

REVIEW PLAN

Chocolate Bayou, Texas
Dredged Material Management Plan

Galveston District

MSC Approval Date: December 2011
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**US Army Corps
of Engineers®**

REVIEW PLAN

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the updated Chocolate Bayou Dredged Material Management Plan (DMMP). The Chocolate Bayou Channel, located in Chocolate Bay, Brazoria County, Texas, is a federally authorized navigation channel that is currently maintained at dimensions of 12-feet deep (MLT) by 125-feet wide. The channel was authorized under the Rivers and Harbor Act of October 1965. The DMMP addresses updated dredging management needs over a 20-year period with consideration of alternatives to produce the most viable means of dredge material placement.

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (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 H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, 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 1165-2-209) 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 Inland Navigation Center of Expertise.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) 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 decision document being submitted for review under this review plan is an updated version of the 2003 Chocolate Bayou Dredged Material Management Plan (DMMP). The updated version addresses changes in placement area capacity needs since the 2003 DMMP submission. The level of approval for this updated decision document will be at Division level. The updated DMMP review submission will be supplemented with the Environmental Assessment report that addresses the same placement area capacity needs as the updated DMMP (note that the Environmental Assessment was conducted in 2009 and remains in effect to date).
- b. **Study/Project Description.**

The Chocolate Bayou Channel is a navigation project located about 40 miles southwest of Houston in Chocolate Bay in Brazoria County, along the upper coast of Texas (Figure 1). The Channel is federally authorized (under the Rivers and Harbor Act of October 1965) and currently maintained at 12-feet deep (MLT) by 125-feet wide. The suggested dredging frequency for the Chocolate Bayou Channel is approximately every four years; however, historical maintenance dredging has been performed on six-year intervals due to project constraints. The industrial firms along the waterway have had to use the waterway in shoaled conditions during previous cycles. Historically, approximately 857,600 cubic yards of material have been dredged during each dredging activity that equates to a shoaling rate of approximately 214,400 cubic yards annually.



The channel traverses Chocolate Bay connecting industries at the northwest end of the bay within Chocolate Bayou with the Gulf Intracoastal Waterway (GIWW) between GIWW mile markers 374.7 and 376.7. The authorized channel is 8.2 miles (13.2 miles to the turning basin) and used primarily for transport of crude petroleum and petrochemical products.

Chocolate Bay is a secondary bay located at the extreme west-end of West Galveston Bay (Figure 1). Chocolate Bayou is surrounded by high quality, inter-tidal, estuarine wetlands. It is estimated that the Galveston Bay system experienced a net loss of approximately 32,400 acres of vegetated wetlands from 1950 through 1989 (White *et al.*, 1993). Development along the channel is limited to petrochemical plants near the terminus of the authorized project on Chocolate Bayou.

The Corps is committed to environmentally sound dredging and placement or management of dredged materials as defined by applicable laws and policies. This can best be achieved through the development of a long-term management strategy for dredged material as delineated in a Dredged Material Management Plan (DMMP). It is the policy of the Corps that all DMMPs include an assessment of potential beneficial use of dredged material for environmental purposes, including fish and wildlife habitat creation and restoration and/or hurricane and storm damage reduction.

Dredged material management planning for all Federal harbor projects is conducted by the Corps to ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically justified, and ensure that long-term placement facilities are available. Ultimately, the DMMP identifies specific measures necessary to manage the volume of material likely to be dredged within the Chocolate Bayou Channel over the next 20-year period.

The Corps is responsible for maintaining the Chocolate Bayou Channel to its authorized dimensions to ensure navigability of the waterway. The Corps has used five upland placement areas (PAs) since 1980 and three beneficial use sites (BUs) since 2003 for channel dredge material disposal. Three of the five historically-used dredged material placement areas are located within the Brazoria National Wildlife Refuge (BNWR), and their continued use conflicted with the management objectives of the Refuge. Consequently, alternatives to these sites were identified and described in the 2003 DMMP. These new sites were designated as BU sites for marsh establishment and nourishment of bird nesting habitat. It was anticipated that the combination of existing upland PAs and new BU sites would provide adequate dredged material capacity for long-term maintenance of this channel. Recent implementation of the BU sites and new information about remaining capacity of the PAs revealed that reliance on these areas to satisfy long-term dredging requirements is not feasible and that additional capacity is needed. The updated DMMP document addresses implementation of additional capacity through creation of a 201 acre expansion of the existing PA 4 Placement Area. This preferred alternative will accommodate the anticipated volume of material to be excavated from the channel over the next 20-year life of the project with the least impacts and greatest benefits.

The PA 4 expansion will facilitate establishment and management of the nearby marsh habitats being created for the BU sites. The PA 4 expansion will be used in conjunction with marsh creation efforts at these BU sites by providing an area for deposition of dredged material in excess of the volumes needed to achieve desired target elevations. Because the Chocolate Bayou Channel is, foremost, a navigation project rather than an ecosystem creation project, the reason for dredging is to restore navigable depth rather than to provide material for BU. If a relatively small volume of

material is all that is needed to achieve the target elevation at a BU site, but that same quantity would not adequately ease draft restrictions, then it is unlikely that dredging would be performed. In other words, dredging would not be performed merely to finish the BU site. Consequently, without additional capacity, the BU objectives would not be realized, and navigation hazards in the channel would continue to exist. Therefore, the proposed expanded PA 4 would help to ensure completion of the BU sites, in addition to providing long-term capacity for maintenance of the channel after the beneficial use sites are completed.

- c. Factors Affecting the Scope and Level of Review.** The updated Dredged Material Management Plan (DMMP) review document was developed to address an unexpected reduction in available placement area capacity since implementation of the 2003 DMMP. The reduction in available capacity is addressed through a simplified preferred alternative consisting of a 201 acre expansion to an existing placement area. The updated DMMP is not considered to require a significant level of review effort due to its low level of complexity. Operations aspects of the updated DMMP remain consistent with the previously reviewed and approved 2003 DMMP. The project is not justified by life safety nor does it involve significant threat to human/life safety assurance or the environment. The project does not pose significant challenges and risks. The project's function serves to provide continued channel maintenance for barge traffic associated with industry operations having significant contribution to our Nation's economy. In addition, the 201 acres of placement area expansion will help ensure continued success in implementing existing beneficial use (BU) sites associated with the project. Uncertainty in economic impacts and decreased benefits are incurred by the project due to a recent bankruptcy of one of the industries along the channel which has resulted in reduced barge traffic. However, because of its desirable infrastructure, the bankrupted facility is expected to be occupied by new industry within a short period of time. This likely scenario in conjunction with an expected rebound in the economy would approximately double the current economic benefits of the project. The project is not anticipated to involve significant public dispute and is not based on novel, complex or innovative uses of materials or methods of construction.
- d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. However, no in-kind products and analyses by the non-Federal sponsor are anticipated.

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.** The DQC will be documented in accordance with the District's Quality Management Plan (QMP). DQC documentation will be provided to the ATR team.

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 only products to undergo ATR will be the updated Chocolate Bayou Dredged Material Management Plan (DMMP). The updated DMMP document will be supplemented with the 2009 Environmental Assessment Report for Expansion of Placement Area 4 which was previously reviewed through the ATR process.

b. Required ATR Team Expertise.

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. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience in shallow-draft navigation.
Economics	The Economics reviewer should be a economist with experience in shallow-draft navigation.
Environmental Resources	The Environmental Resources reviewer should be a reviewer with experience in shallow-draft navigation.
Real Estate	The Real Estate reviewer should be a reviewer with experience in shallow-draft navigation.
Cost Estimating	The Cost Estimating reviewer should be a reviewer with experience in shallow-draft navigation.
Operations	The Operations reviewer should be a reviewer with experience in shallow-draft navigation.
Geotechnical	The Geotechnical reviewer should be a reviewer with experience in shallow-draft navigation.

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 be 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 addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, 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 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 AFB, 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 1165-2-209, 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 1165-2-209.
 - **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.** The request for IEPR waiver/exclusion was approved by Headquarters on 23 September 2011.
 - b. **Products to Undergo Type I IEPR.** Not Applicable (refer to Section 6a).
 - c. **Required Type I IEPR Panel Expertise.** Not Applicable (refer to Section 6a).
 - d. **Documentation of Type I IEPR.** Not Applicable (refer to Section 6a).

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 DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

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 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, ATR, and IEPR (if required).

- a. **Planning Models.** The economic analysis portion of the updated DMMP included development of an economic spreadsheet model. This model served to evaluate benefits in terms of transportation cost savings associated with various channel depths for the determination of benefit to cost ratios (BCR) and also the assessment of variations from baseline conditions. Using Waterborne Commerce Data from IWR and vessel operating costs (VOC) from Informa, and applying weights based on tonnage, the model showed the highest BCR at the authorized 12 foot channel depth.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Study specific spreadsheet model	A study-specific spreadsheet was developed to evaluate transportation cost savings benefits associated with various channel depths. The transportation cost saving benefits along with the operations and maintenance and construction costs were used to determine benefit to cost ratios (BCR) and for assessing variations from the baseline condition.	Status is pending review submission. Not approved to date.

- b. **Engineering Models.** No Engineering Models are proposed for use in this study.

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The ATR was originally scheduled to be completed in June 2011 but has incurred delays. Required review time was not expected to be significant given that the DMMP document 1) is an update to the previously authorized 2003 DMMP and 2) the study involves a

simplified preferred alternative consisting of expansion to one existing placement area. Reviewers did meet a revised July 2011 deadline for submission of comments; however, comment responses have been delayed due to a number of factors. Most of the factors have been resolved to allow the ATR process to resume with an expected new completion date of February 2012. Total cost for the ATR is expected to be approximately \$40K to \$50K.

- b. **Type I IEPR Schedule and Cost.** Not Applicable (refer to Section 6a).
- c. **Model Certification/Approval Schedule and Cost.** The PDT will pursue approval for a single-use as a local model at a review level of 3 (limited). Certification plan to be developed at a later date.

11. PUBLIC PARTICIPATION

The updated DMMP document does not require public participation/comment. The document is an update to the existing 2003 DMMP with simplified revisions. The updated DMMP focuses on one placement area expansion that will accommodate a reduction in placement area capacity availability that has occurred since implementation of the 2003 DMMP (within the past two dredging cycles). The project consists of typical dredge material management and placement methods. Operations aspects of the updated DMMP remain consistent with those of the 2003 DMMP.

12. REVIEW PLAN APPROVAL AND UPDATES

The Southwestern Division Commander is responsible for approving this Review Plan. The 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 decision document. Like the PMP, 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 MSC 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 MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this review plan can be directed to the following points of contact:
(Names removed prior to posting to District website)

ATTACHMENT 1: TEAM ROSTERS
(Roster names removed prior to posting to District website)

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 [DMMP](#) for Chocolate Bayou Dredged Material Management Plan (DMMP), Chocolate Bay, Brazoria County, Texas. The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer’s needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

(Names removed prior to posting to District website)

SIGNATURE

[Name](#)
ATR Team Leader
[Office Symbol/Company](#)

Date

SIGNATURE

[Name](#)
Project Manager
[Office Symbol](#)

Date

SIGNATURE

[Name](#)
Architect Engineer Project Manager¹
[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](#)
Acting Chief, Engineering and Construction Division
[Office Symbol](#)

Date

SIGNATURE

[Name](#)
Chief, Planning Division
[Office Symbol](#)

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
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	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
ITR	Independent Technical Review	RTS	Regional Technical Specialist
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act