agency/Org Code</b>	<b>Name and Contact Information</b>
Lead Planner	CESAJ-PD-PN	(b)(6)
Real Estate	CESAM-RE-P	
Economics	CESAM-PD-D	
Navigation Operations	CESAM-OP-TN	
Cost Estimating	CESAM-EN-E	
Hydraulic Design	CESAM-EN-HH	
Ship Simulation	CEERD-HN-ND	
Environmental (NEPA)	CESAM-PD-EC	
Cultural Resources	CESAM-PD-EI	
Geotechnical	CESAM-EN-GG	
Plan Formulation	CESAM-PD-FP	
Office of Counsel	CESAM-OC	
Engineering Technical Lead	CESAM-EN-H	
Project Manager	CESAM-PM-CM	

**DISTRICT QUALITY CONTROL (DQC) REVIEWERS**

<b>Title</b>	<b>Agency</b>	<b>Name</b>
Economics	CESAM-PD-D	(b)(6)
Navigation Operations	CESAM-OP-TN	
Cost Estimating	CESAM-EN-TC	
Hydraulic Design	CESAM-EN-H	
Environmental (NEPA)	CESAM-PD-EC	
Geotechnical	CESAM-EN-GG	
Real Estate	CESAM-RE	

**ATR TEAM**

<b>Discipline/Expertise</b>	<b>Name</b>	<b>District/Division</b>
<b>Agency Technical Review Team</b>		
ATR Team Leader	TBD	
Plan Formulation	TBD	
Cost MCX	TBD	
Economics	TBD	
Operations	TBD	
Environmental	TBD	
Geotechnical Engineering	TBD	
Hydraulic Design	TBD	
Real Estate	TBD	

**\*\*\*The composition of the ATR review team members is being developed. This document will be updated to reflect the review team members once known\*\*\***

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

**COMPLETION OF AGENCY TECHNICAL REVIEW**

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

SIGNATURE  
\_\_\_\_\_  
Name  
ATR Team Leader  
Office Symbol/Company \_\_\_\_\_ Date \_\_\_\_\_

SIGNATURE  
\_\_\_\_\_  
Name  
Project Manager  
Office Symbol \_\_\_\_\_ Date \_\_\_\_\_

SIGNATURE  
\_\_\_\_\_  
Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location \_\_\_\_\_ Date \_\_\_\_\_

SIGNATURE  
\_\_\_\_\_  
Name  
Review Management Office Representative  
Office Symbol \_\_\_\_\_ Date \_\_\_\_\_

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

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

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

SIGNATURE  
\_\_\_\_\_  
Name  
Chief, Engineering Division  
Office Symbol \_\_\_\_\_ Date \_\_\_\_\_

SIGNATURE  
\_\_\_\_\_  
Name  
Chief, Planning Division  
Office Symbol \_\_\_\_\_ Date \_\_\_\_\_

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

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>