

State of Louisiana Coastal Protection and Restoration Authority

2016 Annual Inspection Report

for

West Lake Boudreaux Shoreline Protection and Marsh Creation Project (TE-46)

State Project Number TE-46 Priority Project List 11

April 15, 2016 Terrebonne Parish

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I. Introduction

The West Lake Boudreaux Shoreline Protection and Marsh Creation Project (TE-46) is located in Terrebonne Parish, Louisiana along the northwest quadrant of the Lake Boudreaux, south of Bayou Butler, east of Bayou Grand Caillou and Hwy 57. The project encompasses approximately 250 acres of intermediate marsh and 927 acres of open water, for a total of 1,177 acres (O&M Plan).

The West Lake Boudreaux (TE-46) project is located on the Teche Ridge, a feature of the Terrebonne delta plain which is a result of landforms produced by the Teche-Mississippi delta cycle approximately 3,500 years ago (Gagliano and Wicker,2002). Lake Boudreaux was created as a result of fault events between early to mid 1800's when the area's fresh marshes and swamps reached maximum development and the marsh was continuous and unbroken (Lear, 2012). Since the turn of the 20th century, a combination of natural and anthropogenic alterations within the Terrebonne Delta plain has contributed to its deterioration (Gagliano and Wicker, 2002). Factors contributing to the deterioration of the marshes along the shoreline of West Lake Boudreaux are exposure to wind-driven wave energies, subsidence, and saltwater intrusion.

The western shoreline of Lake Boudreaux helps protect the interior low salinity marshes and aquatic grass beds from high wave energies and turbidity found in Lake Boudreaux. The West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46) project is intended to protect the shoreline from further erosion due to direct exposure to wave energies and to restore interior marsh lost as a result of subsidence and saltwater intrusion. The project included the construction of 220 acres of marsh along the western shoreline of Lake Boudreaux using material dredged from the lake; 24,553 linear feet of earthen containment dike which was degraded in the third year following construction; 12,447 linear feet of foreshore rock dike along the western shoreline of Lake Boudreaux; construction of a rock riprap choke down section and an earthen canal plug (O&M Plan, 2012).

The project has a twenty (20) year project life, which began in November 2009. The principal project features include:

Northern Section

- Marsh Creation (122 acres)
- Foreshore Rock Dike (5,350 Linear Feet)
- Earthen Containment Dike (10,519 Linear Feet)

Central Section

- Marsh Creation (38 acres)
- Foreshore Rock Dike (2,140 Linear Feet)
- Earthen Containment Dike (5,398

Linear Feet) Southern Section

- Marsh Creation (60 acres)
- Foreshore Rock Dike (4,957 Linear Feet)
- Earthen Containment Dike (8,636 Linear Feet)

Other Features

- Earthen Plug
- Choke Down Section (Rock Riprap)

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46) project is to evaluate the constructed project features in order to identify any deficiencies. The inspection results are used to prepare a report detailing the condition of the project features and recommending any corrective actions considered necessary. Should it be determined that corrective actions are needed, the CPRA shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies, as well as an assessment of the urgency, of such repairs. The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance, and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since construction of the West Lake Boudreaux (TE-46) project is outlined in Section IV.

The annual inspection of West Lake Boudreaux (TE-46) project took place April 12, 2016. In attendance were Brian Babin, Adam Ledet, Elaine Lear, and Benjamin Hartman with CPRA, and Robert Dubois with the U.S. Fish and Wildlife Services. The attendees met at a launch in Dulac, near the bridge at Four Point, and traveled to the project area by outboard. The inspection began around 10:00 am at most southern marsh creation area and rock dike, and concluded around 11:15 a.m. at the most northern marsh creation area and rock dike. The trip included a visual inspection of the project features, structures and outer edges of the marsh creation areas. Photographs of the inspection are located in Appendix B.

III. Project Description

The following completed, structural components jointly accepted by CPRA and USFWS will require operation, maintenance, repair, and/or rehabilitation throughout the twenty (20) year life of the project.

North Segment – Rock Dike (Sta. 0+00 to 54+28)

Consist of approximately 5,350 linear feet of rock dike with a 3 ft. crest and 2.5:1 side slopes, constructed to an elevation of +3.5' NAVD 88. Approximately 3,040 linear feet of the dike is adjoining the containment dike (revetment) and the remaining dike is a foreshore dike.

Central Segment – Rock Dike (Sta. 0+00 to 19+46)

Consist of approximately 2,140 linear feet of rock dike with a 3 f.t crest and 2:1 side slopes, constructed to an elevation of+3.5' NAVD 88. Approximately 1,605 linear feet of the rock dike is adjoining the containment dike (revetment) and the remaining dike is a foreshore dike.

Southern Segment – Rock Dike (Sta. 0+00 to 53+98)

Consist of approximately 4,957 linear feet of rock dike with a 3 f.t crest and 2:1 side slopes, constructed to an elevation of+3.5' NAVD 88. Approximately 248 linear feet is a foreshore dike and the remaining length is a rock revetment adjoining the fringe marsh.

Earthen Plug

The earthen plug is approximately 75 feet long and is located in the northwest corner of an oil and gas access channel off of Lake Boudreaux at the north end of the project area. The plug was constructed to an elevation of +4.0' NAVD88 with an 8 foot wide top width and 3:1 side slopes.

Choke Down Section

The choke down section is approximately 100 feet in length along the shoreline and is located between the north rock segment and central rock segment. The rock structure is constructed across the opening in the shoreline and is approximate 75 feet wide and 2 feet thick.

IV. Summary of Past Operation and Maintenance Projects

As of now there have been no maintenance events or project features that required routine operations. This section will be used to reference all maintenance activities on future inspection reports.

V. Inspection Results

North Segment – Rock Dike

The northern segment of the rock dike appeared to be in good condition. There are no signs of settlement along the rock dike; the elevation is consistent throughout the entire length of the structure. There is still some evidence of erosional shadowing on the north end of this segment, measuring approximately 70 feet wide and 20 feet deep, as noted in the previous reports. This erosion may impede structure functionality, however this area has been identified and will continue to be monitored on future inspections. There are no recommendations for maintenance at this time. (See Appendix B, Photos 13 through 17)

Central Segment - Rock Dike

The central segment of the foreshore rock dike also appeared to be in good condition. There are no signs of settlement along the rock dike; the elevation is consistent throughout the entire length of the structure. There are no recommendations for maintenance at this time. (See Appendix B, Photo 10)

Southern Segment - Rock Dike

The southern segment of the rock dike appeared to be in good condition. There are no signs of settlement along the rock dike; the elevation is consistent throughout the entire length of the structure. All of the warning signs along this segment are visible and appear to be in good condition. On the southern end of the structure, the adjacent marsh shoreline has eroded significantly since the time of construction. This has caused the southern end of the rock dike to protrude approximately 150 feet into the lake. There are no recommendations for maintenance at this time, but this area will continue to be monitored on future inspections to determine if any corrective actions need to be made. (See Appendix B, Photos 1 through 8)

Earthen Plug

The earthen plug located on the northern end of the project area in an existing oilfield canal appeared to be in good condition. The structure is fully vegetated since construction and there are no signs of settlement or erosion of the plug. There are also no signs of erosion or washouts of the embankment tie-ins on either end of the structure. Overall, the earthen plug appears to be in good condition and there are no recommendations for corrective actions at this time.

Choke Down Section

The choke down section of the foreshore rock dike could not be observed during the annual inspection as it is submerged under the waterline. The warning sign on the Lake Boudreaux side of the choke down section is still missing, as noted in the previous reports. The timber piling support is still in its location and in good condition, but the sign itself is no longer there. It is recommended that this sign be replaced to notify boaters coming from the lake of the navigational hazard posed by the choke down section. (See Appendix B, Photos 11 through 12)

VI. Conclusions and Recommendations

All of the structures to be maintained in the TE-46 West Lake Boudreaux Shoreline Protection and Marsh Creation Project are in good condition. The foreshore rock dike segments remain at a consistent elevation with no evidence of settlement or displacement of the rock. From a visual inspection, these structures appear to have fared well since the end of construction. There was some erosion noticed on the northernmost and southernmost ends of the foreshore rock dike. The erosion in these areas do not seem to have increased significantly previous reports, not to the magnitude that would prevent the structure from operating as designed or require corrective actions. The earthen plug on the north side of the project area continues to be well vegetated with no observed settlement or erosion of the plug. The subaquatic choke down section appears to be in good shape from what was visible from above the waterline. The only deficiency found during this year's annual inspection was the fore mentioned warning sign on the lake side of the choke down section. As noted in previous inspections, it is recommended that this sign be replaced as it is the only indicator of the submerged structure for vessels traveling in that direction. There are no other recommendations for maintenance at this time.

References:

Gagliano, S.M. and K. M. Wicker. April 2002. Geological Characterization of Potential Receiving areas for the Central and Eastern Terrebonne Basin Freshwater Delivery Project. DNR Contract N. 2509-01-02. Report prepared for the Louisiana Department of Natural Resources. Baton Rouge, La. 57 pp. plus appendices.

Lear, E. December 2012. Monitoring Plan, West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46). Coastal Protection and Restoration Authority. Thibodaux, La. 13 pp. plus appendices

O&M Plan. September 2012. Operation, Maintenance, and Rehabilitation Plan, West Lake Boudreaux Shoreline Protection and Marsh Creation Project (TE-46). Coastal Protection and Restoration Authority, Thibodaux, La. pp 151 including appendices.

Appendix A

Project Features Map



Appendix B

Photographs



Photo 1: View of the southernmost end of the foreshore rock dike, looking west



Photo 2: View of access corridor for Gulf South pipeline in foreshore rock dike, looking west



Photo 3: View of the foreshore rock dike near the south end of the marsh creation southern section, looking north



Photo 4: View of the foreshore rock dike near the south end of the marsh creation southern section, looking north



Photo 5: View of the foreshore rock dike near the south end of the marsh creation southern section, looking west



Photo 6: View of the fish dip near the south end of the marsh creation southern section, looking south



Photo 7: View of the foreshore rock dike along the southern section of marsh creation



Photo 8: View of the foreshore rock dike along the southern section of marsh creation near the no work



Photo 9: View of No Work Zone between the southern section and the central section, looking west



Photo 10: View of the south end of the central section foreshore rock dike, looking north



Photo 11: View of the choke down section in the foreshore rock dike, looking west



Photo 12: The warning sign on the lake side of the choke down section is missing form its support.



Photo 13: View along the foreshore rock dike northern section, looking north



Photo 14: View along the foreshore rock dike northern section, looking north



Photo 15: View along the foreshore rock dike northern section, looking north



Photo 16: View along the foreshore rock dike northern section, looking west



Photo 17: View of the northernmost end of the foreshore rock dike, looking south

Appendix C

Three Year Budget Projection

West Lake Boudreaux Shoreline Protection andMarsh Creation (TE-46)Three-Year Operations & Maintenance Budgets07/01/2016-06/30/19

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Babin	USFWS	Babin
	2016/2017	2017/2018	2018/2019
Maintenance Inspection	\$ 20,823.00	\$ -	\$ 21,430.00
Structure Operation	\$ -	\$ -	\$ -
Administration	\$ -	\$ -	\$ -
COE Administration	\$ -	\$-	\$ -
Maintenance/Rehabilitation			
16/17 Description:			
F&D	s -		
Construction	\$		
Construction Oversight	\$ -		
Sub Total - Maint. And Rehab.	\$		
17/18 Description			
E&D		\$ -	
Construction		\$ -	
Construction Oversight		\$-	
	Sub Total - Maint. And Rehab.	\$	
18/19 Description:			
E&D			\$ -
Construction			\$ -
Construction Oversight			\$ -
		Sub Total - Maint. And Rehab.	\$ -
	2016/2017	2017/2018	2018/2019
Total O&M Budgets	\$ 20,823.00	\$ -	\$ 21,430.00
O&M Budget (3 Vr Total)			\$ 42 253 00
Unexpended O&M Funde			φ 42,233.00 \$ 1.637.326.00
onexpended Odim i unus			Ψ 1,037,320.00

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46)

FY 16/17 –						
Administration				\$		0
O&M Inspection & Report			\$	20,82	3	
Operation:				\$		0
Maintenance:				\$		0
E&D:	\$	0				
Construction:	\$	0				
Construction Oversight:	\$	0				
<u>CPRA Direct Costs</u>						
Inspection:						
CPRA Engineer 3 – 12 hrs@ \$60/hr	r.:	\$	720			
CPRA Engineer 6 - 12 hrs @ \$73/h	nr.	\$	876			
CPRA Scientist 4 – 10 hrs @ \$50/h	r.	\$	500			
		\$	2,096			
Report:						
CPRA Engineer $6 - 60$ hrs. @ \$73/l	hr.	\$	4,380			
Total Direct CPRA Costs:		\$	6,476 x 3%	Inflation	= \$ 6,6	570
<u>CPRA Indirect Costs</u> Inspection:						
CPRA Engineer 3 – 12 hrs@ \$127.30/hr.:			1,528			
CPRA Engineer 6 – 12 hrs @ \$154.88/hr.			1,859			
CPRA Scientist 4 - 10 hrs @ \$106.	08/hr.	<u>\$ 1,061</u>				
		\$ 4,448				
Report:						
CPRA Engineer 6 – 60 hrs. @ \$154.88/hr.			9,293			
Total Indirect CPRA Costs:		\$1	13,741 x 3%	Inflation	=\$14,1	.53
FY 17/18 –						
Administration				\$		0
O&M Inspection & Report				\$		0
Operation:				\$		0
Maintenance:				\$		0
E&D:	\$	0				
Construction:	\$	0				
Construction Oversight:	\$	0				

FY 18/19 –			
Administration		\$	0
O&M Inspection & Report		\$ 21,	430
Operation:		\$	0
Maintenance:		\$	0
E&D:	\$ 0		
Construction:	\$ 0		
Construction Oversight:	\$ 0		
CPRA Direct Costs			
Total Direct CPRA Costs:	\$ 6,476 x 6% Infla	tion = \$ (6,865
<u>CPRA Indirect Costs</u>			
Total Indirect CPRA Costs:	\$13,741 x 6% Infla	tion = \$1 4	4,565

O&M Accounting:

Total O&M Budget:	\$1,664,815.00
OCPR Expenditures to Date:	\$ 27,488.11
Unexpended O&M Budget:	\$1,637,326.89