



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

REPLY TO  
ATTENTION OF:

CEMVD-PD-N

29 Aug 2011

MEMORANDUM FOR Commander, New Orleans District

SUBJECT: Review Plan - Louisiana Coastal Area - Medium Diversion at Myrtle Grove with Dedicated Dredging Construction Report

1. References:

a. EC 1165-2-209, Civil Works Review Policy, 31 Jan 10.

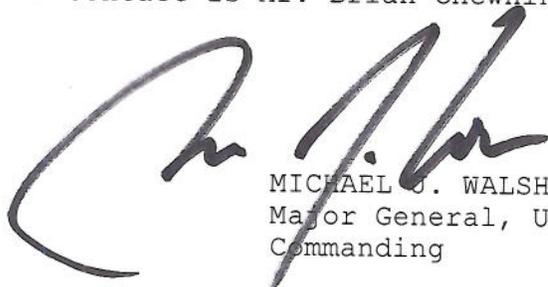
b. Memorandum, CEMVD-PD-N (ECO-PCX), 17 Mar 11, subject: The Louisiana Coastal Area Medium Diversion at Myrtle Grove with Dedicated Dredging, Ecosystem Restoration Planning Center of Expertise Endorsement of Review Plan (encl).

2. I hereby approve subject Review Plan (RP) as enclosed and concur in the conclusion that an independent external peer review of this project is necessary. The proposed RP has been coordinated with the Ecosystem Restoration Planning Center of Expertise (ECO-PCX), and they recommend approval. The RP in accordance with EC 1165-2-209 complies with all applicable policy and provides an adequate independent technical review of the plan formulation, engineering and environmental analyses, and other aspects of the plan development. As the RP is a living document, it should be monitored and amended as appropriate to incorporate additional review requirements if the project moves into the implementation phase. Non-substantive changes to this RP do not require further approval.

3. The District should post the RP to its website and provide a link to the ECO-PCX for their use.

4. The MVD point of contact is Mr. Brian Chewning, CEMVD-PD-N, (601) 634-5836.

Encl

  
MICHAEL J. WALSH  
Major General, USA  
Commanding

CF:

CEMVD-PD-N (ECO-PCX, Staebell)  
CEMVN-PM-W (Sims)  
CECW-MVD

# **REVIEW PLAN**

**Louisiana Coastal Area – Medium Diversion at Myrtle Grove  
with Dedicated Dredging Construction Report**

**New Orleans District (MVN)**

**MSC Approval Date: 29 August 2011**

**Last Revision Date: 8 August 2011**



**US Army Corps  
of Engineers®**

**REVIEW PLAN**

**Louisiana Coastal Area – Medium Diversion at Myrtle Grove  
with Dedicated Dredging Construction Report**

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## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Louisiana Coastal Area (LCA) Medium Diversion at Myrtle Grove with Dedicated Dredging Construction Report.

### b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (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) LCA Medium Diversion at Myrtle Grove PMP

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 1105-2-407).

## 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 Ecosystem Restoration Planning Center of Expertise (ECO-PCX).

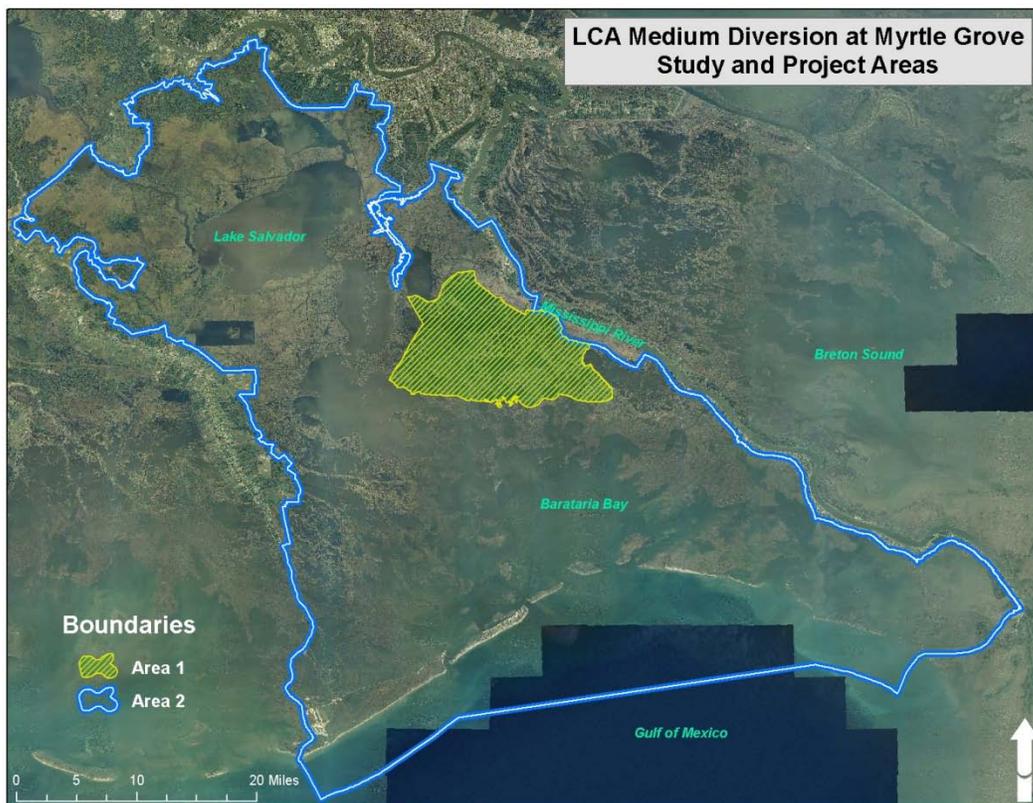
The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. As with previous LCA studies, the Walla Walla District (NWW) Cost Engineering Branch Directory of Expertise will be used for this process.

## 3. STUDY INFORMATION

a. **Decision Document.** Per language from the Water Resources Development Act of 2007 (WRDA), Section 7006 (c)(1)(E), referencing the LCA Medium Diversion at Myrtle Grove with Dedicated Dredging project (MDMG), the Secretary is authorized to carry out this project substantially in accordance with the restoration plan outlined in the 2005 LCA Chief's Report. *WRDA Section 7006 (c)(3) Construction Reports* states that "Before the Secretary may begin construction of any project under this subsection, the Secretary shall submit a report documenting any modifications to the project, including cost changes, to the Committee on Transportation and Infrastructure of the House of Representatives." A supplemental EIS will be tiered off of the LCA programmatic document and made part of the construction report. It is considered authorized once the construction report is

submitted. Ultimate approval will come from the Assistant Secretary of the Army for Civil Works ASA(CW).

- b. Study/Project Description.** The MDMG, a single-purpose ecosystem restoration project, is identified as a critical restoration feature in the 2005 LCA Report. The project is located in Plaquemines Parish, Louisiana on the right descending bank of the Mississippi River near the community of Ironton (river mile 61 above Head-of-Passes). A range of locations may be considered for placing the diversion structure and dedicated dredging but this will be determined during the course of the report. The recommended plan is to construct a medium sized diversion (2,500 to 15,000 cfs) along with dedicated dredging to directly create up to 6,500 acres of marsh in the vicinity of Myrtle Grove, Louisiana. Myrtle Grove is located on the west bank of the Mississippi River in Plaquemines Parish at river-mile marker 61 above Head-of-Passes. A graphic of the proposed location is shown below. The project is designed for ecosystem restoration and will calculate National Ecosystem Restoration (NER) benefits. Potential measures include different types of diversion structures (siphons, box culverts, etc.), weirs, terraces, vegetative plantings, or Mississippi River/localized dredging. WRDA authorized the cost at \$278.3M but allows for a 150% adjustment which pushes the overall budget up to a maximum of about \$417M. There is no 902b cost-cap adjustment for the project. The non-Federal sponsor is the State of Louisiana and preparation of the construction report is being cost-shared 50/50.



Implementation guidance received for the LCA projects on 10 July 2009 contains several references to the MDMG project. Section 7(c)(iii) of that guidance provides details about the critical near-term projects and states that "The feasibility level of detail decision documents will be provided to MVD and CECW-MVD for policy review and completion of a 'Director of Civil Works Report' and Draft Record of Decision (ROD). The Director of Civil Works Report and the draft ROD will be transmitted

to the ASA(CW) for review and approval.” At the same time, WRDA 2007 calls for a ‘Construction Report’ to be completed for the MDMG project. The Construction Report is intended to provide the required feasibility level of detail that was outlined in the 2004 LCA Main Report which described the original Myrtle Grove project. Although the report terms are confusing, the PDT is developing the project to feasibility level of detail and is referring to the write-up as a construction report. The report will be accompanied by a separate EIS.

- c. **Factors Affecting the Scope and Level of Review.** This project will produce a supplemental EIS due to the significant (positive) impact to the environment, strong interagency interest, and the scope of the project. It is not likely that the project will have significant negative economic, environmental or social effects to the Nation. Significant adverse impacts on scarce or unique cultural, historic, or tribal resources are not anticipated and there are not expected to be adverse impacts on fish and wildlife threatened or endangered species or their habitat under the Endangered Species Act. No mitigation is anticipated to compensate for project construction. Changes in habitat and species distribution in the area surrounding the diversion could occur due to changes in the salinity regime. This would include both recreationally and commercially important species such as shrimp or oysters.

There are potential impacts to navigation on the Mississippi River both through the construction of the diversion structure and dedicated dredging. Induced shoaling effects, though unlikely, will also be examined during the feasibility analysis. Additionally, the recommended placement of the LCA Medium Diversion at White Ditch project could occur directly across the Mississippi River from the MDMG location. Another LCA effort, the Mississippi River Delta Management study is expected to begin soon and will be tasked with evaluating the effects of multiple diversions on the Mississippi River and the surrounding estuaries. It also will examine different locations and capacities for planned and future diversions.

A new Federal levee system is currently being designed and is expected to be under construction or complete by the time the MDMG study finishes. This will require certain considerations when planning for cost and design features, some of which may be unknown as the MDMG study progresses. Regardless of the phase the new levee work is in, the MDMG study will coordinate closely with the levee teams to ensure an awareness of project developments and to maximize efficiency. Since the focus of the MDMG project is ecosystem restoration, it is not expected that coordination with the Flood Risk Management PCX or the Inland Navigation PCX will be necessary.

Controversy associated with diversion projects has been expressed. Existing diversion projects are criticized by some stakeholders as being inefficient at creating new marsh and incurring detrimental effects such as undesirable habitat changes. Public scoping meetings held in November 2010 indicate that not everyone agrees about what the proper techniques are for restoring coastal Louisiana. This could result in added scrutiny of the project. Additionally, management plans for the Barataria Basin have been created by the Barataria-Terrebonne National Estuary Program which would have to be reconciled with MDMG recommended alternatives.

Uncertainties exist in predicting habitat benefits for diversion projects. New research indicates that structure location on the Mississippi River plays a very important role in determining how much sediment can be diverted into surrounding marshes. As with most ecosystem restoration projects, there is little risk to life safety inherent to the project. The team plans to reduce this risk by using standard and conservative designs for structures, utilizing a robust public involvement plan to

articulate the proposed project features, and ensuring a transparent study process. Risk of project failure after implementation is expected to be minimal.

The MDMG study will rely heavily on lessons learned from existing diversion projects as well as comments and recommendations during the evaluation and study phase for new diversions. The PDT is already actively involved in arranging and holding stakeholder update meetings to inform interested parties of project developments and to solicit expertise and opinion on certain proposed project features. Examples include operational plans, structure capacity, and coordination with other diversions. Emphasis has been placed on keeping stakeholders updated on project developments to help minimize controversy and to ensure interest groups are aware of the project status.

The project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule. Discussion of and details as to why or why not will be finalized as the study progresses in the PED phase.

- d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors such as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include:

- (1) Hydrodynamic modeling of the Barataria Basin
- (2) Preliminary structure designs
- (3) Sediment analysis potential of the Mississippi River

All of these products, though initiated by the non-Federal sponsor, will be reviewed and adjusted to conform to USACE standards for quality and completeness.

#### **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.** DQC will be performed at milestones where ATR is required (Feasibility Scoping Meeting, Alternative Formulation Briefing, draft decision and NEPA documents, and final decision and NEPA documents). Prior to submittal of review products to the ATR team, the PDT will review all documents and report products for quality and consistency with USACE standards and regulations. Review will also be completed by the non-Federal sponsor and relevant participating agencies as part of the DQC process. A memorandum will be signed by the appropriate District technical review leads and submitted to the ATR team as part of the review package.
- b. Products to Undergo DQC.** The construction report and SEIS, along with supporting appendices will be reviewed for DQC prior to ATR submittal.
- c. Required DQC Expertise.** N/A

## 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 construction report and supplemental EIS will be submitted to the ATR team for review. There are numerous appendices that will be included as part of the combined report that will also undergo ATR including the engineering analysis, cultural resources analysis, and water quality analysis. All components of the report will be submitted to the ATR team for review in their current state of development. Currently, there are three ATR's scheduled for the following project milestones: 1) Feasibility Scoping Meeting, 2) Alternative Formulation Briefing, and 3) review of final draft report. Key members of the ATR team will also be asked to participate during interim milestones such as In-Progress Reviews.
- b. **Required ATR Team Expertise.** The ATRT will be comprised of individuals 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 9-11 reviewers. The ATRT members will be identified at the time the first review is conducted and will be presented in appendix B in an updated review plan.

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 a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	Reviewer must have strong planning background related to coastal ecosystem restoration projects, good communication skills, extensive knowledge of the planning process and experience with alternative formulation and comparison. It is recommended that this discipline also serve as the team leader.
Economics	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 Resources	Reviewer must be experienced with National Environmental Policy Act (NEPA) compliance and have a biological or environmental background that is familiar with coastal areas. Additionally, the reviewer must have experience with urban projects and impacts, evaluation of social impacts associated with ecosystem restoration projects, and public coordination.
Hydrology/Hydraulic Engineering	Example Description: The hydraulic engineering reviewer will be an expert in the field of hydraulics and have a thorough understanding of open/closed channel dynamics and systems, and/or computer modeling techniques that will be used such as RMA-2, RMA-4, and TABS. It is recommended that the reviewer have experience with sediment modeling, especially in the Mississippi River.
Coastal Engineering	
Geotechnical Engineering	Team member must be experienced in dredged material placement design and construction, and capable of evaluating impacts of wave energy and geomorphic processes to the proposed project features. A certified professional engineer is recommended.
Civil Engineering	Reviewer must have experience in dredged material placement, sediment transport, and shoreline restoration. A certified professional engineer is necessary.
Structural Engineering	Several proposed freshwater and sediment diversion structures may be utilized for this project. The reviewer should be familiar with how these different designs could influence the success of the project.
Cost Engineering	Reviewer must be familiar with cost estimating for similar civil works projects using MCACES. 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 NOT required through the Walla Walla District Directory of Expertise (DX) for cost engineering because Congressional authorization is NOT required for the project.
Real Estate	Team member must be experienced in civil work real estate laws, policies and guidance and 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 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 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.

**Decision on IEPR.** This decision document will present the details of a feasibility study undertaken to solve a water resource problem as described in Section II. A Type I IEPR will be conducted for the following reasons:

- 1) **Cost** – The total project cost will exceed \$45 Million. Estimated implementation cost is \$417 million.
- 2) **Environmental Impact Statement** – The study will produce an EIS.

Type II IEPR will not be conducted on the MDMG project since there are not expected to be any life safety issues either during design or the eventual construction.

**IEPR Method.** Restoration of coastal areas requires assessment of complex natural systems, including wave patterns; wind patterns; ocean, inlet and bay currents; sediment transport and placement; vegetative colonization; salinity changes due to freshwater inflow and marine forcing; and dynamics of the Mississippi River due to project influences. The IEPR will focus on the formulation of the restoration plan and will address these principles. The review panel will be composed of at least 4 individuals with expertise in coastal geomorphology and processes, tidal habitat, coastal engineering and others. The District requests assistance from the ECO-PCX in determining the appropriate qualifications for panel members. The public will not be asked to nominate panel members. The entire feasibility report with appendices will be provided to the IEPR panel. It is recommended that the panel conduct a site visit if possible.

WRDA 2007 Section 7009 establishes a specific requirement for external peer review of LCA projects. The law notes that a Louisiana Water Resources Council “shall serve as the exclusive peer review panel for activities conducted by the Corps of Engineers in the areas in the State of Louisiana declared as major disaster areas in accordance with section 401 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170) in response to Hurricane Katrina or Rita of 2005, in accordance with the requirements of section 2034.” This council has not been established but is expected to be organized and functioning by the time this project will require IEPR.

Until the external Louisiana Water Resources Council is established and operational, IEPR for the LCA Program will be managed by an Outside Eligible Organization (OEO) to be selected by the ECO-PCX. The ECO-PCX will follow the process established in EC 1105-2-410 in managing the IEPR. The OEO will select panel members. MVN suggests use of the LCA Science Advisory Board or the National Academy of Science as possible panel sources.

**Timing and Schedule.** The IEPR will be conducted after ATR and concurrently with the AFB of the draft report. The IEPR is scheduled to begin May 2012 at an estimated cost of \$200,000. The following is the draft schedule for the IEPR:

Task	Schedule
Initial Coordination with ECO-PCX	TBD
ECO-PCX Prepares IEPR Scope of Work	TBD
IEPR Contract Awarded	TBD
IEPR Review Initiated	May 2012
Final IEPR Report Submitted	August 2012

The panel will provide timely written and oral comments throughout the development of the project as requested. Written comments will be submitted using DrChecks. The panel will prepare and submit a final report, no more than 60 days following receipt of the AFB project guidance memo for the draft project study to enable the district to address all necessary actions before the final report is completed. The report will contain the panel's economic, engineering, and environmental analysis of the project study, including the panel's assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used. The recommendations and responses will be presented to the Civil Works Review Board by the District Engineer with an IEPR panel or OEO representative participating, preferably in person. HQUSACE will consider all recommendations contained in the report and prepare a written response for all recommendations adopted or not adopted. Written recommendations of the panel and the responses of HQUSACE shall be made available to the public on the PCX website.

- a. **Products to Undergo Type I IEPR.** The draft construction report and supplemental EIS will be submitted to the IEPR team for review. There are numerous appendices that will be included as part of the combined report that will also undergo IEPR including the engineering analysis, cultural resources analysis, and water quality analysis. All components of the report will be submitted to the ATR team for review in their current state of development.
- b. **Required Type I IEPR Panel Expertise.** N/A, but it is expected that disciplines for IEPR arranged by the Louisiana Water Resources Council will mimic that of the ATR team.

IEPR Team Members/Disciplines	Expertise Required
Planning	Reviewer must have strong planning background related to coastal ecosystem restoration projects, good communication skills, extensive knowledge of the planning process and experience with alternative formulation and comparison. It is recommended that this discipline also serve as the team leader.
Economics	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 Resources	Reviewer must be experienced with National Environmental Policy Act (NEPA) compliance and have a biological or environmental background that is familiar with coastal areas. Additionally, the reviewer must have experience with urban projects and impacts, evaluation of social impacts associated with ecosystem restoration projects, and public coordination.
Hydrology/Hydraulic Engineering	Example Description: The hydraulic engineering reviewer will be an expert in the field of hydraulics and have a thorough understanding of open/closed channel dynamics and systems, and/or computer modeling techniques that will be used such as RMA-2, RMA-4, and TABS. It is recommended that the reviewer have experience with sediment modeling, especially in the Mississippi River.
Coastal Engineering	
Geotechnical Engineering	Team member must be experienced in dredged material placement design and construction, and capable of evaluating impacts of wave energy and geomorphic processes to the proposed project features. A certified professional engineer is recommended.
Civil Engineering	Reviewer must have experience in dredged material placement, sediment transport, and shoreline restoration. A certified professional engineer is necessary.
Structural Engineering	Several proposed freshwater and sediment diversion structures may be utilized for this project. The reviewer should be familiar with how these different designs could influence the success of the project.
Cost Engineering	Reviewer must be familiar with cost estimating for similar civil works projects using MCACES. 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 NOT required through the

	Walla Walla District Directory of Expertise (DX) for cost engineering because Congressional authorization is NOT required for the project.
Real Estate	Team member must be experienced in civil work real estate laws, policies and guidance and experience working with sponsor real estate issues and coastal property rights.

c. **Documentation of Type I IEPR.** The IEPR panel will be managed by the Louisiana Water Resources Council, as defacto Outside Eligible Organization (OEO), or managed by an 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 would 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 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 1105-2-407 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 1105-2-407 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).

**Planning Models.** The following planning models are anticipated to be used in the development of the decision document:

- A. **General.** Most of the models to be employed in the study have either been developed by or for the USACE.

### Ecosystem Output Model –

The Wetland Value Assessment (WVA) methodology is a quantitative habitat-based assessment methodology developed for use in determining wetland benefits of project proposals submitted for funding under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). The WVA quantifies changes in fish and wildlife habitat quality and quantity that are expected to result from a proposed wetland restoration project. The results of the WVA, measured in Average Annual Habitat Units (AAHUs), can be combined with cost data to provide a measure of the effectiveness of a proposed project in terms of annualized cost per AAHU gained. In addition, the WVA methodology provides an estimate of the number of acres benefited or enhanced by the project and the net acres of habitat protected/restored.

The WVA has been developed strictly for use in determining the wetland benefits of proposed CWPPRA projects; it is not intended to provide a detailed, comprehensive methodology for establishing baseline conditions within a project area. Some aspects of the WVA have been defined by policy and/or functional considerations of the CWPPRA; therefore, user-specific modifications may be necessary if the WVA is used for other purposes.

The WVA is a modification of the Habitat Evaluation Procedures (HEP) developed by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 1980). HEP is widely used by the Fish and Wildlife Service and other Federal and State agencies in evaluating the impacts of development projects on fish and wildlife resources. A notable difference exists between the two

methodologies, however, in that HEP generally uses a species oriented approach, whereas the WVA utilizes a community approach.

The WVA model is completing model certification in accordance with EC 1105-2-407, May 2005 Planning Models Improvement Program: Model Certification. The model has undergone external review which is documented in the July 8, 2009, Draft Model Certification Review Report for the Wetland Value Assessment Models prepared by the Battelle Memorial Institute for the US Army Corps of Engineers, Ecosystem Planning Center of Expertise. The WVA revision documentation and spreadsheets have been submitted to the ECO-PCX. The ECO-PCX has reviewed the revisions and will forward a recommendation to certify the model for use in the LCA projects.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
IWR Planning Suite	IWR has developed IWR-PLAN Decision Support Software to assist with the formulation and comparison of alternative plans. IWR-PLAN can assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR-PLAN can assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans that are the best financial investments and displaying the effects of each on a range of decision variables.	IWR Planning Suite is certified.
Wetland Value Assessment (WVA)	The WVA will quantify changes in fish and wildlife habitat quality and quantity that are expected to result from this wetland restoration project. The results of the WVA, measured in Average Annual Habitat Units (AAHUs), will be combined with cost data to provide a measure of the effectiveness of the project in terms of annualized cost per AAHU gained. In addition, the WVA methodology will provide an estimate of the number of acres benefited or enhanced by the project and the net acres of habitat protected/restored.	Model certification is in process but is allowed for use on LCA projects.

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

MCACES: This is a cost estimating model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989.

SAND II Model - The methodology was developed to estimate the benefits of nutrients and sediments introduced into coastal marshes and to improve the predictability of coastal restoration alternatives. The methodology employs commonly used quantifiable measures to characterize various wetland types and to predict trends of wetland condition. Because soil and vegetation are the primary components that form the structure of the wetland area, those components are used to establish the minimum requirements to sustain a wetland. This model is currently under development by ERDC and has been used on other LCA projects.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
RMA-2	RMA2 is a two dimensional depth averaged finite element hydrodynamic numerical model. It computes water surface elevations and horizontal velocity components for subcritical, free-surface flow in two dimensional flow fields. RMA2 computes a finite element solution of the Reynolds form of the Navier-Stokes equations for turbulent flows. Friction is calculated with the Manning's or Chezy equation, and eddy viscosity coefficients are used to define turbulence characteristics. Both steady and unsteady state (dynamic) problems can be analyzed.	Supported by the Coastal & Hydraulics Laboratory
RMA-4	RMA4 is a finite element water quality transport numerical model in which the depth concentration distribution is assumed uniform. It computes concentrations for up to 6 constituents, either conservative or non-conservative, within the computational mesh domain.	Supported by the Coastal & Hydraulics Laboratory
DELFT 3D	Delft3D is a world leading 3D modeling suite to investigate hydrodynamics, sediment transport and morphology and water quality for fluvial, estuarine and coastal environments. ( <a href="http://delftsoftware.wldelft.nl/">http://delftsoftware.wldelft.nl/</a> )	Not on the supported list of the Coastal & Hydraulics Laboratory
HECRAS	HEC-RAS allows you to perform one-dimensional steady flow, unsteady flow, sediment transport/mobile bed computations, and water temperature modeling.	Supported by the Hydrologic Engineering Center of the Institute for Water Resources
FLOW 3D	FLOW-3D provides flow simulation solutions for engineers investigating the dynamic behavior of liquids and gases in a wide range of physical processes. It specializes in the solution of time-dependent (transient), free-surface problems in one, two and three dimensions, and models confined flows and steady-state problems. ( <a href="http://flow3d.com">http://flow3d.com</a> )	Not on the supported list of the Coastal & Hydraulics Laboratory
HEC-6T	HEC-6T is titled "Sedimentation in Stream Networks (HEC-6T)." It is an enhancement of the Corps program HEC-6 (Scour and Deposition in Rivers and Reservoirs) but is proprietary and is owned by MBH Software. ( <a href="http://www.mbh2o.com/hec6t.html">http://www.mbh2o.com/hec6t.html</a> )	Not on the supported list of the Coastal & Hydraulics Laboratory (but HEC-6 is supported)

MCACES II	This is a cost estimating model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989. This will be used to determine and validate cost estimates.	The DX will provide certification of the final total project cost.
ERDC SAND II Model	SAND II is an ecohydraulic engineering model specifically designed to assess the effectiveness of potential diversion projects on restoration of land in coastal marshes. It focuses on several variables that are dependent upon structure operation including historic land loss, compaction, subsidence, nutrient cycling, sediment accumulation, nitrogen accumulation, etc.	Model has been developed and refined by ERDC and was used on other LCA projects as an engineering model.

## 10. REVIEW SCHEDULES AND COSTS

**ATR Schedule and Cost.** An ATR Manager from outside of the Mississippi Valley Division (MVD) will be designated by the ECO-PCX to lead the ATR process. In general, the ATR Manager is responsible for providing information necessary for setting up the review, communicating with the Team Leader, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team (ATRT), ensuring that the ATRT has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR had been conducted and resolved in accordance with policy. The anticipated cost of the all reviews is approximately \$150,000.

(1) Throughout the development of this document, the team will hold planning milestone reviews to ensure planning quality. Senior staff and subject matter experts from the PDT District and members of the vertical team (DST, Planning COP, RIT) will attend the reviews and provide comments on the product to date.

(2) The ATR will begin prior to the Feasibility Scoping Meeting and end immediately prior to the submission of the report to Corps Headquarters.

(3) The PDT will hold “page-turn” sessions to review the draft reports and ensure consistency across the disciplines and resolve any issues prior to the start of ATR periods. Writer/editor services will be performed on the drafts prior to ATR periods as well.

(4) The ATR process is integrated with the planning process. The timeline below shows when the reviews will take place. Involvement of the ATR team is indicated in the second column of the table. Actual dates will vary depending on availability of funding. It may be necessary for the ATR team to review the report after the Alternative Formulation Briefing and Public and Agency Reviews if substantial changes to the report are made as a result of review comments. The ATR team leader will be asked to make this determination. The ATR team leader will attend the Feasibility Scoping Meeting and the Alternative Formulation Briefing.

Review Milestone	ATR Team Involvement	Scheduled/Actual Date
In Progress Reviews (IPRs)	X	Continuous
ATR of Feasibility Scoping Meeting Package (or draft report)	X	Feb 2011
Feasibility Scoping Meeting	X (partial team)	May 2011
ATR of Draft Report (pre AFB)	X	Mar 2012
IEPR		May 2012
Alternative Formulation Briefing (AFB)	X (partial team)	Jul 2012
Public Review of Draft Report		Dec 2012
ATR of Final Report	X	Feb 2013
CWRB (if necessary)	X (partial team)	May 2013
State and Agency Review		Jun 2013
Final Report Submission		Aug 2013

**a. Type I IEPR Schedule and Cost.**

IEPR Milestone	Schedule Date
Initial Coordination with Eco-PCX	TBD
Eco-PCX Prepares IEPR Scope of Work	TBD
IEPR Contract Awarded	TBD
IEPR Review Initiated	22 May 2012
Final IEPR Report Submitted	TBD

**b. Model Certification/Approval Schedule and Cost.** N/A: All the models anticipated to be used are already certified or approved for use.

**11. PUBLIC PARTICIPATION.** Release of the draft document for public review will occur after issuance of the AFB policy guidance memo and concurrence by HQUSACE. Whenever feasible and appropriate, the District will make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. ATR and IEPR reviewers will be provided with all public comments.

Public review of this document is scheduled to begin after the completion of the AFB process and issuance of the HQUSACE policy guidance memo. The estimated time frame for this review is December 2012. The period will last 45 days. There may be possible public concerns regarding this project but no specific issues have been raised to date.

A formal State and Agency review will occur after the release of the final report is approved by the Civil Works Review Board. However, intensive coordination with these agencies will occur concurrently with the planning process. There may be possible coordinating parties' regarding this project but no specific issues have been raised to date.

Upon completion of the review period, comments will be consolidated in a matrix and addressed, if needed. A summary of the comments and resolutions will be included in the document.

A website is maintained for the LCA program and draft documents will be posted there for review and download. Additionally, there is expected to be a significant public outreach process that will allow the PDT to provide project updates directly to interested stakeholders and the general public. Details of this process are not yet complete, but the desire for periodic updates was expressed several times during the public scoping meetings held in November 2010.

## **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. 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**

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

- MVN Planning Lead: Andrew MacInnes – (504) 862-1062
- MVR Eco-PCX Lead: Camie Knollenberg – (309) 794-5487
- SAJ ATR Coordinator: Jim Baker – (904) 232-2698

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>
8 Dec 2010	Review Plan document submitted for initial approval	
11 Jan 2011	Draft review plan updated per reviewer comments	
18 Jan 2011	Final review plan submitted to Eco-PCX	

**ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS**

<b>Term</b>	<b>Definition</b>	<b>Term</b>	<b>Definition</b>
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
LCA	Louisiana Coastal Area	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MDMG	Medium Diversion at Myrtle Grove	WRDA	Water Resources Development Act
MSC	Major Subordinate Command		