



U.S. Army Corps  
of Engineers

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# Louisiana Coastal Protection and Restoration

## ENCLOSURE M

### External Peer Review Report

Preliminary Technical Report to Congress  
June 2006

**EXTERNAL PEER REVIEW REPORT**

**for**

**Louisiana Coastal Protection and Restoration (LACPR) Project  
Preliminary Technical Report (PTR)**

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# **EXTERNAL PEER REVIEW REPORT**

**for**

## **Louisiana Coastal Protection and Restoration (LACPR) Project Preliminary Technical Report (PTR)**

### **EXECUTIVE SUMMARY**

Under the Department of Defense Appropriations Act of 2006 (P.L. 109-148), Congress directed the U.S. Army Corps of Engineers (USACE) to initiate a 24-month endeavor, the Louisiana Coastal Protection and Restoration (LACPR) project. The project is intended to identify, describe, and propose a full range of flood control, coastal restoration, and hurricane protection measures to protect South Louisiana from a Category 5 hurricane. As a first step in this project, Congress mandated that USACE submit a preliminary technical report (PTR) on these analyses to Congress by June 30, 2006. In order to strengthen quality control processes and help ensure that the LACPR project is supported by the best scientific and technical information, an external peer review (EPR) process has been implemented by USACE to complement internal technical review (ITR). This report describes the EPR process and summarizes and reports verbatim the comments received during the EPR.

After screening more than 65 candidate peer reviewers outside of USACE for potential conflicts of interest and relevance to predetermined technical criteria focusing on flood control, coastal restoration, and hurricane protection, nine reviewers were selected. Reviewers selected were primarily from academia, but also included one federal government employee (NOAA) and two independent engineering consultants. In balance with the technical content of the PTR, the areas of technical expertise of the selected peer reviewers included: two engineers with expertise in civil or geotechnical engineering; two engineers/scientists with expertise in geology and/or hydrology; one engineer/scientist with expertise in hydrodynamics; two engineers/scientists with expertise in environmental engineering, wetland ecology, and coastal ecosystem restoration; one social scientist with expertise in evaluating human factors/impacts; and one economist.

The peer reviewers were provided with copies of the final draft PTR on May 17, 2006 and a charge containing guidance on key types of input of interest to USACE. The peer reviewers had one week for the review of the final draft PTR and were allowed up to 20 hours of billed time.

Several hundred external peer review comments were received (see Appendix A). Overall, the consensus of reviewers was that the final draft PTR was generally complete and represented a considerable effort on the part of USACE and partners in a very short time frame. The reviewers noted that the draft PTR contained important information and innovative ideas, and its emphasis on coastal restoration as means of hurricane protection was well-received. However, the reviewers generally thought that the presentation of technical information throughout the draft PTR was uneven in detail and content. The most critical comments related to the poor definition and description of the alternatives and measures being considered for hurricane protection and the inadequate discussion of the risks and protection of human uses of the coast. The authors of the draft PTR responded to the reviewer comments, and their responses are included in Appendix A (see the "USACE Responses" column in Tables A-1 through A-17) of this report.

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# 1. INTRODUCTION

## 1.1 Background of Report Reviewed

The Department of Defense Appropriations Act of 2006 (P.L. 109-148) directed the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), to conduct a comprehensive hurricane protection analysis and design to develop and present a full range of flood control, coastal restoration, and hurricane protection measures. The purpose of the Louisiana Coastal Protection and Restoration (LACPR) project is to identify a plan for increased protection against storm surge equivalent to a Category 5 hurricane within South Louisiana. The scope is to address the full range of flood control, coastal restoration, and hurricane protection measures needed for comprehensive Category 5 protection.

Per congressional direction, a preliminary technical report (PTR) for comprehensive Category 5 protection must be completed within 6 months of the enactment (enacted 30 December 2005) and a final technical report (FTR) for Category 5 protection must be completed within 24 months of enactment. These reports will describe findings of technical analysis and design for several alternatives of increased comprehensive hurricane protection across South Louisiana, integrating water resources objectives of hurricane protection, coastal restoration, flood control, and navigation. The PTR and FTR will consist of engineering analysis and design using the best science and engineering available. The PTR describes a preliminary solution developed based on existing data and information.

The primary work efforts of the LACPR PTR focused on:

- Characterizing previously conducted examinations of increased hurricane protection for South Louisiana;
- Portraying innovative, conceptual, multi-objective water resources alternative plans that will be developed further in the FTR;
- Presenting a refined project management plan for completion of the FTR; and
- Recommending component areas for authorization of protection plans.

The LACPR project management plan specifies that the LACPR PTR will be reviewed by an external peer review panel, in addition to an internal technical review panel within USACE. This report summarizes the external peer review process that was conducted and the comments on the PTR that were received from the external peer reviewers.

## 1.2 Purpose of External Peer Review

The purpose of the external peer review (EPR) panel, in general, is to strengthen USACE's quality control processes for the development of decision documents in support of their Civil Works program. The greater degree of outside expertise that the EPR process provides is especially important for those cases involving higher risk and impact, such as the LACPR project.

To help ensure that USACE documents are supported by the best scientific and technical information, a new peer review process has been implemented by USACE that includes EPR to

complement their internal technical review (ITR), as described in USACE’s guidance *Peer Review of Decision Documents* (EC1105-2-408), dated 31 May 2005. In this case, the EPR was conducted and managed using contract support from an independent 501 (c) (3) organization (Battelle Memorial Institute; hereafter Battelle) to insure objectivity, along with a high degree of flexibility and responsiveness, which was essential for USACE to meet their deadlines under the Defense Appropriations Act.

## 2. METHODOLOGY

This section describes the methodology followed by Battelle working with USACE to plan the review, select peer reviewers, and conduct the external peer review. The external peer review was conducted following procedures described in USACE’s guidance *Peer Review of Decision Documents* (EC1105-2-408) and the Office of Management and Budget’s *Final Information Quality Bulletin for Peer Review*, released December 16, 2004. Supplemental guidance on evaluation for conflict of interest used the National Academies’ *Policy on Committee Composition and Balance and Conflicts for Interest for Committees Used in the Development of Reports*, dated May 12, 2003.

### 2.1 Planning and Schedule

Table 1 defines the schedule followed in execution of the EPR.

**Table 1. Schedule**

Action	Completed by Date
Planning	April 17, 2006
Information collected on potential peer reviewers	April 27, 2006
Peer reviewers selected and contracts completed	May 17, 2006
Draft PTR and charge sent to external peer reviewers	May 17, 2006
Comments from reviewers received	May 23, 2006
Draft peer review report completed	May 26, 2006
Responses from LACPR authors received	June 21, 2006
Final peer review report completed	June 22, 2006

### 2.2 Identification and Selection of External Peer Reviewers

More than 65 potential peer reviewers were evaluated in detail. Of these, 28 were contacted to evaluate technical knowledge, availability, and potential conflict of interest. Preliminary information about the 16 available reviewers and their rates was evaluated in consultation with USACE. The reviewers were primarily from academic institutions, but peer reviewers who were consultants (company-affiliated and independent) or associated with industry, non-governmental organizations, and non-USACE government agencies, were also considered.

The credentials of the peer reviewers were evaluated according to the overall PTR scope, focusing on the three key areas identified in the Congressional mandate (see Table 2 for detail):

- Flood control,
- Coastal restoration, and
- Hurricane protection.

**Table 2. Technical Criteria/Areas of Expertise for Potential External Peer Reviewers**

Flood Control	Coastal Restoration	Hurricane Protection
<ul style="list-style-type: none"> <li>• Engineering (civil, environmental, geotechnical)</li> <li>• Geology/geomorphology</li> <li>• Soil physics/mechanics</li> <li>• Hydraulics/sedimentation</li> <li>• Hydrology/coastal hydrology</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland/coastal ecology</li> <li>• Fisheries</li> <li>• Oceanography/marine science</li> <li>• Water chemistry/quality</li> <li>• Wetland/soil biochemistry</li> <li>• Natural resources management</li> </ul>	<ul style="list-style-type: none"> <li>• Risk assessment</li> <li>• Mathematics/statistics/modeling</li> <li>• Spatial analysis/GIS</li> <li>• Meteorology (e.g., storm surge characterization)</li> <li>• Economic analysis</li> <li>• Cost estimating</li> <li>• Environmental regulation</li> <li>• Urban/environmental planning</li> <li>• Real estate/land ownership issues</li> <li>• Navigation and transportation systems</li> <li>• Sociology/community response</li> </ul>

The following experience areas were also considered:

- Participation in previous USACE technical review committees (also see conflict of interest criteria below);
- National Academy of Sciences review committee experience;
- Louisiana Coastal Area (LCA) Plan National Technical Review Committee (NTRC);
- Other technical review panel experience; and
- Gulf Coast experience.

The peer reviewers were also screened for the following *potential* exclusion criteria or conflicts of interest:

- Involved in producing the preliminary technical report;
- Current USACE employee;
- Former USACE employee;
- Other USACE affiliation [scientist employed by the USACE (except as described in NAS criteria, see EC 1105-2-4 section 9d)];<sup>a</sup>

<sup>a</sup> Note: Potential peer reviewers from universities and consulting firms that are receiving USACE funding were evaluated to ensure they had sufficient independence from USACE to be appropriate peer reviewers. See the OMB memo p. 18, "...when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

- Repeatedly served as USACE technical reviewer;
- Involvement in any USACE/Louisiana-area projects;
- Current or future financial arrangements with USACE for Louisiana coastal protection or restoration contracts/awards; and
- Other perceived conflict of interest.

In selecting final peer reviewers from the list of potential peer review candidates, an effort was also made to balance the number of experts in a given area of technical expertise (see Table 2) with the technical content of the PTR. Based on a review of a preliminary internal version of the PTR and information provided by the USACE report authors, it was determined that a balanced external review committee would preferably contain approximately:

- two to three engineers with expertise in civil or geotechnical engineering;
- one to two engineers/scientists with expertise in geology and/or hydrology;
- one to two engineers/scientists with expertise in hydrodynamics;
- two engineers/scientists with expertise in environmental engineering, wetland ecology, and/or coastal ecosystem restoration;
- one social scientist with expertise in evaluating human factors/impacts; and
- one economist.

Based on these considerations, nine peer reviewers were selected from the potential list (see Section 3 for names and biographical information on the selected peer reviewers). A request for quotation, including a scope of work and conflict of interest inquiry, were prepared and sent to each reviewer. Battelle established subcontracts with the peer reviewers for agreed-upon rates and hours upon receipt of the reviewers' written quotations indicating their willingness to participate and confirmation of the absence of conflict of interest (through a signed conflict of interest form).

### **2.3 Preparation of the Charge and Conduct of the Peer Review**

A charge for peer review, which contained specific questions regarding the PTR and guidance on key types of input of interest to USACE, was developed to assist the EPR panel. The charge was prepared based on technical direction received from USACE and guidance provided in USACE's guidance *Peer Review of Decision Documents* (EC1105-2-408) and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review*, released December 16, 2004. A draft charge was prepared as part of the work planning process and revised when the final draft PTR became available. The final charge is in the appendix at the end of this report.

The peer reviewers were provided with copies of the final draft PTR and the charge on May 17, 2006. The peer reviewers had one week for the review of the final draft PTR and were allowed up to 20 hours of billed time.

### **2.4 Preparation of the Peer Review Report**

The peer review report was prepared as follows:

- 1) When the comments were received from the peer reviewers, they were collated and evaluated by Battelle for completeness and responsiveness to the charge.

- 2) All materials submitted by the peer reviewers were provided to the USACE verbatim, along with a first draft of this peer review report prepared by Battelle.
- 3) The LACPR PTR authors responded to the peer reviewer's comments on the PTR within twelve business days, and the responses from the PTR authors were incorporated into the peer review report.

### **3. BIOGRAPHICAL INFORMATION ON EXTERNAL PEER REVIEWERS**

Table 3 provides an overview of the nine reviewers selected for the LACPR external peer review panel for the PTR and their qualifications in relation to the technical evaluation criteria. Reviewers were randomly assigned anonymous reviewer identification numbers – R1 through R9 – which were used for cross referencing in the comments summary tables in section 4 of this report. Reviewer identities were unknown to the USACE PTR authors. More detailed biographical information regarding each candidate and their technical areas of expertise is summarized below.

#### **Jesse C. Feyen, Ph.D.**

*National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS),  
Office of Coast Survey Development Laboratory  
Silver Spring, MD*

Scientist at NOAA/NOS/Office of Coast Survey Development Laboratory. Research includes implementation of large-scale, highly refined hurricane storm surge models that capture all pertinent scales of motion using finite element models; development and testing of parameterizations of air-sea interactions; testing and implementation of a discontinuous Galerkin finite element method for shallow water modeling; modeling of circulation in coastal regions via computational geophysical hydrodynamics; and simulation of hydrodynamic change in estuarine systems due to sea level rise. Holds a PhD in civil engineering from the University of Notre Dame. This reviewer was chosen primarily for his expertise in storm surge and hydrodynamic modeling.

#### **Charles G. Groat, Ph.D.**

*University of Texas at Austin, Department of Geological Sciences  
Austin, TX*

Professor of geological sciences and director of the Center for International Energy and Environmental Policy at the University of Texas at Austin. From 1998 to 2005 was director of the U.S. Geological Survey, with administrative and policy responsibility for an organization with 10,000 employees and an annual budget of approximately \$1 billion. Also previously executive director of the American Geological Institute, director of the Louisiana Geological Survey, and director of the Center for Coastal, Energy, and Environmental Resources at Louisiana State University. Areas of expertise include resource and infrastructure development impacts on natural systems (including coastal and fluvial systems), restoration ecology, energy and minerals resource assessment, groundwater occurrence and protection, geomorphic processes and landform evolution, and coastal studies. Holds an M.S. degree in geology from the University of Massachusetts and a Ph.D. in geology from the University of Texas at Austin. This reviewer was chosen primarily for his expertise in geology, coastal studies, and experience in directing large-scale programs.

**Shirley B. Laska, Ph.D.**

*University of New Orleans, Department of Sociology  
New Orleans, LA*

Director of the Center for Hazards Assessment, Response and Technology (CHART) and professor of sociology (environmental and natural hazards sociology) at the University of New Orleans. Previously served as vice chancellor for research at the University of New Orleans. For more than 20 years, she has been engaged in policy and applied research funded by federal agencies such as the U.S. Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), National Oceanic & Atmospheric Administration (NOAA), Sea Grant and the U.S. Department of Housing and Urban Development (HUD), as well as state and local agencies, and has conducted extensive research on the communities and cultures of South Louisiana and the impacts of coastal land loss and hurricanes on these communities. CHART is working to develop robust community and regional sustainability and proactive community disaster response, with a focus on sub-regional analysis of hurricane evacuation behavior; consideration of reducing societal risk through flood mitigation efforts; area flood solutions to complement FEMA's flood insurance program that focuses on individual homeowners; inclusion of the human/social impacts of coastal restoration rather than only the ecological; and improving hazard mitigation outcomes by including community members and stakeholders as full participants in efforts to reduce the human risk to hazards. Holds a B.S. degree in communication from Boston University and a Ph.D. in sociology from Tulane University. This reviewer was chosen primarily for her expertise in social impacts of natural disasters, social policy, and impacts of hurricanes on coastal communities..

**David E. Lourie, P.E.**

*Lourie Consultants  
Metairie, LA*

A practicing geotechnical engineer with expertise in South Louisiana soil conditions, local area geology, and geotechnical-related construction practices. Founder and owner, Lourie Consultants, Metairie, Louisiana, a consulting engineering firm that provides geotechnical engineering and geo-environmental consulting services. Has performed comprehensive geotechnical engineering studies for offshore structures, the petrochemical industry, private developers, airports, ports, local, state and federal agencies, and others in the region. Before forming Lourie Consultants in 1992, spent nine years directing the technical and financial operations of Fugro-McClelland (Southwest), Inc., and McClelland Engineers throughout Louisiana. Holds B.S. and M.S. degrees in civil engineering with concentrations in construction management and geotechnical engineering. Licensed professional engineer, registered in Louisiana to practice civil and environmental engineering. This reviewer was chosen primarily for his expertise in geotechnical engineering, local soil conditions, and geotechnical construction practices.

**William J. Mitsch, Ph.D.**

*The Ohio State University, School of Natural Resources  
Columbus, OH*

Distinguished professor, School of Environment and Natural Resources and director of the Schiermeier Olentangy River Wetlands Research Park at The Ohio State University. Research interests include wetland ecology and biogeochemistry, the creation and restoration of wetlands,

ecosystem modeling and wetland management policy. Co-author of the standard textbook on wetland ecology (*Wetlands*, 3rd ed., Wiley) and editor-in-chief of the journal *Ecological Engineering*. Dr. Mitsch received the 2004 Stockholm Water Prize, and holds a B.S. degree in mechanical/industrial engineering from Notre Dame and M.E. and Ph.D. degrees in environmental engineering sciences (systems ecology) from the University of Florida. He was on the National Technical Review Committee (NTRC) for USACE's Louisiana Coastal Area (LCA) project 2002-05. This reviewer was chosen primarily for his expertise in wetland ecology and ecosystem restoration.

**Nancy J. Rabalais, Ph.D.**

*Louisiana State University, Louisiana Universities Marine Consortium  
Chauvin, LA*

Executive director of the Louisiana Universities Marine Consortium (LUMCON). Has conducted extensive research on hypoxia in the Gulf of Mexico and on estuarine water quality in Louisiana, and has been instrumental in bringing national attention to the problem of Gulf of Mexico hypoxia related to excess Mississippi River nutrients. First woman to chair the Ocean Studies Board of the National Research Council (2002-2004), and serves on numerous other scientific committees. Research interests include the dynamics of hypoxic environments, interactions of large rivers with the coastal ocean, estuarine and coastal eutrophication, benthic ecology and animal/sediment relationships, and environmental effects of habitat alterations and contaminants. Holds B.A. and M.S. degrees in biology from Texas A&I<sup>b</sup> and a Ph.D. in zoology (Marine Studies) from the University of Texas. This reviewer was chosen primarily for her expertise in coastal ecology and ecosystem restoration.

**Marion Skouby, P.E.**

*Independent consultant  
St. James, MO*

Practicing engineer with more than 40 years' experience in geotechnical engineering, with expertise in foundation engineering, drilled piers, driven piling, earthworks, groundwater studies for potable water supply, design, installation, and operation of construction dewatering and permanent groundwater control systems, caissons, earth retention systems, mine subsidence, dams, levees, locks, and the design and construction of slurry cutoff trenches. Has designed relief well systems and sheet pile cutoffs to control seepage beneath levees/flood walls in the New Orleans area, and also previously did project engineering work for dewatering and piles for a number of locks on the Arkansas River. Holds an M.S. degree in civil engineering from the University of Illinois. This reviewer was chosen primarily for his expertise in geotechnical engineering.

**Stephen Swallow, Ph.D.**

*University of Rhode Island, Department of Environmental and Natural Resource Economics  
Kingston, RI*

Professor of resource economics at the University of Rhode Island. Has been a director of the Association of Environmental and Resource Economists and a director of the Northeast

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<sup>b</sup> Named Texas College of Arts and Industries until 1967 when its name officially changed to Texas A&I; again changed to Texas A&M – Kingsville in 1993 (<http://www.tamus.edu/offices/realestate/names.html>)

Agricultural and Resource Economics Association, and an associate editor of *Journal of Environmental Economics and Management* and *The Wildlife Society Bulletin* and is currently an editor of *American Journal of Agricultural Economics*. His primary research interest is in integrating economics within conservation biology and environmental management. Other research focuses on economics of environmental resource management, including land conservation and development, watershed management planning, interdependent renewable and nonrenewable resources, valuation of environmental resources in relation to human uses, decision-making integrating natural and economic science, role of land use in ecosystem health and human welfare, and public preferences for environmental management. Holds Ph.D. and M.S. degrees in resource economics from Duke University, and a B.S. in wildlife ecology and natural resources from Cornell University. This reviewer was chosen primarily for his expertise in economics and resource management.

**David Tarboton, Ph.D.**

*Utah State University, Utah Water Research Laboratory  
Logan, UT*

Professor of civil and environmental engineering at Utah State University's Utah Water Research Laboratory and director of the Utah State University Water Initiative, the purpose of which is to foster collaboration and interdisciplinary work across the multiple colleges and departments involved with water sciences at Utah State University. Adjunct professor in aquatic watershed and earth resources and geology departments. Has expertise in spatially distributed hydrologic modeling, GIS applications in hydrology and development of software tools for hydrologic modeling and geospatial analysis. Holds a B.S.E. degree in civil engineering from the University of Natal in South Africa, and an M.S. degree in civil engineering, and an Sc.D. degree in civil engineering, both from the Massachusetts Institute of Technology. This reviewer was chosen primarily for his expertise in environmental engineering, hydrology, hydrologic modeling, and geospatial analysis.

**Table 3. LACPR External Peer Reviewer Panel and Technical Criteria /Areas of Expertise**

Name	Affiliation	Engineering/ Geotechnical Criteria					Ecology/Wetland Criteria					Other Criteria/ Hurricane Protection					Other Considerations				Reviewer Category			
		Engineering (Civil/Env/Geotech)	Hydraulics/Sedimentation	Hydrology/Coastal Hydrology	Geology/Geomorphology	Soil Physics/Mechanics	Wetland/Coastal Ecology	Wetland/Soil Biochemistry	Water Chemistry/Quality	Fisheries	Oceanography/Marine Science	Natural Resources Mgmt	Math/Stats/Modeling	Spatial Analysis/GIS	Meteorology/Storm modeling	Economics	Urban/Environmental Planning	Sociology/Community Response	NAS Panel Exp.	LCA NTRC	Other Technical Review Exp.	Gulf Coast experience	Academic	Consultant
totals ----->		4	3	3	2	2	3	2	2	1	1	4	2	1	1	1	1	2	2	7	6	6	2	1
Jesse C. Feyen, Ph.D.	NOAA/NOS Coast Survey Development Laboratory	1	1	1								1		1										1
Charles G. Groat, Ph.D.	University of Texas at Austin, Department of Geological Sciences			1	1		1				1							1		1	1	1		
Shirley B. Laska, Ph.D	University of New Orleans, Department of Sociology														1	1				1	1	1		
David E. Lourie, P.E.	Lourie Consultants, Metairie, LA	1			1	1														1			1	
William J. Mitsch, Ph.D.	The Ohio State University, School of Natural Resources						1	1	1		1								1	1	1	1		
Nancy J. Rabalais, Ph.D.	Louisiana Universities Marine Consortium; Louisiana State University						1	1	1	1	1								1	1	1	1		
Marion Skouby, P.E.	Independent consultant, St. James, MO	1	1			1														1		1		
Stephen Swallow, Ph.D.	University of Rhode Island, Department of Environmental and Natural Resource Economics										1			1					1	1	1			
David Tarboton, Ph.D.	Utah State University, Utah Water Research Laboratory	1	1	1								1	1					1		1		1		

#### 4. SUMMARY OF PEER REVIEW COMMENTS

The LACPR preliminary technical report (PTR) to Congress (May 15, 2006 draft), including the main body of the report and five appendices for review (plus seven additional appendices providing background information only), was delivered to peer reviewers on May 17, 2006. Hundreds of comments were received from the nine peer reviewers on May 23, 2006. These comments covered 24 sections of the main report plus five appendices, and answered 18 specific questions asked in the charge. All the comments received are provided verbatim in Appendix A of this peer review report, organized by PTR section (and corresponding to questions 1 through 18 in the charge). A short qualitative review of the comments was conducted. Key technical comments and common themes that emerged from review comments are summarized below (some editorial comments and suggestions for improvement of report readability were received and are included verbatim in Appendix A of this peer review report, but are not detailed in this summary).

Overall, the reviewers stated that the PTR contained important information and represented a considerable effort on the part of USACE and partners in a very short time frame. The consensus was that the report was generally complete for a preliminary technical report and served as a good start for further work in the final technical report. Reviewers recognized that they had received a draft and assumed that final editing would occur; therefore, their focus was on technical content, clarity, and completeness.

The reviewers noted that the PTR has “gems” of ideas, “some very innovative sections,” and a wealth of material, especially in the appendices. For example, the workshops were considered “important steps” in the LACPR process. The reviewers commented that the stakeholder meetings had many good ideas that could be better integrated in the LACPR process. The hydrodynamic modeling section was considered strong; the reviewers felt that the PTR team appropriately used process-based and risk-based hydrodynamic models and appropriately considered the impact of coastal landscape/surrounding wetlands on storm surge. General support was expressed regarding the emphasis on coastal restoration as a means of hurricane protection. The recognition of issues such as subsidence and sea level change in the PTR were viewed positively.

However, the reviewers generally thought that the presentation of technical information throughout the PTR was uneven in detail and content. They felt that some sections were complete, some needed more detail and clarification, and some had “excessive text on less relevant topics.” Specific overall comments related to technical content and clarity that were repeated by several reviewers were:

- The purpose, goals, and content of PTR need to be more clearly stated up front in the main report. They are covered somewhat effectively in PTR Appendix A, but are not translated clearly into the main report. Additionally, how the report meets those goals should be discussed.
- The audience of various sections of the report needs to be considered. For example, the executive summary needs to be accessible to the general public, but the hydrodynamic section can be more technical.

- The appendices contain a wealth of material, some of which should be better summarized in the main text, especially the technical appendices such as PTR Appendix L.

One major weakness identified by the reviewers was the poor definition and description of the alternatives. The alternatives and measures being considered for hurricane protection are a part of the congressional mandate and they were considered by reviewers to be inadequately defined and buried in various places in the PTR. Concern was also expressed that a preliminary solution was not presented. While it may not be possible in a preliminary report to make a final recommendation, reviewers thought, at the very least, that the alternatives should be summarized in one place and a preliminary approach should be identified. Ideally, the reviewers thought the alternatives should be detailed using the analyses presented in the appendices, which contain significantly more information.

The second major weakness identified by the reviewers was inadequate discussion of the protection of human uses of the coast. Although the report included information on population and economics, it was significantly lacking in consideration of human factors, environmental risk, and natural resource economics. One reviewer felt strongly that stakeholder participation was largely reactive since it was focused on public hearings; the reviewer stated that stakeholder participation should instead be fully integrated into the process. A “scientifically designed study of public values and priorities” should be planned to run in parallel with the engineering and other technical studies under the LACPR project. Additionally, an “economic analysis of the values of relative habitats, industries, [and] communities... would beneficially augment engineering analyses.”

Other sections were thought by reviewers to be missing or in need of considerable additional development. While engineering and geotechnical information in the draft PTR was generally considered strong, key areas where the reviewers felt more development was needed included the following:

- Existing flood protection projects, specifically adequate detail to assess their implementation status and effectiveness, and information on how they will be integrated into the LACPR;
- Further assessment of the “Dutch solution” related to the Gulf Coast; several reviewers seemed to think it is not a universal solution and may not be directly applicable to geologic and storm conditions in the Gulf region and the expected level of government resources and commitments; and
- Hydrology/sediment transport and their significance on the impact of the LACPR plans as well as the need to further develop hydrological considerations surrounding intercepted/interior drainage (Appendix L), especially because this will be a substantial portion of the total project costs.

The recognition of coastal resources, wetlands, and ecology in the report was considered positive. Area where further development of ecological concepts could be improved included:

- Information on the environmental baseline and well-documented wetland functions, such as floodwater retention and water quality enhancement (Appendix D) and anthropogenic contributions to wetland systems vulnerability;
- Ecological risk, particularly from changing coastline, wetlands, and ecosystems; and

- Historic and current water quality issues, specifically a more comprehensive discussion is required.

As mentioned above, the reviewers identified the human and economic aspects of hurricane protection as areas needing further development, including:

- Economics, especially the role of environmental and natural resource economic analysis;
- Relationship of various sectors, such as agriculture, tourism, and shipping, to hurricane protection;
- Hurricane history, specifically additional history beyond seven years and better assessment of the frequency of large storms;
- Social risk, particularly from similar-size storms on community and social dynamics; and
- Better involvement of multi-disciplinary approaches and specialists, such as economists, social scientists, and wetlands engineers, in the project management plan and the LACPR as a whole.

Appendix A of this peer review report contains the verbatim comments from the external peer reviewers, which provide details related to the input to the report not covered in this summary. Included with the comments are the responses from the USACE authors of the PTR. Table A-1 contains the comments and responses on the overall report (corresponding to questions 17 and 18 listed in the charge, see Appendix B) and Tables A-2 through A-17 contain comments and responses organized by report section (corresponding to questions 1 through 16 listed in the charge).

## APPENDIX A

### Verbatim External Peer Review Comments

and

### USACE Responses

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**Table A-1. Peer Review Comments on the LACPR PTR: Overall**

ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
<sup>d</sup> Q17. Comment on the completeness of the report. Identify technical areas or subjects that are missing from the report and represent deficiencies that should be addressed in the FTR.		
R1	The objectives of the preliminary LACPR (as identified in the appendices, NOT in the main body of the PTR) are repeated below and their completeness judged (IN CAPS).	Noted.
	Characterize previously conducted examinations of increased hurricane protection for south Louisiana. LIMITED INFORMATION IN THE BODY OF THE REPORT AND NO APPENDIX TO DETAIL THIS INFORMATION.	This section was meant as an overview only and detailed information on specific project can be found in individual reports or at the Corps website.
	Portray innovative, conceptual, multi-objective water resources water protection plans that will be developed further in the FTR. DONE WITH REGARD TO MULTI-OBJECTIVE PLANS, BUT THESE FOLLOW THE STANDARD LCA, CWPPRA METHODS. THE LIMITED INNOVATIONS ARE IN THE SECTION ON DEVELOPING THE FTR AND SHOULD BE IDENTIFIED EARLIER	Revised report has some discussion earlier in text. However, most this work will be performed for the FTR.
	Present a refined PMP for the completion of the FTR. DONE IN APPENDIX A.	Noted.
	Develop recommendations for component areas for authorization of protection plans. DONE FOR THE 5 SPECIFIC PROJECTS FOR WHICH PED, AUTHORIZATION OR APPROPRIATIONS WERE IDENTIFIED FOR IMMEDIATE ACTION Specifics include:	Noted.
	- Scoping meetings. Technical workshops. DONE	Noted.

<sup>c</sup> ID refers to reviewer identification number, which were randomly assigned to reviewers R1 through R9.

<sup>d</sup> Question numbers refer to numbering system in the charge for review provided to external peer reviewers.

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	- Assemble up to three conceptual alternatives for preliminary examination. THE FOCUS WAS ON ALTERNATIVE 1 AND ALTERNATIVE 2.	The overall objective of the formulation effort is the development and evaluation of an adequate number of alternatives to facilitate decision making. The use of an iterative formulation / evaluation process is provided to explain how additional alternatives would be identified and considered. The 2 alternatives represent basic starting points for initiating evaluation. Working from these broad constructs the formulation will optimize toward a functionally efficient and effective plan
	- Hydrodynamic modeling of conceptual alternatives. ADEQUATELY ADDRESSED IN AN APPENDIX	Noted.
	- Identify standard designs and innovative technologies for construction and designs. MINIMAL	Noted.
	- Seek rights of entry for field collection data. STATED AS A NEED BUT NOT ACCOMPLISHED AT THIS POINT	Right of entry for field collection of data has been requested but is not completely available at this point in time.
	- Develop nonstructural measures. LIMITED AT THIS POINT	Will be further developed for the PTR.
	- Develop a set of ecosystem restoration plans for integration into a Category 5 plan. MOSTLY FOLLOWS THE Louisiana Comprehensive Coastal Protection Master Plan (LCCPMP)	Noted.
	- Update PMP components for moving forward with a FTR. MINIMAL	The Project Delivery Team (PDT) has been heavily focused on finalizing the PTR. Once the PTR is finalized an effort to update the Project Management Plan (PMP) with the FTR steps ahead will occur.

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	<p>- Recommend component areas for authorization of protection plans. THE 5 THAT WERE OUTLINED, BUT THESE WERE NOT FULLY INTEGRATED INTO THE OVERALL PLAN OF ALTERNATIVES 1 AND 2</p>	<p>The alignments presented represent a subset used to determine potential surge heights. These alignments, along with additional un-modeled variants, are intended to be combined into either alternative based on effectiveness and with variations in elevation relative to risk. These alignments have provided as intended some initial insight to potential surge elevation relative various locations and configurations. The FTR will expand on alternative structural, environmental, and non-structural combinations.</p>
	<p>- Develop PMP with state of Louisiana for formulation of the FTR. ADOPTED THE LCCPMP</p>	<p>Will be further developed for the PTR.</p>
	<p>There are many editorial changes that need to be made.</p>	<p>Noted. A technical editor has been working with the team since the review. Along with the many reviews already taken place, many of these mistakes have been identified.</p>
	<p>Preliminary Report should include:                      - Clarification of goals and objectives; development of draft evaluation criteria. THE GOALS OF THE PTR ARE NOT STATED IN THE PTR, BUT ARE LOCATED IN AN APPENDIX. THEY SHOULD BE STATED IN THE MAIN BODY OF THE REPORT.</p>	<p>The goal of the PTR is to present initial results of the team’s work.</p>
	<p>- Definition of planning units among the study area. ADOPTED THOSE ALREADY IN USE</p>	<p>This delineation was built on well documented hydrologic subdivisions with in the coast developed in previous planning efforts. However, some additional consideration of underlying hydrologic process was applied in breaking down planning unit 3 into 2 components.</p>

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	- Initial development of innovative conceptual alternatives. VERY LIMITED	Will be further developed for the PTR.
	- Process for screening/developing innovative conceptual alternatives. NEED ACKNOWLEDGED BUT NOT OUTLINED.	The coast wide planning objectives presented in the plan formulation section provide the basis for identifying evaluation and screening criteria. The finalization of these criteria has not yet been completed.
R2	I have included comments of this nature throughout my comments on the various sections.	Noted.
	The sections vary considerably in their approach to their subject matter, some describing process, others preliminary results, and others details on selected aspects of the section subject matter. The PTR, by its very nature, cannot be complete in what it says, only in touching on the appropriate elements of what the LACPR is expected to accomplish. Given the time available to prepare the PTR and the complexity of the many activities that comprise the LACPR, the PTR gives the reader a reasonable sense of what the whole will include when it is described fully in the FTR.	Noted.
R3	The report should also consider addressing the significance of hydrology or sediment transport in considering the impact of the LACPR plans.	Concur. The FTR will include the effects of available sediment transport as related to proposed diversion projects via the Mississippi and the Atchafalaya Rivers. These vital sources of sediment and nutrients are of primary importance for a sustainable wetland ecosystem. A great amount of information and design relative to sediment transport has been accomplished under the Louisiana Coastal Area (LCA) study but did not get sufficient coverage in the PTR as warranted.

**Table A-1. Peer Review Comments on the LACPR PTR: Overall**

ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R4	Although the report has some very innovative sections, in general it is uneven. Some well-written sections are balanced with sections with little information and poor editing. A good generalist needs to go through the whole document to even it out. Furthermore, there is a wealth of information in the Appendices and perhaps someone needs to mine those for some gems.	The team agrees in general and will address this issue in the FTR.
R5	I expected a tentative list of projects derived from the methodologies determined most useful for addressing Category 5 Protection. If it is only a preliminary why include the old projects before they have been subjected to the new methods of assessment? Is this simply a new exercise to select the projects that are already “on the books?”	Older projects were included to describe the current conditions and levels of protection. The FTR will describe how these legacy projects will function with projects proposed to provide higher levels of protection.
R6	The study team appears to be drastically under-staffed in the economics expertise necessary to assess the full range of public benefits that will or could arise from alternatives implemented. Environmental economics methods, both based on revealed preferences and stated preferences, as well as bioeconomic literature, should be used to assess the value of restoration and protection alternatives.	Agreed, this will need to be addressed in the FTR.
	Notably, there is no discernable effort to estimate the likely significant, non-marketed ecosystem services provided by restoration of natural landscape features and habitats.	Agreed, this will need to be addressed in the FTR.
R7	Given the time constraints to prepare the PTR, it seems relatively complete. In previous comments, I have noted those areas that I think need more detail and/or clarification, so I will not repeat them here.	Noted.
R8	Overall, I think that the report also needs to address the difficult questions associated with hurricane risk, whether or not a risk based approach or worst case scenario (probable maximum hurricane) is used to establish protection alternatives. Some of these questions are:	Noted.
	- How should the consequences for the areas protected (population, property, economic value) be traded off against the cost of providing protection?	This discussion has been significantly improved since the review.

**Table A-1. Peer Review Comments on the LACPR PTR: Overall**

ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>- What are the spatial factors associated with hurricane risks and probabilities? The probability of a hurricane hitting any one specific location any one year may be very small (e.g. 1/100 or 1/1000 providing a basis for 100-yr or 1000-yr design storms), but when this probability is accumulated over the thousands of miles of U.S. coastline subject to hurricanes the probabilities become a lot higher. For example if for each 100 mile stretch of coastline the probability is 1/100 and there are 20 such stretches along 2000 miles of coastline exposed to hurricanes (approximately the Gulf and Atlantic coastlines combined) the probability of a 1/100 hurricane hit somewhere each year is about 1/5. As coastlines become increasingly populated, can the scale of catastrophe that results from such a hurricane hit exceeding 1/100 design standards be tolerated by the nation on average every 5 years?</p>	<p>Annex 5 of the Engineering Appendix addresses to a considerable extent the spatial factors and probabilities of hurricane occurrences in the Central Gulf Coast. The issue of increasing population and the potential for catastrophic loss of life and property are from the national prospective issues that go beyond the scope of this report but none the less beg for a National policy for coastal development standards directed at minimizing these losses.</p>
	<p>- What is the best rationale for design against the occurrence of very low probability, but very high consequence risks. A popular book about NASA Mission Control used the phrase "Failure is not an option". This should somehow be the mantra of a hurricane protection system around a major modern day city. Perhaps the Dutch Solution or risk based methods provide the answer. In any event, I suggest that the FTR consider this question in greater depth.</p>	<p>The FTR will include a risk analysis. Public Policy will need to address the appropriate and acceptable level of risk.</p>
	<p>- Consider the role of failure modes, and the definitions of "failure" and "protection". A failure by overtopping without a breach into a region that has measures to accommodate the overtopping (e.g. behind protection drains and pumps) and measures to isolate the overtopping (e.g. lower internal levees that partition the behind protection area), is much less of a catastrophe than a breach. One might say that the system, even though it was overtopped provided protection.</p>	<p>Concur with the statement and will include in the FTR design measures or provisions to prevent breaching of protective works plus other considerations for compartmentalization of protected areas to minimize flooding in the event of overtopping and/or breaching. Multiple lines of defense will be a guiding theme during the FTR preparation.</p>
	<p>- Consider how to build resiliency and redundancy into the coastal protection system.</p>	<p>Concur. See immediate response above.</p>

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ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>- Consider how to prioritize protective measures. All protective measures can not be implemented at once, so some will be delayed and the full suite of protective measures will need to be scheduled. There is a need to identify and pursue rapid risk reduction strategies. A prioritization that implements first the measures that, for least cost, most reduce the risk (calculated as consequence times probability), may provide a rational prioritization. Non structural measures such as warning systems, emergency preparedness and response planning should be factored in to this prioritization.</p>	<p>Concur. Prioritization of protective measures that maximize protection and minimize risk will be included with any recommended plan.</p>
R9	<p>I think the report is relatively complete.</p>	<p>Noted.</p>
	<p>One item not discussed in the report is the construction of barrier islands off shore which could reduce a storm surge.</p>	<p>The use of barrier islands as a means of reducing storm surge is discussed throughout the report, but the PDT has not yet quantified the benefit these barrier islands will exactly have. This is an item for FTR development. Also, one of the component area recommendations includes a barrier island plan.</p>
	<p>From other sources it is understood the intensity of a hurricane is dependent on the temperature of the surface water it passes over. Considering the cost of damage done by a hurricane it would be worth while to consider means of lowering the temperature of the surface water. This could be done.</p>	<p>This is certainly an interesting concept and one that has been discussed by “out of the box” thinkers when contemplating ways to control the intensity of hurricanes. However, the practicality of affecting the heat content of an area as large as the Gulf of Mexico presents a considerable challenge. One need only consider the Role of the Loop Current in the Gulf and realize that the 26 degree isotherm extends to a depth of more than 200 meters. The team would welcome a discussion on this matter and invites the commenter to contact Vann Stutts at david.v.stutts@mvn02.usace.army.mil to follow-up on this matter.</p>

**Table A-1. Peer Review Comments on the LACPR PTR: Overall**

ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
<p>Q18. Comment on the overall organization and clarity of the report. Please explain and/or describe any proposed alternatives to the organization of the PTR, or the specific part in question.</p>		
R1	<p>The main body text is well organized by sections and in vertical flow, but there is an uneven expansion of ideas among the sections. This is a result of uneven information. There are many solid pieces of information in the appendices that can be brought forward, at least as examples, in the main body of the report. This would give some sense of preliminary achievements that can be built upon, rather than a listing of what is available to work with and their brief descriptions.</p>	<p>The team agrees in general and will address this issue in the FTR.</p>
R2	<p>I have made comments about organization at various places. Most of my suggestions involve combining sections. These include suggesting that the Performance Evaluation section be included in the previous section on hurricane and flood control protection projects. Also all or much of what is in “Process for Developing Alternative Plans” subsection (1277) should be included in the “Alternative Plan Formulation Rationales” section.</p>	<p>The report was deliberately organized so that each topic in the report is broken down into one to four page sections for easy readability. The layout of the report has now been completed using professional publishing software with headings across the top of each section</p>
	<p>I also questioned the need to include some of the appendices in the report, suggesting that they be made available on line and cited in the report.</p>	<p>Appendices will be provided electronically on a CD-ROM which will be enclosed in the report.</p>
	<p>“Planning Units” doesn’t need to be a stand-alone section. It should be a subsection under “Planning Principles and Objectives.”</p>	<p>Noted.</p>
R3	<p>Report clarity would benefit if further discussion of the purpose, process, and results were stated in the introduction so that the reader would anticipate further sections and analyses presented.</p>	<p>Will add some text on page 1 of the PTR.</p>
	<p>The PTR should do more to emphasize parallels to the Louisiana Comprehensive Coastal Protection Master Plan (LCCPMP) Plan Formulation Report, from which it draws heavily.</p>	<p>Language has been added throughout the Plan Formulation section to clarify that the PTR is summarizing the LCCPMP. The formulation process is being conducted jointly to ensure the compatibility of the plans.</p>

**Table A-1. Peer Review Comments on the LACPR PTR: Overall**

ID <sup>c</sup>	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R4	The organization of the report, although done on a short time schedule, leaves a lot to be desired. Appendices are disjointed, repetitive, and confusing. For example, there are appendices of appendices. In some cases, gems of ideas were found in the appendices but did not make it to the report. In other cases, the report had excessive text on less relevant topics and little text on important subjects. Overall the report showed a lot of effort. Certainly the report finished much stronger than it started.	The team agrees in general and will address this issue in the FTR.
R5	I'm confused about the goals of the preliminary report and how they have been implemented. In the instructions describing the goals of the PTR and FTR reviewer instructions described "recommending component areas for authorization of protection plans." What does that mean, sections of the coast? The old proposed projects?	This is still being deliberated at this time as to what can be done with regards to recommendations. The recommendation process is likely to change substantially from the way it was presented.
R7	Most of the report was well written, but I thought the geotechnical components of the LACPR Engineering Appendix text were not as well written as other parts of the report. Organizationally, I thought the PTR was adequate.	Noted.
R8	I found the organization and clarity of the report difficult. I think that the report should directly say what the alternatives are that have been evaluated, what they cost, what they protect and what the value of what they directly protect is. This information is hard to discern in the report as it is currently written. I suspect that much of the difficulty stems from the fact that being a preliminary report much of the information is uncertain. Nevertheless I think that even uncertain results should be stated directly with the uncertainty mentioned.	At this stage of the assessment only initial storm models of the all inclusive alignments are complete. Since this information represents an incomplete iteration of formulation of the initial alternatives results have not been presented in the PTR.
	If the authors are uncomfortable giving specific numbers for things such as costs or the level of protection (e.g. value of assets or population protected) ranges could be given (e.g. alternative 1 is estimated to cost from 200 to 250 billion dollars).	Non-concur. PTR scope did not produce sufficient detail to allow this type of discussion.
Any other comments on the overall document.		
R1	Needs a careful editing.	Noted. A technical editor has been working with the Team since the review.
	Critical documents, such as the NRC review of the Near-Term LCA report and the "Framework" report, are missing from consideration.	Noted. The range of references will be expanded in the FTR

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R2	It is clear that at this stage sections written by different people have been brought together in time to meet the deadline for a draft for review. The draft is pretty rough. Styles of writing differ, approaches to presenting the topics vary, and dealing with overlap of subject matter (such as the discussion of rationales and alternatives in two of the sections) has not been accomplished. I assume the draft is currently being worked on internally to deal with these matters and to provide a more finished product for final review.	Noted. A technical editor has been working with the Team since the review.
R4	The USACOE is dealing with a very complex set of problems that do not have easy solutions. I would recommend that you think out of the engineering box that you are in and find sustainable ecological and architectural solutions that complement the heavy engineering that will consume massive amounts of resources (\$\$).	The Team is trying to highlight non-structural, coastal restoration, and innovative engineering concepts.
R5	Include a list of the participants on the various committees that put the various parts of this report together.	Concur. We will list contributors to the effort in the PTR.
R7	It must be recognized that the External Peer Reviewers had only a limited time and budget to review the LACPR PTR package. These limitations prevent in-depth reviews, independent analyses, and other elements of a comprehensive technical peer review activity. Therefore, only “broad brush” reviews are possible, and only general opinions can be formulated. Furthermore, considerable reliance must be placed on experience and professional judgment.	Noted.
R8	[2697] Not all acronyms are defined on page 72. Acronyms that I found used that are not on the list are PPKR, PU, NED, FS.	These acronyms have been removed from the main report and the words are now spelled out.
	Where costs are given it would be helpful to use consistent notation. Sometimes they are given in billion \$, other times in million \$ and other times as big numbers of \$.	Consistency in presentation of costs will be reviewed.
R9	Considering the time period allowed for review (5 days) and the allotted 20 hours, the review, at best, is a cursory review.	Noted.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q1. Provide overall comments on the purpose and objectives of the LACPR study.		
R1	[Executive Summary] The Executive Summary reads more as a prologue to the document, rather than a summary of findings and conclusions from the whole document.	The Executive Summary since the review has been revised.
	It is not clear from the ExSum what the ‘purpose/goal’ of the preliminary technical LACPR report is. The overall goal of the LACPR is given in the Introduction, but the purpose of the preliminary (as opposed to the full final report) is not identified. It is finally outlined on 454-456 as a summary of preliminary analyses of technical analysis and design for various alternatives..... Given this goal, the ExSum should have some of the findings, or the critical findings of the preliminary report.	The Executive Summary since the review has been revised.
	The overall objective of restoration of natural features for storm protection is vitally important to both the resource base for the state and future generations of individuals who will benefit from the restoration(s) and the sustainability of the resources.	Noted. Report makes clear case to this effect.
	A ‘strong structural hurricane levee protection system’ while necessary to protect citizens and LA economy, may not be compatible with the protection of natural features that serve as storm barriers.	Our work indicates that a single approach will not work. We have adopted a multiple lines of defense strategy. Historic storms (i.e. before levees) verify that a wetlands only scenario will not protect coastal communities.
	The work of the USACE Institute of Water Resources ‘A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes of 2005’ is not acknowledged in the ExSum as a document that supports the deliberations of the LACPR group. If this omission is continued in the body of the document, then an important theoretical background is lost.	This work is referenced and in one for or another each of the principles is addressed in the PTR.
	The idea of fighting storm surges on the ‘outer fringe of populated areas with large structural surge barriers and levees fronted by natural coastal protection features’ gives concern, first with the definition of ‘outer fringe’ that can be determined very close to a population center, or a much larger area. In the case of the latter, such barriers would not protect the natural coastal protection features.	Do not concur. Levees would be outside of populated areas with coastal features such as wetlands, ridges, and barrier islands in front of the levees as added buffers.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>The MRGO modification plan with 6 months (of date of release of this report?) is a major factor related to other plans for the metropolitan New Orleans area. This report must adhere to the same overall objective of restoration of natural features and protection of citizens and economy that the LACPR espouses. Recommend a review of this document before its submittal.</p>	<p>Agree. However the recommendation will be revised for PTR.</p>
	<p>It is not clear how the complementary components listed in the ExSum will be considered for the LACPR and vice versa. Perhaps this will be detailed in the document. If not, there needs to be a comprehensive coastal landscape and protection system into which these specific projects can be incorporated.</p>	<p>Noted. Features are identified and discussed in the body of the report.</p>
	<p>[Introduction] The ExSum discusses the need to change from ‘Category’ storm designations to the USACE method, but the Intro sets the goals of the LACPR in terms of ‘Category 5.’</p>	<p>Category 5 is standard set in Congressional directive.</p>
	<p>[510-513] It is not clear how the peer review and the ITR will be coordinated and/or synthesized. The relative roles are presented in the Appendix A, but may need to be presented in the report somewhere. One is within the USACE and one truly external. The ITR meeting 4 times through the development of the final document is critical for good oversight of the progress and the technical aspects.</p>	<p>The input received from both the ITR and EPR for the PTR is intended not only to improve that document but to aid in focusing effort and products for the completion of the FTR. Consideration of these comments will continue beyond the completion of the PTR. This could be aided by some distillation process to identify the most pressing and attainable needs.</p>
R2	<p>The Executive Summary does a good job of summarizing the most important elements of much of the body of the PTR. It doesn’t tease out the most important points from each of the sections* in the PTR in an organized way, but it does present the realities of storm protection, such as admitting that not all areas can receive equal levels of protection and that non-structural approaches will need to play a prominent role. The Executive Summary should be revisited after the body of the PTR is in near-final form to determine if other points should be brought forward. The PTR will be placed in the hands of high-level policy makers, most of whom will not get past the Executive Summary. It needs to focus on priority components of the LACPR and communicate them effectively.</p>	<p>The executive summary is being revised.</p>

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ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>The Introduction describes the Federal Authority, citing the legislation that provides specific guidance for LACPR. It doesn't mention the Section 3 call for integration of hurricane protection, flood control, and ecosystem restoration objectives into an interoperable plan as is stated on lines 343-344 of the PMP (Purpose and Scope). In the Background section of the Charge to Peer Reviewers for the PTR, it says the PTR and FTR will "describe findings of technical analysis and design for several alternatives.....integrating water resources objectives of hurricane protection, coastal restoration, flood control and navigation." This integration of objectives of several programs as they relate to hurricane protection and coastal restoration should be the context for all analysis and design done in preparation of the PTR and FTR. This should be prominently stated in the Purpose and Scope section of the Introduction and mentioned in the Executive Summary. In fact the Purpose and Scope section of the PMP has some language that could be used here.</p>	<p>Will address.</p>
	<p>* This comments document refers to the major headings in the PTR as "subsections." Since these are the highest ranked organizational units of the report I have called them "sections" and referred to units below them in rank as "subsections." The "Parts" identified at the tops of the pages would be higher rank, but are not included in the Table of Contents. Are the "Part" headings necessary?</p>	<p>They are now referenced in the Table of Contents.</p>
R3	<p>[65] A probability-based approach will lead to a more informed, higher quality engineering analysis and design; this approach is recommended for the FTR.</p>	<p>Agreed, a risk assessment type approach will be used to evaluate designs.</p>
	<p>An economic analysis of values of relative habitats, industries, communities, etc. would beneficially augment engineering analyses and planning of coastal restoration and protection.</p>	<p>Assets at risk are an integral part of the FTR.</p>
	<p>[125] Further study of the link between coastal features and hurricane protection is necessary in order to quantify the role restoration plays in providing protection.</p>	<p>Noted, this is an important issue that will be further explored in the FTR.</p>
R4	<p>Executive summary is generally well written. Because of its length, subheads would have been useful. It is not clear how the 5 components on p. iv are called Spin-Off projects on p. 59 when they appear central to the project.</p>	<p>The Executive Summary is being modified and will include sub headers.</p>
	<p>The purpose and scope given in the Introduction are good guidelines for the rest of the report. Making both focus on a Category 5 storm is appropriate.</p>	<p>Noted.</p>
R6	<p>The purpose of LACPR appears to be comprehensive in evaluating and using integrated manmade infrastructure and natural coastal features to provide maximum protection to human, economic, and environmental resources from future storms. This objective is appropriate.</p>	<p>Noted.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[420-436 versus 438-450] The Purpose and Scope section emphasizes flood protection, while the State Authority section provides comparable weight to coastal ecosystem sustainability or restoration. The Purpose and Scope does include coastal restoration, but this section appears to deemphasize the longer term and broader benefits of ecosystem services that may contribute to the “full range of public and private interests.” The federal language at line 416, “to provide direct protection of the assets found in the coastal landscape” should be more explicitly recognized in the Purpose and Scope section. The Purposes and Scope should motivate full integration of the role of natural landscape and habitat features (as may be restored) as a productive tool in establishing a resilient hurricane protection system and providing long-term ecosystem benefits of interest to the full range of public and private interests. Consideration of these ecosystem benefits will also imply that environmental economics expertise should be involved to assess the relative values to the public interest, at least.</p>	<p>Sections have been revised.</p>
	<p>[39-50] Recognizing that natural coastal features, including geologic features and forest or wetland habitats, serve as a first line of defense is likely critical to a achieving maximum protection from future storms. Unfortunately, information in Appendix A (see comments below) suggests an inadequate appreciation for the potential economic benefits of fully integrating this innovative perspective, for cost reduction integrated with manmade structures, and for provision of benefits beyond storm protection that may offset monetary costs of restoration or add in-kind (non-market) costs arising from placement of manmade structures. While natural features may form a defense as storm surges approach, natural features may also be restored, enhanced or leveraged to provide redundancy that decreases the risk of heavy reliance on manmade structures such as levees; this redundancy acts as an insurance value deserving economics evaluation.</p>	<p>Appendix A is a work in progress. The FTR will consider these comments.</p>
	<p>[145-175] The Executive Summary gives no indication whether the LACPR will review pre-existing projects for possible modification in recognition of new opportunities, flexibility, or needs created by the damages of Katrina and Rita. Loss of previous developed-areas (loss of buildings, etc.) has likely changed the economic constraints that existed on projects initiated prior to late August 2005. Expeditious review could uncover opportunities to save costs or improve performance by taking advantage of the changed rural and urban landscapes left behind by Katrina and Rita.</p>	<p>Concur. Information is covered in plan formulation and PTR Appendix A.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[183-185] Focus on population density is reasonable. But insured or insurable commercial values and other economic values – including non-market values – should also be weighed.	Economics analysis will be expanded for FTR.
	[191-192] The potential role of the LACPR to encourage diversification of energy or transportation infrastructure regionally and national should be explored. Designation of alternative areas to place or replace infrastructure critical to the nation’s economy should be explored, within the project area as well as regionally or nationally.	This is outside of the scope. We are including some work on non-structural options that include relocations.
	[221-222] Public involvement through public meetings and comment periods should be supplemented by a scientific, controlled approach to assess the preferences and values of a representative sample of the broad public (measuring values qualitatively and in monetary terms for both market and non-market impacts of the LACPR Project alternatives).	Several independent survey sources are available and may be used for the FTR. Additional workshops, small group meetings, and public comment meetings are planned.
R7	The purpose and objectives of the LACPR study are not specifically identified in the Executive Summary. It would be clearer and more effective if they were presented there, in addition to being presented in the Introduction.	Sections have been revised.
R8	[Overall] The charge to reviewers indicates that the purpose for the preliminary technical report (PTR) is to describe a preliminary solution based on existing data and information. I think that this is a good purpose. I think that this report falls short of presenting a (singular) preliminary solution. Some options are presented, but a suggested solution was not presented. Also lacking is sufficient discussion and evaluation of the options to allow their advantages and disadvantages to be considered in arriving at a recommendation or decision. I recognize that, given the preliminary nature of this report, it is difficult to present a final solution, but the report should make a case for what, in the opinion of the authors, and drawing upon all the analysis they have done, is the current best suggestion based on existing preliminary data and information.	Revising the report.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>I think that it is important for the executive summary and introduction to concisely say what is proposed, or what the alternatives being considered are. It is only by delving in to the report and seeing the alignments on pages 22-25 [lines 1041-1057], then LACPR measures and strategies [page 50, lines 1862-1878] then appendix L [page L-42] which states: "The alignments under consideration at this time provide a continuous barrier across the entire State of Louisiana." that a picture emerges as to what is being considered. The executive summary needs to say that the protection plan is based on a continuous barrier of levees (in places up to 40 feet high) along the entire length of the Louisiana coastline and that the alternatives being evaluated primarily involve different alignments (0 to 30 or more miles from the coast) and other multiple line of defense strategies that affect the height to which levees need to be constructed to provide protection against the probable maximum hurricane scenario.</p>	<p>Revising the report to include alternatives.</p>
	<p>To address the concern of a solution not being presented, I suggest some text along the lines of: Following analysis from the various workshops, the design team considered 5 alternative designs. Each of these is associated with a levee alignment plan and coastal features, barrier islands and back-barrier marshes that form the outer lines of defense. These 5 alternatives are representative of the range of options available and address coastal protection in different ways. Alternative 1 relies on levees that extend along the entire length of the coast. Alternative 2 provides for tidal passes into Lake Pontchartrain, intended to absorb some of the impact of storm surges (if this is the correct reason behind tidal passes). Alternative 3 leaves upper Barataria open, relying on swamps to reduce storm surge effects with lower less expensive levees behind the swamps protecting population concentrations. Alternative 4 ... (give the reasons for alternatives 4 and 5) Each alternative was modeled in a sophisticated hydrodynamic simulation model and subjected to probable maximum hurricane scenario along 10 representative storm tracks. The model results were used to determine the required height and cost for levees for each alternative. The model results were also used to evaluate the effectiveness of protection provided by each alternative. The costs and effectiveness of protection (in terms of population protected, or whatever the appropriate measure is) are summarized in a table.</p>	<p>The Executive Summary is being reworked as a result of higher level reviews. This idea can be incorporated where appropriate in the Executive Summary.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	I suggest that this summary presentation of the findings should be followed by a discussion of the advantages and disadvantages of each alternative and a preliminary suggestion as to which alternative is best, or how the alternatives might be ranked. I do not think that suggesting a best alternative should be avoided, because the direction from congress seems to call for a preliminary solution to be presented.	The Team is not at this point yet.
	The executive summary should also give the cost of each alternative as well as the value of assets protected. Value of assets protected might be quantified in terms of the population protected and the economic value in terms of property value and/or contribution to the economy from the specific geographic area protected.	Do not concur.
	Overall, I also think that the alternatives evaluated need to be broader than the 5 alignments presented and should also include alternatives that involve buyouts of exposed property, and relocation of the population and assets from these locations to protected or less exposed areas. Such an alternative could also include the environmental value derived from establishment of (natural) marshes or swamps in these areas that may also contribute to storm surge protection.	Non-structural options will be more fully developed and evaluated for the FTR. Do not concur regarding # of alignments – team developed work plan to accomplish scope, given a tight schedule. The five alignments are representative and used to identify hydrodynamic responses.
R9	For a preliminary report the purpose and objective appear to be logical and complete.	Noted.
Other comments on subsection.		
R1	[Executive Summary] [5] Delete ‘literally’	Will be addressed.
	[31,32] Two day loss from two hurricanes is not straightforward	This statement has been improved since the review.
	[32,33] Based on present land loss rates?	Yes, this will be noted in the sentence.
	[36] Meaning of ‘poor soil conditions’ not clear, perhaps later	Will add “foundation” before conditions to be consistent with other statements.
	[52] The Saffir-Simpson scale is new to any reader of this document without some explanation as is the Corps method. Suggest that this paragraph start off with a statement along the lines of ‘Louisiana citizens are accustomed to description of storms according to Category, while the USACE designs projects based on a series of characteristics of several storms. ....	Sentence will be edited to state, “The widespread use of the Saffir-Simpson scale, a scale for categorizing hurricanes, for weather...”

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[117-119] I think the summary of the public expression here is correct.	Noted.
	[141] And elsewhere, use of complement	Checked.
	[210-211] The loss of wetlands inside of structural protection barriers also needs to be considered.	All wetland impacts will be considered.
	[Introduction] The idea of nonstructural modifications in areas of low population density does not please citizens of communities, such as Pointe au Chene or Dulac.	Concur.
	Addressing coastal erosion from larger navigation projects, e.g. Houma Navigation Canal, does not appear to be considered in the deliberations for the LACPR.	Agree. Need to note as one of many causes.
	As noted in the National Academies review of the near-term LCA, there needs to be a better ‘selling’ of the importance of Louisiana.	Agree.
	The purposes and products expected to be included in the preliminary report should be included. Then it will be possible to determine if these have been accomplished.	Noted.
R4	The word “data” is plural	Noted, will review its use.
R6	Reference to the project-area map in the executive summary, or provision of at least a small version on the cover of the report, would be helpful. Figure 1 or at lines 501-502 would be fine.	With the graphical layout now, the Figure is only a few pages away and making a small version will not do it justice. Will attempt to reference the Figure in the Executive Summary.
R7	[26] The phrase “civil engineering” should be inserted after “water resources” and before ‘challenges.’	Disagree. The use of the word “civil engineer” would exclude many of the other disciplines contributing to and critical to this effort.
	[179] This line in the Executive Summary implies that population size is the determining factor when it comes to making decisions about providing protection. It may be a factor, but it is not the only factor nor is it necessarily even the most important factor. There are other ways of assessing value other than population size. The determination of value indicators is more a matter of public policy at this time rather than a technical issue. As such, it probably does not belong in this PTR. Engineers, scientists, and other technically trained people have a vital role to play in shaping public policy, but the PTR’s focus is technical.	Concur.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	[78-81] For context, recognizing that the executive summary needs to be comprehensible to a lay audience, it would be helpful to give key characteristics of the three screening storms described in lines 78-81. These characteristics might include maximum sustained wind, radius of hurricane force winds, Saffir-Simpson scale category, anticipated storm surge (from modeling) if the storm were to approach Louisiana along a path similar to Katrina. This interpretive information would be useful in assessing whether the screening storms are more or less severe than Katrina/Rita which are fresh in peoples minds and would provide a context for the selection of only the probable maximum hurricane in the simulations.	Do not concur. Defining terminology such as “central pressure” and “radius to maximum winds” may be inappropriate for a lay audience and beyond the scope of an executive summary.
	[89-90] Here the 5 levee alignments are mentioned for the first time. It should be stated that these form the basis for the design alternatives that this PTR evaluated. The significance of these 5 alignments seems to be more than just for initial hydrodynamic modeling as stated here.	Concur.
	[180-183] Here ring levees and non structural protection mechanisms are suggested. These should be integrated in to at least one of the design alternatives evaluated. At present it seems like the design alternatives evaluated are centered on only the 5 alignments of levees that essentially form a continuous barrier along the entire coast and do not include ring levee options.	Concur. However, this is where the alignments are to this point.
	[216-217] What are the plan alternatives "identified for further development"? These have not been listed and if they are the levee alignment alternatives, they do not include ring levee and non structural protection alternatives.	Concur.
	[501-503] It would be informative in Figure 1-1 to include a scale and indicate for orientation purposes key points of interest, such as New Orleans, the Mississippi River, and some of the other geographic points used in the report (e.g. Pearl river, Lake Charles, Houma-Thibodaux, Lafayette).	An improved figure has been developed that addresses most of these comments.
Comments on Appendix A as appropriate.		
R1	[379-384] The purposes of the preliminary report are buried here. These should be elevated to the Introduction and Executive Summary. See final comments on report Q.17.	Under further review by the Team.
	[452-440] Other products expected from the preliminary report are listed here.	Under further review by the Team.
R2	[Project Management Plan (PMP)] Note: The cover says April 17, 2006 DRAFT while the headings on the inside pages say May 15.	The PMP has been updated since April 17 <sup>th</sup> but edits are likely not substantial. Anyway, the cover will be revised.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	For someone outside of the Corps of Engineers (COE) who doesn't understand the intricacies of internal COE project organization and management, the first 23 pages are most useful and give a good picture of how basic functions are being organized and what is to be accomplished. The Purpose and Scope on p. 8 does a nice job of stating the essentials of what the PTR and FTR are expected to accomplish.	Noted.
	Figures 2 through 8 and the accompanying text describe the program organization and identify the players. There is one minor inconsistency in identifying members of the PMT. Figure 3 shows the State being represented by Mr. Hanchey and Mr. Bradberry while Figure 5 includes only Mr. Hanchey from the State.	Figure 3 will be revised to only include Mr. Hanchey on the Project Management Team (PMT).
	Including talent from outside the COE and outside the Federal government on the PDT is wise and helps ensure an open planning and design process. Giving the CPRA responsibility for getting input from stakeholders on the development of "locally preferred plans" is also an effective way to focus that input as it comes from the organization responsible for the formal link between the COE and the State. Presumably Appendix K of the draft PTR "Louisiana Comprehensive Coastal Protection Master Plan, Plan Formulation Report" is part of this input.	Noted.
	The review process is well described, but it is not clear to what degree it has been implemented. The ITR Panel, assembled from among experts within the COE is described and Figure 8 shows "potential" members of the panel. Line 855 on p. 21 begins the description of an Independent Peer Review Process and says the Planning Centers of Expertise will assemble this external peer review team. Is this process underway and when will it be completed?	This review right here is the External Peer Review. The paragraph is confusing mixing the efforts of the Internal Peer Review and EPR. It will be revised to better explain the role and efforts of each.
	[613] On p.15 states that a Science and Technology Peer Review Board (S&TPRB) will be formed and will report to the PMT which will select its members. This board "may include various scientific disciplines from academia, industry, and government agencies."	Noted.

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>Shouldn't this board be shown in a box reporting to the PMT in Figure 5? Has this board been formed? What is the relationship of this board to the science advisory group that has been the subject of much discussion among the State, USACE, Louisiana University Community and others over the past year? I am referring to the one for which it was proposed that the U.S. Geological Survey serve as chair, then decided otherwise, and later reinstated in a letter from the Assistant Secretary of the Army's office.</p>	<p>This text has been modified. The concept, beyond the initial 24 month reporting period, is that any authorization stemming from this effort could capitalize on the advisory group recommended under LCA with some expansion of technical disciplines. For the 24 month reporting effort we will rely on a combination of this review effort with a longer-term integration of a National Academy of Sciences (NAS) review.</p>
	<p>[2275] p. 66 is a statement in a policy guidance memorandum signed by Mr. Waters. It states that "Future guidance will follow an adaptive management approach." I assume this refers to adaptations of the guidance and not a commitment to adaptive management of projects in the South Louisiana Hurricane Protection and Restoration effort. If it is a commitment to this, it is a very positive development, if it is not, to what degree has the COE committed to an adaptive management approach to project implementation and to the resources necessary to use this approach effectively?</p>	<p>Adaptive management processes and procedures have not been fully developed within the USACE to allow us to address the subject at this time. However, there is a growing understanding within the USACE that adaptive management of projects is desirable. Guidance on how to implement this needed.</p>
R6	<p>[793-796, 818-850] The Independent Technical Review Panel does not appear to include expertise in resource and environmental economics suitable for identifying non-market values and resources that could arise from LACPR, evaluating the contribution of restored natural habitats and hydrologic system services to the public (services which may not be limited to hurricane protection), and assist in evaluating tradeoffs that could promote the general public welfare not only through the commercial or market enterprises but also through the effect of a restored coastal ecosystem on quality of life for coastal communities. Expertise in economics methodology to evaluate public choice should be included to aid in completing analyses that quantitatively represent of the general public values affected by LACPR.</p>	<p>At this point in the team's efforts the detailed economic analysis has not reached to point where this level of detailed review is possible. The FTR will be the vehicle for this analysis.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[883-885] Public involvement is planned based on public hearings. What methods, if any, will be used to assure representative involvement from the broad spectrum of public constituencies? Public hearings are an important mechanism, but are vulnerable to influence by those interest groups with the time and financial resources to assure a presence (even professional representation) at hearings. This approach can skew evaluation of public values away from a broad spectrum of citizens – causing a bias in or failure to consider the full range of public values. A parallel, scientifically designed study of public values and priorities for the LACPR should be incorporated in the study, running in parallel with ongoing hydrologic, meteorological, and engineering studies, and in addition to engineering cost studies.</p>	<p>Do not concur. The team may seek to utilize other available surveys and results currently being collected in Louisiana.</p>
	<p>[957-964] Establishing the baseline of post 2005 conditions is critical to enabling the LACPR to fully leverage the flexibility to allocate land to different structural and non-structural (built or restored natural) elements of the future coastal protection system. This element is nice to see included, but appears in conflict with Assessments of Assets initiated around lines 1308-1348.</p>	<p>There are a number of potential economic redevelopment scenarios that will need to be considered to guide future action. The assessment of assets undertaken in the formulation process is intended to provide a starting point for the assembly of initial alternative plans to begin evaluations</p>
	<p>[989-998] The spatial data base being created could be used to support broader evaluation of public values and preferences for alternative LACPR designs. Not all multi-resource, integrated and engineered systems will be equally valuable to the public or subpopulations within the public. These data should be available to support comprehensive study of economic values (beyond commercial or market values protected, and including non-marketed ecosystem service and resource values).</p>	<p>Concur.</p>
	<p>[1184-1199] Including a scientifically designed assessment of public preferences and values for alternative design outcomes should be integrated with the analyses anticipated here. A public value (as measured within standards of environmental economics) should be used to incorporate multi-resource outcomes, including ecological habitat values, protection of property and allocation of land to alternative structural and non-structural elements of the storm protection system.</p>	<p>Do not concur.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[1515-1556] The Economics tasks completely ignore the intention to integrate multi-resource considerations in the overall LACPR Project. There is no provision whatsoever to evaluate the relative economic value of non-marketed benefits of the Project, including traditional urban and rural recreation sites protected, and the economic value of restored ecosystem services provided by the restoration of natural habitats and coastal ecosystem structures (e.g., back-barrier marshes, upper estuary forest, forested ridges on old banks, as referenced in lines 123-132 and elsewhere in the Executive Summary). These values will influence local (planning unit) residents, other state residents, and general U.S. public taxpayers differently; at least relative values should be assessed.</p>	<p>The PMP is still evolving. Current direction from USACE headquarters is in the direction of multi-objective decision-making within a matrix environment wherein assets, even those with can be monetized, will be identified but not assigned a dollar value. Consideration of normally non-monetized assets, such as restored ecosystem services, will emerge prominently once full disclosure within the four National Income Accounts (national economic development, regional economic development, environmental resources, and other social effects.) Locally, investigations of recreation-related benefits are normally proposed/conducted by the Cultural/Recreation group, rather than the Economics group, and deference should be given to their judgment.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[1628-1713] The Responsibility Matrix assigns all tasks under economics to a team consisting of one individual. This level of effort in economic analysis (regardless of the qualifications of the individual professional) is woefully inadequate. In part, this aspect of the plan suggests an inadequate understanding of the role that economic analysis can play, particularly environmental economic analysis, in assessing alternatives and identifying the alternative of highest value to the public. There is a clear focus on commercial-marketable values alone (e.g., building structure). The Environmental Design and Evaluation Team (EDET) could benefit greatly from inclusion of expertise in environmental economics, yet even the sole economist is not assigned joint responsibilities with the EDET, despite many examples of joint responsibilities across other teams. Including environmental economics expertise can be critical to identifying in-kind or money-valued tradeoffs between the benefits of man-made (built) structures and the losses of ecological habitats and services that are displaced by these structures. Integrating environmental economics experts with the various Design and Assessment teams would assure civil, hydrologic, and environmental engineering designs are more likely to integrate and leverage the public benefits of using coastal habitat features as a complement to man-made (i.e., earthen, concrete, or steel levees or drainage structures, etc.) elements of the protection project.</p>	<p>The sole economist identified is a team leader, supervising a staff of seven professional economists that is available to support LACPR as the district's highest priority. Any supplemental expertise in environmental economics is a resource-management issue and not one of technical capability. The multi-objective matrix framework, that represent the current thought as the decision-making criteria is evolving, strongly indicates that trade-offs with environmental impacts will have a high profile in plan recommendation.</p>
R7	<p>The Project Management Plan is complex, which is expected since this is a complex project. However, it appears that additional external (independent) oversight at a high level might be beneficial.</p>	<p>Concur. The PMP has been vetted in ITR and Vertical Team reviews.</p>
	<p>Also, is there enough external (private sector) involvement at various levels to promote technology transfer, encourage innovation, and reduce the burden on the USACE and other governmental agencies and groups?</p>	<p>The team is composed of 38 organizations and 150 members.</p>
	<p>[1236 &amp; 1237] What data sources will be included in the inventory, USACE, other government, non-government, private?</p>	<p>Emphasis on existing with needed efforts to collect data to fill gaps.</p>
	<p>[1260 thru 1263] In those activities that involve data collection, it is important to collect the right data from the right locations using methods consistent with data quality objectives needed for the project and planned analyses. So, the influence of the data collection methods also must be considered.</p>	<p>Concur.</p>
	<p>[1602 &amp; 1603] Based on personal knowledge, it appears that only a limited number of</p>	<p>Noted.</p>

**Table A-2. Peer Review Comments on the LACPR PTR: Executive Summary and Introduction**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>professional service firms are involved at this point given the size and complexity of this data gathering and analytical activity. If too few firms are involved, innovation is limited, personnel resources are spread too thin, QA/QC can suffer, etc.</p>	
R8	<p>Line numbers refer to Appendix A. [448-450] Description of the process for screening/developing innovative conceptual alternatives is an important part of the preliminary technical report content that appears to be lacking in the PTR as currently under review.</p>	<p>Concur. See revised PTR.</p>
	<p>[985-998] Spatial analysis and GIS is an important part of the analysis. A map showing vulnerability to different sources of hazard, namely hurricane winds, hurricane storm surge, flooding due to hurricane rainfall, flooding due to other hydrologic processes (like a flood on the Mississippi river) would be helpful to establish the composite protection provided by the various alternatives. A map would also facilitate discrete and geographically specific analysis of the protection provided by different components of each alternative and the effects and consequences of failure of different alternatives. Integrated analysis of failure probabilities and consequences is an important part of risk analysis that will be crucial for prioritizing implementation of protections (because it will not be possible to implement all protections at once). Spatial analysis that characterizes protected and unprotected (or yet to be protected) areas will be an important part of the analysis. Spatial analysis will also serve to inform non structural measures, such as emergency preparedness and response planning that may be required to provide interim protection before structural protection measures can be implemented. The PTR is rather limited in its spatial analysis and it should be a high priority to advance spatial analysis in the immediate future.</p>	<p>The PTR is limited in scope because it is limited by the time allowed for its preparation. This will be further developed in the FTR.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
<p>Q2. Given the impact of Hurricanes Katrina and Rita and the ongoing loss of coastal protection, explain whether you agree with the analysis of the extent and magnitude of risks of hurricane damage to the communities, the industries, and coastal resources of South Louisiana.</p>		
R1	<p>The impacts of hurricanes Katrina and Rita are described well. Their placement within a landscape that is continuously affected by hurricanes, from minimal to severe, is not adequate. To develop a coastal landscape that includes structural protections requires a broader overview of the conditions post-multiple hurricanes.</p>	<p>Concur. More expansive discussion will occur in the FTR.</p>
	<p>While the focus of the new approach to coastal protection and restoration results from the 2005 hurricane season, the lack of data on other hurricanes listed in this section does not support a coastal landscape approach to designing protection and restoring/maintaining coastal hurricane barriers. Many of the major storms identified in this section are not included in the data summaries of the appendices B-D, which begin with data from 1998.</p>	<p>Appendix B has been expanded to include more information on past hurricanes.</p>
	<p>Agree that taking no action is not politically or socially acceptable.</p>	<p>Noted.</p>
	<p>Agree that the continued loss of natural coastal habitat as coastal barriers in hurricane protection poses a threat to the ecological and economic future of southern Louisiana and the US.</p>	<p>Noted.</p>
	<p>This section is missing the value of the commercial fishery (as opposed to recreational fishing in the tourism section).</p>	<p>In 2004, Louisiana commercial landings exceeded 1 billion pounds with a dockside value of \$274 million- that accounts for approximately 26% of the total catch by weight in the lower 48 States (USDOC, 2005).</p>
R2	<p>The text up to the Shipbuilding subsection is effective.</p>	<p>Noted.</p>
	<p>The Shipbuilding subsection is missing.</p>	<p>This section has been developed since the review.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	The Coastal Resources at Risk subsection needs work. It is written in a different style and has a different tone. It states things that don't need to be said here [676-678, 731-732]. This subsection should be reorganized, perhaps under two subheadings. One should focus on the value of the commercial fisheries that depend on the wetlands (menhaden, crabs, shrimp, drum, seatrout, oysters, etc) and emphasize this in the same way ports and oil&gas infrastructure have been highlighted. The other subheading could have under it the ecological resources of importance such as waterfowl, migratory birds, alligators, nutria (I'm kidding), etc.	The Coastal Resources at Risk section has been revised similarly to the suggestion. Two subsections have been created for "Wetland Losses" and "Environmental and "Ecosystem Impacts." The speculative language has been removed and the sections are tighter.
R3	The PTR accurately assesses areas at risk, including communities, industries, and natural resources.	Noted.
	An assessment which quantifies risk to assets in Louisiana would provide a clearer picture of the threat to resources.	Concur. More expansive discussion will occur in the FTR.
	[610] The long-term effects of subsidence and sea level rise do increase inundation but it is necessary to quantify these effects in relation to the severe event water levels that occur over the design life of the project.	Concur. Increased water levels due to eustatic and relative sea-level rise will be incorporated into upcoming technical analyses in many ways. One method will include examining the effects of the increased base water levels used in modeling storm surge and waves for severe events.
	[674] The threat to coastal resources from hurricanes is not well described (other than from contamination); for example, the report could also discuss how sediment-starved wetlands cannot naturally recover from severe disturbances and how anthropogenic activities have caused this problem.	Concur. More discussion will occur in the FTR.
	[732-733]: "The lack of hurricane protection..." implies the need for engineering solutions that will prevent inundation; however, it should also be stated that a sustainable ecosystem that can survive severe events will also protect the use of valuable habitats.	Concur. Add after "The lack of hurricane protection provided by engineered structures and a healthy, sustainable coastal ecosystem leaves all of..."

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[734-736] It has not been clearly demonstrated that massive loss of wetlands will cripple all coastal industries (e.g., ports and agriculture may not be affected by marsh loss); this statement should be revised or clarified by additional analyses or data.	“Will” should be replaced with “has the potential to.”
R4	[p. 6-11] This section of the report describes the hurricane frequency in Louisiana, details of the two major 2005 hurricanes, and what is at risk in south Louisiana. Other than saying that 10 hurricanes hit south Louisiana from 1900 - 1950 and 12 from 1950 – present there is no discussion of any change in frequency or, as is currently reported in the news, any cycles of hurricanes in general. On p. 7 there is the statement “The impacts of Katrina and Rita were made worse due to the cumulative action of man [sic] on the ecosystem.” This is a strong statement and needs to have some backup. And if it is true, then it is clear that restoration of the ecosystems surrounding New Orleans, including the river, should be the order of the day.	Interestingly enough, the world- wide frequency of occurrence of hurricanes has remained steady over the past 35 years. The yearly hurricane numbers have oscillated around a mean value of 90. Since 1970, the global annual frequency of storms has been steady, says Kerry Emanuel of the Massachusetts Institute of Technology in Cambridge. Other investigators report that the intensity of hurricanes has increased substantially over the past 30 years. This is born out by the information presented in Annex 5 of the Engineering Appendix where it is shown that the standard project hurricane (SPH) for Zone B as defined in NOAA’s Hur 33, dated 1956 when updated through 2005, the central pressure index (CPI) for the SPH has decreased 934 millibars to about 902 millibars. The engineering team strongly disagrees with the statement on page 7 of the PTR and has so commented to the rest of the project delivery team. We recommend completely removing the statement.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>Figure 2-1 is confusing as it is not obvious what the red part of the pie charts is or what the graphic is trying to show. Why were there not graphics related to critical infrastructure (e.g. 4<sup>th</sup> largest port in the world)? This section also failed to convince the reader that the situation is getting worse because of land subsidence and wetland loss. The Coastal Resources at Risk section should come before the other risks and should describe the wetland loss as a cause, not only a result, of hurricane damage. I am anxious to see if the marshes “lost” by Hurricane Katrina are permanently lost or if it is temporary as hurricanes often have the effect of reversing wetland loss (see e.g., Mitsch, W.J. and J.G. Gosselink. 2000. Wetlands, 3rd ed. J. Wiley, New York.)</p>	<p>Figure will be updated to better explain the larger slices of the pie chart. The sequencing of the Coastal Resources at Risk was intended to provide a transition into Louisiana’s Unique Coastal Environment.</p>
R5	<p>I am concerned that the only measure of human risk used the physical infrastructure linked to economic. While infrastructure supports the cultural/social/political processes that comprise community and societal dynamics, it is totally contrary to the focus of social scientists to consider that as the exclusive measure of human impact. I have been unable to see who served on the various scientific/technical committees that put this draft together to see if you had social scientists on the committees. What you want to do rather than the approach you have taken is to ask what are the functions that are necessary to sustain the coastal communities and then ask what infrastructure is needed to retain these functions. While the answer won’t be contradictory to your approach it will provide analyses that would suggest which structures are most critical, what functions might be combined into the same structures, what structures that are at risk need absolutely to be protected, what structures can be protected with the redundancies of the non-structural mitigation activities. Much too minimal consideration of social risk.</p>	<p>Congress and the public appropriately focus on the human risk when considering storm protection projects. Not surprisingly, when the implementation costs are discussed, then the focus is directed to infrastructure. In a study with no limits a full discussion of both are essential. The “60 percent” solution, as may be represented in the FTR, appeals to a focus on the efficacy of protecting physical structures and social impacts generally more limited to the loss of life.</p>
R6	<p>[566] Should the reference to appendix E actually be for appendix C?</p>	<p>Yes, this typo has been corrected.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[590-591] Recognizing that storm damages have been exacerbated by the “cumulative actions of man on the ecosystem” is a major, positive step forward for society and government in any effort to avoid a future that repeats the past: Beyond protection of populated areas (line 595-596), “losses of coastal areas outside of the [manmade] protection systems [relying heavily on levees and pumps] pose an increasing threat to economic and environmental sustainability of the region.” This is a critical realization for society and government to accept and to act upon, and is an excellent piece of this report. The project clearly needs additional economics expertise to back this recognition with actions within project design and evaluation.	Agreed, this will need to be addressed in the FTR.
	[643-650] This section should highlight the role that stability and confidence in the hurricane protection system can play in the volatility of energy prices, at least similar to material on lines 84-93 of Appendix C.	Agreed, this will need to be addressed in the FTR.
	[659-663] The agriculture section is surprisingly brief. This would be an appropriate section to identify impacts on many of the upstream states feeding products through the major tributaries of the Mississippi watershed.	Concur. But the report is kept intentionally short for brevity to the audience and may get shorter. This topic will be expanded in the FTR.
	[664-669] Tourism section is also surprisingly brief. It does provide a good indication that natural coastal landscape and habitat features are significant elements of the commercial economy. Writers should clarify whether the figures given are annual values (not stated for hunting). Are there other forms of recreation that bring coastal visitors? These might include wildlife watchers, recreational boaters, or beach goers.	Concur. But the report is kept intentionally short for brevity to the audience and may get shorter. This topic will be expanded in the FTR.
	[655-658] The figure on Total U.S. Energy Resources Transported is quite unclear. The 67% piece of the left pie-chart is out-of-scale compared to the 71% piece on the right pie-chart; it is unstated or confusing what these portions represent in any case. The left pie chart fails to clearly separate (or clearly explain) allocations to markets and to refineries (which are presumably not markets).	Concur: the charts may be out of scale since the updated numbers from prior editions were not matched with changes in graphics. Non-concur: the market for crude petroleum is refineries.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[674-740] The Coastal Resources at Risk section is, relative to other sections, a strong contribution in recognizing the historically underappreciated role that natural coastal habitat and landscape features have had in providing critical support through protecting coastal communities from storms and serving as a source of natural productivity that ultimately supports recreational and commercial fisheries, while simultaneously protecting energy and transportation infrastructure critical to the nation. Reference could be made to an extensive literature in environmental economics that could quantify or at least provide an indication of the non-marketed services provided by these natural habitat and related resources for fisheries and wildlife recreation, or natural resource-based tourism. Louisiana’s coastal wetland complex can also be recognized as a key resource for the Mississippi flyway for migratory birds, including, but not limited to, North American waterfowl species central to natural resource-based recreation and tourism throughout the central flyway. Additional economics expertise in assessment of ecosystem service and resource values is clearly needed.</p>	<p>Concur, however the PTR is not the forum for full investigation.</p>
	<p>General comment: Overall, this preliminary section does not yet make a hard-hitting, precise case for the massive picture of commercial and non-commercial (including natural habitats) infrastructure and resources that lie at risk in south Louisiana. Many of the basic points are included, but the picture remains somewhat scattered. Nonetheless, the report correctly makes the case that the natural, cultural, and commercial (economic) resources of south Louisiana are valued in billions of dollars and that value affects the national citizenry generally.</p>	<p>Concur. The FTR will provide a more complete accounting of the assets at risk.</p>
	<p>If sources exist for the dollar value or tonnage of goods passing through south Louisiana ports, divided by imports and exports, these data should be summarized quantitatively in pie charts or overview tables.</p>	<p>Agreed, this will need to be addressed in the FTR</p>
R7	<p>[544 thru 563] The loss of life from Hurricanes Katrina and Rita is not mentioned. Also, are the economic damages identified here current losses or do they reflect estimated future losses due to the loss of businesses, tourism, downsizing of the universities, the loss of population, etc.?</p>	<p>Loss of life is reported in other sections of the PTR. Scope of other losses still being assessed and will be incorporated into the FTR as appropriate. May consider adding in the first sentence; “Hurricane Katrina brought widespread devastation and loss of like to areas of the .....</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[570 thru 740] These paragraphs address “What’s at Stake” and they do it very well.	Noted.
R8	[Overall] This section presents an analysis that is too broad and sweeping. The analysis is not specific enough to be useful for evaluation of hurricane protection alternatives.	Non-concur. The purpose of the section was to provide an overall discussion of what the risks are. A more detailed analysis will be provided in the FTR that will provide the necessary support for the evaluation of alternatives.
	[617] In the section on industries at risk the sort of general statistics presented serve to establish the broad importance of this region nationally (e.g. contributes to over 10% of U.S. economy), however these statistics are not useful in any specific way towards evaluating the need for hurricane protection. To properly evaluate hurricane protection options the specific economic return from spatially specific threatened areas needs to be quantified and an option for providing protection that involves relocating the assets that generate economic return needs to be evaluated. If an industry can be moved for less than the cost of the levee to protect it, then moving would be the option to do. It seems to me that this sort of evaluation can only be done using discrete and geographically specific analysis, because the costs of levees and costs of relocating will be spatially variable.	Suggested changes to language have already been submitted.
	[674] As with my comments on industries at risk the specific coastal resources at risk need to be listed and quantified using a geographically specific analysis so that the consequences of flooding are quantified. This section concludes that "it is imperative to address hurricane protection in south Louisiana..." This is true and was the motivation for the congressional direction for this study. What this study should be about is how to address hurricane protection and this requires more geographically specific quantification of the resources at risk for use in the evaluation of protection alternatives.	Concur. A more expansive analysis will be developed in the FTR.
R9	[570] I partially agree with the analysis but the report attributes too much of the problem to man.	Concur. Delete sentence on lines 590-591.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[590] The report states “The impacts of Katrina and Rita were made worse due to the cumulative action of man”. Man is there so people just need to deal with it. I am quite certain the ecosystem of the area has been disturbed every time a hurricane strikes the area—even before man set foot in the area.	Concur. Delete sentence on lines 590-591.
Other comments on subsection.		
R1	[537-539] Statement about coverage of details concerning hurricanes is misleading, because the information described is not in Appendix B (C in text).	The information described has been added to Appendix B and the reference has been corrected.
	[539] History is in Appendix B. Several other cross-references to appendices need to be corrected in text and appendices.	Cross references will be corrected.
	[540-541] Data for post 1950 are not included in the appendices, start at 1998	Missing data has been added to the appendix.
	[572-573] The only reason the hurricane protection has been sufficient is because the level of storms prior to Katrina and Rita did not match their strength(s). Protection for the New Orleans area was not sufficient in 1965 with Betsy.	The referenced sentence has been deleted from the report.
	[579] A worst-case scenario for Katrina with regard to the New Orleans area would have been if the eye had passed more to the west than it did.	The referenced sentence has been deleted from the report.
	[581] Delete ‘virtually’	Word deleted.
	[590-591] The cumulative impacts of man is likely defensible, but does this document intend to say that natural factors were not important. Suggest ‘human’ instead of ‘man’ here and elsewhere.	Referenced sentence will be deleted from the report.
	[622-623] Major coast-perpendicular waterways are also important and may be related to some of the causes of wetland loss, e.g. Calcasieu Channel, Wax Lake and Atchafalaya shipping channels, Houma Navigation Canal, Barataria Waterway, Belle Pass, MRGO.	Concur. A more expansive analysis will be developed in the FTR.
	[637-638] Need to define what the Port of South Louisiana includes.	The Port of South Louisiana encompasses an extensive corridor of riverfront industrial facilities, processing plants, and grain elevators over a multi-parish reach bounded on the north by the Port of Baton Rouge and to the south by the Port of New Orleans.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[643] This percentage seems low given the description preceding it, the value of the oil and gas industry, and the importance of the ports. However, this is in comparison with the remaining US.	Noted.
	[676-678] Two sentences are duplicative	Sentences have been modified.
	[683] Change to ‘will’ need to be .... We know this is an issue.	The verbs could and would are used because a hypothetical hurricane is being discussed.
	[708-709] Although shellfishes is a commonly used term, the grass shrimp is a crustacean, not a shellfish. Suggest, fishes and crustaceans.	Webster’s Dictionary defines shellfish as an aquatic animal, as a mollusk or crustacean, with a shell or shell-like exoskeleton.
	[722] Oysters should be included as an important commercial fishery, even though the paragraph deals with wetlands. Oysters are part of an estuarine ecosystem, of which wetlands are part. The sediments brought in with hurricane surges can also smother oyster beds, while building sediment levels in marshes.	Suggest adding after “The American oyster occurs throughout the brackish marshes in south Louisiana”, and supports a valuable commercial fishery. By the way, it should be “Eastern oyster”, not American.
	[740] What is an ‘industrious economy’?	The word ‘industrious’ will be changed to ‘robust.’
R2	[589] says the “perceived” threat of storm surge has increased. This would imply that the threat may not be real and that people just think storm surge is a threat. I think what you mean is that more people are now aware of the threat.	Sentence has been changed to “As coastal wetland losses continue, the threat of storm surge to populated areas increases.”
R3	[573] It is more accurate to state that the hurricane protection system was not compromised instead of claiming it was sufficient; the level of risk was the same in 2005 as years before but the system happened not to be tested in the same way.	Concur. Sentence [572-573] has been deleted.
	[579] It has not yet been established that Katrina was “very nearly a worst-case scenario”, as there are several factors that could have made it a more damaging storm. This statement should be justified by a risk-based assessment that attempts to quantify the rarity of the event.	Referenced sentence has been deleted.
R4	Figure 2-1 is not numbered in the text.	All figure numbers have been deleted for consistency with report style.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R7	[570 thru 740] The material here lends itself well to becoming a bullet list of items for highlighting in tangible ways why it is important to make a national commitment to restoring and protecting Louisiana's coast.	Noted.
R8	[539] This should refer to Appendix B.	Reference has been corrected.
	[572-573] The phrase "sufficient for many years" is questionable or misleading. The fact that a severe hurricane did not occur to expose deficiencies does not mean that deficiencies were not there and that the protection was sufficient. I think that the deficiencies have been present for many years, but were only exposed with Katrina.	Referenced sentence has been deleted.
	[579-580] Katrina was close to a "worst-case scenario". The report has not yet detailed the maximum possible hurricane and probable maximum hurricane that have been discussed. Support for this statement would depend on how Katrina compares to these scenarios. A forward reference to where these are detailed and compared to Katrina is needed to give this statement credibility.	Referenced sentence has been deleted.
	[605-607] It would be helpful to show the population centers mentioned on a map.	Addition of a map will be considered.
	[672] The section on shipbuilding needs to be written or deleted.	Write up has been added.
Comments on Appendix B as appropriate.		
R1	[167] Why does the list here start at 1998, when others were listed as having major impacts, e.g. Andrew?	In 1998, an update to previous Corps reports on hurricanes was written. The previous missing years have been added to the appendix.
R4	Appendix B provides factual summaries of past hurricanes in Louisiana. In a general context, written summaries of each hurricane could be more consistent. Also, this appendix would be easier to read and understand if summaries were placed next to the maps.	The appendix was compiled quickly because of time constraints and because presenting a hurricane history was not the main focus of the project.
R7	The reason for using only a 7-yr window for the hurricane history discussion is not given. Without some rationale for it, 7 yr seems to be a short time frame.	The missing years have been added to the appendix.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	Appendix B appears to be incomplete. This appendix is introduced on lines 537-539 of the main report as storms from the 16th century to present, however only hurricanes from 1998-2005 are presented as an "update". Update to what? This appendix presents an opportunity to provide a historical context for the three screening storms (maximum possible storm, probable maximum storm and Katrina like storm) that are used.	The missing years have been added to the appendix. More attention will be given to this appendix and information for the FTR.
	This appendix also presents a prime contextual opportunity to educate the public about statistical risks associated with extreme storm [as mentioned in the main report, lines 58-59] and provide details on the storms that meet the various definitions used [Design storm, lines 2724-2727, Maximum Possible Hurricane, lines 2745-2747, Probable Maximum Hurricane, lines 2749-2754, Standard Project Hurricane, lines 2779-2787]. The details about these design storms do not appear to be given elsewhere in the report so this appendix may be a good place to present this information.	Risk assessment will be further developed in the FTR.
	Appendix B also provides the opportunity to present a common sense rationale for interpreting hurricane statistics that can sometimes appear puzzling Appendix L [page L-11] indicates that over 150 years (between 1851 and 2004) eighteen hurricanes that were category 3 or higher made direct hits on Louisiana. Katrina made landfall as a strong category 3 storm [appendix B, line 119], putting it in the realm of a $18/153 \approx 1/9$ or roughly a 9 year return interval hurricane for the Louisiana coastline, yet the report indicates that the return interval for a Katrina like hurricane is unknown [line 581].	The reference to the return interval for a Katrina-like storm was in reference to the New Orleans Metropolitan area, not the entire coastline. Risk assessment will be further developed in the FTR.
Comments on Appendix C as appropriate.		
R1	The nonstructural examples in this appendix may be useful in the full report.	These have been addressed in the PTR given the limit imposed on the entire length of the report.
R2	Useful background information. General comment on appendices: Are all of the ones included with the PTR necessary for this report? Would some be better as appendices to the FTR or posted online and referenced in the PTR? Appendices A and K seem directly relevant to the PTR. The PTR is a 6-month report. Stating in the text, for example, that three important workshops were held and identifying the topics may be all that is needed for the PTR.	Noted. Organization of the report was a team decision with the intent to keep the main document at a reasonable length, but allow for important supplementary information to be offered to those interested in the form of an appendix.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R3	[101-114] It is not clear how resources such as fisheries will benefit from the protection system; it is important to note the balance that needs to be struck between restoration and protection in many cases.	These issues will be addressed in the FTR.
R4	New Orleans is obviously an important area economically for the country due to its function as a port and value of energy supply. A general introduction is given, but this chapter is mostly a summary of economic damages due to Katrina and should be titled to acknowledge this. Also, since this project includes large-scale restoration, a thorough understanding of the economic benefits of ecological services provided by systems that are to be restored is important and should be discussed in this section.	The project management plan (PMP) defines the scope of the economic investigation intended for the FTR.
R6	[84-93] This paragraph states a valid case for the role that confidence in hurricane protection systems can have in market prices for energy, although this case is probably stronger on a seasonal basis.	Concur.
	[100-114] The examples given of industries relying on wetland resources are appropriate. It is surprising that freshwater aquaculture is not mentioned.	Concur. Aquaculture has a large role in total agricultural production in Louisiana.
	[117-155] The population history of the affected area is critical to the impact of 2005 damages. However, it should be acknowledged here, or in the “South Louisiana at Risk” section of the main report (around lines 599-615 in the main report) that planning needs to anticipate the choice of many historic residents not to return home. Thus the future at-risk population may not return to 2005 levels immediately.	Concur. Redevelopment scenarios will be addressed in the FTR, which will be, in turn, based upon repopulation scenarios.
	[350-367] If available, damages to National Forests, National Parks and state parks and natural resource management areas should be estimated. Also, it is unstated whether losses of forestry products include losses of standing forest stock.	This information is not available but will be compiled for the FTR. As for agriculture, forestry is a large percentage of production in La., however, it is concentrated primarily in portions of the state that lie beyond the coastal zone.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>General Comment1: Appendix C does not include an attempt to recognize damages to non-marketed or recreational resources in economic terms, particularly ecosystem services that may sustain communities outside market mechanisms and manmade infrastructure. This appendix focuses almost exclusively on infrastructure (residential and commercial buildings) damage and durable consumer goods (automobiles, appliances).</p>	<p>To the extent that recreation resources are addressed in the PTR, they should appear in the environmental resources section.</p>
	<p>- Losses of 118 square miles of wetlands are noted elsewhere in the report; the economic value of these wetlands, to both market and non-market services, should be estimated or at least indicated by critical review of existing literature of environmental economics. South Louisiana has been a relatively significant study area for such studies in environmental economics literature.</p>	<p>Concur.</p>
	<p>- Omission of non-marketed, often ecosystem service benefits lost, is inconsistent with the purposes of LACPR concerning the “full range of public and private interests” and “to provide direct protection of the assets found in the coastal landscape” [lines 415-450 of the main report] including ecosystem assets. If “the application of economic principles and practices . . . is fundamentally institutionalized for the evaluation of public works projects in the United States” [lines 450-452] in order to “maximizes net benefits” [line 405], then at least an effort should be made to indicate the relative, monetized economic value of damaged or lost ecosystem services.</p>	<p>Concur.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>- One source of possible lower-bound estimates of damages could be conservation expenditures for lost habitats prior to August 2005 and public pledges and restoration expenditures planned or implemented by major conservation organizations (e.g., The Nature Conservancy, Ducks Unlimited) for south Louisiana habitats and islands lost or severely degraded by Katrina and Rita; these sources would be in addition to evaluation or appraisal derived from existing literature in environmental economics.</p>	<p>The context of the comment is that estimates of the monetary value of habitats lost to hurricanes should be made in order to fully develop the value of assets found in the coastal landscape, assets that LACPR would provide direct protection for. While it is noted that, as suggested, the Nature Conservancy or Ducks Unlimited may have relevant data to show what the cost of replacing lost habitats is, the habitats are not necessarily part of the package of assets to be protected. In other words, we may build a levee or other barrier to protect homes, infrastructure, oil facilities, etc., but there is divided opinion on whether you help or hurt wetlands by putting them behind a levee. While a levee may provide some protection from hurricane impacts, wetlands can withstand temporary inundation by storm tides, and some researchers even believe that hurricanes benefit wetlands. Whether that is true or not, there is a history of levees that have negatively impacted wetlands, and the resource agencies are firm in their position that they want the acreage of wetlands behind levees kept to a minimum.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>General Comment 2: Material in Appendix D indicates substantial natural resource and ecosystem services losses of high value to the nation, including habitat contributions to very highly valued commercial fisheries directly or through forage, habitat contributions to migratory waterfowl and neotropical migrant birds and to endangered species for which high public values are known to exist. While attribution of value narrowly to south Louisiana habitats may be infeasible in the short run, revisions to Appendix C should use existing bioeconomic literature and environmental or resource economics literature to demonstrate an indication of the potential values. In the longer term, these values should be estimated as part of new study. Examples include fisheries listed in Appendix D [lines 178-179] and Essential Fish Habitat [lines 184-186] (possible sources from National Marine Fisheries Service or Fishery Management Council studies of bioeconomic models); possible evaluation of lost visitor days to National or State Wildlife refuges [App. D, lines 347-356 lists sites to consider], the value of open space as an aesthetic resource contributing to a public quality of life [App. D line 436 indicates a qualitative value – has there been a search of environmental economics literature in an effort to monetize this value?]; water quality impacts [App.D, line 456-458 indicates damages].</p>	<p>Any EIS investigations that are conducted subsequent to the FTR would be the most appropriate area to discuss monetized impacts to ecosystem values, not Appendix C of the current report. Even so, the PMP for the FTR constrains economic investigations that would normally be performed for a conventional feasibility study.</p>
	<p>- In several of these resource areas, methodologies for estimating value can be derived from methodologies used under CERCLA and associated statutes governing liability for hazardous and toxic waste impacts on wetlands, lost recreation visitor-days, water quality, and fisheries.</p>	<p>For the FTR, the Team will determine the need for monetizing natural resources, given that the purpose is not to protect natural resources within a hurricane protection system but to preserve natural resources for both their habitat value and potential integration into the system.</p>
	<p>- Expertise in Natural Resource Damage Assessment should be obtained to contribute an improved perspective to the economic background in Appendix C. Absence of such economics expertise is inconsistent with stated purposes.</p>	<p>See immediate response above.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	This appendix is the one part of this report that takes the very necessary broader perspective on protection alternatives that I suggest in my comments on the executive summary and elsewhere. Ring levees and other non-structural features, such as buy outs need to be more fully evaluated than just in this appendix. This appendix is also helpful in that it quantifies population and assets (at least housing units) at risk by parish so that spatial evaluation of specific protections in terms of the population and housing units protected becomes possible.	Concur, noted, agree, and deserving of emphasis.
	[120] The figure, 55% of the total population of the state, is slightly inconsistent with the 51% given in the main body of the report [line 602].	The number in the report should be corrected to 55%.
Comments on Appendix D as appropriate.		
R1	The importance of sediment accumulation is not adequately addressed. Given the importance of Hurricanes Katrina and Rita on marsh loss, the impact of these storms on coastal forests should receive adequate attention compared to what was done for the marshes.	LCA environmental impact statement (EIS) incorporated by reference. Noted, will be expanded in the EIS.
R3	The appendix describes the physical destruction to the habitat caused by hurricanes; however, what is needed in the PTR is a discussion of how the LACPR could address this process. For example, it could be that restoration will provide natural capability to respond to this damage by increasing sediment supply.	This will be covered in the Future With Project section of the EIS.
R4	This appendix summarizes “Existing Environmental Conditions” in the project area. After reviewing this appendix it is unclear what “Existing” is meant to refer to (should the focus be on conditions pre-hurricane, or post-hurricane) because specific impacts of the hurricane or post-hurricane conditions are only discussed for some topic areas, mainly wetlands.	In general, existing conditions are post-hurricane conditions.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>Overall this appendix lacks a lot of valuable information, especially considering the nature of the LACPR and the focus on restoration. The engineering aspect of the project has hundreds of pages in Appendix L devoted to it, while “Existing” environmental conditions are brushed over in little more than 10 pages here and in a brief U.S. Fish &amp; Wildlife report [Appendix J]. Extensive data and knowledge of existing environmental conditions are imperative for any restoration or engineering project of this nature to be a success and appropriate energy should be invested into compiling this information.</p>	<p>Noted.</p>
	<p>Considering the attention given to wetland ecosystems and their role in coastal protection, this section in the appendix is especially lacking. It fails to provide information supporting valuable and well-documented wetland functions. The introduction to the wetlands section instead focuses mainly on the temporary detrimental affects of hurricanes, especially Katrina, to coastal wetlands such as vegetation washout and die off due to sedimentation. Extensive references are provided on this effect (making up the majority of references in this entire appendix). No equal discussion is given to the benefits of marine sediment input and river sediment redistribution to these systems by hurricanes, which is a critical process for land building, marsh maintenance, and basic marsh function in this region (Mitsch, W.J. and J.G. Gosselink. 2000. Wetlands, 3rd ed. J. Wiley, New York.). The entire context of marsh function and how it relates specifically to hurricanes needs to be addressed including discussion of BOTH positive and negative affects of hurricanes, human activities, and how they are related.</p>	<p>Noted, will be expanded in the EIS.</p>
	<p>Also, wetland functions such as sediment retention, habitat, nursery for fish, and organic matter production are mentioned in this section; however there is NO discussion of other marsh functions such as floodwater retention or water quality enhancement, which are more directly related to project goals. It is also mentioned that damage to the marshes due to Hurricane Katrina could further accelerate marsh loss but this is not explained. The effect of previous marsh destruction and subsidence due to anthropogenic effects and how this may have left these systems more vulnerable to storm impacts should also be discussed.</p>	<p>Will incorporate the LCA EIS by reference.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[Additional inconsistencies in Appendix D]            WILDLIFE – It is stated that wildlife are mostly affected due to habitat destruction, NOT direct mortality from storms – Is this claim supported in the literature? Sources could be included to strengthen arguments in this section.</p>	<p>Where wildlife species have already lost habitat (human development, conversion to farms, draining wetlands, etc), any further habitat loss can cause even more stress on an already stressed species. References: J. Meyers, et al. 2005. Wildlife and hurricane damage assessment after Hurricane Charley, J. of Coastal Research. (Additional references could be pulled from this article.)</p>
	<p>Endangered species – major threats to survival are provided for most species except piping plovers, the Red-cockaded woodpecker and turtles.</p>	<p>Plovers – early arrivals to the wintering grounds could be directly affected by the storm. Post storm and later arrivers could be faced with habitat loss.            Red-cockaded woodpecker (RCW) – the storm could damage nesting habitat by breaking or blowing down the trees. Known loss of nesting trees has been noted at the Nature Conservancy’s Abita Creek Flatwoods Preserve. Long term effects would be further loss of fragmented habitat. Effects were also noted to RCW in Ding Darling National Wildlife Refuge (NWR) in Florida after the 2004 Hurricane Charley (J. Meyers, et al. 2005. Wildlife and hurricane damage assessment after Hurricane Charley, J. of Coastal Research).            Tortoises – Since they live on typically higher ground, they would not be directly affected by flooding. Passage of the storm would only be a temporary stressor. Long term effects could be further loss of fragmented habitat.</p>

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	How do hurricanes relate to wildlife refuges, cultural resources, recreation, or aesthetics? This is not discussed for these sections but is for others.	Temporary or long-term closures due to storm related damage to infrastructure, places of interest (natural or man-made).
	WATER QUALITY – This section provides inadequate discussion of “historic and current water quality issues” (only 3 lines of text) and should be expanded to provide more relevant background information especially on major water quality issues such as the gulf hypoxia, which affects the environment and economics of the region. Potential impacts of the hurricane on water quality are discussed but not in a comprehensive manner.	Applicable historic and current water quality issues are addressed in the LCA main report and Final Programmatic Environmental Impact Statement (EIS) (November 2004) and in a report by the Louisiana Department of Environmental Quality titled “2004 Water Quality Management Plan, Water Quality Inventory, Section 305(b).” These documents and other post-hurricane data and information will be referenced and incorporated in the LACPR EIS.
	HAZMATS – In this section it is identified that there are many areas of concern and that phase I assessments will be performed, however no discussion is included on the effects/threats of hurricanes to these sites and what risks they pose to environmental health. This information would be valuable in the context of this report.	Effects/threats of hurricanes to Hazardous, Toxic, and Radioactive Waste (HTRW) sites of concern and risks to environmental health within the footprint of the project area will be addressed in the Future Without section of the LACPR EIS.
	Overall this section needs to be more consistent so the information provided in this appendix is more integrated with the topic of the report.	Noted, the LACPR EIS will follow a standard format.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R6	[124-125] Is it 30% or 40%?	30%--Document has been revised for consistency.
	[8-20] These land and wetland loss statistics appear different than wetland losses noted in the Executive Summary [at line 31] and in the Impacts section [lines 698-704] of the main report.	Numbers presented in the appendix are offering more detail on a particular basin.
	General Comment 1, Appendix D: This appendix outlines major, nationally-valued natural and ecological resources and cultural-historical resources that are largely unnoticed in the Appendix C on economic background. In Appendix D, [lines 178-179] list several species of fish supporting wild harvest industries throughout the Gulf of Mexico; the Economics Appendix C makes little or no mention of these substantial landings value of these fisheries (which cannot all be attributed to the south Louisiana habitats) and indicates no plans to assess the potential economic value that lost habitats made to these fisheries, yet environmental and resource economics literature exists and should be used to indicate these values (from bioeconomic models).	Landing quantities can be queried at the following website for the National Marine Fisheries Service (which are as recent as 2004): <a href="http://www.st.nmfs.gov/st1/commercial/">http://www.st.nmfs.gov/st1/commercial/</a> . Louisiana is second in the nation only to Alaska in the total number of fish harvested in her waters. Current to date landing tables will likely be included in the Appendix for FTR. However, the emphasis of the comment is more of an economics related issue than biological.

**Table A-3. Peer Review Comments on the LACPR PTR: The Impact of Hurricanes on South Louisiana and South Louisiana at Risk**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>General Comment 2, Appendix D: While this appendix gives a reasonable summary of static ecosystem, environmental and natural resources present in the project area, this summary serves, primarily, the important but limited role of cautioning project planners and designers of issues to consider rather than providing a thorough, quantitative perspective of these resources. It may be that Appendix authors found the quantitative perspective infeasible within time available. However, given that “The impacts of Katrina and Rita were made worse due to the cumulative actions of man on the ecosystem” [main report, lines 590-591], it would be desirable for this appendix to describe, quantitatively if possible, the types of cumulative impacts humans previously created and to estimate the degree to which these prior impacts contributed to the loss of natural, ecological, historical, cultural or environmental resources – and to estimate the economic values or indicators of relative values failure to correct these human impacts. For example, a publicly discussed source of these impacts is channelization and wetland removal, for energy and transportation development; the appendix should review here the extent of that channelization in terms of its estimated range of effect on Katrina and Rita impacts, and support appropriate economic estimates of assessments of damages that are likely attributable to these pre-existing implications of channelization.</p>	<p>At this point in project alternative development, information regarding environmental analysis is more qualitative than quantitative. The most critical component of the report, time, was extremely limited; therefore limiting the ability to develop a more qualitative analysis. Furthermore, because alternatives are currently under development, it would be difficult to provide an effective analysis. Much of the technical information required for evaluation of impacts of any particular alternative are not yet realized. A more in-depth environmental analysis, the environmental impact statement, would be provided with the Final Technical Report. The final environmental impact statement, a separate document from the final technical report, would provide a more in-depth and qualitative analysis of impacts to the environment.</p>
R8	<p>I did not find appendix D very helpful. It amounts to a list of the many and varied environmental issues important in the project area. It did not however provide any quantifiable information that could be used in the evaluation of project alternatives. Are there some project alternatives that protect environmental resources better than other alternatives? Which alternatives are they? Which environmental resources are better protected and how much better are they protected? I think that answers to these questions are needed to properly factor environmental considerations into the decision making about alternatives.</p>	<p>A more complete analysis of the impacts of the various alternatives that are currently being developed would be documented in the environmental impact. Also, see immediate response above.</p>

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q3. Evaluate the effectiveness and integration of ongoing hurricane protection and flood control projects and coastal ecosystem restoration projects.		
R1	The treatment of existing flood protection structures is inadequate. This section focuses primarily on those under construction, authorized but not under construction, or under study. This does not provide a comprehensive picture of what is currently in existence and on the books for consideration of future plans. Those that are identified are listed in a table and placed on a map. There is no discussion of them.	Concur. This section is a summary of all of the projects and studies that are on the books. More discussion will occur in the FTR.
	A general description of the USACE and local levee board responsibilities would be appropriate.	Concur. But discussions of this type are more appropriate for the FTR.
	[931] The section on the LCA plan needs to incorporate the near-term LCA plan and its review by the National Research Council, along with major conclusions of the NRC report.	As a principle of formulation all alternative plans include the recommended components of the LCA near-term plan. As they relate to the objectives of coastal protection a revised priority for those components may be recommended. This relationship will be expanded upon in the FTR. It should be noted that there has been no Congressional action taken to authorize or otherwise execute the LCA plan as a complete package in relation to the hurricane recovery efforts.
	[972] The BTNEP section needs to include the continuing mechanism of the Management Conference to enlist all stakeholders in management of resources within the Bartaria-Terrebonne National Estuary Program (BTNEP).	The LACPR team has noted during the data gathering and coordination step of formulation that programs such as the BTNEP represent significant levels of public involvement that need to be involved and accounted for in the development of plans and in decision making. The exact method for weighting and balancing these substantial external coordination efforts in the LACPR effort has not been finalized and will be addressed for the FTR.

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R2	<p>[900] This sentence says the LACPR team is examining the coastal ecosystem restoration plan components for integration into the overall LACPR plan. This would lead one to believe that the “integration of ongoing hurricane protection and flood control projects and coastal ecosystem restoration projects” is a work in progress making it difficult to evaluate the effectiveness of this integration. There are indications in the discussions of alignments and planning areas that storm protection and ecosystem restoration are being considered together so things seem to be on track in this regard. Evaluating the effectiveness of integration will have to wait until the results are available which they are not in the draft PTR.</p>	<p>In strict terms of storm surge protection the effectiveness of integrated structural / environmental features has not yet been fully evaluated. The hydrodynamic model assessments are the key to this evaluation. Tools to assess the ecosystem response to both these types of measures also require the completion of hydrodynamic assessments. The hydrodynamic assessments are underway. The tools that will be used to assess the integrated performance of these measures are described in Part 8 of the PTR “Next Steps to the Final Technical Report.” These tools will support measurement of parameters related to the coast wide planning objectives presented in the plan formulation section.</p>
	<p>These two sections identify and briefly describe each of the components of the hurricane protection and coastal restoration programs in south Louisiana. This is useful information and informs the reader what programs and projects need to be integrated. What is lacking is an explanation of the integration process and how the LACPR will reflect the integration in its plans.</p>	<p>See immediate response above.</p>
R3	<p>Designs of protection systems to 100-year levels or to poorly quantified design storms do not accurately reflect risk of inundation across the system; this methodology should be replaced by a risk-based analysis.</p>	<p>Concur. This section presents only what the existing project consist of and to what level of design they where built to or studied to. More discussion will occur in the FTR.</p>
	<p>The report should address the issue that many existing hurricane protection systems were not designed to a single standard, and the system is only as good as its weakest point.</p>	<p>Concur. Each project was a stand alone project with its own benefit/cost (B/C) ratio and national economic development (NED) benefits. More discussion will occur in the FTR.</p>
	<p>The question of effectiveness of current systems is best addressed by the IPET report below.</p>	<p>Noted. No response needed.</p>

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	The report lacks discussion of the important link between restoration and protection, activities that cannot proceed without accommodating each other; it is significant that at times their needs will support one plan of action but at other times they will have competing interests.	Concur. More discussion will occur in the FTR.
R4	<p>Hurricane Protection Programs Clearly as we saw in 2005, the hurricane protection and flood control systems are inadequate to protect the residents of South Louisiana. And clearly, the marsh restoration projects to date, particularly the CWPPRA projects, are on a scale so small that even their combined effects on marsh restoration are negligible. The lists given in Table 3-1 and 3-2 provide little additional information. How much area, how large a population to they support? What is their size? What is their cost? When were they built (or planned to be built)? And why were these projects done with the knowledge that they only protected against a Category 2 hurricane?</p>	All of the additional information is in the project's individual reports and it was felt not necessary for this report. The individual design was based on B/C ratios and NED benefits.
	<p>Coastal Restoration Programs This section is weak and without details. It needs to be improved with details on costs, projects etc. Why should we try large scale restorations, for example, if they failed a CWPPRA small scale projects? It only gives the many acronyms/names of programs and few other details of each program. One sentence on CWPPRA? How many acres were restored by this program? How much was spent? When? What are the projects (here a table would be useful). Coast 2050 was just a name and as far as I know it accomplished little (I could be wrong). LCA, which is Coast 2050 renamed, never got off the runway. There should be a better synopsis of this. Millions were spent on trying to get it going and to simply say that it is pending in WRDA is an insufficient summary.</p>	There has been text added to provide additional information on the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) program. The full background information on both the CWPPRA and LCA programs is voluminous. An appropriate addition may be to reference the web sites of each program if possible for the PTR and certainly in the FTR. Additional language can be added in the FTR as well. These are, however, independent programs. One authorized and one approved and pending authorization based their merits independent of this effort. Absent the identification of direct conflicts between programs this effort will strive to identify the optimal coordination between all current and proposed coastal protection actions.

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R6	<p>General: This section currently provides a listing of existing, on going, or previously defined but not yet implemented projects related to ecosystem restoration and hurricane protection in south Louisiana. The section provides little information indicating how these projects might be integrated within the LACPR.</p>	<p>See immediate response below.</p>
	<p>The LACPR could create an opportunity to relax the constraints that each individual project natural faces within the history of project-by-project authorizations. LACPR could produce cost savings and enhanced environmental, ecological and storm protection benefits by identifying situations in which existing or planned projects impact each other. For example, wetlands restoration in one geographic area (sub-project area) may provide storm surge and floodwater storage protection for a more urbanized sub-project area; the storm protection services of wetland restored wetland areas may then substitute for structural measures (e.g., reducing the height needed for levees) protecting the urban areas.</p>	<p>The hydrodynamic relationships affected by both structural and environmental features are the key to the assessment of any coast wide plan, whatever the purpose. These basic hydrodynamic effects are also the key to assessing the performance, both positive and negative, of an integrated storm protection and ecosystem restoration system. Hydrodynamic models being applied for assessing storm surge, interior drainage, and tidal exchange provide this linkage for both discreet extreme events and normal hydrologic conditions. Tools developed specifically for the LCA study, and further refined, address the ecosystem linkages that are a key to making appropriate system wide recommendations regardless of the planning purpose. The tools that will be used to assess the integrated performance of these measures are described in Part 8 of the PTR “Next Steps to the Final Technical Report.” These tools will support measurement of parameters related to the coast wide planning objectives presented in the plan formulation section.</p>

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Moreover, decisions to protect some areas through non-structural means or through greater reliance on natural habitat and landscape features may alter the focus of demand for residential or commercial development and redevelopment, as structural protection mechanisms may attract future development and raise the value of property at risk.	See response to second comment from R6 on page A-51.
	In addition, construction of structural elements for storm protection around some land areas removes those land areas (particularly areas that were formerly wetland or floodplains) from the available inventory of storm water storage, which in turn requires that other areas will face the added volume of displaced waters or redirected storm surge.	See response to second comment from R6 on page A-51.
	This section could benefit from providing users of the report with the perspective that these projects are not independent in their effects and that the LACPR will have an opportunity to reduce costs or increase the full range of benefits by integrating existing projects into a single, more carefully coordinated comprehensive project for south Louisiana.	See response to second comment from R6 on page A-51.
	[801-892, esp. 802-804, 876] This section is relatively strong in providing a qualitative impression that evaluation of the successes and failures of the New Orleans Hurricane Protection System will be used to develop better designs and identify priority areas for rehabilitation or reinforcement of existing elements.	Noted.
	[920-923] Description of the Barataria Basin project could motivate an example explanation of how the existing projects could be integrated and to what benefit (or cost). For examples: Does the availability of sediment resources [line 921] imply a resource that could benefit other sub-projects in the LACPR? Will marsh creation in the southwestern basin and delta-diversion from the lower Mississippi [lines 927-928] create or remove water storage capacity or storm surge protection services beneficial to neighbor sub-project areas?	See response to second comment from R6 on page A-51.
	[956-997] Again, these sections primarily inform readers of the existence of the projects discussed and their planned elements, without providing a vision of how these would be integrated in LACPR (rather than simply subsumed into LACPR with little, if any, modification) to leverage advantages of the opportunity to coordinate design and implementation for maximum net benefits.	See response to second comment from R6 on page A-51.

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R7	[742 thru 794] This portion of the report summarizes or catalogs projects, but it does not provide enough detail to formulate opinions concerning effectiveness and integration of the hurricane protection and flood control projects. Also, projects that are approved but not constructed confuse the public and continuous study frustrates them.	See response to second comment from R6 on page A-51.
	[751 and 752] System redundancies in critical areas are essential since multiple, high-strength storms could hit the same or nearly the same area (e.g., Katrina and Rita), and there may be insufficient time to repair the damage from one storm before the next storm hits.	Noted.
	[893 thru 997] An adequate summary of the existing coastal and ecosystem restoration programs and plans; however, without adequate funding, they cannot be turned into reality.	Noted.
R8	[Overall] There is insufficient information in this report to respond to this question. The report basically is limited to a list and map of project locations with a statement [lines 750-752] that "The team has outlined a vision for success..." It would be better to somehow demonstrate effective integration of the ongoing hurricane protection projects. An evaluation of effectiveness should include evaluation of how these projects would perform collectively for a design scenario, such as the probable maximum hurricane. What assets would be protected or what assets would be lost?	Concur. Integration of existing projects will be more fully explained in the FTR.
R9	[742] Based on the report it appears the various projects are being effectively integrated. I have no basis to disagree.	Concur. No response required.
<b>Other comments on subsection.</b>		
R1	[760-762] Minimal treatment of existing flood protection structures.	Noted, the FTR will accommodate the additional information required to detail these projects.
	[782] It is not clear what Table 3-4 provides information on. Are these USACE projects or local levee board projects?	Concur. USACE projects. The table has been reduced to some language in the report but a clarification on these being USACE projects will be made.
	[792] Figure 3-1 is a good figure, but the legend is not completely visible, nor are the black lines identified.	The graphical artist has improved this figure since the review. Figure will be enlarged and rotated sideways for clarity.

**Table A-4. Peer Review Comments on the LACPR PTR: Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana and Existing Coastal Ecosystem Restoration Programs and Plans**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R2	The level of detail for the hurricane protection and flood control information is different that that for the ecosystem restoration. Specific projects are listed for hurricane protection whereas the section on ecosystem restoration describes several programs with some specific project information. The CWPPRA description, for example, is one sentence. It would not be practical to list all of the CWPPRA projects, but a few examples could be given as a way of characterizing the types of projects CWPPRA includes.	There has been text added to provide additional information on the CWPPRA program. An appropriate addition may be to reference the web sites of each program if possible for the PTR and certainly in the FTR.
R4	[p. 14] Figure 3-1 p 14 is hard to understand. It needs a better and longer legend and a better interpretation of what the lines are (which bleed of the edge of the page anyhow and need to be much larger). Give this compute- generated map to an artist to clean up. Also it is not cited in the text.	Concur. The graphical artist has improved this figure since the review. Figure will be enlarged and rotated sideways for clarity.
R8	[742-794] I found this section to be weak. The precise areas protected by the various projects are not shown in a geographically specific way. The map on page 14 is unclear with respect to the level of protection and specific geographic areas that are protected. I can not read what the legend for the blue dashed line is. It is not clear which areas are protected against flooding, or hurricanes or both.	This figure has been corrected. This section is only a summary of all the projects and studies, more information is available with their individual reports which may be included in the FTR.
	[771-783] In tables 3-1 to 3-4 it would be informative to list dollar values next to each project for both the cost of the project and some quantitative measure of the assets protected. For example, the population, number of homes, or potential damage cost of the infrastructure that the project protects may be quantitative measures of the assets protected. Such information would be useful for prioritizing projects.	Concur. More detail will be provided in the FTR.
	[794] It would be helpful to depict in this map which areas are vulnerable to different sources of hazard (hurricane, flood, wind) and how this vulnerability is changed by the protection projects.	This will best be explained in the FTR.

**Table A-5. Peer Review Comments on the LACPR PTR: Performance Evaluation of Existing Authorized Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q4. Explain the importance of including the results of the Interagency Performance Evaluation Task Force (IPET) into the LACPR study.		
R1	The section on performance evaluation of existing authorized projects is cursory even in a preliminary form. There are no appendices associated with this section, which is critical to developing further projects. While the reason may be the continuing nature of determining the performance(s), this should at least be stated with perhaps a guide to how future information will be obtained (within the 2 year report period) and integrated into the FTR.	The IPET report will be incorporated as an appendix or by reference now that it is available. The data and findings of the IPET will be integrated in the decisions for the FTR.
	While ‘the whole system’ was addressed, the focus is on Katrina (understandable to a point), but the effects of Rita and potentially dangerous storms in the future need to be addressed across the full coastal landscape.	Understood, that is the directive for the LACPR.
R2	Including the results of the IPET in the LACPR study is essential. Inclusion of information about the IPET in the PRT as a separate section, especially wedged between two sections that should follow each other (the existing hurricane protection and existing ecosystem restoration plans sections) is questionable. It might be more appropriate to include the IPET project description and key results as a subsection within the “Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana” section.	Noted.
R3	Accurate assessment of the hurricane protection system during Katrina is important in understanding what is needed to improve protection.	Noted.
	[881] A risk/reliability analysis is key to determining the requirements of the protection system.	A risk based assessment methodology is being employed for the LACPR effort. This type of methodology is a change in paradigm for assessing federal investment and is being developed through efforts in the IPET. Its application in this effort will require significant additional vetting and modification beyond this preliminary report to meet the directed timeline.
	[840] Accurate vertical elevation control must be a part of all planning in Louisiana due to significant subsidence.	Noted updating of vertical controls is ongoing as levee restoration work proceeds. This information is incorporated into the digital elevation models as it becomes available.

**Table A-5. Peer Review Comments on the LACPR PTR: Performance Evaluation of Existing Authorized Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R4	<p>It is important to include a description of the IPET study for two reasons. First so that this LACPR project benefits from its findings, and second, so we do not duplicate that effort here. My problem with the IPET outline, as shown, is that it does not address the importance of the natural hurricane protection system—the coastal wetlands. To gloss over this is unacceptable. Ecological engineering solutions are not even mentioned here.</p>	<p>The IPET effort was specific to the performance of the structural protection system as it existed prior to Katrina. The LACPR effort will take into account the performance potential of all protection features and the landscape with and without additional action.</p>
R6	<p>[General] The IPET represents a sound resource for improving the net benefits produced by LACPR by illuminating weaknesses in past design and implementation of the hurricane protection system (HPS). However, if the IPET focuses narrowly on the HPS specifically around New Orleans, then LACPR will need to assess the opportunities to leverage the storm protection services of the built and relatively natural landscape outside the New Orleans vicinity to identify resource-services in neighboring areas that could have been designed (if manmade) or restored (if relatively natural) to provide redundancy to the HPS or reduce the pressure on the HPS during Katrina and Rita. By looking beyond the IPET focus area, LACPR can identify threats that could have developed from historic failures to coordinate past protection projects, and to learn from the operation of these threats during Katrina and Rita in order to design a more comprehensive plan serving the entire south Louisiana region.</p>	<p>Understood, that is the directive for the LACPR. Also see immediate response above.</p>
	<p>[821-833] These elements of the IPET focus do not explicitly recognize the role of historically degraded wetlands and natural coastal landscape changes, accumulating through human activities of past decades, in exacerbating (or mitigating) the stress placed on the HPS. LACPR will be better able to reduce costs and enhance benefits by explicitly evaluating the role of natural coastal landscapes and wetland habitats in absorbing the energy of storm surges and storing or redirecting storm waters.</p>	<p>Noted. See response to R4 above.</p>
R7	<p>[802 thru 809] These lines explain the importance of the IPET study and are a good introduction. The information in the remainder of the section does not present or discuss any of the results. The inclusion of the results from the IPET study that are available now should be included for completeness purposes. The inclusion of the results also can be linked to activities that are planned to be done to prepare the final technical report (FTR).</p>	<p>The IPET report will be incorporated as an appendix or by reference now that it is available. The data and findings of the IPET will be integrated in the decisions for the FTR.</p>

**Table A-5. Peer Review Comments on the LACPR PTR: Performance Evaluation of Existing Authorized Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	[Overall] Given the stated goals of the IPET project [lines 807-809] it seems very important to evaluate and synthesize IPET results in the LACPR study. All pertinent information needs to be integrated and evaluated.	Noted.
R9	[795] It is important in that every one should be working to accomplish the same goal without duplication.	Noted.
Other comments on subsection.		
R1	[808] Not clear what the ‘entire system’ includes.	The IPET was focused specifically on the performance of the structural protection system. This will be clarified.
R2	[857-867] This performance description describes how IPET results will be used “..in determining approaches to reducing vulnerability to breaching mechanisms in the future.” This is of critical importance to the LACPR and hopefully there was enough information available to influence the repair of existing structures that is underway and that will be completed by June 1.	Noted.
R4	Are there no other studies that are evaluating existing conditions prior to Hurricane Katrina?	The LCA study, which is also discussed in the PTR, evaluated and forecast landscape conditions prior to the storms. This information is also being reviewed and updated for planning future measures.
R8	[836-891] Much of this section is written in the future tense with phrases like [lines 858-859] "Detailed information is being gathered ..." and [lines 861-862] "Results of these efforts will be instrumental ..." These are all good things to do, but with them apparently not having been reported yet it is difficult to assess this work.	The IPET report release does allow a slight overlap with the completion of the PTR. However, the bulk of the integration of the IPET effort with LACPR will occur in the FTR.
	[904-907] As I read this text I anticipate an examination that identifies coastal restoration features that contribute to overall hurricane protection. What follows is actually just a list of projects.	Noted. At this stage of the effort the assessment of the surge reduction related effects of environmental features has not been completed. The measures included in these efforts will be assessed for their relative contribution as a part of the overall formulation process. The FTR will document those findings.

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q5. Assess the effectiveness of the planning and design workshops and public outreach and involvement activities, and coordination with other planning efforts.		
R1	[Appendix E] Wind, Waves and Water Workshop has many good ideas in it (Appendix E). Without listing all of them, some summary of what salient points will continue to guide the process. Alternatively, point out what the useful components are in Appendix E. The PTR is beginning to be an outline of items that have been conducted without addressing the overall objectives of the preliminary report.	Comment noted.
	[Appendix F] The Plan Formulation Workshop (App F) is FULL of ideas. What is the recommendation in this Preliminary Final Report for a distillation of these many ideas and development of a plan?	A meeting was held the day after the workshop and attendees determined several alternatives.
	The Alignment configurations in main body text are entirely structural and protect or not protect relative proportions of the population. The introduction to the App F was that natural and structural protection barriers should be combined into an integrated concept of coastal flood protection. This idea seems to becoming lost. App G is entirely structural.	Concur. The sequencing of sections has changed significantly to better present the rationales which lead into the alignments. This is still much work to be done with the alignments.
	The summary of the NEPA regional meetings did provide some of the basic recommendations of these meetings. What should also be noted is that there are considerable inter-regional desires for hurricane protection plans, as well as intra-regional viewpoints.	Noted.
	[1177] The USFWS plan comments and alternative formulations in App J are important inputs into the development of a hurricane protection SYSTEM that includes structural and habitat restoration plans that supplement and complement each other. The pitfalls, from the viewpoint of important habitat losses, of structural designs is also a major contribution of this report. It would be good to make statements along these lines in the body of the report, otherwise the contributions from this excellent document will not receive adequate attention.	Concur. The PTR has been revised since the review to include more of these ideas.
R2	These workshops were important steps in the LACPR process. They brought together experts to consider important components of the LACPR and demonstrated the COE's sincerity in its pronouncements that it would include a broad base of expertise in its work.	Noted.

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>The level of detail presented for the “Wind, Waves and Water Workshop” and the “Engineering Technical Approaches and Innovations Workshop” is appropriate for the PTR. Because most interest will be in the plans that are being developed for increased hurricane protection, you should consider bringing forward from the report of the “Initial Plan Formulation Workshop” (Appendix F) a few of the major recommendations that will influence the LACPR. These might include the importance of multiple lines of defense, recognition that subsidence must be taken very seriously, and that planning should include maintenance and repair. Including these and other key point from this workshop will demonstrate to the reader that some of the persistent concerns expressed by many about the hurricane protection system are being taken seriously in the LACPR.</p>	<p>Concur.</p>
R3	<p>The wind, waves, and water workshop is noted for its technically competent list of participants who provide scientific guidance that should be heeded during the process.</p>	<p>Comment noted.</p>
	<p>The project demonstrates good cooperation across state and local levels.</p>	<p>Noted.</p>
R4	<p>Planning Workshops First, it was good to see that these workshops occurred. However, there was little information in the report on these workshops, so it impossible to tell their effectiveness from the report. The two meetings were not widely announced when they happened.</p>	<p>Additional explanation has been added.</p>
	<p>Public Outreach - No specific comments</p>	<p>Noted</p>
	<p>Coordination with Other Planning Efforts It is curious that there are only 2 other planning efforts and one Federal agency listed here. For example, what about Working Group for Post-Hurricane Planning for the Louisiana Coast (Boesch et al. 2006)? That report gave a much better synopsis of what needs to be done in a planning sense. (See Boesch, D.F., L. Shabman, L.G. Antle, J.W. Day, Jr., R.G. Dean, G.E. Galloway, C.G. Groat, S.B. Laska, R.A. Luettich, Jr., W.J. Mitsch, N.N. Rabalais, D.R. Reed, C.A. Simenstad, B.J. Streever, R. Bruce Taylor, R.R. Twilley, C.C. Watson, J.T. Wells, and D.F. Whigham. 2006. A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes of 2005. University of Maryland Center for Environmental Science, Cambridge, MD, 48 pp.)</p>	<p>Noted. Work is now noted in the PTR.</p>

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R5	<p>The number one result of your own workshops is “The LACPR plan should incorporate local knowledge and concerns.” To accomplish this, stakeholders must be part of the operational groups, working committees, etc. It is called Participatory Involvement. All that you are proposing is Reactive Involvement. Once the plan is proposed the public gets a chance to react. This approach does not accomplish what the stakeholders want. And it alienates stakeholders who are kept on the outside looking in until it is too late to effect any real alterations to what is proposed without stakeholders at the table. Systematic social science studies have repeatedly demonstrated that such a non-participatory outreach approach results in delays in plan development and implementation when stakeholders finally get a chance to participate through legal actions.</p>	<p>These workshops were important steps in the LACPR process. They were proactive in that they brought together experts to consider important components of the LACPR and demonstrated the USACE’s sincerity in its pronouncements that it would include a broad base of expertise in its work. The workshops were followed by four Scoping Meetings that were very well attended. Since the workshops, study and environmental managers have attended, for the purpose of providing information and receiving input, meetings of city councils, neighborhood associations, Regional Planning Commissions, Police Juries and Parish council meetings, land development associations, non-governmental organizations, community advisory panels, and technical societies, as well as two additional public meetings.</p>
R6	<p>[1000-1083] These workshops appear to be excellent prospecting sessions, particular given the exhaustive ideas presented in Appendix F [referenced at line 1021 here]. Summaries given in this section give the impression that these workshops focused only on the production-side (engineering solutions, structural and non-structural), while, at least in Appendix F, there are solutions with behavioral elements arising from these workshops. These include tax incentives (or other incentives) to encourage private action for transporting sediments, setting aside natural (or re-naturalized, after storm destruction) landscapes through purchase of development rights, and broader incentive ideas. This section of the report should give a more comprehensive flavor of the range of solution methods discussed at the workshops, especially the methods such as economic incentives that may be less obvious from the perspective of readers who are prone to anticipate only engineering-physical structural solutions.</p>	<p>Noted. Will research additional solution methods, i.e., tax incentives, landscape set asides, etc.</p>

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[General] Adding expertise in economics generally, or environmental economics particularly, could be a focus of future workshops to explore innovative behavioral and market-based methods to guide future development and re-development into areas with storm protection bearing excess capacity or away from areas with insufficient storm protection capacity. Example question: Could behavioral means be linked to the capacity of storm protection? A workshop focused on economic incentive and behavioral means to guide future development (re-development) and the placement of that development could produce innovative solutions to reduce significantly the outright taxpayer costs of hurricane protection in the immediate and foreseeable future.</p>	<p>Noted as future outreach initiative.</p>
	<p>[1084-1185] The public outreach components currently rely on public meetings and have generated good participation. However, the hazard of public meetings is the risk that these meetings attract particular constituencies with a non-representative level of interest in the outcomes of coastal restoration and hurricane protection. The efforts to date and the plans mentioned do not include a provision for a rigorous evaluation of a broad cross-section of the public, as could be done with administration of a public survey (or other contact method) to a random sample of citizens, at least within the region. An objectively designed public survey, which should include choice questions following methods of stated preference research in environmental economics, would provide decision-makers with a quantitative (or, minimally, a qualitative) evaluation of the alternatives that a representative cross-section of society might prefer to see from LACPR; this could help decision-makers weigh tradeoffs among methods based on descriptions of land allocation outcomes and protection levels (including GIS based presentation of information about habitat qualities, protection levels, and other details of alternatives). The main point, however, is to consider a method that assures input from a representative sample of citizens. Environmental economics expertise should be used to develop this information.</p>	<p>We feel we had a broad spectrum of the public attend and participate in the scoping and public meetings, as well as at smaller meetings with civic and neighborhood associations. However, a survey is a tool that should definitely be considered and will be researched as a near future strategy.</p>
	<p>[General] Existing public meetings and outreach methods seem reasonably well coordinate with other related efforts.</p>	<p>Noted.</p>
R7	<p>In general and based on what is presented here, they seem to have been beneficial. They all seemed to be a means of communication and obtaining public and expert involvement.</p>	<p>Noted.</p>

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[1075 and 1076] These lines mention a number of innovative materials and methods for building on the soft ground conditions that exist in most of the project reaches. However, there is no discussion here or elsewhere that explains why only deep soil mixing (DSM) methods are being considered. Other approaches such as using geofoam (EPS) have been used locally (below runways at Armstrong International Airport), as well as in roadway and earthen embankment projects in various locations in the US and internationally.	See Engineering Appendix. Also, it is now stated in the PTR that “other innovative technologies may be used to further reduce settlement.
R8	The planning and design workshops appear to have been quite effective at generating ideas and gathering public input. The challenge now appears to be evaluation and inclusion of the ideas into alternatives for consideration.	Noted.
R9	[998] Based on the report it appears it appears to be effective but I have no independent information to actually judge the situation.	Noted.
Other comments on subsection.		
R1	[1119] and elsewhere, websites are mentioned but their URLs are not provided. Perhaps a listing at the end of the report would help.	Will be addressed in the PTR.
R2	Including the maps (Figs. 4.1-4.4) is a good idea.	Noted.
	Same comment about the need for the appendices (E,F,G) as stated earlier.	Noted.
R4	Appendix E gives much better detail of the December 2005 Wind, Waves, and Water Workshop. See for example page 4 ---Post workshop design ideas #4 is a key idea that does not appear in the report—using ecological solutions to ecological problems with the added advantage of attracting national support.	Revised PTR reflects contribution and need for coastal restoration features.
	Figures 4-2 – 4-4 appear with very little text and almost nonexistent legends in the report. Impossible to determine what an illustration is when the legend was only “Model Alignments 1 and 2.” Figures need description in the text of the report or leave out.	These figures have been improved significantly since the review and more language in the text will be provided explaining their value.
	Appendix F gives detail on the February 2006 workshop and the report gives great recommendations. Why are these recommendations not in the main report?	Main report summarizes suggestions and highlights use of five representative alignments for modeling and coastal restoration objectives and measures.
	Appendix G on Engineering Innovations workshop emphasized non-ecological solutions even though they did emphasize reducing the footprint of the levees.	Comment noted.

**Table A-6. Peer Review Comments on the LACPR PTR: Planning and Design Workshops, Public Outreach and Involvement, and Coordination with other Planning Efforts**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	<p>[1015-1057] This is the first section in the report where a reader starts to learn what sort of alternatives are being considered. These alternatives should be introduced earlier in the report, and should be broader in scope than these 5 alignments which looking at the figures are generally quite similar, composed of a levee along the entire length of the coast. In fact from Terrebonne parish westwards the alignments appear to be identical, although there are subtle differences in costs given in appendix L due to design alignment differences.</p>	<p>Do not concur. Report is presented in logical order. Five alignments are representative for modeling of hydrodynamic responses.</p>
	<p>[1041-1057] There appear to be errors in figures 4-1 to 4-4. St Martin parish is shown twice (in different locations) in the figures. St John the Baptist and St Charles parishes are not shown as being protected in figures 4-1 and 4-4, yet they seem to be behind the levee alignments. St John the Baptist is also not shown as being protected in figure 4-2, yet seems to be behind the levee alignment. Due to these omissions the population totals protected and unprotected are inaccurate. It would also be more informative in these figures and analyses to evaluate actual population protected, rather than total population in each parish, because it is unlikely that the area at risk from storm surge coincides exactly with these parish boundaries. There may be some parts of some parishes that are not exposed to storm surge risk, while the counter to this is that there may be some parts of inland parishes that have some storm surge risk and are protected by the levee alignment, but have not been counted in this analysis.</p>	<p>These figures have been improved significantly since the review and more language in the text will be provided explaining their value.</p>
	<p>[1041-1057] In considering the alignments presented in figures 4-1 to 4-4 what happens at the end of them in Mississippi to the east and Texas to the west. Although the political domain of responsibility covered by this report apparently ends at the state borders the hurricane risks in adjacent Texas and Mississippi coastlines is likely comparable to Louisiana so it would seem illogical to abruptly end a 30 to 40 ft high levee at a state political boundary.</p>	<p>Each alignment ties into high ground Louisiana. Team is aware of potential cross border impacts of surge deflection and is analyzing this potential. Projects should not translocate damage from one area to another without appropriate consideration and mitigation.</p>

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q6. Assess the cohesiveness and applicability of how alternatives will be developed in terms of programmatic and plan formulation principles, coast-wide objectives, identification of specific needs and objectives of planning units, and the process envisioned to develop the alternatives.		
R1	The goal of seamlessly overlaid plans reflecting the Federal and State requires is laudable.	Noted.
	Appendix K outlines the LCCPMP. From the main body of the PTR, it is not clear which processes will be followed and how the processes will be followed, other than to accept for presentation many of the broader concepts in the LCCPMP and make them integral to the LACPR. The plan selection process and the regional divisions are those of the LCCPMP; their incorporation indicates that these concepts were accepted. The PTR summarizes many of the plan formulation methods of the LCCPMP and presents them as the processes that will be followed in the formulation of the FTR.	Language has been added throughout the Plan Formulation section to clarify that the PTR is summarizing the LCCPMP. The formulation process is being conducted jointly to ensure the compatibility of the plans.
	From reading this section, it appears that the LACPR will follow the LCCPMP in its deliberations, but the report is not clear how the federally-mandated components of the LACPR will be merged with the LCCPMP.	The evaluation criteria based on the coast wide planning objectives, which have not yet been finalized, are expected to allow the identification of measures that meet both mandates. It is anticipated that the State plan components may be more expansive in addressing coastal restoration.
R2	[1210-1211] The alternatives development process and the principles that guide it are well described in this section. The role of the LCPRA in alternative plan formulation could be highlighted more, perhaps in the sentence (1210-1211) that refers to Appendix K which is the report of the LCPRA. This appendix is important to include in the PTR.	In order to reduce the volume of material in the Main PTR the plan formulation process presented in Appendix K has been summarized. The plan formulation appendix has been reassigned as Appendix A. For the FTR the plan formulation appendix will be expanded to more clearly illustrate the Federal / State coordination.
	Your question here refers to "...how alternatives will be developed..." This section focuses on planning principles and objectives which are generally well described. There is a separate section on alternatives ("Alternative Plan Formulation Rationales"). Shouldn't the "Process for Developing Alternative Plans" material here be included in that section? It could be mentioned in this section, chiefly by referencing the main discussion of alternatives in that later section.	There has been reorganization of the plan formulation section to improve clarity.

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R3	Extensive cooperation between state and federal planning is shown by development of common principles and an iterative process for developing master plans.	Noted.
R4	Coast-wide objectives A through G (p. 31) provide some of the most useful principles in this report but they are not used as guiding principles for the report. Principle D should be the preface to this entire report.	These objectives will provide the basis for establishing evaluation criteria and performance measures. This step of formulation has not been finalized but will be a critical area of information included in the FTR.
	The plan selection process diagram (Figure 4-5) is of little use without a complete description.	The diagram has been moved to the beginning of the section and text has been added to integrate the diagram with the plan formulation description.
R6	[1236-1256] Objectives here, if intended as measures of success, should be explicitly highlighted in the Executive Summary. These make clear that the overall project extends well beyond a narrow focus on the built (manmade) infrastructure.	These objectives will provide the basis for establishing evaluation criteria and performance measures. This step of formulation has not been finalized but will be a critical area of information in the FTR.
	[1281-1282] The Plan Selection Process figure. - Step1: The divide between evaluating the human and the natural communities needs to be complemented by an evaluation of interactions, particularly recognizing that cumulative human impacts are identified in preceding sections as causes of heightened impacts from major storms.	A risk based analysis will be used based on current assets in the landscape. The minimization of risk to both categories of assets should bias solutions against non-productive interactions.
	- Step 2: Again, an integrated evaluation of the future risks and consequences for an integrated human and natural environment should be added, to avoid underestimating the importance of protecting natural landscape structure and function in terms of reducing costs or increasing benefits flowing from the project.	The evaluation criteria will attempt to account for interactive values.

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>- Steps 3-5: Little detail is provided for criteria by which Alternative Plans will be evaluated. Material in Appendices H and I indicate that economic and environmental criteria have been discussed. If cost-effectiveness or cost-benefit analysis are to serve as a basis for evaluation and choice among alternative plans, this should be stated.</p>	<p>The evaluation criteria based on the coast wide planning objectives, which have not yet been finalized, are expected to allow the identification of measures that meet both mandates. It is anticipated that the State plan components may be more expansive in addressing coastal restoration.</p>
	<p>- Also the role and conduct of public meetings and discussions should be included.</p>	<p>Text has been added.</p>
	<p>- Economic methodology for evaluating public values could provide models for choice among alternatives, which will bear different outcomes for manmade and relatively natural landscapes and habitats.</p>	<p>Noted.</p>
	<p>An outline of details relative to the use of public meetings to identify specific needs and conflicts, and the potential to conduct a controlled evaluation of public preferences across elements of alternatives should be provided. The process as currently drafted is quite vague.</p>	<p>This could be considered for the FTR. State recovery efforts are attempting to gather this type of public input.</p>
	<p>[1281-1282] I realize that this is a Preliminary Plan, but the level of vagueness here is surprising.</p>	<p>It should be noted that the information presented in this report does not represent a preliminary plan, only conclusions that can be drawn from the analysis completed at this point.</p>
	<p>How can Future Landscape be projected in Step 2?</p>	<p>Several of the restoration planning efforts cited in the PTR provides future landscape forecasts that can be used on a preliminary basis.</p>
	<p>Doesn't the possible placement of levees, restored wetlands, sediment distribution systems, restoration or construction of ridges and forest or plant communities affect where development and redevelopment will occur?</p>	<p>Yes, this is a general effect of any coastal protection system.</p>
	<p>Doesn't a sediment redistribution system, as discussed in supporting appendices, imply expansion of wetland areas?</p>	<p>Yes, this is the intent of these measures.</p>

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>How will the process anticipate the development or redevelopment of human communities without allowing for an integration of the feedback between a Hurricane Protection System (HPS) design and human behavior to choose among places to develop subject to varying levels of protection and access to ecosystem or landscape resources?</p>	<p>This is intended to be a risk based assessment. As, such we will first identify the levels existing assets at risk and determine the value of providing protection and restoration. If the existing assets indicate that increased protection is not appropriate it is likely that additional develop would be encouraged. Any redevelopment would likely be encouraged only with the addition of some form of non-structural protection.</p>
	<p>A more cohesive Plan Selection Process would evaluate current conditions (Step 1), brainstorm several alternative designs, then Project Future Landscapes (Step 2), and obtain feedback from public representatives (political, business, non-profit, and independent citizens), and then work through a cycle of redesigns.</p>	<p>These steps are imbedded in the traditional water resource plan formulation process employed by federal water resources agencies. The process laid out in the PTR is intended to mirror this process. Some text has been added to the PTR to make this clearer. At this point we have not completed a full cycle of the formulation process.</p>

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>Alternatively, the brainstorming step could produce many alternative scenarios, each characterized by a map of possible levee placements, areas of wetland restoration, areas for both natural and assisted deposition of sediments, and so forth. These alternatives would include one representing substantial restoration of pre-Katrina conditions, while other alternatives provide various configurations that reallocate many of the devastated areas to wetland restoration with redevelopment redirected to areas of greater protection and mixtures of protection coming from a combination of natural landscape and structural elements; these latter alternatives should be identified in an effort to take advantage the flexibility offered by the post-Katrina landscape. These several alternatives would then be evaluated from the perspective of maximum net benefits to society, including the design of programs that will compensate owners of land that becomes less valuable in the post-Katrina and post-LACPR landscape, and including the relative value of commercial, residential, natural resource, and non-market ecosystem service benefits. In short, this process should be designed to promote the long-term welfare of the local, regional and national society, without arbitrary weight given to the allocation of lands pre-Katrina.</p>	<p>See immediate response above. A significant constraint to the formulation effort is the ability to actually complete meaningful analysis of potentially very large numbers of alternative configurations within the prescribe timeframe. Like the initial LCA effort the team has worked to interactively create two basic, but very broad initial alternatives. An iterative, multi-criteria, assessment process will work to optimize the available analytic capacity. The FTR will have expanded documentation of this effort.</p>
	<p>Alternatives that consider the redesign and relocation of critical energy, transportation, port, and residential facilities should be included in an effort to minimize costs of the HPS while reducing property and resources at risk and enhancing benefits. LACPR decisions will stimulate choices by individuals and businesses in contemporaneous and future development and redevelopment, and the Plan Selection Process needs to anticipate the realities that will come from individual and business choices. Additional economics expertise is needed to identify these opportunities and potential outcomes.</p>	<p>The application of non-structural alternatives is fully intended. The team is first attempting to assess the effectiveness of structural protection to help identify areas where the application of non-structural measures might be most effective. This iterative step will be captured in the FTR.</p>
R7	<p>The approach seems to be systematic and integrated with involvement sought from interested stakeholders.</p>	<p>Noted.</p>
R8	<p>[1186-1304] I found the section on planning principles and objectives in the main body of the report rather vague. It provides a general listing of objectives but is not sufficiently detailed to assess the cohesiveness and applicability of how alternatives will be developed. I looked at appendix K, which is the detailed description of the alternative plan formulation process, and feel that the executive summary for this appendix does present a cohesive and concise description of how alternatives are being developed. I suggest replacing much of the current main body text with text from this appendix executive summary.</p>	<p>There has been a conscious effort to reduce the volume of material in main report. The iterative development and evaluation of alternative plans from the initial alternatives will involve subsequent steps the details of which are still being developed. In the FTR a more detailed summary and appendix will be provided.</p>

**Table A-7. Peer Review Comments on the LACPR PTR: Planning Principles and Objectives**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Other comments on subsection.		
R2	The “Coastwide Planning Objectives” subsection provides the opportunity to emphasize the integration of storm protection, flood control, navigation, and restoration efforts that is a guiding principal for the LACPR. Adding some wording to accomplish this emphasis should be considered.	These objectives will provide the basis for establishing evaluation criteria and performance measures. This step of formulation has not been finalized but will be a critical area of information included in the FTR.
R3	Links between the LACPR plans and LCCPMP plans should be more strongly identified in the PTR. This section should include at minimum references to the principles and objectives being used.	Language has been added throughout the Plan Formulation section to clarify that the PTR is summarizing the LCCPMP. The formulation process is being conducted jointly to ensure the compatibility of the plans.

**Table A-8. Peer Review Comments on the LACPR PTR: Assessment of Assets**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q7. Comment on the method used to determine critical baseline information on issues and risks.		
R1	The overall process of the LCCPMP is again summarized and incorporated as the process for the LACRP plan development. As noted at the beginning of Part 4, the federal and state objectives and authorities are not the same. The comments above about the need to identify mechanisms to merge the federally-mandated components with the state’s overall planning process hold for the Assessment processes as well.	Noted.
R2	This section describes what was done to assess assets, it doesn’t describe the results or how they will be used. Methods for assessing assets are outside of my area of expertise, but I can say that this section, as written, doesn’t tell me much about how all of this fits into the LACPR.	The assets form the basis for determining current and future risk. The represent the data for making evaluations versus the objectives. The current information provides initial insight for developing alternative plans and will be refined for the FTR. The application of this information in the evaluation step will also be documented in the FTR
R3	Methodology used in PTR is appropriate and should be noted for its beneficial use of past efforts and analyses.	Noted.
R6	[1307-1348] The summary of Assessment of Assets at risk is one reasonable starting point, derived from pre-Katrina conditions and authorized CWPPRA. This is a useful baseline due to its familiarity to most stakeholders.	Noted.

**Table A-8. Peer Review Comments on the LACPR PTR: Assessment of Assets**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>However, a second baseline would also be useful, particularly for enabling the LACPR to leverage the reality of post-Katrina landscape as a source of flexibility to redesign the Hurricane Protection System (HPS) with its implications for influencing redevelopment and new development. The tragedy of Katrina and Rita includes substantial devastation of developed areas and assets of the natural landscape. Yet this tragedy offers a flexibility to re-direct new development to more suitable areas, or, at least, to areas for which an HPS can be provided with a combination of natural landscape and structural elements more cost-effectively. A baseline that protects surviving and historic areas of New Orleans and other communities, while recognizing the possibility that the most low-lying (and often the most devastated) land areas may prove suitable zones for wetland restoration or restoration of natural sedimentation and hydrological processes, would provide a baseline for several alternative futures. Each of these alternative futures would likely provide a greater promise of long-term sustainability than would futures based on restoring the past, pre-Katrina, unplanned (or less-carefully planned) levels and locations of development. Therefore, it is appropriate to outline a second baseline that reflects the reality of post-Katrina devastation and the desirability, based, for example, on cost-benefit criteria, of protecting surviving natural and manmade assets while re-assessing the desirability of alternative land allocations made possible by the tragic losses of 2005. This second base-line can be critical to the mission to consider the “full range of public and private interests” [Introduction, line 434] and to “integrate” [line 440] and “to address the full range of flood control, coastal restoration, and hurricane protection measures” [lines 448-450] within the sound practice of cost-effectiveness and cost-benefit analysis.</p>	<p>The use of scenario planning with regard to assets, sustainability, and redevelopment is being considered in the risk based assessment. The potential for removal of some protection in ordered to improve the viability of increased levels or sustainability of protection in other areas is also being investigated. The basic evaluation criteria have not yet been finalized nor has the criteria for making these types of decisions. The FTR will document these items and their application in arriving at a final plan.</p>
R7	The method seems reasonable and Appendix K provides supporting details.	Noted.
R8	[1307-1348] Appendix K contains the details of the methods used to assess assets at risk. This appendix appears to be quite detailed with only a very brief overview given in the main body of the report.	This has been done to reduce the size of the main report and provide detailed information to those who desire it.
Other comments on subsection.		
R2	[1309-1311] Mentions a process which isn’t critical to this report. A better lead-in sentence or two is needed saying what “assessment of “assets” means and why it is important.	Text has been added to make this connection more clear.

**Table A-9. Peer Review Comments on the LACPR PTR: Alternative Plan Formulation Rationales**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q8. Explain whether you agree with rationales used for assembling measures into the alternative plans.		
R1	Same comments as Questions 6 and 7 concerning the merging of federal and state.	Noted.
	The information in the Independent Formulation Review begins to address this issue, but is too preliminary in its work to be fully described. The PTR should emphasize that this type of resolution mechanism is to be used in the development of LACPR.	The preliminary nature of this effort resulted in the text being removed from the main report but is included in Appendix K. There will be numerous interactions with resources agencies and stakeholders to verify formulation and resolve issues. The full integration of even this first meeting is still preliminary.
	In the section on development of the FTR, this process will be followed. However, there is no recognition of the difficulties in coming to consensus plans and a rationale for prioritizing and justifying various alternatives.	The federal and state teams have recognized that the decision making process will involve multiple expressions of value versus risk. Determining the exact evaluation criteria and their application for decision making is a major outstanding task and will be documented in the FTR. These criteria decisions will in turn affect the broad range of stakeholders and will account for their involvement.
R2	The rationales are well explained and provide choices. The first rationale is more in line with the Congressional charge for Level 5 protection. The second reflects a more realistic approach in terms of deciding which areas can receive maximum structural protection, construction and operations and maintenance (O&M) costs, reliance on non-structural approaches as a larger element in the planning, and integration with ecosystem restoration.	The rationales are intended to set an appropriately broad range of measures in combination while simultaneously reducing the initial modeling and analytic burden.
	The link to the State Master Plan (Appendix K) and its role in defining alternatives is important and stated well here.	Noted.

**Table A-9. Peer Review Comments on the LACPR PTR: Alternative Plan Formulation Rationales**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Shouldn't Figure 4-5 be in this section and how it relates to what is described here made clear in the accompanying text?	This figure has been moved to the front of the plan formulation section and text added throughout to link the narrative to the process. The rationale development step is a mid point in the overall process for condensing gathered information. It is also a predecessor to initiating iterative formulation cycles.
R3	The rationales used are beneficial since they attempt to bracket a range of protection plans that will attempt to balance issues of protection, environmental impact, cost, and sustainability.	Noted.
	It is also beneficial that the iterative plan development will enable incorporation of additional analyses and input and should gain user buy-in.	Noted.
	Decision-makers would benefit from economic and environmental impact analyses.	These evaluation steps have not yet been initiated but are key to informing iterative formulation cycles and ultimate decision making. These steps will be documented in the FTR.
R4	[p. 36] I am confused by Rationale One statement "Minimize overall length of flood protection features, regardless of primary wetland impacts." It is hard to imagine a flood protection feature that would assist the development or sustainability of a wetland. I do agree that if artificial flood control features are used to maintain wetland vegetation, the removal of those features should not be discouraged on ecological grounds.	This rationale recognizes that there are direct trade offs between the efficiency of structural protection measures and ecological performance. The maximization of the efficiency of protection may result in the highest level of direct wetland impacts. However, in combining environmental features with protection the overall effect should be at least neutral.

**Table A-9. Peer Review Comments on the LACPR PTR: Alternative Plan Formulation Rationales**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	I disagree with the assumption “Ecosystem restoration projects...maximize acres of wetlands in the near term, regardless of self-sustaining nature of features.” There is no point in restoring wetlands that are not able to self-design and maintain themselves.	This merely identifies the means to achieve the maximum level of immediately attainable coastal protection though it may come with high operations and maintenance (O&M) costs. This rationale identifies the configuration that might achieve this upper limit of protection and allows evaluation of the relative tradeoffs and costs.
	[p. 37] “Ecosystem restoration combinations maximize acres and ensure self-sustaining processes” while this should be true, what is the context here for stating this?	This text has been modified to reflect that this is a context for identifying potential measures under this rationale.
R6	[1366-1367] Rough estimates of O&M costs should be included based on reasonable rules of thumb for each structural or non-structural element. At this stage, precise O&M estimates may not be appropriate, but rough estimates could be obtained by expert judgment for levees of various types, in conjunction with knowledge of basic soil parameters or other landscape features.	These costs will be included in the evaluation of alternatives but are not being applied as an initial constraint in assembling measures for this rationale.
	[1375-1381] These elements are too vaguely described for reasonable judgment. If trade-offs of long-term sustainability of natural resources (line 1366) is part of Rationale One, then minimizing overall length regardless of primary wetland impacts (line 1375-1376) represents a conflict unless “trade-off” is meant to imply “without consideration to.”	The last statement is correct. This rationale is maximizing structural and immediate protection without initial constraint of direct impact or relative sustainability.
	[1363-1381] If Rationale One will serve as a benchmark for a maximum cost Hurricane Protection System (HPS) based on manmade structures alone, then I agree that this Rationale is useful as it will allow an assessment (from one perspective) of the value of substituting restored landscape and habitat features as complements to manmade structures, and as a means to reduce the overall costs of the ultimate alternative chosen.	This is an accurate interpretation of the rationales intent.

**Table A-9. Peer Review Comments on the LACPR PTR: Alternative Plan Formulation Rationales**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[1383-1400] Rationale Two is an appropriate description of alternatives to a base case established by Rationale One. However, it will not be possible for a single design alternative to simultaneously minimize impacts on wetland ecosystems, minimize constrictions to hydrologic exchange, maximize acres of ecosystem restoration, and minimize O&amp;M costs. This Rationale should be expected to produce more than one design alternative. Evaluation will then need to compare the relative to the benefits and costs of different structural and non-structure elements and different productivities of natural ecosystem services in addition to risks remaining to developed property included in each design alternative.</p>	<p>This is an accurate interpretation of this rationale. Text has been added with regard to the iterative formulation process and how additional alternatives or modified rationales might be developed from these base rationales.</p>
	<p>[1402-1460, particularly 1435, 1442, 1445, 1454-1459] This Independent Formulation Review and Plan Development appropriately anticipates the creation of several alternatives through an iterative process and based on a collection of technical evaluation tools and methods (which are left unspecified here).</p>	<p>This text was compressed for readability. The discussion of the Independent Formulation Review has been maintained in Appendix A. Additional use of these independent reviews will be continued throughout the formulation process.</p>
	<p>- The emphasis on optimizing the mix of design elements (1455) is appropriate. However, this plan clearly omits consideration of social science tools, beyond public meetings, that would aid in quantitatively assessing the benefits of alternative designs and land allocations to the public generally. This process would be improved by including environmental economics experts, at least, in developing a quantitative decision support tool that can objectively summarize the diverse preferences and values of a representative sample of citizens.</p>	<p>These sampling techniques and tools will be brought to the project team for consideration. The suggested actions could provide significant additional insight. Similar processes may already be under consideration for the Louisiana Recovery Authority effort and could be incorporated.</p>
	<p>- An environmental economics-based tool would consider the preferences of south Louisiana residents (and potentially broader populations) for outcomes relative to the degree of natural landscape and habitat elements relative to structural elements. Integration of environmental economics models of preferences into these stages of analysis would enhance the ability of this process to truly optimize the mix of design elements relative to “the full range of public and private interests.”</p>	<p>See immediate response above.</p>
R7	<p>From my perspective and knowledge base, the methods seem reasonable and various processes will be used to evaluate and optimize concepts to formulate a recommended plan.</p>	<p>Noted.</p>

**Table A-9. Peer Review Comments on the LACPR PTR: Alternative Plan Formulation Rationales**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	[1349-1460] The alternative plan formulation rationales appear to be biased towards protection of the entire region to the extent technically feasible using structural measures and protection of existing population centers and areas of economic importance. I do not think that the alternatives that emerge from these rationales give enough consideration to isolated ring levees around critical areas, buy-outs and relocation of people from and hardening of infrastructure in unprotected areas to withstand hurricanes. Such alternatives should at least be considered in the suite of alternatives evaluated as they may be less expensive and more environmentally preferable in certain areas.	The current assessment has been geared toward actions for complete protection of the entire Louisiana coast. Successive analysis and measures are under consideration to address variable levels or discreet protection elements. These will be documented in the FTR.
Other comments on subsection.		
R4	Should there be a 3 <sup>rd</sup> Rationale? Text says 3. [1399] p. 37 line 1399 close parentheses missing	This text as been changed to read 2. However, a possible example of an additional rationale stemming from the iterative formulation process has been described.
R6	[General] Based on Engineering challenges, any comprehensive optimization of benefits and costs, whether or not performed in monetary-economic units, will need to consider impacts on sites for borrow materials [e.g., lines 1508-1513]. These may impact habitats, landscapes and communities north of the project area, as well as marine resources (such as fisheries habitats) affected by offshore sources employed, to suggest a few examples.	The source requirements for both structural and restoration measures will be considered relative to the effect on protection and ecosystem performance.
R8	[1360-1361] Only two rationales follow the mention of "three" rationales in this sentence.	See response to R4 above.

**Table A-10. Peer Review Comments on the LACPR PTR: Coastal Engineering Design Challenges**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q9. Assess the extent of the coastal engineering challenges that are considered in providing protection.		
R1	[1469] I may have missed it, but was the ‘project life span’ identified in the PTR?	The project has a 50 yr design life.
	One of the issues that is not addressed is the needs of BOTH structural plans and habitat restoration as natural barriers for the sediments needed. Besides not having a clear source of the necessary sediments, there is no discussion of priorities or time-lines for the use of these limited sediments.	Concur. An analysis of sediment needs and sources will be included in the FTR.
	[1516-1527] is a very well stated summary of the loss of wetlands to protect people and wetlands. A quick calculation assuming only one levee the length of the coastal zone results in the loss of 2.5 times the loss of 118 sq mi during Hurricane Katrina. This should be avoided. The additional loss of wetlands because of disruption of hydrology and sediment flux would be in addition.	Concur. The loss of wetlands must be minimized while providing reliable protection.
	Subsidence section accurately notes the difficulties in taking account for varying rates across the coast, but no reasonable solution which is critical to engineering design.	Concur. Subsidence is still being studied.
	The drawbacks of the natural geology and landscape should be placed within an ancillary concept of marshes keeping pace with sea level rise as long as there are plants and organic matter accumulation. The result is relative sea level rise.	Comment noted.
R2	This is an important section because it indicates an awareness of design challenges and informs the reader that coastal Louisiana presents complexities that are daunting.	Comment noted.
	It might be useful to add a section on “Sediment Movement.” Since many projects, especially wetland restoration projects, call for the movement of water and sediment across the landscape from the Mississippi River or other sources on a continuing basis, it could be pointed out that the presence of roads, canals, and engineered storm barriers pose obstacles to water and sediment movement that make integrated design even more complex.	Concur. A discussion on sediment movement and availability will be included in the FTR.
	In the “Climate Change and Sea Level Rise” subsection, I suggest adding a sentence that points out how relative subsidence rates impact actual sea level rise. Not only is sea level rising, but relative sea level rise is even greater in areas of high subsidence rates. This adds to the sea level rise challenge.	Concur. This is included in the sea-level change appendix to the engineering annex but will be discussed in greater detail in future reports.

**Table A-10. Peer Review Comments on the LACPR PTR: Coastal Engineering Design Challenges**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R3	It is important that the impact of all challenges be assessed over the design life of the project; this is especially true for subsidence and sea level rise. When combined with levee obstruction of flow these can lead to extensive wetland loss and change in ecosystem habitat. These impacts should be assessed before design implementation, which could be done through modeling.	Concur. One of the purposes of the planned intercepted drainage modeling is to determine the effects of the proposed levees on the natural flow patterns.
R4	[p. 40] Disruption of 100 acres of wetlands per mile of levee constructed is a significant impact and one that calls into question the building of levees in marsh areas.	Do not concur.
	[p. 40] relative subsidence rates of 0.5 to 5 ft per century are reported. It is clearly positive that subsidence is now being discussed but it is not only an engineering problem, it is an ecological problem when new sediments are not replenishing the system.	Concur.
	[p. 41] Climate change – again this is not only an engineering limitation but it is also an ecological issue too. Glad to see this problem mentioned.	Concur.
	There is no discussion of ecological engineering approaches either in this report or especially in this section. That approach would be more adaptable to all of these constraints because it would involve the design and creating of ecological systems, not engineered structures, to deal with hurricane and other water resource problems.	These are discussed as non-structural and engineering ecosystem restoration measures.
R6	[1576-1580] From an economist’s perspective, the implications of the engineering challenges in this section imply that design alternatives will likely produce higher net benefits if alternatives include behavioral or incentive-based mechanisms to redirect development. Evaluating tax or subsidy methods, or innovative programs for transferable development rights, may prove to be cost-effective methods to achieve an optimal redirection of future development while providing for compensation to property owners who face development restrictions.	Concur. These methods will be investigated during preparation of the FTR.
R7	The section provides a good overview of the primary coastal engineering challenges, many of which are geotechnical issues. Fundamental in solving the geotechnical and coastal engineering issues is a solid understanding and application geology and coastal processes. However, there is no explicit discussion of the low strength of the foundation soils and its influence on bearing capacity, slope stability, and constructability. These are all major considerations and the magnitude of them is unique to south Louisiana.	Comment noted.

**Table A-10. Peer Review Comments on the LACPR PTR: Coastal Engineering Design Challenges**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[1491 thru 1500] Settlement is properly identified as a key performance issue. DSM is mentioned as one way to improve the foundation soils and reduce settlements. Since imposed loads cause consolidation settlements, it seems prudent to look at solutions that will reduce the imposed loads. The use of geofabric or lightweight fill in the levee cross-section will reduce the imposed loads and reduce settlement, too. Reductions in the applied loads will reduce bearing capacity, slope stability, and certain constructability problems. Smaller levee footprints should be possible.	Concur. These methods will be investigated during the FTR and Pre-Construction, Engineering, and Design (PED) phases of the project.
	[1506 thru 1527] These lines address the quantity of borrow material that will be needed and wetland impacts. The smaller footprint levees commented on above, will reduce the amount of borrow material that would be needed and they should reduce negative impacts to wetland areas.	Concur.
R8	[1461-1580] The engineering design challenges to be faced in this coastal environment appear to be well appreciated and sufficiently described in the report.	Comment noted.
R9	[1461] Soils along the coast are very compressible and have a low shear strength and the area is subsiding at a slow rate. Since the entire area is at a low elevation the only local source of borrow material to construct an earth levee is to dig a ditch. These conditions may make concrete flood walls more practical and economical than earth levees.	Concur. A comparison of levees with floodwalls will be done for the FTR.
Other comments on subsection.		
R1	[1473] A bit dramatic, and that word ‘literally’ again.	Comment noted.
R2	[1573] If this is a reference to Appendix L it needs to be clarified.	This is a reference to Annex 8 of Appendix L and has been simplified since the review.

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q10. Explain whether you agree or not with the approach being used for engineering and technical design work.		
R1	The work that supplements this section was acted upon immediately and represents is the only viable data to present in the PTR. While preliminary in nature, the information in the appendix shows that work is being conducted, can be or will be modified, and that useful modeling results can be incorporated into the FTR and the longer term LACPR plan and its modification. This is document that shows there are plans for moving from the PTR to the FTR. More attention should be given to the materials in App L, if nothing other than to excerpt how this is the initial stage and identify measures that will be undertaken to produce the final LACPR plan.	Comment noted.
R2	I agree with the approach. The section is a little thin as a stand-alone section.	Comment noted. This was intended to be a summary of the work included in the Engineering Investigations Appendix.
	With all of the discussion of the role natural features (barrier islands, marsh wetlands, forested wetlands) in diminishing storm surge and run-up, it would be good to state that models that include these features will be part of the analysis. This is discussed in some detail in the “Hydrodynamic Modeling” section under “Coastal Features and Storm Surge” (1718-1769). Perhaps “Hydrodynamic Modeling” should be a subsection under “Engineering and Technical Design Work.” Rather than saying (1589) “With no time to wait for hydrodynamic modeling to be completed, engineers proceeded...” the discussion could point out that full design work needs and will utilize model outputs and that design work completed to date is preliminary.	Both the Hydrodynamic Modeling and Engineering And Technical Design Sections are Sub-sections under part 5 “Engineering Design”.
	This section describes what was done rather than results which presumably will be included in the FTR. Where additional work is identified, such as (1599 and 1603), it should be stated that this will be completed for inclusion in the FTR.	The model results were used for determination of required protection elevations and costs for the PTR.
R3	The approach the PTR is appropriate considering the time limitations; however, data gaps will need to be addressed before final design recommendations are completed.	Concur. We will address as many data gaps as possible for the FTR.
R6	[1596-1601] Methods appear to give due consideration to tradeoffs between environmental resource impacts (e.g., from levee footprints) and performance criteria (role of levee slopes in mitigate storm surge and dissipating energy) and cost.	Comment noted.

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R7	[1581 thru 1620] The geotechnical information is limited to the results of stability analyses using the USACE-NOD’s mandated slope stability method (other methods are more commonly used in the private and public sectors, including other USACE districts). While some soil properties are presented, no raw data (boring logs, boring location, laboratory data, stratigraphic profiles, etc.) are presented in the text or in Appendix L. So, no opinions can be formed about the selection of parameters used in the analyses.	As stated in the report, soil design properties for the typical stratifications were based upon geotechnical engineering experience in the region. This assignment of soil properties is common for design reports with similar scope and sufficient for the cost estimating purpose of this preliminary technical report.
	[1622 thru 1625] Hopefully, site investigation methods other than soil borings will be used. One approach is to use electric cone penetrometer tests with pore pressure measurements (CPTUs or PCPTs). They would provide more complete soil profiling, do it faster, and do it cheaper. Since borings are relatively more expensive than CPTUs and CPTUs can identify zones of interest that require further assessment, the CPTU data should be used to select boring locations.	For the Feasibility Study, boring locations were selected based on existing boring data and knowledge of the environments. CPT’s and other methods may be utilized where appropriate during the PED phase.
R8	[1581-1625] I agree with the general approach being used for engineering and technical design work. There is appropriate emphasis on hydrodynamic modeling to determine the storm surge and wave heights to be used for design, and the geotechnical considerations surrounding construction of levees in the coastal environment as these are the most challenging problems facing structural protection measures in this area.	Comment noted.
R9	[1581] In general I agree with the approach being used.	Comment noted.
Other comments on subsection.		
R2	“Under Field Data Collection” it states that the Preliminary Technical Report was completed with data on hand. I believe this is a given for all parts of the PTR and is stated somewhere in the description of the components of the LACPR. It is ok to state this here and it might be wise to make sure there is a clear understanding that all of the PTR is based on available data and that the FTR will more fully incorporate analyses and design activities that are still underway. A sentence saying this and what is said in (1622-1623) could be included somewhere in the Introduction (404-413).	Comment noted.
	Could this section be combined with the Hydrodynamic Modeling Section?	Both this section and the Hydrodynamic Modeling Section are sub-sections to the Engineering and Design Section.

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Comment on engineering and design related information in Appendix L as appropriate.		
R1	Not an engineer, but I appreciate the sections that discuss the damping of hurricane surge over distance and acreage of wetlands, which makes the case for natural barriers against hurricane flooding in conjunction with the structural protection barriers for humans and businesses. It is also obvious from reading this document that much of the materials in the main body of the PTR on coastal landscape, soils, subsidence, etc. were generated from this document.	Comment noted.
R2	Wow! This appendix is chock full of stuff! Again, I question whether it is necessary to include it all as a PTR appendix or whether it could be made available on line and cited here.	Comment noted. This material will be included on a CD-ROM which will be included with the PTR.
R6	[Annex 6] This file does not indicate clearly whether construction costs estimates are assumed constant or whether prices may be affected by a construction schedule that dramatically increase the demand for component parts. This concern should lead to caution in interpreting cost estimates. Despite this caution, it appears reasonable engineering cost estimates were performed.	These costs were prepared assuming constant pricing based on current post-Katrina prices. A more thorough analysis of this concern will be done for the FTR.
R7	The geotechnical material contained in Appendix L, including the LACPR Engineering Appendix text, seems like it could be more complete at this stage. A detailed parameter sheet could be developed for each reach since it appears that parameters were selected to conduct the analyses. Parameter sheets combined with representative boring logs containing laboratory data or CPT logs would give reviewers a better sense of the judgment and approach being used.	Comment noted. This type of information will be included in the FTR.
	In various places in the LACPR Engineering Appendix text and on plates contained in Appendix L, there are references to the use of a high-strength geotextile (e.g., Page L-51 of the LACPR Engineering Appendix text). Are geogrids possible substitutes or alternatives? Also, there are references to a sand layer being needed in some reaches for constructability purposes. Is the use of a geosynthetic needed or beneficial below the sand and above the natural ground? Finally, there are comments on Page L-52 of the LACPR Engineering Appendix text about placing a geotextile below the armor, but no discussion of the fact that the geotextile must be able to remain intact during the placement of the armor.	Currently, no geogrids meet our required strength at 5% strain.  A separator fabric between the sand base and the in situ foundation will be utilized in areas where necessary depending upon the condition of the base soil.

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>On the levee drawings in Appendix L, the type of semi-compacted fill should be noted; the text on Page L-52 indicates that it will be clay.</p>	<p>Comment noted.</p>
	<p>[p. L-52] On Page L-52, there is a reference to using a factor of safety (FS) of 1.3 for slope stability (presumably for the end-of-construction condition). However, simply mentioning a value for the FS can be misleading unless there is a discussion about the reliability or uncertainty of the other factors influencing the stability calculations. A value of 1.3 may or may not be adequate depending on the strength parameters and loading conditions that are used. Also, should methods of analysis other than Method of Planes be used to compute the minimum FS? What about circular failure surfaces?</p>	<p>Many factors influence the slope stability analyses. The most important factors include shear strength and unit weight of the in situ foundation. These two components are determined by test specimen from soil borings. The quality of the specimen samples plays a huge role in obtaining near in situ shear strength values. Our experience in sampling and testing the foundation soils of south Louisiana extends well over fifty years. Our experience has shown that a factor of safety of 1.3 is sufficient given the quality of our sampling and testing, the method of analysis, and other systemic components through the historical period of use.</p>
	<p>[p. L-54] Neither the LACPR Engineering Appendix text nor the other geotechnical aspects of the report give much attention to underseepage. Page L-54 refers to minimal areas where sand may exist at shallow levels underneath the proposed levee. Is underseepage believed to be an issue at London Avenue and were sand boils observed elsewhere in the system?</p>	<p>During the next phase of the feasibility study, when more soil borings will be taken areas of under seepage potential will be addressed as they are identified. All commenters with questions in regards to the London Avenue floodwall failures and sand boils in that area are referred to the IPET reports.</p>

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[p. L-54 and L-55] There are references to correlations with liquid limit (LL) being used to estimate settlement-related properties; however, those correlations and LL values could be presented in more detail.</p>	<p>The correlation for the compression index (<math>C_c</math>) of the foundation soils used was proposed by Terzaghi and Peck in <i>Soil Mechanics in Engineering Practice</i>, 1967 and referenced in Holtz and Kovacs' <i>An Introduction to Geotechnical Engineering</i>, 1981. The correlation is:</p> $C_c = 0.009 (LL - 10) \text{ and } C_r = 0.10(C_c)$ <p>A presentation of the liquid limits (LL) is not warranted with the scope of the PTR.</p>
	<p>[p. L-54 and L-55] In Tables L-30 through L-32 on Pages L-54 and L-55, the amount of estimated settlement for levees supported on soil-cement columns is greater for those in Reach 2 than it is for those in Reach 1. However, earlier in the report, it was stated that the soils in Reach 2 are better than the soils in Reach 1. Thus, the reason for the greater settlement in Reach 2 is not apparent.</p>	<p>In the last paragraph on page L-50, it is stated that Reach 2 is slightly better soils than Reach 1. And this can be seen when looking at Tables L-27, L-28, and L-29 as the required levee footprint noticeably decreases from Reach 1 to Reach 2 for the same levee grades. Additionally, the estimated ultimate is appreciably lower for Reach 2 than Reach 1 only for the geotextile alternative (see Tables L-31 and L-32). For the soil-cement columns alternative, the estimated ultimate settlement is slightly greater for Reach 2 than for Reach 1. The reason for this is that the zone (from surface to Elevation -60) stabilized in Reach 1 contributed a larger amount to the settlement as did the same zone in Reach 2. Additionally, the strata below El. -60 in Reach 2 produced slightly more settlement than the same strata in Reach 1.</p>

**Table A-11. Peer Review Comments on the LACPR PTR: Engineering and Technical Design Work**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	How do the amounts of settlement and the time rates of settlement compare to previous USACE experience in similar soils for similar types of structures and loads?	The magnitude of the estimated settlement for these levees is obviously much greater than any of the existing hurricane levees in this vicinity because no hurricane levee are currently even close to the grades proposed by this study (even the lowest alternate grade of +25). Therefore, the large numbers for settlement are reasonable and expected for the CAT 5 grades.
	[p. L-77] In the first paragraph under L.12.1 General, the phrases “Extraordinary methods such as...” and “...it may not be practical to employ this degree of protection for the entire state.” are used. Referring to DSM and high-strength geotextiles as “extraordinary methods” is, I think, misleading. DSM and high-strength geotextiles are commonly used on soft ground construction project around the world, as well as here in Louisiana. The commentary about the practicality of providing a high degree of protection for the entire state is inconsistent with the “Dutch Solution” that espouses the philosophy of “never again” that is cited in the LACPR report as being what an admirable goal for the US to adopt. I also think it is judgmental and inappropriate here since this is a technical report, not a public policy document.	The comment about commentary about the practicality of providing a high degree of protection for the entire state is noted.
	The LACPR Engineering Appendix text is not written as well as other reports. There are many typographical errors and some grammatical errors. The writing quality and the errors detract from the quality of the document.	Comment noted. Some of these concerns have been addressed in the latest revision.
R8	[Page L-9] There is a discrepancy between the planning unit numbering here and elsewhere in the report [page 34, line 1298]	Concur. Page L-9 has been revised to agree with the planning unit descriptions elsewhere in the report.

**Table A-12. Peer Review Comments on the LACPR PTR: Hydrodynamic Modeling**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
<p>Q11. Comment on the completeness, accuracy, and the ability to synthesize the major approaches for external estimation of surges and waves through use of hydrodynamic modeling into an optimal approach that will evaluate storm probabilities for hurricane risks in Southern Louisiana.</p>		
R1	<p>This is another example of how the instantaneous work that followed Hurricanes Katrina and Rita have provided the groundwork for further studies. This is also concrete evidence of progress in the PTR. I am not qualified to judge the technical merits of this section.</p>	<p>Comment noted. Agree with the assessment of importance of work done by others after Katrina and Rita.</p>
R2	<p>Strong section. This section does a good job of describing the importance of hydrodynamic modeling and provides some results that are informative. The section builds confidence in the ability to estimate surges and waves through hydrodynamic modeling. Clearly what is described here is critical to the design process and despite the statement (1589) about not waiting for hydrodynamic modeling to be completed, some results have been obtained that can be used in preliminary designs.</p>	<p>Comment noted. Available hydrodynamic model results were used in preliminary designs.</p>
	<p>Storm-track analysis from past hurricanes and the surges in various locations associated with them should be useful in determining which future storm tracks pose the greatest surge threats in various areas. The use of historical data to guide modeling efforts should increase the efficiency of the modeling process. The selection of the initial screening storm and tracks described here is consistent with this approach.</p>	<p>Concur. This approach will be used in the modeling efforts for the FTR.</p>
R3	<p>The use of process-based hydrodynamic models is key in developing an effective design for the hurricane protection system since they are able to simulate the impact alternative designs have on surge.</p>	<p>Comment noted.</p>
	<p>[1659] The PTR should note the probable maximum hurricane may not be synonymous with the probable maximum surge due to the limited storm parameters investigated.</p>	<p>Concur. Comments noted and a statement will be added to the PTR indicating that the PMH surge may not produce the probable maximum surge.</p>
	<p>[1680] The risk-based approach is necessary for creating a reliable design.</p>	<p>Concur.</p>
	<p>[1766-1767] The analysis of the impact of coastal landscape on storm surge is very important in tying the impact of coastal restoration to hurricane protection from severe hurricanes.</p>	<p>Concur. This analysis will be conducted for the FTR.</p>

**Table A-12. Peer Review Comments on the LACPR PTR: Hydrodynamic Modeling**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R4	<p>The major question to be determined in storm surges is the effects that surrounding wetlands have on storm surges. The section on Coastal Features and Storm Surge properly covers this question in detail and is the information is presented well. I was also pleased to see the work by Boesch et al (2006) [referred to in this report as Working Group for Post-Hurricane...(2006) and Luettich's model results. The range of surge reduction of 3 to 4 inches per mile of wetland is significant when the original expanses of wetlands that used to surround New Orleans are illustrated. Conversely, increasing the amount of deep open water, particularly for levee or other construction increases the storm surge. Bravo on this section!</p>	<p>Comment noted.</p>
R6	<p>This section (and appendices) appear to provide suitable outputs relative to protection outcomes and assessing the role of natural landscape and structural elements of a design system. These outputs could support social science (environmental economics) methodologies suggested in comments on other sections above.</p>	<p>Comment noted.</p>
	<p>I have no technical comments on hydrodynamic modeling.</p>	<p>Comment noted.</p>
R8	<p>I am not an expert in hydrodynamic modeling of storm surges and waves, but from an outside perspective this modeling appears to be quite comprehensive. In modeling there are always uncertainties and some of these uncertainties should be mentioned here. Specifically it would be helpful if the report provided some assessment or analysis of sensitivity of the results to uncertainty in hydrodynamic model parameters (e.g. roughness of the bed), and what the error or uncertainty associated with this sort of model is. If possible results should be compared to data or another model to provide some quantification of model uncertainty.</p>	<p>Concur. We will include and independent assessment on Model uncertainty as an annex to the Engineering Appendix.</p>
	<p>In the context of addressing "storm probabilities for hurricane risks" asked in the charge to reviewers, I do not believe that this section was written to specifically address this sort of probability question. The storm used in all the model runs was the probable maximum hurricane. This appears to be a reasonable approach consistent with the legal project direction to provide protection for a storm surge equivalent to a category 5 hurricane. However this approach does not quantify the probability of such a storm and the report does not present an analysis of the probability of different storms and associated storm surges.</p>	<p>Concur. The analysis of probability of different storms will be the focus of the risk assessment to be conducted for the FTR.</p>

**Table A-12. Peer Review Comments on the LACPR PTR: Hydrodynamic Modeling**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>- An analysis considering a range of input storms would broaden the uncertainty associated with the results. Such an analysis could be done and would likely involve random simulation of storm magnitude, speed, track and other storm parameters, drawing from historical records. A sufficiently large number of storms would need to be simulated to represent the estimated probability distribution of storm parameters. Each would need to be input to the hydrodynamic simulation model to calculate storm surge and from the results a probability distribution of storm surge would need to be determined. This would need to be done for each levee alignment. All of this is an immense amount of work and is subject to uncertainty in the storm parameters to simulate from as well as parameters associated with the hydrodynamic model. Nevertheless for the FTR, probabilistic consideration of these uncertainties may be needed for the risk-based approach that is mentioned (lines 1679-1682).</p>	<p>Concur. See response immediately above.</p>
<p>Other comments on subsection.</p>		
R2	<p>[1757-1759] says replacing wetlands would have “increased” storm surge elevations. Is this correct?</p>	<p>The statement refers to model runs where the existing wetlands were replaced in the model geometry with open water 8 ft deep.</p>
	<p>[1628-1630] Again, since the introductory sentence (1628-1630) says hydrodynamic modeling is being performed for design purposes, shouldn't this and the previous section be combined?</p>	<p>This section and the previous section are subsections to the Engineering Design Section. It was felt that since the modeling was such an integral part of the project it needed at separate subsection.</p>
R4	<p>[p. 46 Para 1 and p. L-39 in Appendix L] “Although these landscapes are widely recognized for their great value to the Nation and for the natural resources and ecosystem services they provide, they may also function to provide some level of protection from hurricane wave action and storm surge.” Of course—storm protection has long been listed as an ecosystem service of wetlands (see Mitsch and Gosselink, all editions). (Mitsch, W.J. and J.G. Gosselink. 2000. Wetlands, 3rd ed. J. Wiley, New York.)</p>	<p>Comment noted.</p>
<p>Comment on hydrodynamic and hydrology related information in Appendix L as appropriate.</p>		
R1	<p>One item to note is that the water level on the western side of the eye dropped in some areas, rather than increased, because of the north winds and the barometric pressure.</p>	<p>Comment noted.</p>

**Table A-12. Peer Review Comments on the LACPR PTR: Hydrodynamic Modeling**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	It is also necessary to document what the water level was in areas not as affected by a particular storm as those that showed substantial effect. Both are necessary for a coast wide plan.	Concur. This will be documented in the FTR.
R3	The ADCIRC model does not incorporate surface wave effects and tends to slightly underestimate predicted surge as a result. The report should discuss if this is significant and how it could affect model results.	Concur. We will include an independent assessment on Model uncertainty as an annex to the Engineering Appendix.
R4	Section 2.1.3.2 of Appendix L repeats Appendix B.	Comment noted. Section 2.1.3.2 talks about the most intense hurricanes. Appendix B includes all hurricanes.
	[p. L 39] Introduction to coastal features and storm surge in L.2.5 differentiates between wetlands value for natural resources and ecosystem services from protection from hurricane wave action and storm surge. These functions are of course recognized ecosystem services provided by the wetlands, which are of obvious value to our society.	Comment noted.
	[Sect. 3.1.3] Relative Subsidence – While all of the reasons for subsidence are discussed in this section there is no mention of the process of accretion, which balances subsidence in natural systems. There is no discussion of how channeling of the Mississippi to the Gulf of Mexico has reduced sediment accretion in marshes exacerbating the seriousness of subsidence.	Comment noted.
R8	With respect to the hydrology details in appendix L, I do feel that hydrological considerations surrounding intercepted drainage [section L.2.7] need to be developed to at least the level of considering feasibility. Section L.2.7.3 last line [on page L-43] indicates that "intercepted drainage designs will because of time limitations necessarily be limited to less than feasibility scope." I can accept that for the PTR there was insufficient time to undertake interior drainage designs, but for the FTR drainage designs should be pursued to at a minimum establish the feasibility of the alternatives put forward. I think that this is important to properly estimate costs which the report anticipates will be a sizable component of total costs [lines 1788-1789]	The term “feasibility scope” in this case refers to specific design requirements for a USACE feasibility report. The drainage designs for the FTR will be done to the level necessary to establish whether the alternatives are feasible and determine an idea of costs.

**Table A-13. Peer Review Comments on the LACPR PTR: Risk Assessment**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Q12. Evaluate the approach used to determine realistic probabilities of hurricane characteristics that will determine waves and surges in the planning units.	
R1	Not applicable; however, an appendix of the quality of others in the PTR would have been beneficial.	Comment noted.
R2	[1810-1821] The approach is logical. The opening paragraph (1810-1821) explains what is being done and why. What isn't clear and should be included is how the results of the risk assessment relate to hydrodynamic modeling and how the risk assessment results will be used in the design process.	Concur. The results from the hydrodynamic Advanced Circulation (ADCIRC) modeling will be used to develop the water level risk at various points along the proposed alignments. This will be expressed as a stage-frequency relationship. This information coupled with an associated wave height and wave period will provide the principal drivers for designing the protection system. The recommended design frequency for a particular system of protection will depend on many factors that among other things involve what is at risk behind the line of protection and what are the consequences of failure. The matrices for recommending a specific design level of protection are presently under discussion with higher authority and will be fully spelled out in the FTR.
R3	The approach used is necessary to examine the probability of significant storm parameters. However, it is also important to address how these relate to storm size.	The Risk Assessment team will address the significance of the various storm parameters and also discuss their relationship to storm size in the FTR.
R6	A mechanistic, science-based approach to identifying the probability of storm surge events along the Louisiana coast is appropriate to support economic evaluations of the risk to property and natural resource or ecosystem assets along the coast. Such an approach is described here, based on repeated storm simulations developed from the historic record.	Comment noted.
	I have no technical comments on the extensive engineering methodology used here.	Noted.

**Table A-13. Peer Review Comments on the LACPR PTR: Risk Assessment**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	[1808-1860] This section is written entirely in the future tense. The approach to be used seems reasonable but little information is given upon which to base an evaluation. This approach is likely to be limited by the historical storm data available upon which to base the simulations.	Concur. Several of the approaches do rely on the availability of historical data on storms and as such the quality of the data is important. Fortunately, considerable work has been accomplished in this area with preparation of new base flood elevations for FEMA in the Louisiana coastal zone. That study effort involved use of 47 historical hurricanes and the data base used for the work is readily available for this effort. These storms will be run in the Advanced Circulation (ADCIRC) model to establish maximum stages for selected locations for each of the alternative alignments under study. The Empirical Simulation Technique (EST) and Modified EST will be used to establish stage frequencies at selected locations.
Other comments on subsection.		
R2	Much of the language in this section is specialized and will be lost on the general reader. This may be unavoidable and is a problem only if the reader doesn't understand the role of the analysis itself.	Comment noted.
R4	[p. 48] What is Holland's "B" parameter?	The B parameter is an additional scaling parameter whose significance was discussed by Holland (1980). It effectively determines the peakedness of the pressure profile in a storm. The analytical form is used to explicitly model the storm pressure field for use in hydrodynamic models

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q13. Evaluate the strengths and weakness for each of the two alternatives in terms of the coastal restoration, structural features, and non-structural features. Consider the following:		
R1	[1866] The final plan WILL consider all 3 aspects, not SHOULD.	Text has been revised. All aspects will be considered and evaluated.
	It is not clear which are the ‘two’ alternatives, because several treatments have multiple alternatives within them.	Two initial alternatives based on the formulated rationales are summarized. The description of an iterative formulation / evaluation process is provided to explain how additional alternatives would be identified and considered.
	This section is a bit problematic to review, since the ‘two’ alternatives are often modifications of each other and are placed within the context of provinces so that a-g below are not easily answered across the 5 planning areas as a summary.	Noted.
	This section relies on App K, which is the LCCPMP document. The degree to which this backbone will be carried forward in the LACPR FTR is not identified nor the process to accept or deviate from this plan. There is little merging of the good ideas in the USFWS Planning Aid Report, App J, with the LCCPMP.	Text has been added throughout the Plan Formulation section to indicate that the LCCPMP formulation effort and the LACPR effort are a single effort. The integration of the US Fish and Wildlife Service (USFWS) Planning Aid report in to the formulation effort is being addressed. Addition information regarding the USFWS report has been added to the PTR.
	[1889] The graphic from the Lk Pont Fd is missing vast expanses of intertidal and fresh marshes and forested areas, and is suitable as a ‘generalized’ diagram. The different natural barriers within the various planning areas need to be incorporated into the conceptual model of alternatives for each planning area.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R2	<p>First, this section mentions the two alternative plans identified in collaboration with the State of Louisiana [1870-1871] but doesn't state clearly what they are! Reference is made to Appendix K [1921 and 1940], but one shouldn't have to go to an appendix to learn what this section is talking about! These are described as "Rationale One" and "Rationale Two" in the "Alternative Plan Formulation Rationales" section and called "alternatives" in Section 1.7 of Appendix K and are described there. The two alternatives need to be described following [1870] or reference made to their description in the "Alternative Plan Formulation Rationales" section, pointing out they are equivalent to the two rationales presented there.</p>	<p>Text has been modified to clarify this connection.</p>
	<p>Not enough is said here about the application of alternatives and their underpinnings to determine their strengths and weaknesses in specific locations. Most of the text describes actions in planning units and alignments, not the two alternatives. Based on what is said about them in Section 1.7 of Appendix K, the strength of the second alternative is its inclusion of non-structural approaches and that it reflects the realities of benefit/cost and O&amp;M considerations. It also includes environmentally sustainable options.</p>	<p>Noted. The intent of this section was to generally describe the basic measures being investigated, as well as the nature of the initial alternative combinations. Greater detail will be developed through the evaluation phase and documented in the FTR.</p>
R3	<p>The first alternative provides more substantial short term protection but at the risk of long-term maintenance cost and lack of sustainability. Also, it may be less feasible from a technical perspective to build such large, extensive levees.</p>	<p>Noted. This is the basic initial concept for initiating evaluation. Working from more extreme constructs and optimizing toward a functionally efficient and effective plan.</p>
	<p>The second alternative is more cognizant of using sustainable processes for habitat preservation and restoration, but risks an ineffectual response, especially in the short term.</p>	<p>See immediate response above.</p>
R4	<p>[LACPR Measures] <u>Strengths</u> The multiple lines of defense strategy is a sound strategy for a defense against hurricanes in So. Louisiana. Figure 6-1, a graphic taken from other sources, shows the feature well.</p> <p>Coastal restoration has and must be the first line of defense and the proper suite of alternatives from direct placement of dredged material to river diversions are discussed briefly.</p> <p>Structure raising and wind-resistant design are very important ways for humans to adapt and minimize flood damage. The Case Study from Myrtle Grove is quite a good "experiment" to show this.</p> <p>Relocation and Real Estate options are also welcome additions to the discussion in So. Louisiana.</p>	<p>Noted.</p> <p>Noted.</p> <p>Noted.</p> <p>Noted.</p>

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p><u>Weaknesses</u>                      Alternatives and Planning Units are discussed on p. 51. While these are discussed in Appendix K, they should be redefined here.</p>	<p>The FTR will feature a more expansive discussion of the completed formulation effort. This will include discussion of the performance of alternatives by planning unit.</p>
	<p>Alignments as described in maps earlier and here could be ecological disasters. They will lead to marsh disappearance on the sea-side and marsh isolation on the land-side. The Alignment maps should have been shown in this section.</p>	<p>Alignment maps have been moved to this section.</p>
	<p>[Dutch Solution]  <u>Advantages</u>                      Clearly what they have done has worked and no significant storm damage has occurred there since the 1950s.</p>	<p>Noted.</p>
	<p>They are unified by unanimous support and bold decisions.</p>	<p>Noted.</p>
	<p><u>Disadvantages</u>                      The enormous expense that was required for the stabilization of the Dutch shoreline is probably not possible in Louisiana. Large quarries in nearby Belgium supplied most of the massive rock material used to stabilize the coastline; material is not generally available near the locations where it is needed in So. Louisiana.</p>	<p>Noted. The evaluation of economic risks versus costs should illuminate these considerations in the FTR.</p>
R6	<p>[1898-1905] The potential values of coastal restoration as a complement to installed components is appropriately recognized here.</p>	<p>Noted.</p>
	<p>[1921-1957] The main report is lacking in details sufficient to consider the foundation for the two alternatives identified. Alternative 1, the maximum protection scenario, appears to constitute a baseline condition that would likely maximize costs without necessarily having increments to costs matched by additional benefits in protection of built or ecosystem assets. This alternative would likely represent the worst-case cost scenario of planners nearly ignored consideration of weighing costs and benefits quantitatively or subjectively. Alternative 2 appears to allow for a more careful balancing of costs and benefits by incremental elements of the protection system. However, Alternative 2 should, during the assessment and scoping stages, be expected to be defined in several different actual alternatives with each actual alternative involving a different mix of structural and non-structural elements.</p>	<p>These are the basic initial concepts for initiating evaluation. Working from more extreme constructs and optimizing toward a functionally efficient and effective plan.</p>

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R7	The presentation and comparison of the two alternatives could benefit from the use of a matrix that summarizes the features and benefits of each alternative and then compares the two alternatives. The matrix presentation may be easier to comprehend than the text-based presentation.	This type of presentation, could be most useful, and will be considered, for the evaluation results in the FTR.
	The discussions associated with each alternative seem appropriate and complete. However, many of the issues are outside my area of expertise and experience.	Noted.
	The “Dutch Solution” represents a strong resolve and commitment, as well as the willingness to commit the necessary level of funding. As noted in the report, we as a nation need a similar level of commitment, boldness, and funding to solve the challenge of protecting and restoring coastal Louisiana and it must be viewed as a national priority.	Noted. The evaluation of economic risks versus costs should illuminate these considerations in the FTR.
R8	[1862-2203] Overall, I find this section on Measures and Strategies difficult to follow. It writes of two initial alternative plans, five levee alignments and four categories of actions. The distillation of these into specific alternatives occurs in appendix K, where measures that comprise the details of each alternative are listed for each planning unit.	Noted. The intent of this section was to generally describe the basic measures being investigated, as well as the nature of the initial alternative combinations. Greater detail will be developed through the evaluation phase and documented in the FTR. The appendix, although providing more detail with regard to environmental measures and structural protection approach, also continues to consider the range of structural and non-structural measures presented here.
	I tried to examine the strengths and weaknesses for each alternative by examining planning unit 1 in appendix K. The major difference between alternative 1 and 2 appears to be a lower levee and hence lesser protection level from Caernarvon to Point a la Hache. I was able to see these differences in figures 2-4 and 2-5 in appendix K. I am not familiar enough with the area and did not have sufficient time to as part of this review examine non-structural differences. I was not able to, based on information that I could find in the report, evaluate advantages and disadvantages of these alternatives. Specifically tables 2-1 and 2-3 give relative damage to assets (concentrated and distributed) while tables 2-2 and 2-4 score these assets. But these tables do not indicate the different potential damages to these assets for different storm surge levels for the separate alternatives.	These are the basic initial concepts for initiating evaluation. Working from more extreme constructs and optimizing toward a functionally efficient and effective plan. At this stage of formulation and evaluation potential surge levels have not been completed. Damage risks in the appendix were based on parametric inundation levels.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>This report does also not (that I could find) give costs associated with each alternative. Appendix L gives one cost for each alignment and planning unit. Without this information evaluation of the strengths and weaknesses of the alternatives is difficult.</p>	<p>At this stage of the assessment only initial storm models of these all inclusive alignments are complete. Since this information represents an incomplete iteration of formulation of the initial alternatives no costs have been presented</p>
	<p>I found it puzzling to read in appendix K [page 22, 8 lines from the bottom] that alternative 2 would provide "feasible protection to other areas". Alternative 1 is described in the main body of the report [lines 1921-1923] as "maximum technically achievable". What is the distinction between feasible and maximum technically achievable? Surely for something to be technically achievable, it must be feasible.</p>	<p>The distinction relates to application of relative economic risk. Where "maximum technically achievable" would be provided regardless of these relative risks and "feasible" would be in relation to these risks.</p>
<p>13-a. To what extent do the alternatives achieve the overall purpose over the projected design life, and what risk do they achieve?</p>		
R1	<p>[1907-1915] That outline existing alternatives for coastal restoration to be included into the designs for alternatives one and two should consider the currently documented effectiveness of diversions in land building, salinity changes, or coastal restoration. Without sufficient sediments, the diversions will not contribute to the goals envisioned for this method.</p>	<p>Noted. This need is integrated into the stated coast wide objectives. These objective relate heavily to providing basic system function</p>
	<p>In addition to management of existing hydrology, there should be considerable attention to facilitating a more natural hydrology amidst the altered hydrology of the Louisiana coastal zone.</p>	<p>See immediate response above.</p>
	<p>It has been shown that hardening of wetland fringes does not stabilize the shoreline and create long-term sustainability; instead the marsh inside the 'hardened' shoreline falls apart.</p>	<p>Noted. Long-term sustainability is an evaluation consideration.</p>
	<p>[1917] The LCA near-term was reviewed by the National Research Council and that review should be taken into account when taking forward specific plans in the near-term LCA. Also the final version of the NRC report was written after the passage of the two hurricanes, and the idea that the near-term plan should be the way to proceed was recommended for further and serious reconsideration. The full LCA plan never received the review of the National Research Council.</p>	<p>Noted. The full range of measures investigated in the LCA study is being considered, as well as the relative priority of the near-term plan recommendations.</p>

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R2	Alternative one maximizes human and infrastructure protection at the expense of maintaining natural systems in some areas. Alternative two would do less to reduce risk to many communities, but is more realistic in terms of practical and affordable protection. It does generally increase the risk for people living in some areas, but this will ultimately be unavoidable.	Noted. This is the basic initial concept for initiating evaluation. Working from more extreme constructs and optimizing toward a functionally efficient and effective plan.
	Emphasizing that in the end it is most likely that not all areas will receive equal levels of structural protection and that some areas may choose to be abandoned if the risk is too high would be appropriate. It could even be mentioned that planned retreat could be part of the non-structural approach in alternative two.	The evaluation of initial alternatives is expected to provide insight to exactly which areas would most benefit from non-structural measures including relocation. Iterative formulation steps will allow incorporation of these measures.
R3	The first alternative is better at protecting existing resources but carries more cost in the near and long terms.	Noted.
	The sustainable restoration approach used by the second alternative would be better at returning function to coastal habitats.	Noted.
R4	Not enough information to assess what the Dutch solution is.	The Dutch Solution describes a high level, multiple barriers, with managed hydrology solution. This is in contrast to the multiple lines of defense which the initial alternatives in this effort are more in conformance with.
R6	Alternatives appear broadly consistent with objectives. However, additional configurations to Alternative 2 could be considered if new alternative design processes integrate economic assessments of ecosystem values overlooked in economic evaluations to date.	Noted. That is the intent of the iterative formulation / evaluation process described in the report.
	Design of additional configurations of Alternative Two would likely increase the net benefits provided by the final design over the full range of public benefits, including built and ecosystem service and natural resource assets.	The formulation effort will attempt to capture some of these ecosystem related benefits, in the form of sustainable system function, in the evaluation phase.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Implementation methods could involve localized studies of public values and preferences across tradeoffs between various configurations of wetland, habitat, and landscape restoration and structural (levee) elements of the final design. These studies, coordinated prior to construction of various project phases, would uncover opportunities to improve public benefits in an adaptive project management approach.	The identification and capture of public values could be very useful. It is appropriate to suggest that such efforts may extend beyond the FTR and into a preconstruction phase.
R8	I am unable to find information in the report that allows me to judge the extent to which the alternatives achieve the overall purpose over the design life and the risk that they achieve. Risk and design life are not quantified in the report, except that appendix K does refer to a Coast 2050 report suggesting a design life to 2050.	The design horizon to be applied in the evaluation phase has not been decided but is being suggested as 100 years. Existing efforts being using for initial formulation are typically based on a 50 year planning horizon
13-b. In your opinion, explain whether or not each alternative provides for sufficient data, appropriate assumptions, fatal flaw analysis, and adequate/accurate analysis.		
R1	Not even one page is given to the use of coastal restoration measures for hurricane protection, with a combination of two alternatives within 5 planning areas. This is minimal information on which to make a judgment of appropriateness. The detail in App K requires consideration of the assumptions and potential effectiveness of alternatives in a matrix of planning area by planning area with subsets of alternatives within them. This would equate to a review of App K. The PTR is not clear that the LCCPMP will be the framework for the LACPR plan, although it is identified as a starting point.	At this point in the assessment structural and environmental measures are being combined as integrated protection systems. The effectiveness of these integrated systems has not yet been evaluated. Nor has the appropriateness of the potential combinations. This will be achieved in the completion of the FTR. Text has been added throughout the Plan Formulation section to indicate that the LCCPMP formulation effort and the LACPR effort are a single effort.
	[1964-1966] Makes this statement that the alignments currently developed may be modified in the FTR.	An iterative formulation process that affects all the types of measures considered is being employed. At this point only the continuous coast wide alignments have been used to develop potential surge heights other configurations will be identified and evaluated for the FTR.
	[1979] than	Text modified.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[2016] modifications	Text modified.
	Figures from App K that show the various model alignments discussed in the text would help a reader of the PTR the ability to visualize these rather than seeking the details in the appendix.	Figures have been placed with text.
	[2035] There is the potential that ring levees could contribute to greater flooding and property damage than no levees, such as areas that have been breached historically and there is no mechanism to get the flood waters out of the flooded areas, in this case the ring levee. Besides evacuation, there needs to be plans for returning to these areas. If they remain flooded this will likely cause continued water damage and erosion.	The local drainage as well as risk associated with overtopping for ring levees are being considered in the evaluation phase.
	Regarding the assumptions and analyses associated with the ‘Dutch solution,’ which is soundly supported in the PTR.:	Noted.
	The Dutch ‘solution’ is given more credit as a universal coastal protection mechanism than is deserved. It is not universal and does not apply globally. The commitment of society, government and resources to protecting 60% of the GDP is not expected to ever be the case for either SE Louisiana or other US coastal areas.	Noted. The evaluation of economic risks versus costs should illuminate these considerations in the FTR.
	<p>The USACE Water Resources Report “A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes of 2005” is not as enamored with the diking system of The Netherlands. The report notes:</p> <ul style="list-style-type: none"> <li>- substantial differences between the Netherlands and south Louisiana limit the applicability of the Dutch model, including contrasts in human settlement patterns, land uses, geology, hydrodynamics and coastal ecology.</li> <li>- The Netherlands sits on a more stable geological foundation. Rates of subsidence are much lower than in coastal Louisiana.</li> <li>- Large storms in the Netherlands are less severe than in Louisiana. Short-term rainfall is much more intense in Louisiana than in the Netherlands.</li> <li>- Implementation of the flood protection system in the Netherlands has resulted in significant environmental degradation. Over 90% of wetland habitat has been lost and there are pervasive water quality problems behind dikes.</li> </ul>	See immediate response above. We are also engaging the Rijkswaterstaat to capitalize on lessons learned from their experience.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	The “Framework” report advises that there may be suitable engineering lessons to be learned from the diking system in The Netherlands, but that wholesale acceptance of their system as a solution for south Louisiana is not appropriate and should be approached with adequate analyses, engineering, ecological and economic. This report should be considered a resource document for the LACPR, as the many named reports in the PTR and its appendices.	Noted.
R2	This can’t be determined based on the text provided here. Not clear what “provides for” means. There doesn’t appear to be any limit on the data, assumptions, etc. that go into the consideration of the alternatives. The question will be whether the necessary data will be collected and analyzed as part of the decision making process. This is a PTR and not all data and analysis is expected to be completed at this point. Assumptions and preliminary conclusions are sufficient for this report. More will be needed in the FTR.	Noted.
R3	Without extensive hydrodynamic modeling to determine risk, neither alternative will provide sufficient data.	Noted.
	Also, it is important for both alternatives to analyses their sustainability and environmental impact.	Noted.
R4	See comment on 13-a.	Response provided for 13a.
R6	Alternatives appear to lack comprehensive economic analysis, particularly including environmental economic analysis or assessment that is feasible if appropriate expertise is invested in the project.	The evaluation phase will be completed for the FTR.
R8	There may be sufficient data in the report do these analyses, but these analyses have not been presented.	At this stage of the assessment only initial storm models of the all inclusive alignments are complete. Since this information represents an incomplete iteration of formulation of the initial alternatives results have not been presented in the PTR.
13-c. Evaluate how ongoing initiatives are incorporated into each alternative.		
R2	This is not clear from the text. It mentions (1917-1919) that the LCA Ecosystem Restoration Plan projects are included in all alternatives, but doesn’t make specific reference to to other plans or initiatives. I’m not sure this is critical, except perhaps as a general statement that alignments, models, etc are derived from other efforts identified in the PTR.	Noted. Reference to planning efforts consider earlier in the Plan Formulation section was intended indicate the general consideration of any findings or recommendations.
R3	Both plans incorporate ongoing coastal restoration plans.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R4	See comment on 13-a.	Response provided for 13a.
R6	Both alternatives appear to consider implementation relative to starting conditions established by the list of existing or previously authorized projects earlier in the report (e.g., MRGO and CWPPRA, and others). Cost savings from planning from these baselines is appropriate, as LACPR offers an opportunity to achieve savings from coordination across and extensions to these projects	Noted.
R8	Ongoing initiatives are stated to be a required part of both alternatives. Appendix K lists for each planning unit the measures within the Louisiana Coastal Authority near term plan that must be completed or accelerated. No justification for the specific inclusion of each measure as part of the alternative is given.	The evaluation and iterative formulation will provide a basis for justification of measures in the final plan in the FTR.
13-d. Explain how the alternatives consider rising sea levels, erosion of coastal areas, and future subsidence of land in providing long-term hurricane protection.		
R1	These considerations are identified as critical components of all protection and restoration projects early in the report, but the specifics of each of these factors are not specifically identified in the alternatives as questioned here. The details of these features are in the annex components of App L, and are appropriate as much as the details of those documents allow.	The evaluation tools applied to assess landscape productivity and sustainability, as well as the estimation of operations and maintenance (O&M) costs will account for the effects of overarching landscape change.
R2	These subjects are not discussed in this section. Sea level rise, erosion, and subsidence are included in the “Coastal Engineering Design Challenges” section and should, therefore, be included in modeling and design activities. These will feed the selection of measures within each of the alternatives. Stating this is sufficient for the PTR.	Relative sea-level change (which includes subsidence rates) will be incorporated into the modeling and design activities as part of the engineering analysis.
R3	The extensive use of diversion projects in the second alternative should enable a sustainable response to these effects if properly designed and implemented.	The evaluation tools applied to assess landscape productivity and sustainability, as well as the estimation of O&M costs will account for the effects of overarching landscape change.
	The larger system of levees in alternative 1 will be more susceptible to subsidence and may require more maintenance.	Noted.
	It should be noted that plans for shoreline hardening can often lead to wetland loss due to sea level rising up to the hardening.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	It is quite likely that without increased freshwater and sediment supply, marsh building activities in alternative 1 will likely fail.	Noted.
R4	See comment on 13-a.	Response provided for 13a.
R8	[1862-2203] Although raising sea levels and land subsidence are mentioned as problems elsewhere in the report they are not specifically addressed in this section on measures and strategies. It is unclear whether the hydrodynamic simulations and levee heights determined there from accounted for raising sea level and land subsidence. Some of the non-structural defense strategies involve coastal restoration measures designed to limit, or even reverse coastal erosion effects by restoring features.	Sea level rise and subsidence were recognized as problems but were not taken into consideration in developing levee heights for the PTR. They will be considered in designs for the FTR.
<b>13-e. Assess how non-structural solutions such as a buy-out plan or raising of structures are considered in these alternatives.</b>		
R1	The non-structural plans are designed for alternatives in which levee protection is farther inland than some of the low density population areas. In this case they are nominally part of an alternative, but not one that provides either structural protection. The lower density areas that might not be afforded structural protection need to be placed within a context of the necessary coastal restoration efforts needed in the immediate of this populace and more distance landscape. While population density may be minimal in many of the areas not to be afforded structural protection, the value of property, businesses, and institutions in some of these areas is substantial.	The evaluation of initial alternatives is expected to provide insight to exactly which areas would most benefit from non-structural measures including relocation. The relative level of economic risk identified will also be applied in identifying these areas. Iterative formulation steps will allow incorporation of these measures.
	[2043] The costs of the elevation of structures as a non-structural alternative are not considered, nor is the source of funds identified. If the Corps' receives substantial funds for structural barriers, then part of the FTR should identify the funds available for the non-structural plans. The cost of elevation, for instance, should not be born by a home or business owner because they live in a low density area that is not afforded structural barriers, as opposed to individuals in a high density area that will be afforded structural barriers. The program of 'assistance and incentives' needs to become part of the FTR.	Noted. The cost and funding aspects associated with non-structural measures will be discussed in the FTR.
	[2141-2143] The sentence reads that better building is best now in the preliminary recovery phase, but these considerations need to become part of a longer-term south Louisiana plan.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R2	This is not my area of expertise, however the inclusion of non-structural solutions is important and the analysis of these should be as rigorous and participatory as is planning for structural and coastal restoration measures.	Noted. Level of analysis for all measures considered will be complimentary.
R3	Both plans implement non-structural solutions; these are more extensive in alternative 2.	Noted.
R4	Good use in the LACPR; not clear in Dutch system	Noted. Conversations with the Rijkswaterstaad personnel indicate that this is an area of experience that they would like to export from us.
R5	Non-structural should first be defined (and perhaps in more than one place in the document given that the term is non intuitive, i.e. non structural including the construction or modification of structures for wind and water resistance. They are non structural because they are not macro structures such as levees or flood walls.	A definition will be developed for inclusion in the FTR.
	More emphasis should be placed on this section. Similar to the multiple lines of defense argument from the Lake Pontchartrain Foundation, “redundancy” should be the term used to include the different types of non structural and structural. Inclusion of them is key to risk reduction. We know the record of structurals.	Discussion of these measures will be expanded considerably in the FTR.
	<p><u>Elevation</u></p> <p>First, the term “mitigation” is a term that is rarely understood by the average citizen as well as architects, structural engineers and contractors. While individual mitigation elements may be known, there is no appreciation of the package of these elements and how taken together they can protect in very significant ways. Inclusion of more discussion of these actions under the “mitigation” umbrella can assist government agency representatives (outside of FEMA) as well as the public in appreciating them.</p>	The appropriate consideration and application of non-structural measures across responsible federal agencies will be addressed in the FTR.
	Second, the opportunities to undertake non-structural construction/restoration mitigation measures should be emphasized more in this document. The preparers of this document may not be aware that many of the house mitigation measures have been studied and improved at the Vicksburg Corps facilities. For example, raising slab-on-grade structures and applying flexible water barriers around houses. This is Corps work and inclusion in this document demonstrates that these best practices are advocated and improvements to their engineering committed to by the Corps.	The national non-structural and flood proofing committee has already been engaged to provide input for the FTR.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Also, the Corps has a national non structural and flood proofing committee of which Falcom Hull at the New Orleans office is a member. If he has not already participated in the preparation of this section I would suggest he be included in the revisions.	See immediate response above.
	Third, “in the absence of further government action outside of financial assistance provided by FEMA.” This section should specify that the Flood Insurance assistance has particular mitigation requirements, some of which the National Flood Insurance Program requires under the conditions described within this section of your report. Other mitigation measures can be undertaken by homeowners through a second FEMA assistance option if they choose to participate. Beyond conformity to the BFE if the home is substantially damaged (over 50%), the Hazard Mitigation Grant Program enables owners of damaged insured homes to add those features that you described with FEMA HMGP assistance. There is \$1.2 billion directed toward these latter efforts in the state of Louisiana alone post Katrina/Rita. The first eligible are those homes that have been repeatedly flooded and then those homes that are “only” substantially damaged. Also, the ICC (Increased Cost of Compliance) “rider” to the Flood Insurance Policy of \$30,000 is for actions such as elevation if the house is not in compliance with the BFE. These are not insignificant elements of a coastal protection plan. Redundancy.	Recommendations regarding appropriate individual and community participation in these programs, relative to the presented plan, will be included in the FTR.
	Fourth, the HMGP funding is constrained by a benefit/cost ratio analysis and must demonstrate greater than 1.0 benefit. It is not without b/c requirements. The basic Flood Insurance compliance with BFE requirements has none.	Noted.
	Fifth, the houses that survived had scouring under the piling slabs from the surge (Lake Catherine), demonstrating that careful consideration of all elements of surge mitigation must be developed.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p><u>Relocation</u>            This section lacks comment about the degree of personal/family/community impact of such decisions. Attachment to coastal Louisiana by residents is remarkable. Louisiana has the highest percentage of native born of any state in the country, i.e. highest percentage that were born here who remain. I do not disagree with your comments. I think they are lacking the context of what I have just said. Such relocation decisions will have impacts on the residents that will not be psychically/socially mitigated for the duration of the lives of the individuals/families and friendship networks that are impacted, and even beyond that to future generations. Recognition of this impact and a declaration of the unwillingness to take these steps unless absolutely necessary are as important as is the restoration/preservation of the ecosystem. By considering relocation, the commercial fisheries will be impacted beyond survival (especially given the threat they now experience from import prices). This in turn will limit the possibilities of retaining the important, complex cultures that are supported by the coastal ecosystem. As you imply in your paragraph, whole communities will not be relocated. It is impossible to do so. Therefore the fragments that move will be isolated within other cultures and within other ecosystems that won't support their natural resource relationships. It is important that the reports pay respect to the impact that this solution will have on coastal residents. And, the same comments hold true for the residents of greater New Orleans as their diaspora experiences become permanent relocations. It is unacceptable to have a tiny paragraph covering the ramifications of this "solution" to coastal risks.</p>	<p>The FTR may or may not present some recommendation of relocation as an appropriate measure. This is likely to a last resort recommendation for the reasons stated in the comment. It is more likely that additional protection beyond environmental restoration will be offered in the plan presented in the FTR. The option of relocation would then be based on individual rejection of the existing level of risk. Should the FTR make any recommendation to diminish existing levels of protection, it will do so with consideration of reducing risk for the greater population and mitigating those increased risks for the population affected.</p>
R6	<p>Non-structural elements, including buy-outs, are mentioned in several portions of alternatives described in Appendix K. However, no details are given on challenges or potential solutions to design acceptable buy-out or incentive schemes that may motivate returning residents and business to redirect development or redevelopment to less hazardous locations. Additional economic and social science expertise would facilitate development of systems to establish non-structural, particularly incentive-based or other processes to motivate changes in individual choices in a post-Katrina project area.</p>	<p>The appropriate consideration and application of non-structural measures across responsible federal agencies will be addressed in the FTR. The Corps national non structural and flood proofing committee has already been engaged to provide input for the FTR.</p>

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	[2058-2059] The report states that non-structural features are an integral component of the engineering solution.	The evaluation of initial alternatives is expected to provide insight to exactly which areas would most benefit from non-structural measures including relocation. The relative level of economic risk identified will also be applied in identifying these areas. Iterative formulation steps will allow incorporation of these measures.
	[2145-2149] The report also indicates that relocation using buy-outs is premature and awaits political decisions.	Recommendations regarding appropriate individual and community participation in these programs, relative to the presented plan, will be included in the FTR.
	Appendix K indicates that as part of each alternative for each planning unit that "it will be necessary to implement a strategic plan to elevate and/or relocate assets located outside the hurricane protection plans." Details of these non-structural solutions are not given. It is not clear to what extent the costs for non-structural alternatives have been factored in. Appendix L [page L-76] indicates that Real Estate and Relocations costs were included with details in annex 7, but the relocations tab in the annex 7 spreadsheet does not list properties, although it lists streets. My assessment based on the above is that non-structural alternatives are a limited part of the alternatives developed to date.	This is correct. See first response to comments from R6 on page A-105.
<b>13-f. Assess the appropriateness of the five separate modeling alignments.</b>		
R2	These were determined by a participatory process involving experts and stakeholders of many types. Public, expert, and stakeholder comment on the PTR and on the original reports that contained the alignments should determine whether any major revisions are necessary. A major question is whether the alignments are workable in either an alternative one or two scenario in each area and as proposed here, which alternative or rationale are they based on.	The alignments presented represent a subset used to determine potential surge heights. These alignments, along with additional un-modeled variants, are intended to be combined into either alternative based on effectiveness and with variations in elevation relative to risk.
R3	The model alignments provide adequate data for examining levee height and will systematically determine needed height.	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	If significantly different alignments are considered they should be modeled as well.	This will be done for the FTR.
R4	I am not in favor of any of the alignments. They will do more harm than good in the long term. Isolating a delta from its sea is just as naïve as shunting the Mississippi River directly to the Gulf of Mexico and preventing its natural flooding of the delta that has caused this problem to begin with.	It is possible that the most cost effective and efficient protection plan will correspondingly have impact to the natural system. It is critical to not summarily dismiss options and adequately assess these tradeoffs in order to support appropriate decisions.
R5	In the LCCPR Master Plan, Lake Catherine is identified as a fishing/recreational community. Yet there is no discussion in this document that I have found which draws so heavily on that document, of the impact on Lake Catherine of running the infrastructure protection directly down Hwy. 90. This alignment will end the prospect of that community ever being restored. The railroad track elevated spoil bank has been proposed by the residents of Lake Catherine who are trying to bring the community back but no alternatives to the proposed alignment are discussed.	This presented model alignment is one of several being considered along this reach including along the railroad. More detail on the effectiveness of these alignments will be presented in the FTR.
R6	Based on existing details about alternatives, this question concerns engineering and geographic considerations. However, more comprehensive economic analysis of the full range of public benefits (built as well as ecosystem service and resource values from restoration), when integrated in risk-based analysis and optimization, would likely produce alternative configurations of Alternative Two. Public scrutiny of some alternative designs not yet produced is likely to identify opportunities to improve net benefits of outcomes achieved by the final design chosen.	Noted. This is the intent of the iterative formulation.
R8	In my opinion the modeling alignments being used are all too similar. Appendix L [page L-42] states "The alignments under consideration at this time provide a continuous barrier across the entire State of Louisiana." Structural barriers to keep the sea out should not be the only options that are evaluated. Over less populated parishes (e.g. Cameron, Vermilion, Plaquemines) non structural options involving buy-outs or relocations should be evaluated.	These alignments have provided as intended some initial insight to potential surge elevation relative various locations and configurations. The FTR will expand on alternative structural, environmental, and non-structural combinations.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
13-g. Discuss the vulnerability, resilience, and risks of the ecosystem restoration and its effectiveness to handle multiple, different-sized storms for the entire project life.		
R2	The role of ecosystem restoration in a program mandated to provide hurricane protection depends on its effectiveness in doing this. The modeling efforts will provide critical information in this regard. In a program that also calls for integration of ecosystem restoration goals with those of hurricane protection, flood protection, and navigation, the vulnerability of ecosystem restoration to various storms takes on an added dimension. Presumably restored ecosystems would not be more vulnerable (or less?) to storm effects than natural ones and would play the same role in storm effect damping as natural ones.	This is a basic assumption of restoration. However, the coast wide objectives also account for the restoration of sustainable function which creates resilience in the coastal landscape.
	Healthy systems are more resilient than unhealthy ones so restoring natural systems to robustness should both increase their effectiveness in storm damping and their resistance to destruction by storm forces.	Noted.
R3	Designing with appropriate sustainable land-building techniques lowers the long term risk of alternative 2 and enables natural restoration following severe events.	Noted.
	Neither alternative benefits from a sediment budget or analysis which would help to address sustainability issues.	There is ongoing work to identify various coastal sediment budgets outside of this effort. It is unknown whether these will be completed in time for the FTR. The potential for sediment limitations will be considered in some form however.
	There is increased risk in a non-sustainable approach (alternative 1) since a single storm can dramatically affect coastal features.	This is one of the measures of risk that will be addressed in the evaluation phase for the FTR.
R4	Ecosystem restoration is a risk but a minimal one if it is done with ecological engineering principles (see Mitsch, W.J. and S.E. Jørgensen. 2004. Ecological Engineering and Ecosystem Restoration. John Wiley & Sons, Inc., New York. 411 pp.). Natural systems are forgiving systems and are quite resilient to storms, floods, and other natural perturbations. The risks are minimal	Noted.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R8	The report does not address (that I could find, and definitely not in the section on measures and strategies) the vulnerability, resilience, and risks of the ecosystem restoration and its effectiveness to handle multiple different sized storm over the project life. The Fish and Wildlife Service planning aid report (appendix J) does raise concerns over the impacts of levees to be constructed on wetland ecosystems.	These are areas of risk that will be addressed in the evaluation phase for the FTR.
Other comments on subsection.		
R1	There are also four categories of non-structural protection strategies	Noted.
R2	Presumably the five levee alignments mentioned here coincide with those that came out of the Initial Plan Formulation Workshop (1023-1032) and that these alignments are among those being modeled by the hydrodynamic modelers and included in the preliminary design work.	That is correct.
	Also, I assume the Planning Units referenced are those in Figure 4-6. This should be referenced in [1929].	Noted.
	[1977 What and where are figures A-1 through A-5?	These figures have been moved to this section.
	Figure 6-1 is very useful and might make a good cover graphic for the PTR.	Noted.
R4	See also Costanza et al. (2006) but soon to be published. (Costanza, R., W.J. Mitsch, and J.W. Day, Jr. 2006. Creating a sustainable and desirable New Orleans. Ecological Engineering. (in press))	Noted.
R5	While the Dutch solution is lauded in terms of protection for the human-constructed infrastructure, reports of the challenges which are faced with regard to the ecosystem behind the infrastructure suggests that such a strong statement of their success if inaccurate. Salination of farming areas to mention one challenge. If, as this PTR report suggests, the two issues—storm protection from infrastructure and from a healthy ecosystem-- must be “married”, the Dutch solution may leave a lot to be desired for the Louisiana coast.	Noted. The evaluation of economic risks versus costs should illuminate these considerations in the FTR.
	As is noted, engineering principals are now “globalized” but sometimes they are depicted out of the context of the full picture of analysis of their respective problems and the challenges faced when they might be applied within a different geophysical context. In addition, when so much money has been spent, there is a tendency to dismiss problems of the solution so heavily invested in.	See immediate response above.

**Table A-14. Peer Review Comments on the LACPR PTR: LACPR Measures and Strategies and The Dutch Solution**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R6	[2173-2203] The Dutch Solution appears well summarized in that engineering technology is well-known, so that the critical element relates to national support for a sustained level of funding to make prevention of future damages possible and reliable. Absolute [2198] and unwavering [2189] financial support and social commitment make the Dutch Solution sustainable.	See response for first comment from R5 on page A-109.
R8	[1955-1956] It is unclear what the meaning or consequence of "management of existing hydrology is dismissed" is.	Text has been modified.
	[2173-2203] The Dutch Solution section is a bit disjoint from the remainder of the report. The report does not make precise what this solution would actually comprise in the case of the Louisiana coast. Which alignment of levees comprises the Dutch Solution? What is the cost of the Dutch Solution compared to the costs presented for other alternatives (page L-76)	Noted. The Dutch Solution describes a high level, multiple barriers, with managed hydrology solution. This is in contrast to the multiple lines of defense which the initial alternatives in this effort are more in conformance with.

**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q14. Comment on the scientific and technical approach, merit, and relative importance of the five preliminary spin-off projects.		
R1	This part of the report is only 3+ pages long, and shorter if a recommendation is accepted that the listing on page 59 be incorporated into the subsequent pages. The section can just begin with the first and continue. If a bulleted list is necessary, then a single line descriptor can identify the projects that follow.	Federal consideration and discussion of the merits of the recommendations have resulted in a significant revision of those recommendations. This section of the report will be rewritten based on that guidance.
	These are more than ‘spin-off’ projects. These are recommendations for authorization and appropriations for the PED and construction of Barataria Basin Shoreline, all the CWPPRA projects, the PED and construction of the Morganza to the Gulf levee, the Mississippi to Pearl hurricane barrier, and modifications (as yet undetailed) on MRGO. These are major structural hurricane barriers that should be identified much earlier in the PTR as activities that are being sought and should therefore be incorporated more clearly in the various alternatives.	See immediate response above.
	The recommendation is to fund all CWPPRA projects, with emphasis on wetland restoration. Not all of the CWPPRA projects are designed for wetland restoration in the same manner as proposed in the various alternatives in App K.	See response to first comment from R1 on page A-111.
	The CWPPRA projects need to be studied in as much detail as the alternatives to see how they can be merged and used to supplement or complement plans in the LACPR.	See response to first comment from R1 on page A-111.
R2	The Mississippi River-Gulf Outlet issue is the highest profile one at the present time. Abandoning or modifying the MRGO is an extremely important element in both the hurricane protection and ecosystem restoration elements of the LACPR. Success in achieving this will be an indicator of the will that must be there to implement other aspects of the LACPR.	Concur. No response required
	[2333-2337] The second three preliminary spin-off projects are well conceived and utilize components of the natural and built environment. As pointed out (2333-2337) for the Morganza to the Gulf project, proceeding does not forgo future planning for Category 5 protection. This is true for the other areas as well. In all three of these, the degree to which present plans follow alternative one vs alternative two planning principles and whether modification could be made to accommodate the preferred alternative need to be considered.	See response to first comment from R1 on page A-111.

**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	In my opinion, authorization and appropriations for constructing all CWPPRA projects is of questionable value. This should be the time for combining storm protection and coastal restoration strategies under a comprehensive plan which is what LACPR intends to be. Unless the CWPPRA projects are important elements of this plan, the money should be allocated to LACPR or at least CWPPRA planning should become an element of LACPR.	See response to first comment from R1 on page A-111.
R3	The study of the impacts of the MRGO needs to be a high priority since it affects all plans.	Concur. No response required.
	LACPR support of existing coastal restoration plans is appropriate and important.	Concur. No response required.
	Protection to the New Orleans region would be provided by the Mississippi River to Pearl River protection system is recommended by both alternatives and therefore the design process is very important to begin.	Concur. No response required.
	It is not clear whether the construction of 100-year level protection for the Morganza project has been shown to be justified versus either higher or lower protection levels that may be recommended by further analyses.	See response to first comment from R1 on page A-111.
R4	MRGO post authorization change – If this authorization results in a rethinking of the maintenance of current conditions of MRGO, it is welcome. This project has a reputation for being low in benefits, high in maintenance costs, and an indirect reason for some of the worst hurricane damage in New Orleans from Hurricane Katrina.	See response to first comment from R1 on page A-111.
	CWPPRA project authorizations – While the CWPPRA projects generally all had merit, they were on a scale too small to deal with either the scale of wetland loss in Louisiana and/or hurricane protection. All of these projects should be reevaluated in terms of the area and quality of marshes that they recreate.	See response to first comment from R1 on page A-111.
R5	How do these projects address the category 5 level storm protection? The text on each one of the “projects” should mention that issue. I only see it in the Morganza project.	See response to first comment from R1 on page A-111.
	Thus, have they been subjected to the assessment process described in this project? How are the two parts of the report connected, the assessment criteria and then the list of projects?	See response to first comment from R1 on page A-111.
	Looking at each: The MR-Gulf Outlet description includes very confusing unclear and jargon vocabulary. While I am very involved in the examination of this issue, I don’t know what the paragraph says.	See response to first comment from R1 on page A-111.

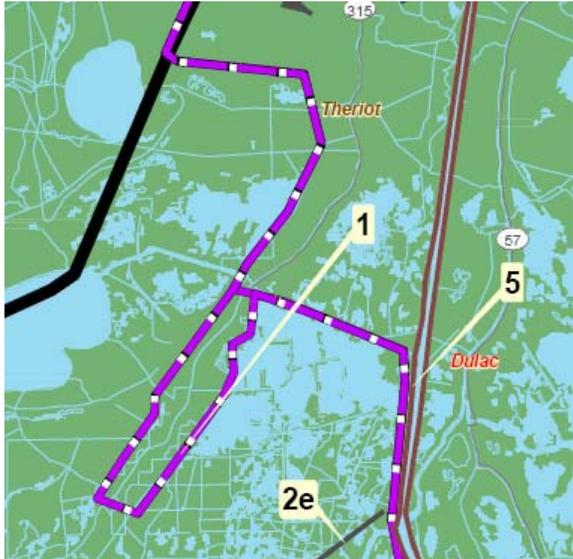
**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Comments above about the Lake Catherine community apply here.	See response to first comment from R1 on page A-111.
	No comments on the Barataria Basin Project.	Noted.
	The Morganza has experienced significant criticism that it is first not inclusive of important communities such as Isle de Jean Charles and may not protect the hydrologic processes necessary to maintain the ecosystem behind the structures. Do these concerns then put this project into the extreme infrastructure and thus expose the flaws re human communities or the ecosystem values and thus expose the hydrologic flaws.	See response to first comment from R1 on page A-111.
	Finally, why recommend the implementation of all CWPPRA projects superseding the process already in place to assess their benefit. If they don't meet the Cat. 5 benefits they should be implemented? We also know that post-Katrina there have been numerous comments that the selection process did not permit them to pass any of the proposed "tests" for immediate utility to protect the human populations. Why now propose total funding?	See response to first comment from R1 on page A-111.
R6	[2251-2270] Inadequate details are provided to judge the benefits and costs of resolving the MRGO deepwater draft issues. This project is argued to be a keystone of all future projects, so resolution may be expected to reduce planning challenges in identifying and evaluating alternatives plans for LACPR. However, note that the projected magnitude of costs (line 2397), relative to the magnitude of costs for other projects, is quite small.	See response to first comment from R1 on page A-111.
	[2272-2300] Inadequate details are provided to judge the benefits and costs of implementing this Hurricane Barrier System proposed here. The description provided makes no specific mention of whether this project would focus on restoration of pre-Katrina levels of development in the affected areas, or whether the project would evaluate alternatives to redirect development and redevelopment to less vulnerable locations while freeing up previously developed lands to contribute to restoration of ecosystem and hydrologic structure and function suitable to buffer levee-based protection.	Concur. More detailed will be provided in the FTR.
	[2311-2313] If barrier shoreline restoration is a precursor to any other coastal restoration, then this project may merit action. The present report, however, does not provide details for judgment based on benefit cost criteria.	See response to first comment from R1 on page A-111.

**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[2343] The value of a construction learning environment for identifying techniques to integrate environmental and levee components of an HPS is likely positive, but no specific projections of benefits and costs are provided.	Agreed. Will be evaluated for inclusion in the FTR.
R7	The five initial spin-off projects seem to be well thought out and appropriate. Given the information in the LACPR report and the limited review time, I am not able to make a more detailed assessment of these five projects.	Concur. No response required.
R8	[2251-2270] The specific recommendation for the Mississippi River-Gulf Outlet report seems to be justified.	Concur. No response required.
	[2272-2300] The specific recommendation for design of the Mississippi River to Pearl River Hurricane barrier system is, in my opinion, of high priority. This design seems critical for the largest segment of vulnerable populations so would only not be needed if major scale relocations (e.g. of the entire City of New Orleans) are to be contemplated, an unlikely prospect. Furthermore knowledge gleaned from this design appears likely to contribute to provide information on critical component details that will be helpful for other parts of the overall protection/restoration plan.	Concur. No response required.
	[2302-2323] Justification for the Barataria Basin Barrier Shoreline Restoration draws from a previous report that appears to predate hurricane Katrina. Given the damage due to hurricane Katrina is this restoration still realistic? Information to address this question is not available to this reviewer.	See response to first comment from R1 on page A-111.

**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>[2325-2344] The Morganza to Gulf project also predates hurricane Katrina and justification is based on a report not available to this reviewer. Furthermore the alignments of the levees associated with this project (as best I can infer them from Figure 4-4 of appendix K) seem to be a bit circuitous. What is the justification for the jutting out alignment shown below, from Figure 4-4.</p>  <p>[Figure 4-4.]</p>	<p>See response to first comment from R1 on page A-111.</p>
	<p>[2346-2352] The recommendation regarding coastal wetlands seems rather sweeping and not substantiated through material presented in this report.</p>	<p>See response to first comment from R1 on page A-111.</p>
R9	<p>[2242] It is considered the restoration of wetlands is the least important of the five primary spin-off projects.</p>	<p>See response to first comment from R1 on page A-111. .</p>

**Table A-15. Peer Review Comments on the LACPR PTR: Recommended Spin-off Projects**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Other comments on subsection.		
R1	[2220] Delete duplicate ‘of the’ [2259] Study not stud	This has been addressed.
R2	Why are they called “spin-off” projects? If they will be components of the LACPR shouldn’t they be called such? The key question is whether they are consistent with the levee alignments and design efforts that are going on as core activities of the LACPR.	Concur. This has been addressed in previous comments. The proposed component projects will be compatible with overall LACPR objectives.

**Table A-16. Peer Review Comments on the LACPR PTR: Projected Costs**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	Q15. Discuss whether you agree with the method used to determine rough order magnitude costs and comment on the costs listed for the five projects.	
R1	Given the preliminary nature of this report, the estimates are probably the best at the time and should follow standard procedures for these types of exercises.	Concur. No response required.
	The five ‘spin-off’ projects are the only ones discussed in the main body of the PTR. The detail in App L is considerably more and covers more than just the 5 listed in the main report. While it would be tentative, I think it is appropriate to give preliminary costs for Alternative 1 and Alternative 2. If the 5 projects can be estimated, then the remainder of the funds should be identified.	All cost information has been removed from the PTR.
	While not the purpose of this report, the balance of funds against projects needs to be considered in the FTR.	Concur. No response required.
R2	The opening lines of this section point out that developing detailed cost estimates is beyond the capability and scope of this report (the PTR). There are too many variables to expect a meaningful estimate at this point. I do not know enough about cost estimate methodology to comment on the methods used here. The estimates provided are for the five spin-off projects, not for all possible activities in the planning areas or alignments. The best strategy may be to add three zeroes to whatever number they come up with.	Noted.
R3	The methodology is sufficient for estimating costs as it is based upon extensive modeling, analysis, and past experiences in the area.	Concur. No response required
R4	Insufficient information on methods. URS report [Appendix L, annex 6] lacks a description of methods in sufficient detail to assess.	Comment noted. More cost details will be provided in the FTR.
R6	[2356-2357] I agree that the legislated, six-month time frame is too narrow to make a complete benefit-cost assessment practical for projects of the magnitude considered in this section.	Concur. No response required..
	[2367-2375, 2386-2387] Review of engineering cost estimates in Appendix L (ANNEX 6.pdf) revealed that a straightforward accounting system for materials and other design costs was used. This approach is appropriate for rough estimation, assuming sources of cost figures are reliable.	Concur. No response required.

**Table A-16. Peer Review Comments on the LACPR PTR: Projected Costs**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R7	The methods seem reasonable and appropriate.	Comment noted.
R8	[2354] The general approaches used to estimate costs appear reasonable. I would however like to see the actual costs reported in the body of the report and the total dollar amount given in the executive summary. I do not think that it is sufficient to refer readers to appendix L to get the costs.	Comment noted. All cost information has been removed from the PTR.
Other comments on subsection.		
R8	[2413-2415] The statement: "The estimate is based upon significant work performed in the program's engineering department." is not informative. What program? What significant work?	CWPPRA's program is now listed.
Comment on alternatives and cost estimate related information in Appendix L as appropriate.		
R1	There are many useful details in App L, which demonstrate the multiple aspects of restoration plans and cost analyses ranging from levee construction to costs of acquiring real estate or moving electrical infrastructure. As stated, these are preliminary.	Comment noted.
R7	They seem reasonable although in some of the cost estimates, there are some apparent anomalies. For example, in Annex 6 for a 56' Sector Gate Structure (Sill El -9), why are some items (e.g., 2, 3, and 4) less costly for the top of wall at El 45 than for lower walls?	Comment noted. All cost information has been removed from the PTR. Any adjustments required will be done for the FTR.
R8	[p. L75-L77] These cost estimates appear reasonable for what they are. However as alternatives are more fully developed for the FTR it would be good to see more complete costs that include any buy-out or non structural alternatives that are evaluated.	Concur. The FTR will show total plan costs including buy-out or non structural alternatives.

**Table A-17. Peer Review Comments on the LACPR PTR: Next Steps to Final Technical Report**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
Q16. Provide any recommendations that may assist in completing the FTR.		
R1	[2478-2496] These two paragraph are confusing and convoluted and do not provide a clear mechanism for evaluating either ecological or structural success in combined flood protection and coastal restoration projects.	The specific metrics for evaluation of measure or plan success have not yet been decided. These paragraphs are intended to relate the broad coastal objectives to the types of measurements that could be made. Significant coordination with sponsors, stakeholders, and academia will be required to finalize these parameters, which will be documented in the FTR.
	[2498] A restatement of the inadequate Category scale and the risk-based approach is good, because it provides the framework for the FTR.	Noted.
	The ideas of storm surge storage are good and should be more evident earlier in the report as an example of innovative approaches. The same is true of the Miss R storm surge transfer and the hollow core levees. The idea about deep soil mixing is noted as not useful, and should have been dropped a long time ago. It should certainly not be treated as suitable for further consideration in the FTR.	Concur that management of storm surge is a promising approach and will be studied further. Non-concur that deep soil mixing is not viable. Although we have no history of levees constructed using this method, the technology and science of deep soil mixing (DSM) is well understood and widely utilized. DSM has the potential to decrease the footprint of levees, lessen the ecological impact and lower costs.

**Table A-17. Peer Review Comments on the LACPR PTR: Next Steps to Final Technical Report**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	<p>The Ecosystem Response Model section is superficial (and not supported by appendices or other identified sources of information). The ‘details of model output parameters’ for level 3 and 4 models provides only 2 that may be of use in determining success of coastal restoration, namely the acreage built and the switching of habitat types. The removal of Miss R nitrogen seems like an unlikely useful measure of coastal restoration that seeks primarily to increase acreage of land by whatever useful mechanisms are employed.</p>	<p>The model described uses all of these types of primary assessment tools to inform its overall forecast of system response. The design of this tool is based on assessing system response in a manner related to, and as a gauge of, the restoration of fundamental system functions – not just system outputs and make up. The full use and integration of all evaluation tools will be documented in the FTR.</p>
R2	<p>There should be a statement that much of the work in getting to the FTR will involve continuing the efforts which were included in a preliminary way in this PTR. Some elements of this are mentioned in [2418-2453], but much of this section describes consideration of interesting structures [2514-2515] (“...an impenetrable barrier to completely halt storm surge and waves...”) and consideration of some of the specific elements described in other sections (hollow core levees and deep soil mixing). These activities are interesting, but emphasis should be on steps and milestones in reaching the FTR. This could include any points when draft products will be available and any key meetings or decision points that are part of the march to the FTR. A timeline would be helpful.</p>	<p>Agree. Will attempt to expand on schedule for the FTR.</p>
R3	<p>The use of process-based models should be used to examine impacts of possible plans on system.</p>	<p>Noted.</p>
R4	<p>Hire some good wetland ecological engineers who can integrate the need for engineering solutions with the need to restore some of the ecology of the regions before it all sinks into the sea.</p>	<p>Noted.</p>

**Table A-17. Peer Review Comments on the LACPR PTR: Next Steps to Final Technical Report**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
R5	<p>My comments above about a real comprehensive human risk assessment are an answer to this question. It is as if you (the Corps') social scientist voice and those of us who have again and again participated in your meetings and committees were talking to an agency from another planet. Why should we bother to repeat again and again the role of assessing coastal community risk? This is a study that is supposed to be addressing the protection of human uses of the coast (that's the command of Congress) and yet nothing except for basic population count is considered in this report beyond economic activity on the coast. This is simply unacceptable. It is like going backwards several decades.</p>	<p>A risk based assessment methodology is being employed for the LACPR effort. This type of methodology is a change in paradigm for assessing federal investment and is being developed through efforts in the IPET. Its application in this effort will require significant additional vetting and modification beyond this preliminary report to meet the directed timeline.</p>
R6	<p>Incorporating additional expertise in economics, particularly environmental and natural resource economics, into design teams and teams responsible for evaluation of public preferences and input, will dramatically increase the ability to optimize the net benefits across property protection and ecosystem services affected by the LACPR. Current investment in economics expertise, particularly for consideration of non-marketed, environmental resources and market benefits derived from renewable natural resources dependent on existing and restorable wetlands habitats, is dramatically inadequate. Adding a team of environmental economics experts is consistent with actually considering the full range of public and private benefits affected by LACPR.</p>	<p>Noted. This will be taken in to consideration in finalizing the risk based assessment methodology.</p>
	<p>[2508-2510] Risk-based evaluation of the benefits and costs of various degrees of protection is consistent with an economically sound approach to decision-making, consistent with the conclusion presented here.</p>	<p>Noted.</p>
	<p>[2527-2531] Innovative techniques and technologies to address expected or potential storm surge volumes by taking advantage of location-specific topographic features (e.g., wetland storage capacities) can provide flexibility that design engineers can exploit to reduce costs relative to property and ecological resource values at risk. These approaches can be consistent with a sound economic approach to decision-making. The example [at lines 2535-2537 and 2563-2565] is consistent with this point and worthy of favorable consideration.</p>	<p>Concur. This approach will be investigated for the FTR.</p>
	<p>[2567] Is there any feasible way to design modest quantities of storm water storage capacity inside hollow core levees?</p>	<p>Will investigate for the FTR.</p>

**Table A-17. Peer Review Comments on the LACPR PTR: Next Steps to Final Technical Report**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	[2594, 2616-1620] Habitat assessment tools could be used within methods of environmental economics to develop a quantitative assessment of the public values or priorities for some ecosystem service outcomes anticipated from alternative designs.	These assessment tools, in fact, do consider these values to an extent, because they are based on the Habitat Evaluation Procedures (HEP) models for specific wetland species. These species were chosen because they reflect desirable biologic outputs of the system. However, they also represent a range of desirable output and no relative weight of preference has been applied.
	[2659-2680] These outputs of ecological and hydrodynamic models could provide a solid foundation for environmental economic tools to assess public values and priorities for outcomes from alternative designs. Such an approach would be consistent with considering the full range of public and private benefits arising from LACPR.	See immediate response above.
R7	It appears that the PTR provides a good basis for the FTR. I think there needs to be significant reliance on private sector professional design firms working in collaboration with USACE personnel. In this way, I think there will be innovation and technology exchange, which are needed for a project of this size and complexity. Furthermore, this approach would add credibility to the final design. In addition, I think there needs to be some type of external, independent oversight and review board composed highly experienced professionals who are leaders in their fields.	Noted. This review is a first step towards this oversight.
R8	<p>In general I agree with the next steps that are listed. I do think however that as stated above a broader set of alternatives needs to be evaluated. In developing broader alternatives I think that the following subjects need more consideration. Some of these come from suggestions in the workshop reports given as appendices:</p> <ul style="list-style-type: none"> <li>- Levee designs that can accommodate overtopping without breaching should be evaluated. These would need to have associated measures to accommodate the extra floodwater that accumulates behind the levees, via culverts, drains, water control structures and pumps etc.</li> <li>- Redundancy and modularity in the system so that the impact of a failure may be isolated and limited in extent rather than catastrophic.</li> <li>- Storm shelters and safe havens designed to very high levels of protection to which citizens could evacuate.</li> </ul>	<p>Concur. No response required.</p> <p>Concur. This is already planned to be investigated during the FTR.</p> <p>Concur. No response required.</p> <p>Concur. No response required.</p>

**Table A-17. Peer Review Comments on the LACPR PTR: Next Steps to Final Technical Report**

ID	Reviewer Comments [line, page, or section reference in brackets]	USACE Responses
	- Hardening the design of critical infrastructure, e.g. ports, railroads, pipelines, hospitals and roads in vulnerable areas so that they can withstand hurricanes and restore their economic and beneficial functions shortly after a hurricane passage and thereby minimize societal and economic consequences.	Concur. No response required.
Other comments on subsection.		
R1	[2680] defined	No longer applicable.
	[2682] continuing	Corrected in the recent version.
R6	USACE should request authorization for economic and behavioral studies to identify alternatives programs to create incentives that direct development and redevelopment toward areas of lower hazard, and that compensate land owners for development restrictions. Transferable development rights programs and innovative zoning mechanisms could be explored as potentially lower cost alternatives to encourage individuals and business to make choices that avoid increasing the property value at risk in vulnerable areas.	These types of studies would be a natural follow on through the recommendation of lower levels of protection and non-structural responses.

**APPENDIX B**

**CHARGE TO THE PEER REVIEWERS**

**Charge to the Peer Reviewers**  
**for**  
**External Peer Review of the Louisiana Coastal Protection and Restoration**  
**(LACPR) Project Preliminary Technical Report (PTR) to Congress**

**BACKGROUND**

The Department of Defense Appropriations Act of 2006 (P.L. 109-148) directs the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), to conduct a comprehensive hurricane protection analysis and design to develop and present a full range of flood control, coastal restoration, and hurricane protection measures. The purpose of the Louisiana Coastal Protection and Restoration (LACPR) Project is to identify a plan for increased protection against storm surge equivalent to a Category 5 hurricane within South Louisiana. The scope is to address the full range of flood control, coastal restoration, and hurricane protection measures needed for comprehensive Category 5 protection. More information on the LACPR project can be found at <http://lacpr.usace.army.mil/>.

A preliminary technical report (PTR) for comprehensive Category 5 protection must be completed within 6 months of the enactment of this act (enacted 30 December 2005) and a final technical report (FTR) for Category 5 protection must be completed within 24 months of the enactment. These reports will describe findings of technical analysis and design for several alternatives of increased comprehensive hurricane protection across South Louisiana, integrating water resources objectives of hurricane protection, coastal restoration, flood control and navigation. The PTR and FTR will consist of engineering analysis and design using the best science and engineering available. The PTR will describe a preliminary solution developed based on existing data and information.

The primary work efforts of the LACPR PTR focused on:

- Characterizing previously conducted examinations of increased hurricane protection for South Louisiana
- Portraying innovative, conceptual, multi-objective water resources alternative plans that will be developed further in the FTR
- Presenting a refined project management plan for completion of the FTR
- Recommending component areas for authorization of protection plans.

Because of the national importance of this project, it has been directed that an external peer review (EPR) be conducted. The EPR will follow the procedures described in the Department of the Army, U.S. Army Corps of Engineers' guidance *Peer Review of Decision Documents* (EC1105-2-408) and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review*, released December 16, 2004. The specific charge schedule, questions, and instructions listed below pertain only to the PTR.

## **Schedule**

1. PTR distributed to EPR Panel with charge for review ..... 17 May 06
2. EPR Panel reviews PTR document..... 17 - 23 May 06
3. EPR Panel submits technical review comments to Battelle..... COB 23 May 06
4. Battelle delivers draft EPR report<sup>c</sup> to USACE..... 26 May 06
5. LACPR authors provides responses to EPR Panel comments..... 31 May 06
6. Battelle forwards LACPR author comments to EPR Panel ..... 1 June 06
7. EPR Panel submits any final comments to Battelle (optional) ..... 2 June 06
8. Battelle submit final EPR report to USACE..... 5 June 06

## **General Charge Guidance**

1. Please answer the scientific and technical questions listed below and conduct a broad overview of the PTR. *Please focus on your areas of expertise and technical knowledge.*
2. Review and comment on the entire main body of the report. Review and comment on the sections related to your areas of expertise in Appendices A, B, C, D, and L.
3. Identify, explain, and comment on assumptions that underlie economic, engineering, or environmental analyses.
4. Evaluate the soundness of models and planning methods as applicable and relevant to your area of expertise. Comment on whether the models answer the scientific and management questions posed in this study.
5. Evaluate whether the interpretations of analysis and conclusions are reasonable.
6. Please focus review on scientific information, including factual inputs, data, the conceptual use of models, analyses, assumptions, and other scientific and engineering matters that inform decision makers.
7. If appropriate, you can offer opinions as to whether there are sufficient analyses upon which to base a recommendation for construction, authorization, or funding.
8. Please **do not** make recommendations on whether a particular alternative should be implemented. Also please **do not** comment on or make recommendations on policy issues and decision making.
9. If desired, EPR panel members can contact each other. However, EPR panel members **should not** contact anyone who is or was involved in preparing the PTR document or are part of the Independent Technical Review.
10. Your comments regarding the draft report and any information contained in the report should remain **confidential** until the document is released publicly. In case of media contact, notify the Battelle project manager immediately.
11. Your name will appear as one of the panelists in the peer review. Your comments will be included in the peer report verbatim, but will remain anonymous. Attributed comments will be shared with the U.S. Army Corps of Engineers, Baltimore District staff.
12. Please contact the Battelle project manager (Dr. Jill Engel-Cox, [engelcoxj@battelle.org](mailto:engelcoxj@battelle.org), 703-875-2144) for requests or additional information.

**Please submit your comments using the attached electronic form to Jill Engel-Cox, [engelcoxj@battelle.org](mailto:engelcoxj@battelle.org), no later than Tuesday, 23 May 2006, 11 pm EDT.**

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<sup>c</sup> Battelle EPR report will include a summary of panelists and their qualifications, verbatim comments organized/collated by PTR report section, and a brief discussion.

## **Specific Charge**

### **Executive Summary *and* Introduction**

1. Provide overall comments on the purpose and objectives of the LACPR study.

Comment on Appendix A as appropriate to your area of expertise.

### **The Impact of Hurricanes on South Louisiana *and* South Louisiana at Risk**

2. Given the impact of Hurricanes Katrina and Rita and the ongoing loss of coastal protection, explain whether you agree with the analysis of the extent and magnitude of risks of hurricane damage to the communities, the industries, and coastal resources of Southern Louisiana.

Comment on Appendix B as appropriate to your area of expertise.

Comment on Appendix C as appropriate to your area of expertise.

Comment on Appendix D as appropriate to your area of expertise.

### **Existing Hurricane Protection and Flood Control Projects and Studies in South Louisiana *and* Existing Coastal Ecosystem Restoration Programs and Plans**

3. Evaluate the effectiveness and integration of ongoing hurricane protection and flood control projects and coastal ecosystem restoration projects.

### **Performance Evaluation of Existing Authorized Projects**

4. Explain the importance of including the results of the Interagency Performance Evaluation Task Force (IPET) into the LACPR study.

### **Planning and Design Workshops, Public Outreach and Involvement, *and* Coordination with other Planning Efforts**

5. Assess the effectiveness of the planning and design workshops and public outreach and involvement activities, and coordination with other planning efforts.

[Note: Appendices E thru I are notes from workshops and outreach activities. Appendix J was prepared by the U.S. Fish and Wildlife Service. They are for background only and comments on these Appendices are not requested, except for addressing the main report.]

## **Planning Principles and Objectives**

6. Assess the cohesiveness and applicability of how alternatives will be developed in terms of programmatic and plan formulation principles, coast-wide objectives, identification of specific needs and objectives of planning units, and the process envisioned to develop the alternatives.

[Note: Appendix K was prepared by the State of Louisiana. It is for background only and comments on this Appendix are not requested, except for addressing the main report.]

## **Assessment of Assets**

7. Comment on the method used to determine critical baseline information on issues and risks.

## **Alternative Plan Formulation Rationales**

8. Explain whether you agree with rationales used for assembling measures into the alternative plans.

## **Coastal Engineering Design Challenges**

9. Assess the extent of the coastal engineering challenges that are considered in providing protection.

## **Engineering and Technical Design Work**

10. Explain whether you agree or not with the approach being used for engineering and technical design work.

Comment on engineering and design related information in Appendix L as appropriate to your area of expertise.

## **Hydrodynamic Modeling**

11. Comment on the completeness, accuracy, and the ability to synthesize the major approaches for external estimation of surges and waves through use of hydrodynamic modeling into an optimal approach that will evaluate storm probabilities for hurricane risks in Southern Louisiana.

Comment on hydrodynamic and hydrology related information in Appendix L as appropriate to your area of expertise.

## **Risk Assessment**

12. Evaluate the approach used to determine realistic probabilities of hurricane characteristics that will determine waves and surges in the planning units.

## **LACPR Measures and Strategies and The Dutch Solution**

13. Evaluate the strengths and weakness for each of the two alternatives in terms of the coastal restoration, structural features, and non-structural features. Consider the following:
  - a. To what extent do the alternatives achieve the overall purpose over the projected design life, and what risk do they achieve?
  - b. In your opinion, explain whether or not each alternative provides for sufficient data, appropriate assumptions, fatal flaw analysis, and adequate/accurate analysis.
  - c. Evaluate how ongoing initiatives are incorporated into each alternative.
  - d. Explain how the alternatives consider raising sea levels, erosion of coastal areas, and future subsidence of land in providing long-term hurricane protection.
  - e. Assess how non-structural solutions such as a buy-out plan or raising of structures are considered in these alternatives.
  - f. Assess the appropriateness of the five separate modeling alignments.
  - g. Discuss the vulnerability, resilience, and risks of the ecosystem restoration and its effectiveness to handle multiple, different-sized storms for the entire project life.

## **Recommended Spin-off Projects**

14. Comment on the scientific and technical approach, merit, and relative importance of the five preliminary spin-off projects.

## **Projected Costs**

15. Discuss whether you agree with the method used to determine rough order magnitude costs and comment on the costs listed for the five projects.

Comment on alternatives and cost estimate related information in Appendix L as appropriate to your area of expertise.

## **Next Steps to Final Technical Report**

16. Provide any recommendations that may assist in completing the FTR.

## **Overall**

17. Comment on the completeness of the report. Identify technical areas or subjects that are missing from the report and represent deficiencies that should be addressed in the FTR.
18. Comment on the overall organization and clarity of the report. Please explain and/or describe any proposed alternatives to the organization of the PTR, or the specific part in question.