



DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80 VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

12 DEC 2012

CEMVD-PD-N

MEMORANDUM FOR Commander, New Orleans District
(ATTN: CEMVN-PM-B)

SUBJECT: Review Plan for Louisiana Coastal Area, Mississippi River
Delta Management

1. References:

a. Memorandum, CEMVN-PM-B, 12 December 2012, SAB
(encl 1).

b. Memorandum, ECO-PCX, 11 December 2012, subject: Louisiana
Coastal Area Mississippi River Delta Management, New Orleans
District, Ecosystem Planning Center of Expertise Recommendation for
Review Plan Approval (encl 2).

c. Engineering Circular (EC) 1165-2-209, Change 1, Civil
Works Review Policy, dated 31 January 2012.

2. The subject RP provided under reference 1.a. was reviewed by the
Mississippi Valley Division staff, which concurred with the RP. The
RP provides for an adequate level of peer review and complies with
current peer review policy requirements outlined in EC 1165-2-209.

3. I hereby approve this RP, which is subject to change as
circumstances require, consistent with the Project Management
Business Process. Subsequent revisions to this RP or its execution
will require new written approval from this office.

4. The RP is to be posted to the District website.

5. The POC for this action is Mr. Jim Wojtala, CEMVD-PD-N, at (601)
634-5931.

A handwritten signature in black ink, appearing to read "Edward E. Belk, Jr.", written over a horizontal line.

EDWARD E. BELK, JR., P.E., SES
Director of Programs

2 Encls

CF:
CECW-MVD (J. Redican)

REVIEW PLAN

Louisiana Coastal Area
Mississippi River Delta Management Study
St. Charles, Jefferson, Lafourche, Plaquemines Parish, Louisiana

Feasibility Report

New Orleans District

MSC Approval Date: 12 December 2012

Last Revision Date: 12 December 2012



**US Army Corps
of Engineers®**

REVIEW PLAN

**Louisiana Coastal Area Program
Mississippi River Hydrodynamic and Delta Management Study
Feasibility Report**

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS.....1

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION1

3. STUDY INFORMATION1

4. DISTRICT QUALITY CONTROL (DQC).....7

5. AGENCY TECHNICAL REVIEW (ATR)8

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)10

7. POLICY AND LEGAL COMPLIANCE REVIEW12

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION.....12

9. MODEL CERTIFICATION AND APPROVAL13

10. REVIEW SCHEDULES AND COSTS.....14

11. PUBLIC PARTICIPATION.....15

12. REVIEW PLAN APPROVAL AND UPDATES15

13. REVIEW PLAN POINTS OF CONTACT16

ATTACHMENT 1: TEAM ROSTERS17

ATTACHMENT 2: STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS19

ATTACHMENT 3: REVIEW PLAN REVISIONS.....22

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS.....23

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Louisiana Coastal Area (LCA) Mississippi River Delta Management (MRDM) study. The MRDM Project has been identified as a large-scale, long-term restoration feature recommended for study in the U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN) LCA, Louisiana, Ecosystem Restoration study (2004 LCA Plan) and is authorized to be studied under Section 7003 of the Water Resource Development Act (WRDA) 2007 (Public Law 110-114), as well as resolutions of the U.S. House of Representatives and Senate Committees on Public Works, dated 19 April 1967 and 19 October 1967, respectively. The Review Plan establishes the appropriate level and independence of review and presents the detailed requirements for review documentation. The Review Plan, a stand-alone document, is a component of the study's Project Management Plan (PMP).

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2012
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011
- (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
- (5) Mississippi River Hydrodynamic and Delta Management Study Project Management Plan, 15 August 2011

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. The EC outlines four review levels: 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/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 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 this Review Plan is the National Ecosystem Restoration Planning Center of Expertise (ECO-PCX).

The RMO will coordinate with the Cost Engineering DX to conduct ATR of cost estimates, construction schedules, and contingencies.

3. STUDY INFORMATION

a. Decision Document. The decision document will present the results of a single-purpose, ecosystem restoration plan in an Integrated Feasibility Report/Environmental Impact Statement (EIS). It will provide planning, engineering, and implementation details of alternatives that were considered and the recommended restoration plan to allow implementation to proceed subsequent to plan approval. This study is evaluating large-scale restoration concepts as recommended in the 2005 Chief's Report for the 2004 LCA Ecosystem Restoration Study Final Report. The Chief of Engineers will approve

the report. This study will require Congressional authorization for implementation. National Environmental Policy Act (NEPA) compliance will be documented in the Integrated Feasibility Report/EIS.

- b. Study/Project Description.** Excerpts from the WRDA of 2007 outlining the MRDM study authority are listed below:

TITLE VII—LOUISIANA COASTAL AREA

SEC. 7001. DEFINITIONS.

(1) COASTAL LOUISIANA ECOSYSTEM.—The term “coastal Louisiana ecosystem” means the coastal area of Louisiana from the Sabine River on the west to the Pearl River on the east, including those parts of the Atchafalaya River Basin and the Mississippi River Deltaic Plain below the Old River Control Structure and the Chenier Plain included within the study area of the restoration plan.

(3) RESTORATION PLAN. — The term “restoration plan” means the report of the Chief of Engineers for ecosystem restoration for the Louisiana Coastal Area dated January 31, 2005.

(5) COMPREHENSIVE PLAN. — The term “comprehensive plan” means the plan developed under section 7002 and any revisions thereto.

SEC. 7003. LOUISIANA COASTAL AREA.

(a) IN GENERAL.— The Secretary may carry out a program for ecosystem restoration, Louisiana Coastal Area, Louisiana, substantially in accordance with the report of the Chief of Engineers, dated January 31, 2005.

(b) PRIORITIES.—

(1) IN GENERAL.— In carrying out the program under subsection

(a), the Secretary shall give priority to—

(A) any portion of the program identified in the report described in subsection(a) as a critical restoration feature;

(B) any Mississippi River diversion project that—

(i) will protect a major population area of the Pontchartrain, Pearl, Breton Sound, Barataria, or Terrebonne basins; and

(ii) will produce an environmental benefit to the coastal Louisiana ecosystem;

(C) any barrier island, or barrier shoreline, project that—

(i) will be carried out in conjunction with a Mississippi River diversion project; and

(ii) will protect a major population area;

(D) any project that will reduce storm surge and prevent or reduce the risk of loss of human life and the risk to public safety;

The State of Louisiana Coastal Protection and Restoration Authority Board (CPRAB), the non-Federal sponsor, and the USACE signed a Feasibility Cost Share Agreement on 15 August 2011.

The MRDM study is a single-purpose ecosystem restoration study. The study area extends throughout the Pontchartrain, Breton Sound, and Barataria Basins in southeastern Louisiana, and falls within portions of St. James, St. John the Baptist, Orleans, St. Bernard, St. Charles, Jefferson, Lafourche, and Plaquemines Parishes (Figure 1) and is in Louisiana’s 1st, 2nd, and 3rd Congressional Districts. The Pontchartrain, Breton Sound, and Barataria Basins are some of the Nation’s most biologically productive estuaries and cover approximately 2.3 million acres in southeast Louisiana.

The dominant habitat types in the study area are bottomland hardwood forest (natural levee forest); wooded swamp; fresh, intermediate, brackish, and saline marshes and associated fresh to saline water bodies. Major navigation channels in the study area include the Mississippi River, the Inner Harbor Navigation Canal, the Gulf Intracoastal Waterway, and Barataria Bay Waterway.

The 1998 report, “Coast 2050: Toward a Sustainable Coastal Louisiana,” established regional and coast wide common strategies and programmatic recommendations, integrated coastal management and coastal restoration, and adopted a multiple-use approach to restoration planning including comprehensive consideration of changes in fish and wildlife populations. This report evolved into the LCA Section 905(b) reconnaissance report, which formed the basis for the broader-scale 2004 LCA Ecosystem Restoration Study, which recommended a suite of restoration strategy components making up the LCA Plan. The goal of the 2004 LCA Plan is to reverse the current trend of degradation of the coastal Louisiana ecosystem. The plan maximizes the use of restoration strategies that reintroduce historic flows of river water, nutrients, and sediment to coastal wetlands, and that maintain the structural integrity of the coastal ecosystem. The MRDM study is a large scale, long term, component recommended in the January 2005 Chief’s Report for the 2004 LCA Ecosystem Restoration Study. The Mississippi River Hydrodynamic study, another component of the 2004 LCA Plan, and the MRDM study were combined into a single study at the request of the non-Federal sponsor to have an actionable Chief’s Report.

Vertical team guidance received in August 2012 identified the MRDM study as a high-priority study for a rescoping charette. The rescoping applies to the MRDM study and not the Hydrodynamic study since it is primarily a data collection and modeling effort that will provide information for other USACE and non-USACE activities beyond the MRDM study. A planning charette was conducted for the MRDM Study in October 2012 to consider ways to rescope the study to meet the requirements of the Civil Works Transformation, the SMART Planning framework, and the 3x3x3 requirements. All schedules, timeframes, etc. detailed in this Review Plan are based on the 3x3x3 paradigm, and could change based on ongoing coordination with the Vertical Team.

The project development team (PDT) has outlined the problems, opportunities, planning constraints, and the planning goal and objectives for the study area as follows:

Problems:

- Extensive wetlands loss and ecosystem degradation in southeast coastal Louisiana has resulted in and is resulting in loss of fish and wildlife habitat.
- Historic and current river management practices have impacted natural deltaic processes, particularly sediment/nutrient and freshwater deposition which has reduced wetlands formation.
- Human alterations, such as canals and navigation channels between interior wetlands and the Gulf of Mexico have accelerated wetlands loss.

Goal: Use Mississippi River resources (freshwater and sediment/nutrients) through natural deltaic processes to restore and sustain a healthy coastal ecosystem while maintaining a balanced river management approach.

Objectives:

- Re-establish natural deltaic processes to restore the maximum number of acres of wetlands and sustain habitats in the long term.
- Maintain dynamic diversity of the coastal wetland ecosystem delta-wide over time.

Constraints (mitigation can be considered):

- Maintain flood conveyance capacity of the Mississippi River based on future without project condition.
- Maintain navigation mission of the Mississippi River based on future without project condition.
- Do not increase flood risk to coastal communities.
- Do not cause substantial and unacceptable adverse impacts to fisheries on a Delta-wide basis.

Opportunities:

- Support recreational and commercial opportunities.
- Restore degraded barrier islands and other geomorphic structures.

Assumptions:

- There will be changes to the ecosystems and habitats over time. Maintaining the status quo is not possible (or even always desirable).
- There will be a total collapse of coastal ecosystems and habitats over time if we do nothing.
- This project will operate under high levels of ecological and engineering uncertainty.

The MRDM study will analyze system-wide features on a large-scale to greatly increase the influence of the Mississippi River in basins surrounding the river. System-wide analysis of three primary basins surrounding the lower river (Barataria, Breton Sound and Pontchartrain), is being considered over a 50-year period (2070). The base year condition (the time the project is operational) of the 50-year period of analysis is assumed to be 2020.

River diversions and alternative navigation channel alignments and other actions may be considered. If channel realignments are considered in detail, the study will be rescoped and a new feasibility cost share agreement and PMP would be required to complete a full assessment of the technical, operational, social, economic, and environmental factors associated with such a significant endeavor.

Sediment introduction features are required to offset land loss due to sea level rise and subsidence. Sustainable land forms are needed to retain critical ecosystems as well as to buffer coastal communities from storms. The primary features to be considered are sediment diversions and placement of dredged sediments. The study will assess multiple restoration strategies that can significantly change the geomorphology and hydrology in targeted basins. Land building processes and the full effects of freshening ecosystems through river diversions are still debated within government agencies, academic circles, and the public. These alternatives will be further analyzed to provide conclusions to support management decisions.



Figure 1: Map of MRDM Study Area, Lower Mississippi River Watershed.

c. **Factors Affecting the Scope and Level of Review.** There is a long history of awareness of coastal issues in Louisiana dating back several decades including, for example, in April 1967 when the Committees on Public Works of the US Senate and House of Representatives authorized the USACE to study the Louisiana coastal area, “with a view to determining the advisability of improvements or modifications to existing improvements in the coastal area of Louisiana in the interest of hurricane protection, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and related water resource purposes.” There have been many efforts initiated over the years, including Coast 2050, 2004 LCA Ecosystem Restoration Study, and Louisiana’s Comprehensive Master Plan for a Sustainable Coast. As a result, there are considerable existing information and data sources available for the MRDM study to draw on. However, the MRDM study is the first large-scale, long-term component to come out of the 2004 LCA Plan. Due to the dynamic and complex nature of the deltaic region of southeast Louisiana and the need to balance the uses of the lower Mississippi River including ecosystem restoration, flood risk management, and navigation, factors potentially affecting the scope and level of review are described below:

- Multiple Users/Stakeholders of Lower Mississippi River and the Deltaic Plain: The PDT is charged with identifying large-scale alternatives to restore the maximum number of acres of coastal wetlands while maintaining habitat diversity across a large study area and balancing multiple uses of the lower Mississippi River. Existing services of the lower Mississippi River and its resources include navigation, flood risk management, and ecosystem restoration. In addition, the deltaic region of southeast Louisiana serves as a “working coast” supporting several, sometimes competing, uses including ecosystem functions, energy and other infrastructure, commercial and recreational fishing, and home to several communities including the Greater New Orleans Metropolitan Area. In developing recommendations to a large-scale problem, tradeoffs and shifts in the current coastal paradigm are expected as outlined in the planning assumptions developed by the PDT at the October 2012 charette. The project has the potential to impact a Nationally significant area and could have significant economic, environmental, and social effects. River diversions and alternative navigation channel alignments and other actions may be considered. If channel realignments are considered in detail, the study will be rescoped and a full assessment of the technical, operational, social, economic, and environmental factors associated with such a significant endeavor will be completed.
- Hydrodynamic Modeling: The deltaic region of coastal Louisiana is a dynamic and complex area presenting difficulties to modelers, especially for such a large study area. Examples of challenges from similar ecosystem restoration projects in coastal Louisiana include:
 - Limited resources to collect topographic and bathymetric data across the expansive study area;
 - Difficulty establishing boundary conditions;
 - On-going datum issues at existing gages resulting in uncertainties in field observations;
 - Difficulty accurately capturing tidal and flow exchanges/velocities at intersections of waterways/bodies; and
 - Application of limited data (e.g., meteorological data) across an expansive model grid.

All of these when combined into one modeling effort create challenges for modelers during calibration, verification and validation.

- **Commercial and Recreational Fisheries:** According to the CPRA¹, Louisiana’s commercial and fishing industries contribute \$3.5 billion and over 40,000 jobs to the state’s economy. Approximately, 21% of the fish harvested by weight in the lower 48 states comes from Louisiana’s coastal zone. The annual economic impact of recreational fishing can amount to between \$895 million and \$1.2 billion.

The MRDM study is considering large-scale measures to achieve the planning objectives. There could be significant shifts and potential tradeoffs in the make-up of the coastal estuaries potentially impacting commercial and recreational fisheries as they currently exist. However, a planning objective is to maintain dynamic diversity of the coastal wetland ecosystem delta-wide over time.

- **Essential Fish Habitat:** The Magnuson-Stevens Fishery Conservation and Management Act (MSA) provides for the conservation and management of the nation’s fishery resources through the preparation and implementation of fishery management plans (FMPs). The MSA calls for NOAA National Marine Fisheries Service (NMFS) to work with regional Fishery Management Councils to develop FMPs for each fishery under their jurisdiction. One of the required provisions of FMPs specifies that essential fish habitat (EFH) be identified and described for the fishery, adverse fishing impacts on EFH be minimized to the extent practicable, and other actions to conserve and enhance EFH be identified. The MSA also mandates that NMFS coordinate with and provide information to federal agencies to further the conservation and enhancement of EFH. Federal agencies must consult with NMFS on any action that might adversely affect EFH. When NMFS finds that a federal or state action would adversely affect EFH, it is required to provide conservation recommendations.

Large-scale shifts and possible tradeoffs are anticipated with the potential recommendations to be developed for the MRDM study. USACE will continue coordination with NMFS throughout the planning process. Most parties agree a paradigm shift is inevitable for coastal Louisiana; however, scale and temporal considerations for fisheries will be fundamental to the objective to maintain dynamic diversity.

- d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. Activities being performed in-kind include planning and management assistance (e.g., report preparation), NEPA/environmental compliance-related tasks (e.g., HTRW investigations), and various modeling efforts.

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 PMP. MVN will manage DQC activities. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the Major Subordinate Command (MSC).

- a. Documentation of DQC.** DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the PMP. It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews,

¹ Louisiana Coastal Protection and Restoration Authority, 2012. “Coastal Crisis – Land Loss.” Accessed from <http://coastal.louisiana.gov> on 15 November 2012.

supervisory reviews, PDT reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. According to the PMP all decision documents and their supporting analysis will undergo DQC. Verification from Planning Division, Programs and Project Management Division, Engineering Division, Economics Branch, Environmental Branch, Real Estate Division, Construction Division and Operations Division products will occur before the release of data /or final products to another office/division, but may include reviewers and PDT members from other functional areas. Verifications will be documented and become part of the project’s records. See Attachment 2 for Example Verification Documentation.

- b. Products to Undergo DQC.** Specific products to undergo DQC include alternative/TSP documentation, and the draft and final reports (including NEPA and supporting documentation).
- c. Required DQC Team Expertise.** The DQC Team will be comprised of individuals within of the home district that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT. It is anticipated that the team will consist of 9 to 11 reviewers.

5. AGENCY TECHNICAL REVIEW (ATR)

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 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.** Under the SMART Planning framework, the PDT will engage the Vertical Team and other elements including the ATR lead throughout the process with frequent/regular in-progress reviews and consensus decisions documented in the decision log. Therefore, concurrent reviews, including ATR, of the draft feasibility report and NEPA documentation (per ER 1105-2-100, Appendix G) will occur after the TSP Milestone.
- b. Required ATR Team Expertise.** The ATR Team will be comprised of individuals outside of the home district that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT. It is anticipated that the team will consist of 9 to 11 reviewers (Table 1).

Table 1: ATR Team

ATR Team Members/Disciplines	Expertise Required
Planning ATR Coordination/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 skills and experience to lead a virtual team. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Plan Formulation	The Planner should have extensive USACE planning experience and be familiar with the planning process and have experience in coastal ecosystem restoration projects. They should have good communication skills, knowledge, and alternative formulation and

ATR Team Members/Disciplines	Expertise Required
	comparison.
Economics	This reviewer must be experienced in civil works and related ecosystem restoration projects, and have a thorough understanding of the IWR Planning Suite. This individual may also review the socio-economic evaluation if qualified.
Environmental Analysis (impact analysis/NEPA, benefits/performance measures)	This reviewer must be experienced with NEPA compliance and have a biological or environmental background and be familiar with Gulf coastal areas. Should also have the ability to evaluate benefits/performance measures of restoration modeling (WVA, etc.).
Hydrology/ Hydraulic Engineering	This reviewer must have be familiar with ecosystem restoration planning and be an expert in multidimensional hydrodynamic, salinity, constituent and sediment transport modeling including cohesive and fine grained sediment transport modeling. Once models are selected a reviewer should be selected based on their experience and use with the specific models being used in the study. A certified professional engineer is recommended.
Engineering/Civil Design and Ops	These reviewers must be a certified professional engineer with experience in riverine and coastal engineering.
Cost Engineering (Cost Dx QA, Risk Analysis, MCACES)	This reviewer must be familiar with cost estimating for similar civil works projects. Reviewer will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination for vetting of this reviewer is required through the Walla Walla District DX for cost engineering.
Real Estate	This reviewer must be experienced in civil works real estate laws, policies and guidance and have experience working with sponsor real estate issues and coastal property rights.

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 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 Headquarters [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 resolution in accordance with the 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 it has been elevated for resolution. However, under the SMART Planning framework iterative DQC and MSC QA checks, and Regional Integration Team (RIT), ATR and USACE Office of Water Project Review (OWPR) interaction during IPRs are expected to have addressed the adequacy of the draft report content prior to the TSP milestone.

At the ATR conclusion, the ATR team will prepare a Review Report. These 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 copy of each reviewer's comments, or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all 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 [SAR]) 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 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.** Type I IEPR is required for this decision document due to the potential large scale of the recommended action, the potential for significant impacts (shifts and tradeoffs) to commercial and recreational fisheries as well as EFH, the potential for controversy or strongly differing positions, the development of an EIS, and the likelihood that mandatory IEPR triggers specified in EC 1165-2-209 will be exceeded.

Similar to the Hydrodynamic study, an “in-progress” or phased IEPR approach is requested for the analyses conducted for the final array in preparation for the TSP Milestone. Specifically, the hydrodynamic and water quality modeling will require early-on and iterative feedback due the various stakeholder concerns.

- b. **Products to Undergo Type I IEPR.** The draft Integrated Feasibility Report/EIS and technical appendices released for public review will be subject to Type I IEPR.
- c. **Required Type I IEPR Panel Expertise.** The IEPR Team will be comprised of individuals outside of the home district that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT. It is anticipated that the team will consist of 9 to 11 reviewers (Table 2).

Table 2: IEPR Members.

IEPR Team Members/Disciplines	Expertise Required
Planning ATR Coordination/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 skills and experience to lead a virtual team. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Plan Formulation	The Planner should have extensive USACE planning experience and be familiar with the planning process and have experience in coastal ecosystem restoration projects. They should have good communication skills, knowledge, and alternative formulation and comparison.
Economics	This reviewer must be experienced in civil works and related ecosystem restoration projects, and have a thorough understanding of the IWR Planning Suite. This individual may also review the socio-economic evaluation if qualified.
Environmental Analysis (impact analysis/NEPA, benefits/performance measures)	This reviewer must be experienced with NEPA compliance and have a biological or environmental background and be familiar with Gulf coastal areas. Should also have the ability to evaluate benefits/performance measures of restoration modeling (WVA, etc.).
Hydrology/ Hydraulic Engineering	This reviewer must have be familiar with ecosystem restoration planning and be an expert in multidimensional hydrodynamic, salinity, constituent and sediment transport modeling including

IEPR Team Members/Disciplines	Expertise Required
	cohesive and fine grained sediment transport modeling. Once models are selected a reviewer should be selected based on their experience and use with the specific models being used in the study. A certified professional engineer is recommended.
Engineering/Civil Design and Ops	These reviewers must be a certified professional engineer with experience in riverine and coastal engineering.
Cost Engineering (Cost DX, QA, Risk Analysis, MCACES)	This reviewer must be familiar with cost estimating for similar civil works projects. Reviewer will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination for vetting of this reviewer is required through the Walla Walla District DX for cost engineering.
Real Estate	This reviewer must be experienced in civil works real estate laws, policies and guidance and have experience working with sponsor real estate issues and coastal property rights.

- d. Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, Appendix D. Panel comments will be compiled by the OEO 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 4.d 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, ATR, and IEPR augment and complement the policy review processes by addressing compliance with Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8. COST ENGINEERING 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 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 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.

- a. **Planning Models.** Planning models include models or a suite of models that are utilized to create outputs which are subsequently used to justify the tentatively selected plan. Planning models are certified for use and ensure that standards are applied equally in ecosystem restoration projects (Table 3).

Table 3: Planning Models.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
WVA	The Wetland Value Assessment (WVA) methodology provides an estimate of the number of acres benefited by the project and the net acres of habitat protected or restored. WVA was developed specifically to apply to habitat types present along the Louisiana coast. Specifically, these are potential changes in salinity, stress and death of marsh vegetation, and further loss or degradation of already stressed coastal marshes. Variables utilized in the WVA were selected from existing, widely accepted Habitat Evaluation Procedures models.	Certified except for marsh modules.

The PDT may decide to use additional planning models.

- b. **Engineering Models.** Engineering models assist in the evaluation of the existing and future conditions to gauge the effects of the tentatively selected plan on the surrounding environment, but are not used to determine the outputs for the benefits of the plan itself. Engineering models involved the application of science and can be used in both the design of the project alternative measures as well as the assessment of effects (Table 4).

Table 4: Engineering Models.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study
ADH	The ADaptive Hydraulics Modeling (ADH) system is capable of handling both saturated and unsaturated groundwater, overland flow, three-dimensional Navier-Stokes flow, and two- or three-dimensional shallow water problems. The system will be used for hydrodynamic, salinity, and sediment transport modeling.
RMA-2/RMA-4 Model	The numerical models RMA-2 and RMA-4 were used in the Donaldsonville to the Gulf study to compute hydrodynamics and transport, respectively. RMA-2 and RMA-4 are part of a family of iso-parametric, finite element models originally developed by Resource Management Associates, Inc., supported by USACE, and included in the Surface-Water Modeling System (SMS) interface. These hydrodynamic models are two-dimensional, depth-averaged, free surface, shallow-water wave models and assume uniform conditions in the vertical dimension. The models will be used for the purpose of determining water surface elevations and salinity.

The PDT may decide to use additional engineering models.

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The anticipated cost for ATR is approximately \$100,000. The schedule for review is shown in Figure 1 and Table 5.
- b. **Type I IEPR Schedule and Cost.** The anticipated cost for Type I IEPR is approximately \$200,000. The schedule for review is shown in Figure 1 and Table 5.

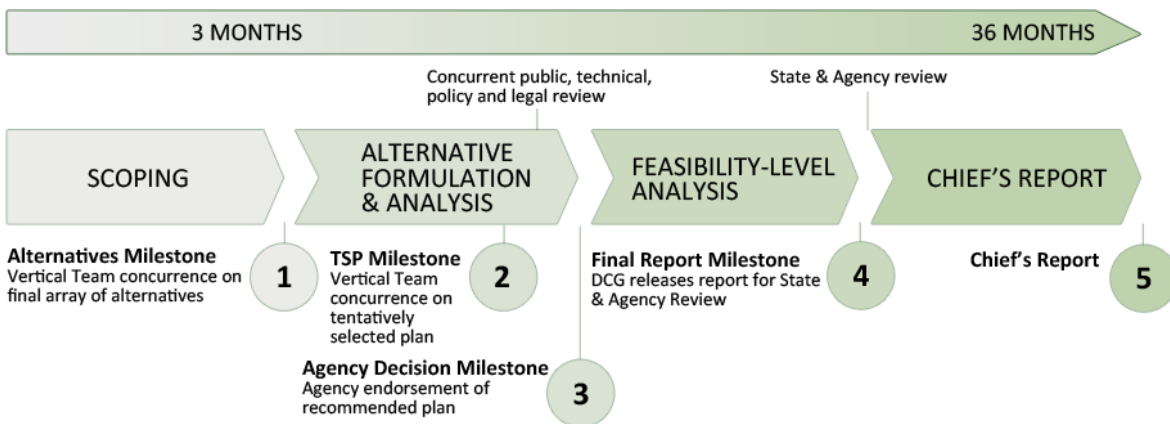


Figure 1: SMART Planning Paradigm.

Table 5: SMART Planning Milestones. (Assumes a start date of 15 November 2012.)

Milestone	Feasibility Level Design					
	Formulated Array	Alternative Milestone	TSP Milestone	Agency Decision	Final Report	Chief's Report
Duration	(3 months)	(6 months)	(1.5 years)	(6 months)	(6 months)	(3 months)
Start Date	15-Nov-12	15-Feb-13	15-Feb-13	15-Aug-14	15-Feb-15	15-Aug-15
Completion Date	15-Feb-13	15-Aug-13	15-Aug-14	15-Feb-15	15-Aug-15	15-Nov-15

c. Model Certification/Approval Schedule and Cost. The WVA is presently approved for regional or nationwide use in accordance with documented geographic range, best practices and its designed limitations (see PCX and/or model review history for details). The PCX is comfortable with application of the planning model and/or the model has been reviewed and issues concerning the model and its documentation have been resolved to the satisfaction of the PCX.

11. PUBLIC PARTICIPATION

Release of the draft feasibility study report and draft EIS for public review will occur concurrently along with technical, policy and legal review after the TSP Milestone. This is in accordance with the SMART Planning framework.

The current schedule has a 45-day public review initiating in 2015. There may be public concerns regarding this project, especially the commercial fishing industry, navigation industry, and/or communities located in and around the receiving areas of potential large-scale diversions. The public review of Federal or state permits will take place during draft report public review. Upon completion of the public review period, comments will be consolidated and addressed, if needed. A summary of the comments and resolutions will be included in the final report.

A formal State and Agency review will occur during the concurrent public, technical, policy, and legal review after the TSP Milestone. Extensive coordination with these agencies will occur concurrently with the planning process. There may be possible State and Agency concerns regarding impacts to fisheries.

12. REVIEW PLAN APPROVAL AND UPDATES

The Mississippi Valley 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. 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 Review 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

Public questions and/or comments on this Review Plan can be directed to the following staff:

- Cherie Price, Plan Formulator, Home District 504-862-2737
- Danny Wiegand, Plan Formulator, Home District 504-862-1373
- Tim Axtman, Senior Plan Formulator, Home District, 504-862-1921
- Bill Hicks, Project Manager, Home District, 504-862-1945
- Darrel Broussard, Senior Project Manager, Home District, 504-862-2702
- Jodi Creswell, ECO-PCX Program Manager, 309-794-5448
- Beth Marlowe, Regional Integration Team, 202-761-0297

ATTACHMENT 1: TEAM ROSTERS

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IEPR TEAM			
TBD	TBD	TBD	TBD

ATTACHMENT 2: STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the feasibility report for the Louisiana Coastal Area (LCA) Mississippi River Delta Management Study. 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 U.S. 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
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

Chief, Engineering Division

Office Symbol

SIGNATURE

Gregory B. Miller

Chief, Planning Division

CEMVN-PD-P

Date

Date

¹ Only needed if some portion of the ATR was contracted

STATEMENT OF DISTRICT QUALITY CONTROL

CEMVN-PD

DATE: January 2012

MEMORANDUM FOR RECORD

SUBJECT: District Quality Control – Louisiana Coastal Area WRDA 2007, Section 7006 (e)(1) Projects Feasibility Report

1. Reference:
EC 1165-2-209, 31 Dec 2009, subject: Civil Works Review Policy.
2. EC 1165-2-209 Paragraph 5(d) requires that all civil works planning, engineering, and O&M products must undergo District Quality Control (DQC).
3. MVN has conducted a DQC review of the subject product in accordance with EC 1165-2-209 Paragraph 8. The Project Delivery Teams (PDTs) have conducted a review of the product (including appendices). It has also been reviewed by the Plan Formulation Branch Chief. It meets the requirements of technical sufficiency for a Final Feasibility Report.
4. CEMVN-PD recommends transmittal and approval of the report.

Troy G. Constance
Chief, Regional Planning and
Environment Division, South

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

2004 LCA Plan: LCA, Louisiana, Ecosystem Restoration study
ADH: ADaptive Hydraulics Modeling system
ATR: Agency Technical Review
CEMVN: U.S. Army Corps of Engineers, New Orleans District
CPRA: State of Louisiana Coastal Protection and Restoration Authority
DQC: District Quality Control
DX: Directory of Expertise
EC: Engineering Circular
ECO-PCX: National Ecosystem Restoration Planning Center of Expertise
EFH: Essential Fish Habitat
EIS: Environmental Impact Statement
ER: Engineering Regulation
FMP: Fishery Management Plans
HQUSACE: USACE Headquarters
IEPR: Independent External Peer Review
LCA: Louisiana Coastal Area
MRDM: Mississippi River Delta Management Study
MSA: Magnuson-Stevens Fishery Conservation and Management Act
MSC: Major Subordinate Command
NEPA: National Environmental Policy Act
NMFS: NOAA National Marine Fisheries Service
PCX: Planning Center of Expertise
PDT: Project Delivery Team
PMP: Project Management Plan
OEO: Outside Eligible Organization
OWPR: USACE Office of Water Project Review
RIT: Regional Integration Team
RMC: Risk Management Center
RMO: Risk Management Organization
SAR: Safety Assurance Review
SMS: Surface-Water Modeling System
USACE: U.S. Army Corps of Engineers
WRDA: Water Resource Development Act
WVA: Wetland Value Assessment