ME-18 - Rockefeller Refuge

CWPPRA
Rockefeller Gulf Shoreline Stabilization (ME-18)
Phase II Request

Technical Committee Meeting

December 5, 2006

Baton Rouge, LA

Project Overview

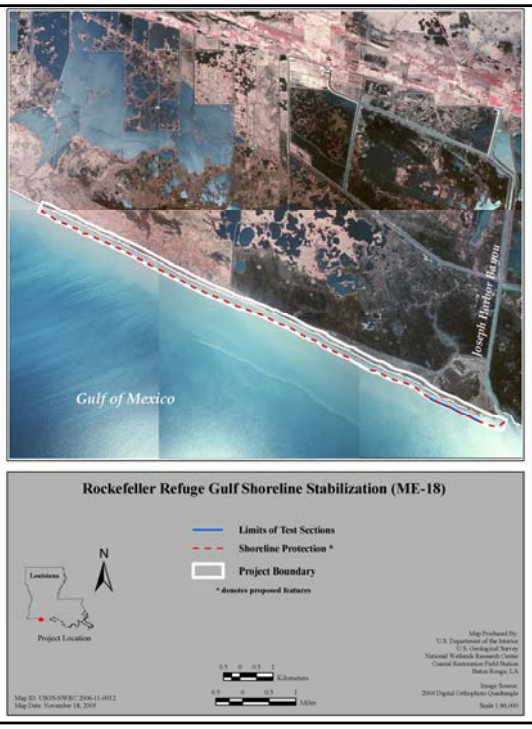
Project Location: Region 4, Calcasieu - Sabine Basin, Cameron Parish, Gulf shoreline between Joseph Harbor and Beach Prong.

Problem: Shoreline erosion rates within the project area vary from 30 to 40 feet per year, with areas near the eastern end of the project approaching 100 feet per year.

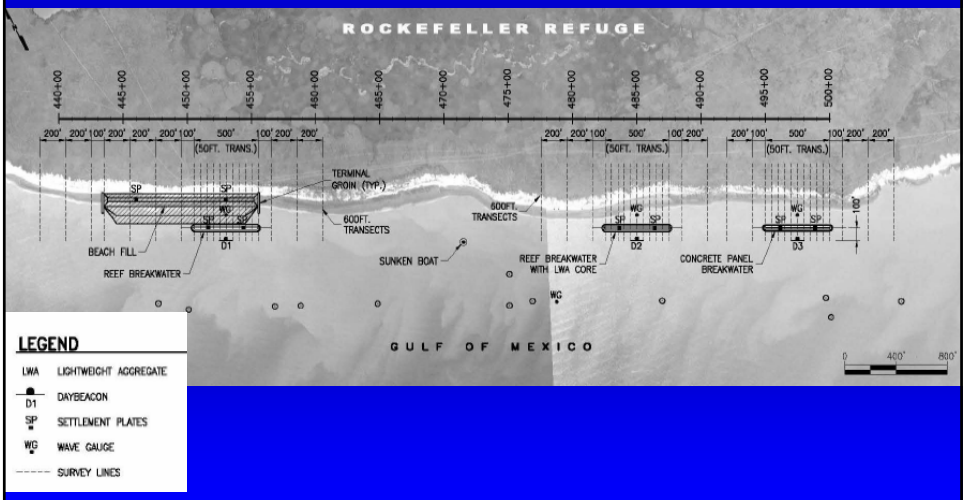
Project Goals

- Halt gulf shoreline retreat and direct marsh loss from Beach Prong to Joseph Harbor
- Protect Saline Marsh Habitat
- Enhance Fish and Wildlife Habitat

Project Map



Layout

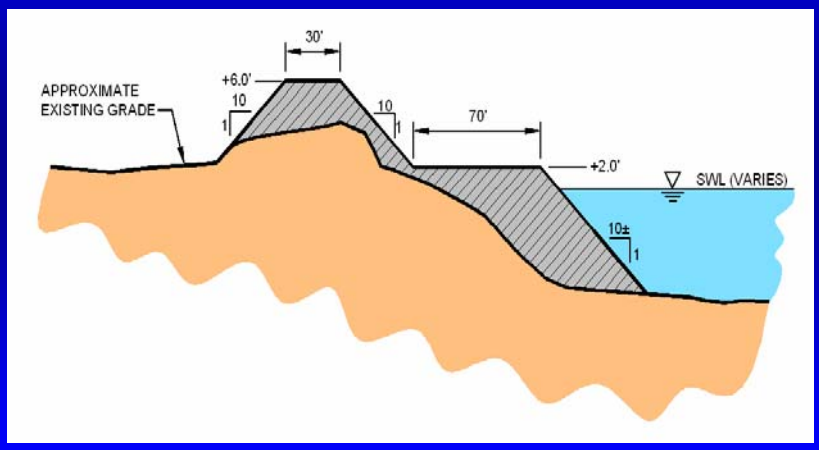


Project Features Overview

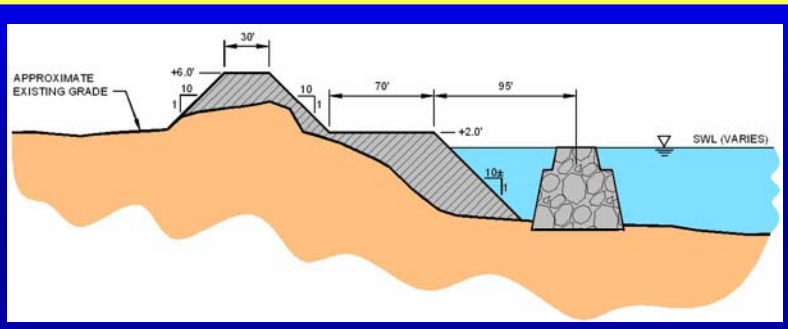
- **Construct and monitor four (4) test sections to determine their constructability, wave attenuation characteristics and the associated shoreline response to each section. The test sections are:**

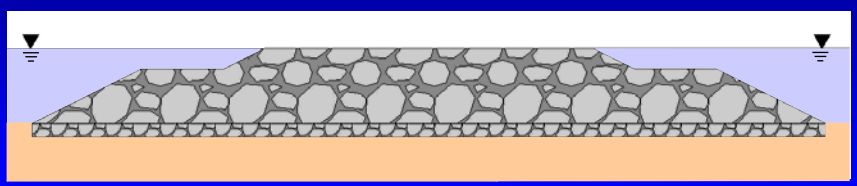
•Gravel/Crushed Rock Beach Fill
•Reef Breakwater with Beach Fill
•Reef Breakwater with Light Weight Aggregate Core
•Concrete Panel Breakwater

Gravel/Crushed Rock Beach Fill

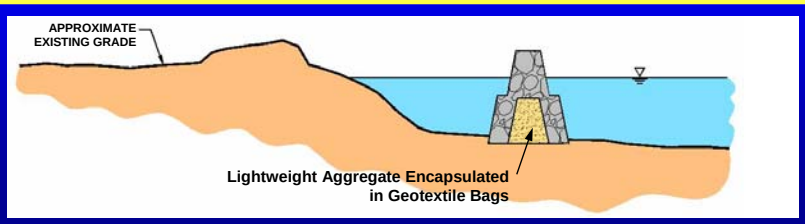


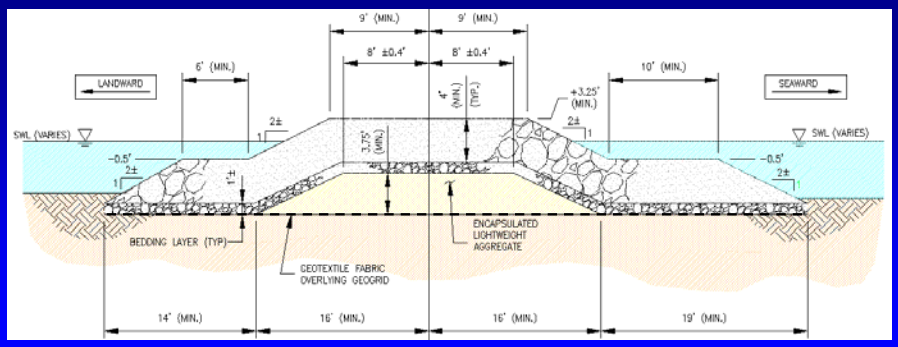
Reef Breakwater with Beach Fill



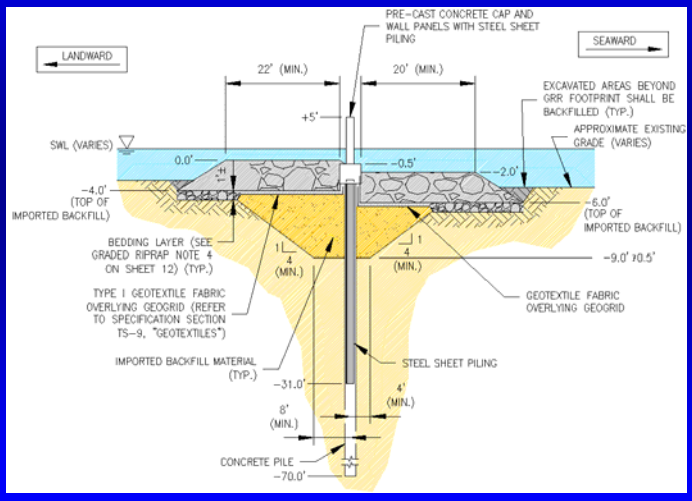


Reef Breakwater with LWA Core

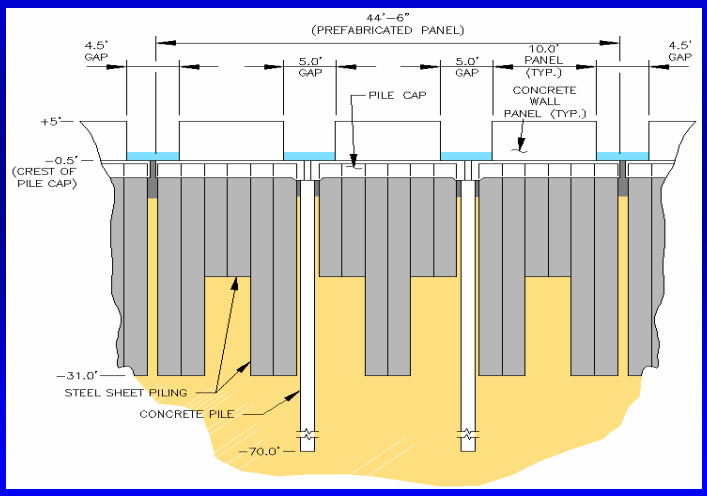




Concrete Panel Breakwater



Concrete Panel Breakwater



Project Benefits & Costs

- **Given the lack of proven design alternatives available for the conditions at Rockefeller Refuge, the analysis of test sections is the only viable option. The performance of these test sections will allow the Project Team to select one alternative for implementation over the full 9.2 mile project .**

- **The Fully Funded Cost of the Proposed Test Sections is approximately 12% of the Original Project Costs, or $12,953,343**

- **The Prioritization Score is: 49.25**

Project Comparison/Contrast

The Present **vs.** PPL #10

Authorized Project - PPL 10

• Single 9.2 mile continuous nearshore rock breakwater placed approximately 400’ offshore at the -5’ contour

Currently Proposed Project

• Construct four (4) Test Sections to determine a preferred alternative for implementation over the entire project length

Questions?

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SEFC/Estuarine Habitats & Coastal Fisheries Center
646 Cajundome Boulevard
Lafayette, Louisiana 70506

DECEMBER 6, 2006

Mr. Tom Podany (Chairman)
CWPPRA Technical Committee
Assistant Chief of Planning, Programs and Projects Management
U.S. Army Engineer District, New Orleans
P.O. Box 60267
New Orleans, LA 70160-0267

Subject: Second Phase II Authorization Request for Rockefeller Refuge Shoreline Stabilization (ME-18).

Dear Mr. Podany,

As the lead federal agency for the Rockefeller Refuge Shoreline Stabilization project the National Marine Fisheries Service (NMFS) herby submit a second request for phase II authorization, in accordance with the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Standard Operating Procedure (SOP) Manual. The initial request from December 2005 is attached.

1.) Description of Phase I Project

This project was authorized under the Coastal Wetland Planning Protection and Restoration Act (CWPPRA) Project Priority List 10 for the protection of an estimated 9.2-mile stretch of shoreline at Rockefeller State Wildlife Refuge. Shoreline loss at Rockefeller averages 39 feet/yr, equivalent to the loss of marsh the size of a football field every week. Project costs were originally estimated to be 96 million (100% funding).

2.) Overview of Phase I Tasks, Process and Issues

Over 80 alternatives were considered during a feasibility study based on their ability to (1) prevent beach erosion for up to Category 1 hurricane conditions, estimated to have a return frequency of about 10 years at the project site, (2) be designed, constructed, monitored, and maintained over a 20-year design life for under $50 million, and (3) where practicable, remain stable for more severe storm conditions up to a 100-year event. A key conclusion from the geotechnical investigation is that the subsurface consists of very soft clay to a depth of approximately 40 ft, which eliminated most conventional shoreline protection alternatives due to bearing capacity and settlement issues. This, coupled with budget limitations of the CWPPRA program, made finding viable alternatives that met these goals extremely challenging. Numerous alternatives were considered, both conventional and unconventional.

Given the unique challenges provided at the Rockefeller Refuge shoreline, questions remained on constructability, design, and performance of restoration features that would meet the project goals. At the February 17, 2005 Task Force meeting, a project change in scope to pursue the development of test sections was approved. Therefore, four final alternatives were selected for consideration in a prototype test program at the Refuge that would help predict their potential for success if installed for the full 9.2 mile project. The test installations would allow detailed evaluation and comparison of each alternative in terms of constructability, ability to deal with the soft soils, wave attenuation, shoreline response, maintenance requirements, cost, and aesthetics. Enclosure 2 contains the fact sheet, updated

	Phase I Fully Funded Cost	Phase 2 Fully Funded Cost	AAC/AAHU	AAHU	Acres Protected/ Created
ORIGINAL	$1,929,888	$94,058,750	$22,799	344	920 ac

Based on the opinion of the Environmental Working Group and Engineering Working Group, no revision of the WVA was made.

N. Prioritization

	Cost Effectiveness	Area of Need	Implementability	Certainty of Benefits	Sustainablity	HGM Riverine Input	HGM Sediment Input	HGM Sturcute And Function
Score	10	11.25	15	6	2	0	0	5
Total	49.25							

Based on the opinion of the Environmental Working Group and Engineering Working Group, no revision in Prioritization was made

Sincerely,

for Erik Zobrist, Ph. D.
NMFS Program Manager

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SEFC/Estuarine Habitats & Coastal Fisheries Center
646 Cajundome Boulevard
Lafayette, Louisiana 70506

NOVEMBER 22, 2005

Mr. Tom Podany (Chairman)
CWPPRA Technical Committee
Assistant Chief of Planning, Programs and Projects Management
U.S. Army Engineer District, New Orleans
P.O. Box 60267
New Orleans, LA 70160-0267

Dear Mr. Podany,

As the lead federal agency for the Rockefeller Refuge Shoreline Stabilization project authorized by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force on the 10th Project Priority List, the National Marine Fisheries Service (NMFS) is requesting, in accordance with CWPPRA's Standard Operating Procedure (SOP), approval to proceed with construction of this project.

This project was authorized for the protection of an estimated 9.2 mile stretch of shoreline at Rockefeller State Wildlife Refuge. Shoreline loss at Rockefeller averages 39 feet/yr, making the acreage lost every week equivalent to that of a football field. Project costs were originally estimated to be 96 million (100% funding). A feasibility study reviewed over 80 design alternatives based on their ability to (1) prevent beach erosion for up to Category 1 hurricane conditions, which were estimated to have a return frequency of about 10 years at the project site (2) be designed, constructed, monitored, and maintained over a 20-year design life for under $50,000,000, and (3) where practicable, remain stable for more severe storm conditions up to a 100-year event. A key conclusion from the geotechnical investigation is that the subsurface consists of very soft clay to a depth of approximately 40 ft, which eliminated most conventional shoreline protection alternatives due to bearing capacity and settlement issues. This, coupled with budget limitations of the CWPPRA program, made finding viable alternatives that met these goals extremely challenging. Numerous alternatives were considered, both conventional and unconventional.

Given the unique challenges provided at the Rockefeller Refuge shoreline, questions remained on constructability, design, and performance of restoration features that would meet the project goals. At the February 17, 2005 Task Force meeting, a project change in scope to pursue the development of test sections was approved. Therefore, four final alternatives were selected for consideration in a prototype test program at the Refuge that would help predict their potential for success if installed for the full 9.2 mile project. The test installations would allow detailed evaluation and comparison of each alternative in terms of constructability, ability to deal with the soft soils, wave attenuation, shoreline response, maintenance requirements, cost, and aesthetics.

ENCLOSURE 2

FACT SHEET
November 20, 2006

Project Name and Number: Rockefeller Refuge Shoreline Stabilization (ME-18)
(Project Priority List 10)

Problem: The average long-term coastal erosion rate in the project area is estimated to be 30.9 feet/year. Recent land loss rates are estimated at 50 feet/year (57 acres/year). Storms can create short-term rates that are much larger than this. For example, in 1998, Tropical Storm Frances caused an estimated 60-65 feet of erosion along this stretch during a four-day period according to antecdotal information. Intertidal marshes are among the most productive ecosystems on earth and their rapid disappearance may significantly impact the economy of South Louisiana. Action is needed to provide immediate protection to existing wetlands.

Goals: Halting Gulf shoreline retreat and direct marsh loss, protecting saline marsh habitat, and enhancing fish and wildlife habitat along a 9.2 mile stretch of Rockefeller refuge is the primary goal. With unproven methods of achieving that goal in this environment, an additional goal of the projects is to determine which of the four feasible alternatives would most economically and viably provide protection prior to construction of the entire length.

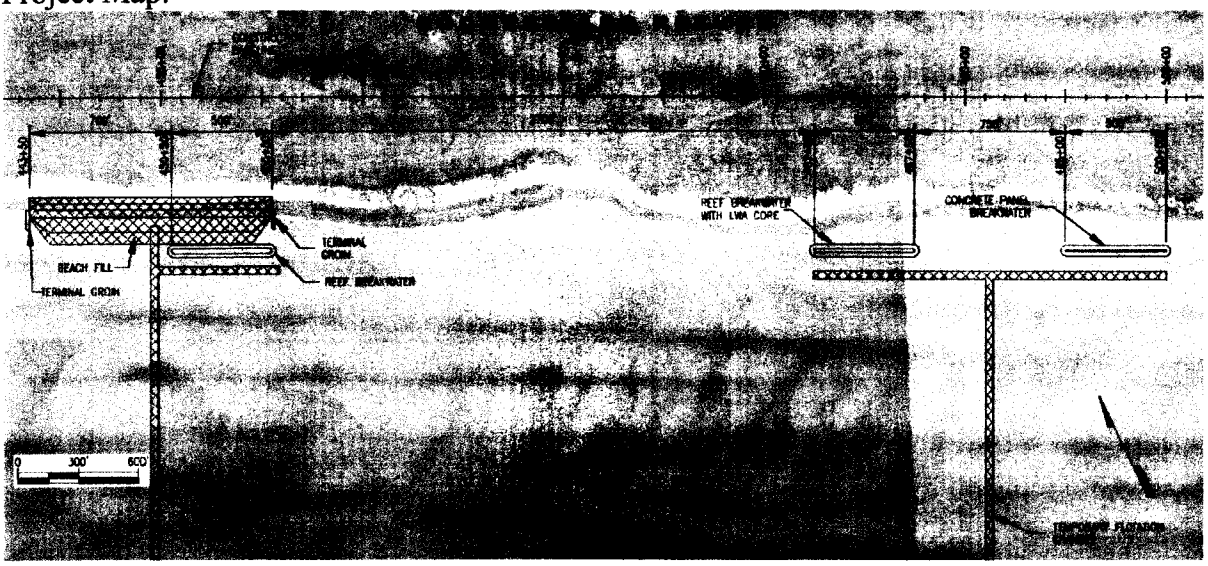
Project Status: Construction of the four feasible designs is awaiting permit and funding.

Proposed Solution: Evaluate four alternatives to compare how each alternative performs in terms of constructability, ability to deal with the soft soils, wave attenuation, shoreline response, maintenance requirements, cost, and aesthetics. The four test sections are: (1) Beach Fill with gravel/crushed stone, (2) Reef Breakwater with sand or gravel/crushed rock beach fill, (3) Reef Breakwater with light weight aggregate (LWA) core, and (4) Concrete Panel Breakwater.

Issues: Poor soil conditions and low bearing capacity severely limit the type of shoreline protection able to be constructed to provide the desired level of shoreline protection. After consideration of over 80 alternatives, and variations of alternatives for construction, most options were determined to be non-feasible for one or more of the following reasons: design parameters, constructability, cost, poor performance, unproven design for Gulf application, not effective for longer wave periods of open coast, unproven design, subject to debris punctures and deflation, soil load, and reflection over rock. Four alternatives are considered feasible, but are unproven for Gulf application.

Estimated Costs and Benefits: Fully funded the cost is estimated to be $12,953,343.

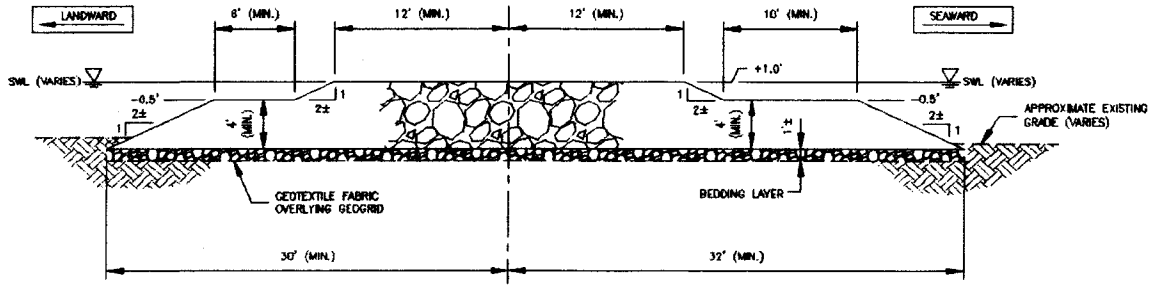
Project Map:



Project Features:
Construction of prototype test installations for four alternatives is proposed, as described in #2 above. Evaluation of the test installations will serve as the basis for implementation of the full 9.2 mile project based on constructability, ability to deal with the soft soils, wave attenuation, shoreline response, cost, maintenance requirements, and aesthetics.

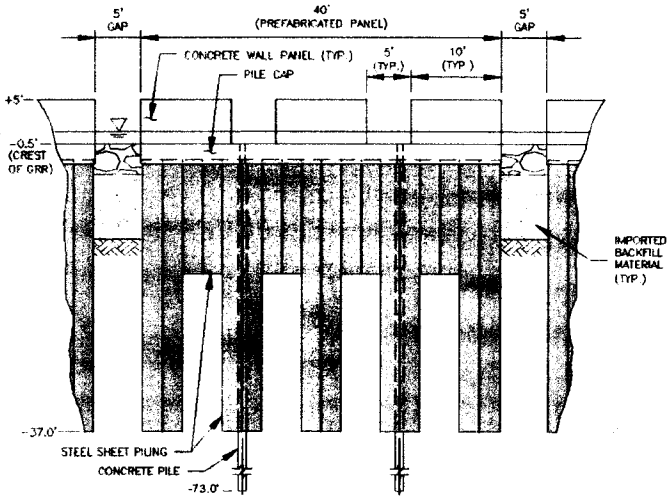
The location of the testing program was selected to be at the eastern end of the 9.2-mile project area a minimum of 2,000 ft from Joseph Harbor. The proposed layout for the testing program affects a total of 0.56 miles along the shoreline.

–The Beach Fill with Gravel/Crushed Stone (G/CS) section consists of adding gravel/crushed stone (G/CS) to the existing soft clay shoreline.



Typical Section of a Reef Breakwater

- The Reef Breakwater with G/CS Beach Fill consists of constructing a reef breakwater conjunction with a landward G/CS beach fill. The two beach fill alternatives would be joined to create a continuous 1,200 ft fill test section with a terminal groin at each end. The reef breakwater would be located within the eastern 500 ft of the fill area, with the remaining 700 ft being unprotected fill that comprises the Beach Fill with G/CS test section.



Typical Elevation of Concrete Panel Breakwater Alternative

ENCLOSURE 4-C

John Grey

State of Louisiana

M.J. "MIKE" FOSTER, JR.
GOVERNOR

JACK C. CALDWELL
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

November 28, 2001

Memorandum

To: Greg Grandy, CRD Project Manager

From: V.J. Marretta, CRD Land Section

RE: Rockefeller Refuge Gulf Shoreline Stabilization Project ME-18
Completion of Landrights

The CRD Land Section has completed all landrights necessary to proceed to construction contracting on the above referenced project. The following information has already been forwarded to you under separate memorandum:

_____ Servitude Agreements
__1__ Letter Agreement with the Department of Wildlife and Fisheries (DWF)
_____ Right-of-Passage Agreements
__1__ CWPPRA Section 303(e) approval
_N/A_ Assignment of Rights to Federal Sponsoring Agency (No Assignment to NMFS)
__1__ Landrights Certification Letter

Note the following:

1) Comply with the requirements noted in the DWF Letter Agreement dated July 5, 2001, a copy of which has already been provided to you.

2) Coordinate all activities with Guthrie Perry, DWF Programs Manager at (337) 491-2593.

Please be sure to closely review the documents to note anything that may need to be included in contract specifications, such as notification periods, physical construction and/or maintenance servitude limits, or the addition of the landowner or the State as an additional insured on any existing insurance policies of the contractor. In cases where the federal sponsor is the contracting party, please notify the agency project

Coastal Restoration Division
P.O. Box 44027 . Capitol Station . Baton Rouge, Louisiana 70804-4027 . Telephone (225)342-7308 . Fax (225)342-9417

ENCLOSURE
4-E

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL RESTORATION AND MANAGEMENT

October 20, 2005

Dr. John Foret
National Marine Fisheries Service
Estuarine Habitats and Coastal Fisheries Center
646 Cajun Dome Blvd, Rm. 175
Lafayette, LA 70506

Re: 95% Design Review for Rockefeller Refuge Gulf Shoreline Stabilization
Statement of Local Sponsor Concurrence

Dear Dr. Foret:

The 95% Design Review Conference was held on September 20th, 2005 for the Rockefeller Refuge Gulf Shoreline Stabilization project. Based on our review of the project information compiled to date, and, in response to your letter of support for the project, we, as local sponsor, concur with the 95% Design Package. LDNR recommends that Phase II funds be requested from the CWPPRA Task Force at the next available opportunity.

This request reflects the construction and monitoring of the designed test sections as documented in the Final Design Report. At the end of the prescribed monitoring period, the success of the individual test sections will be evaluated and a decision made whether to continue with a comprehensive design for the entire project limits.

ENCLOSURE
4-F

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

MEMORANDUM FOR: Rodney F. Weiher, Ph.D.
Chief Economist, NOAA Program Planning and Integration

FROM: William T. Hogarth, Ph.D.
Assistant Administrator for Fisheries

SUBJECT: Finding of No Significant Impact (FONSI) for the Rockefeller Refuge Gulf Shoreline Stabilization Project, Cameron Parish, Louisiana

Based on the subject Environmental Assessment, I have determined that no significant environmental impacts will result from the proposed action. I request your concurrence in this determination by signing below. Please return this memorandum for our files.

1. I concur. _____ 9/11/06
Date

2. I do not concur. _____
Date

Attachments

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

ENCLOSURE
4-G

Rockefeller Refuge Gulf Shoreline Stabilization (ME-18)

Ecological Review Summary
July 6, 2005

Summary/Conclusions

Soils found along the Louisiana coast are typically extremely soft, organic, silt-clays which are subject to high rates of erosion. These soils possess very poor load-bearing capacities and consequently are poor substrates for construction of rock dikes typically used in shoreline protection efforts (Howard et al. 1984). Therefore, it is important to test the effectiveness of alternative hard-structure techniques in protecting vulnerable shorelines. It should be noted that both the CS-01b and TE-29 projects were successful in part due to the availability of a source of sediment. However, conditions are different for this project; there is a lack of availability of sediment supply at the Rockefeller Wildlife Refuge site. Therefore, in the sediment-lean environment, any potential for longshore transport of sediment is not feasible. Consequently, there is no projection that any accretion of sediment will occur behind the various test shoreline protection structures. The design and layout of the test sections appear to be acceptable. In the Lake Salvador Shore Protection Demonstration project, the treatments were not randomly placed along the shoreline, and their close proximity to one another resulted in noticeable treatment interactions. As a result, statistical testing of the data was not possible and definitive conclusions regarding the treatments' influence on shoreline erosion rates could not be drawn. For the Rockefeller Refuge Gulf Shoreline Stabilization project test sections reviewed in this document, Shiner Moseley and Associates, Inc. (2005) considered wave diffraction for spacing of the breakwater alternatives, and estimated that a breakwater spacing that exceeds five times the wavelength will allow the breakwaters to function independently of each other. In addition, the excessive distance from the shoreline that led to the reduced effectiveness on past projects has been addressed in this project. Consideration was given to knowledge that to prevent any potential wave regeneration between the breakwater and the shoreline, a fetch of 200 feet or less would effectively limit the erosive waves that could harm an un-vegetated shoreline (Shiner Moseley and Associates, Inc. 2005). Random variability in local geological conditions may affect the test results more than would any differences among the competing designs. Without replication (building more than one of each design) the relative effectiveness of the designs is essentially unknowable. Monitoring a control area, although worthwhile, does not improve this data gap. Recent aerial surveys show that shoreline erosion rates vary by more than fifteen feet per year over short distances in the vicinity of the test area (Shiner Moseley and Associates, Inc. 2005). The geotechnical survey reports spatial variability in the mechanical properties of the soils that may affect subsidence more than would the differences in breakwater construction (Shiner Moseley and Associates, Inc. 2005). Therefore, limitations exist in interpreting the results of data obtained from monitoring the test sections of this endeavor.

Recommendations

Based on the evaluation of the conceptual design and confidence in goal attainability for Rockefeller Refuge Gulf Shoreline Stabilization, the project appears to be acceptable to proceed toward construction authorization pending a favorable 95% Design Review.

ENCLOSURE
4-J

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

September 5, 2003

REPLY TO
ATTENTION OF:

Real Estate Division
Local Sponsor and Inleasing
Acquisition Branch

Dr. Erik Zobrist
NOAA CWPPRA Program Officer
National Marine Fisheries Service
Restoration Center, 7th Floor, Room 7120
1335 East-West Highway
Silver Spring, Maryland 20910

Dear Dr. Zobrist:

We have reviewed your request for Section 303(e) approval for the Rockefeller Refuge Gulf Shoreline Stabilization Project (ME-18), Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA).

Our Real Estate Division has examined the December 19, 2001, package, as supplemented by the Louisiana Department of Natural Resources (DNR) letter of August 20, 2003, addressed to you. This information includes an executed copy of a July 5, 2001, letter agreement (Letter Agreement), including a project map attached thereto as Exhibit A, between the Louisiana Department of Wildlife and Fisheries (DWF), the purported landowner within the project boundary, and DNR.

Please be advised that prior to construction of the project, appropriate land rights, subject to such terms and conditions as necessary to ensure that wetlands restored, enhanced or managed through this project will be administered for the long-term conservation of the lands and waters and the dependent fish and wildlife populations, must be acquired from all persons or entities with ownership or other property interests of affected land, including oyster leaseholders whose leases will be adversely affected by the project.

The project map indicates that a pipeline is located within the project boundary. If such pipeline is adversely affected by the project, requiring any relocation, alteration, or lowering of the pipeline, then appropriate land rights must be acquired

ENCLOSURE
4-K

USDA United States Department of Agriculture

Natural Resources Conservation Service

3737 Government Street
Alexandria, Louisiana
71302

December 13, 2001

Mr. John D. Foret
National Marine Fisheries Service
Lafayette Office
U.S.L., P.O. Box 42451
Lafayette, LA 70504

Dear Mr. Foret:

RE: Rockefeller Refuge Gulf Shoreline Stabilization Project

I am in receipt of your request for an overgrazing determination for the referenced project. I contacted our local District Conservationist to discuss the grazing in the project area. He informed me that use of the Rockefeller Refuge for grazing by domestic animals is strictly controlled. Therefore, it is our opinion, overgrazing is not a problem in this project area. If you have any questions please let me know.

Sincerely,

W. Britt Paul
Water Resources Staff Leader

cc: Bruce M. Lehto, Asst. State Conservationist/WR, NRCS, Alexandria, LA
Clay Midkiff, District Conservationist, NRCS, Lake Charles, LA
Randolph Joseph, Asst. State Conservationist/FO, NRCS, Lafayette, LA

ENCLOSURE
4-L