



Coastal Protection and
Restoration Authority of Louisiana

**State of Louisiana
Coastal Protection and Restoration
Authority**

2016 Annual Inspection Report

for

**Raccoon Island Shoreline Protection/
Marsh Creation Project**

State Project Number TE-48

Priority Project List 11

**Raccoon Island Breakwater
Demonstration Project**

State Project Number TE-29

Priority Project List 5

April 26, 2016
Terrebonne Parish

Prepared by:

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Table of Contents

I. Introduction.....	1
II. Inspection Purpose and Procedures	2
III. Project Description and History	2
IV. Summary of Past Operation and Maintenance Projects	4
V. Inspection Results	4
VI. Conclusions and Recommendations	6

Appendices

- Appendix A Project Features Map
- Appendix B Photographs
- Appendix C Three Year Budget Projections

I. Introduction

Raccoon Island is part of the Isle Dernieres island chain consisting of four (4) islands (Whiskey Island, Trinity Island, East Island and Raccoon Island) and is located approximately 50 miles south of Houma, Louisiana. These islands are separated from the mainland by Terrebonne Bay, Lake Pelto, and Caillou Bay, with the Gulf of Mexico as the southern boundary (Monitoring Plan, 2008).

The Isle Dernieres arc is part of the Lafourche deltaic complex formed as a result of the abandonment of the Caillou Headland approximately 500 years ago (Penland and Boyd, 1985). Following the abandonment of the river, headland sands deposits were moved and deposited along shore forming flanking barrier islands (Penland et al., 1988). Following the submergence of the abandoned delta, the headland was separated from the mainland and created the barrier islands. These islands have experienced narrowing and land loss as the consequence of the interactions among global sea level rise, subsidence, short supply of sediments, human disturbance, and wave and storm processes (Penland et al. 1988; McBride et al. 1989; Williams et al. 1992)

These islands play an important role in lessening the impact of tropical storms and hurricanes. The process of reducing impacts to Raccoon Island began with the Raccoon Island Segmented Breakwater Demonstration Project (TE-29) authorized on the 5th project priority list under the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). The demonstration project consisted of the construction of eight (8) segmented breakwaters along the south side of the island along the shoreline in approximately 4 to 6 feet of water.

The second restoration project approved in the 11th Project Priority List of CWPPRA was the Raccoon Island Shoreline Protection and Marsh Creation Project (TE-48). During the design process, it was determined through a geotechnical investigation that material available for the construction of containment dikes was inadequate for the proposed design application. Rather than delay the project, the project was divided into two (2) phases: Phase A consisted of the shoreline protection features and Phase B included the marsh creation components of the project. The design of Phase A proceeded while further geotechnical and design alternatives were considered for the construction of the containment dikes.

The Raccoon Island Breakwater Demonstration Project (TE-29) and the Raccoon Island Shoreline Protection and Marsh Creation Project (TE-48) were co-sponsored by the Natural Resources Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The projects were authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and enacted on November 29, 1990 as amended, and were approved on the 5th and 11th Priority Project List, respectively.

II. Inspection Purpose and Procedures

The purpose of performing an annual inspection is to evaluate the constructed project features, identify any deficiencies, prepare a report detailing the condition of such features, and to recommend corrective actions needed, if any. Should it be determined that corrective actions are needed, CPRA shall provide, in report form, a detailed cost estimate for engineering, design, supervision, inspection, construction contingencies, and an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects undertaken since the constructed features were completed and an estimated project budget for the upcoming three (3) years for operation, maintenance and rehabilitation. Initially, the Raccoon Island Breakwater Demonstration (TE-29) Project did not include any Phase 2 funds for operations and maintenance of the constructed features. However, in 2014, CWPPRA approved a request made by NRCS to include the project feature constructed under the Raccoon Island Demonstration Project (TE-29) in the Operations and Maintenance Plan for the Raccoon Island Shoreline Protection and Marsh Creation (TE-48) Project. The combined three (3) year budget projections for operation and maintenance for both projects are shown in Appendix C, and a summary of past operation and maintenance projects undertaken since the completion of the projects are outlined in Section IV of this report.

An inspection of both projects was held on April 26th, 2016. In attendance were Adam Ledet, Benjamin Hartman, Brian Babin, and Glen Curole with CPRA, Loland Broussard with NRCS, and Lance Cambell representing LDWF. All attendees met at the LUMCON facility in Cocodrie, Louisiana and the inspection began at approximately 9:30 am on the eastern end of the containment dike on the north side of the island. The inspection team circled the island by boat to view the segmented breakwaters then walked the length of the dike from the east side to the large breach. The inspection concluded at approximately 12:30 pm.

The field inspection included a complete visual inspection of the marsh fill area, fabric along the containment dike on the north side of the island and the segmented breakwaters along the beach on the south side of the island. Photographs of these features were taken during the field inspection and are shown in Appendix B.

III. Project Description and History

Raccoon Island has experienced significant narrowing and land loss due to a combination of global sea level rise, subsidence, reduction in sediment supply, and wave and storm processes. The island beach has eroded an average of -60 ft/yr. from 1988 to 2002 and narrowed from 368.2 acres to 99.2 acres over the last (15) fifteen years (US Army Corps, 2004).

In an attempt to slow shoreline erosion on Raccoon Island, the Raccoon Island Breakwater Demonstration (TE-29) project was implemented. The project consisted of

the construction of segmented breakwaters along the eastern end of the island. The segmented breakwaters were used to demonstrate the effectiveness of reducing shoreline erosion since they were designed to reduce wave energies and promote potential sediment transport and accretion along the beach (Armbruster, 1999). The Raccoon Island Demonstration (TE-29) Project included the construction of eight (8) breakwaters ranging in length from 227 ft. to 280 ft. long with a crest elevation of 4.5' NAVD, top width of 10' and 3(H):(1)V side slopes, constructed above a plastic filter cloth. Each breakwater has been assigned a number from 0 to 7, east to west, respectively. Settlement plates were installed at the center of the structure and approximately 50' from each end to monitor settlement.

Since the short term results of the breakwater demonstration project effectively protected the island from erosion, the Raccoon Island Shoreline Protection and Marsh Creation (TE-48) project was authorized by CWPPRA Task Force (Monitoring Plan, 2008). During the design phase of the project, the geotechnical investigation revealed that the in-situ material for the containment dikes and marsh fill area were not suitable material for the project's design application (Monitoring Plan, 2008). Subsequently, the project was divided into two (2) separate phases to allow for the breakwater component (Phase A) of the project to proceed while the further investigation can be conducted for the feasibility of Phase B, the marsh creation component (Monitoring Plan, 2008). As of April 2013, both components of the Raccoon Island Shoreline Protection and Marsh Creation (TE-48) project was completed and included the following features:

Phase A

Phase A was completed in September 2007 and consisted of eight (8) segmented breakwaters 300 feet long with a crest elevation of +4.5' NAVD88, top width of 10' and 3(H):(V) side slopes. The breakwaters were constructed above a geotextile fabric, spaced 160' to 280' apart in water depths of 3ft. to 8ft., depending on the location and tide. Each breakwater was assigned a number from 8 to 15, as shown in Appendix A. Settlement plates were installed 50' from each end of the breakwaters to monitor structure settlement (O&M Plan, 2014).

The second component of Phase A consisted of a terminal groin on the east end of the island. The groin was constructed to extend from the existing breakwater 0, constructed under the breakwater demonstration (TE-29) project due west approximately 926 ft. to the existing vegetative bankline. The terminal groin was constructed of rock riprap to an elevation of +4.5' NAVD with a 10' top width and 3(H):(V) side slopes above a woven geotextile fabric (O&M Plan, 2014).

Phase B

Phase B consisted of the construction of approximately 9,969 linear feet of containment dikes and placement of approximately 735,340 cu. yds. of material, by volume of fill, to create approximately 58 acres of back barrier marsh adjacent to the north side of Raccoon Island. Due to the intense wave action generated on the bay side of the project during

construction, an alternative method to conventional earthen dike construction was used to ensure adequate consolidation of the marsh platform by extending the life of the bay containment dikes (O&M Plan, 2014). The method included 400 linear feet of geotubes and 4,620 linear feet of protective geotextile cover on newly constructed earthen containment dikes.

IV. Summary of Past Operation and Maintenance Projects

To date, there have been no maintenance events or project features that have required routine maintenance. This section will be used to reference all maintenance activities on future inspection reports.

V. Inspection Results

Raccoon Island Demonstration (TE-29) Project

A visual inspection of the eight (8) segmented breakwaters constructed on the east end of the island revealed that the features were in fair condition. Several of the breakwaters have settled since construction and the rock riprap was slightly displaced (Appendix B; Photos 1 through 17). Breakwater 3 was entirely submerged. A topographic survey was conducted in 2015 by T.Baker Smith of Houma, Louisiana to profile and cross section the breakwaters to determine the extent of settlement. The survey revealed that the breakwaters have settled at varying degrees with breakwaters 3 and 4 being the most severe with a total average settlement of -2.01', including the east groin which was constructed under the Raccoon Island Shoreline Protection and Marsh Creation (TE-48) project. Below are settlement averages of the breakwaters recorded during the 2015 survey:

<u>Breakwater</u>	<u>Settlement (ft.)</u>	<u>Volumes (cu.yds.)</u>	<u>Tons</u>
0	-1.88'	238	357.0
1	-1.60'	249	373.5
2	-1.54'	305	457.5
3	-4.26'	711	1,066.5
4	-3.09'	190	285.0
5	-1.64'	393	589.5
6	-1.59'	442	663.0
7	-1.19'	368	552.0
Eastern Groin	<u>-1.32</u>	<u>1,084</u>	<u>1,626</u>
Avg. Settlement:	-2.01'		
Total Volume:		3,980 cu.yds.	
Total Tons of Riprap:			5,970 tons

Based on the settlement observed, we are recommending a rock riprap lift of all breakwaters to bring the crest to designed elevations. It is estimated that a total of 5,970

tons of riprap will be required to complete the capping of breakwaters 0 through 7. We anticipate that the design of the maintenance project can begin by November 2016.

Raccoon Island Shoreline Protection and Marsh Creation (TE-48) Project

This project consists of eight (8) additional breakwaters (8 through 15), eastern groin, marsh creation and a protected containment dike on the north side of the island. The breakwaters appear to be in fair condition with no major settlement problems or rock displacement. While we are planning for a significant rock lift on the demonstration features, we will cap the low areas identified on breakwaters 8 through 15. Below are settlement averages of the breakwaters recorded during the 2015 survey.

<u>Breakwater</u>	<u>Settlement (ft.)</u>	<u>Volumes (cu.yds.)</u>	<u>Tons</u>
8	-1.74	681	1,021.5
9	-1.53	521	781.5
10	-1.87	694	1,041.0
11	-2.37	933	1,400.0
12	-2.18	657	985.5
13	-1.92	583	874.5
14	-1.87	605	907.5
15	<u>-1.99</u>	<u>506</u>	<u>759.0</u>
Avg. Settlement:	-1.93'		
Total Volume:		5,180 cu.yds.	
Total Tons of Riprap:			7,770.5 tons

Based on the settlement observed since construction, we are recommending that the rock breakwaters (8 through 15) be recapped at the same time at breakwaters 0 through 7, and the eastern groin. We estimated that a total of 7,771 tons of riprap will be required to raise the crest of the breakwaters to its design elevation.

After viewing the marsh creation area in 2015, our first observation was that the presence of marsh plants were severely lacking. The 2016 inspection revealed more vegetation in the containment area due to breaches in the back dike and the corresponding tidal action to affecting the interior portion of the marsh. There are many locations with sunken geotubes; a location summary the larger breaches is show in table 1, below.

Table 1 Breach Locations

TE-48 Bayside Containment Dike Openings						
2016 April 26 Field Trip						
Waypoints	Latitude	Longitude	y_proj	x_proj	Date & Time	Comment
258	29.05350767	-90.9288831	29.05350767	-90.9288831	26-APR-16 12:25:02PM	CL Large breach on westmost end
259	29.05256731	-90.92512323	29.05256731	-90.92512323	26-APR-16 12:32:29PM	2nd breach - westside
260	29.05246756	-90.92514326	29.05246756	-90.92514326	26-APR-16 12:32:57PM	2nd breach - marsh side
261	29.05254887	-90.92510018	29.05254887	-90.92510018	26-APR-16 12:33:55PM	2nd breach - east side
262	29.05226396	-90.92411312	29.05226396	-90.92411312	26-APR-16 12:36:18PM	3rd breach - no exchange yet
263	29.05190203	-90.92286154	29.05190203	-90.92286154	26-APR-16 12:38:24PM	4th breach - no exchange yet
264	29.0512376	-90.92108281	29.0512376	-90.92108281	26-APR-16 12:45:53PM	CL Large breach on eastern end

After discussing the persistent lack of vegetation on the marsh platform with NRCS, we are planning to perform vegetative planting event in year 2016 and 2017. We also noticed that the seam connections of the fabric material covering the earthen embankment on the north side of the marsh fill area were severely degraded and splitting. The fabric and geotubes were placed during construction to protect the containment dike from wave action from the bay and had a projected life span of 2 years. The intention was to remove this material once the marsh platform had begun to vegetate. However, the dike and fabric require immediate removal despite the absence of total vegetative cover. Combined with the need for heavy machinery to dig the exterior anchor-tubes out, it is recommended to leave the units in place. We plan on removing the interior anchor-tubes, geotubes, fabric, and spill box structure during the first maintenance event in November 2016. (Appendix B; Photos 18 through 36)

VI. Conclusions and Recommendations

Overall, The Raccoon Island Breakwater Demonstration (TE-29) project and the Raccoon Island Shoreline Protection and Marsh Creation (TE-48) projects were in fair condition. As noted in Section V, there were several deficiencies that will require immediate maintenance and repairs during the first maintenance event. The temporary geotextile fabric material covering the containment dike on the north side of the island is nearing its projected life expectancy and will need to be removed to avoid large sections tearing off and floating into the bay. A survey of all sixteen (16) breakwaters in early 2015 indicated that all of the breakwaters have settled to a varying degree. We are recommending that the breakwaters and the eastern groin be capped with rock riprap to the original designed elevation. It is estimated that a total of 13,741 tons of rock will be required to complete this maintenance event. An area of concern is the lack of marsh vegetation on the marsh platform. NRCS has conducted a soils analysis on various soil borings taken across the platform in an attempt to identify the cause of minimal succession of plants. We feel that the lack of vegetation will possibly cause some erosion of the marsh platform when the containment dikes are naturally degraded from bayside wave action. We also believe that it is important to allow the tidal flushing of the marsh platform which in turn should enhance vegetative growth. A combination of vegetative plantings and the newly accessible tidal exchange will help promote vegetative growth.

There are no other issues that will require maintenance as a result of the 2016 Annual Inspection.

References:

Armburster, C.K. 1999. Monitoring Progress Report: Raccoon Island Breakwaters (TE-29). Monitoring Series NO. TE-29-MSPR-0899-1. Louisiana Department of Natural Resources, Coastal Restoration Division, Baton Rouge, La. 32 pp.

Coastal Protection and Restoration Authority. 2008. Monitoring Plan: Raccoon Island Shoreline Protection and Marsh Creation (TE-48) Project. Baton Rouge, La. 18 pp.

McBride, R.A., S. Penland, B.E., M.W. Hiland, S.J. Williams, K.A. Westphal, B.E. Jaffe, and A.H. Sallenger, Jr. 1992. Analysis of barrier island shoreline change in Louisiana from 1853 to 1989. In: Williams, S.J., S. Penland, and A.H. Sallenger, Jr. (eds), Atlas of shoreline change in Louisiana from 1853 to 1989. U.S. Geological Survey Miscellaneous Investigations Series I-2150-A.

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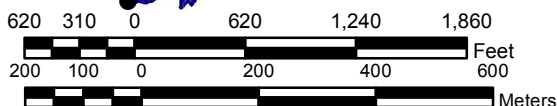
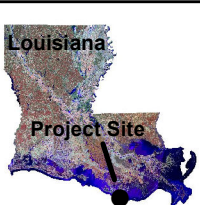
Penland, S. and R. Boyd. 1988. A transgressive depositional systems of the Mississippi River delta plain: A model for barrier island shoreline and shelf sand development. *Journal of Sedimentary Petrology* 58: 932-949

Appendix A

Project Features Map

Caillou Bay

Gulf of Mexico



Data Source:
Coastal Protection and
Restoration Authority of LA
Operations Division

2013 NAIP

Date: October 28, 2014
Map ID: 2014-TFO-048



Appendix B

Photographs



Photo 1 (0003) – View of segmented breakwater 0 and the eastern groin from breakwater to island



Photo 2 (0005) – View of segmented breakwater 0 and eastern groin looking north



Photo 3 (0008) – View of segmented breakwater 1 west



Photo 4 (0014) – View of segmented breakwater 2 north



Photo 5 (0020) – View of segmented breakwater 4 north



Photo 7 (0023) – View of segmented breakwater 5 looking north



Photo 8 (0031) – View of segmented breakwater 6 looking north



Photo 9 (0034) – View of segmented breakwater 7 looking north



Photo 10 (0038) – View of segmented breakwater 8 looking north east



Photo 11 (0043) – View of segmented breakwater 9 looking north



Photo 12 (0047) – View of segmented breakwater 10 looking north



Photo 13 (0050) – View of segmented breakwater 11 looking north



Photo 14 (0055) – View of segmented breakwater 12 looking north



Photo 15 (0060) – View of segmented breakwater 13 looking north



Photo 16 (0063) – View of segmented breakwater 14 looking north



Photo 17 (0067) – View of segmented breakwater 15 looking north.



Photo 18 (0120) – View of geotextile fabric and geotubes along back containment dike near Sta. 5+00 looking west



Photo 19 (0109) – View of geotextile fabric and geotube along back containment dike near Sta. 5+00 looking south east



Photo 20 (0108) – View of geotextile fabric along back containment dike near Sta. 1+00 looking west



Photo 21 (0119) – View of marsh fill area from back containment dike near Sta. 1+00 looking west



Photo 22 (0117) – View of marsh fill area and geotextile fabric containment from Sta. 1+00 looking southwest



Photo 23 (0123) – View of marsh fill area from Sta. 1+00 looking west



Photo 24 (0130) – View of marsh fill area from Sta. 4+00 looking north west



Photo 25 (0132) –View of marsh fill area from Sta. 7+00 looking west



Photo 26 (0145) – View of marsh fill area and failures along containment dike at Sta. 10+00 looking north



Photo 27 (0152) – View of marsh fill area and failures along containment dike at Sta. 13+00 looking north west



Photo 28 (0160) – View of marsh fill area and failures along containment dike at Sta. 16+00 looking west



Photo 29 (0165) – View of marsh fill area and failures along containment dike at Sta. 19+00 looking west south west



Photo 30 (0166) Breach through geotextile fabric near Sta. 20+00



Photo 31 (0173) – View of geotextile fabric tear near Sta. 23+00 and erosion of containment.



Photo 32 (0177) – View of a new tear in geotextile fabric and erosion near Sta. 25+00.



Photo 33 (0180) – View of a new tear in geotextile fabric and erosion near Sta. 25+00



Photo 34 (0184) View of marsh fill area and failures along containment dike at Sta. 27+00 looking south east



Photo 35 (0198) View of marsh fill area and large breach near Sta. 31+00 looking west



Photo 36 (0206) View of marsh fill area and large breach near Sta. 31+00 looking south west

2016 Annual Inspection Report

Raccoon Island Shoreline Protection/ Marsh Creation & Raccoon Island Breakwater Demo Project

State Project No. TE-48 & TE-29

Appendix C

Three Year Budget Projection

Raccoon Island/ TE-48 / PPL 11 (2016-2019)
Three-Year Operations & Maintenance Budgets

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>B.Babin</i>	NRCS	<i>B. Babin</i>

	2016/2017	2017/2018	2018/2019
Maintenance Inspection	\$ -	\$ 20,823.00	\$ 21,446.00
NRCS Administration	\$ 268,400.00	\$ -	\$ -
CPRA Administration	\$ 90,454.00		\$ 14,095.00
Maintenance/Rehabilitation	\$ -	\$ -	\$ -

16/17 Description: removal of geofabric material from containment dikes and recap rock breakwaters along shoreline and Plantings on the marsh platform

E&D/Construction Oversight	\$215,007.00
Construction	\$1,989,375.00
Sub Total - Maint. And Rehab.	\$ 2,204,382.00

17/18 Description:

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

18/19 Description: Plantings on Marsh Platform

E&D	\$ -
Construction	\$ 146,000.00
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ 146,000.00

	2016/2017	2017/2018	2018/2019
Annual O&M Budgets	\$ 2,563,236.00	\$ 20,823.00	\$ 181,541.00

2016 - 2019 O & M Budget (3 yr Total)	\$ 2,765,600
Unexpended O & M Funds	\$2,779,235
Remaining O & M Budget (Projected)	\$13,635

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: TE-48/TE-29 Raccoon Island Breakwater and Marsh Creation

FY 16/17 –

CPRA Administration	\$ 90,454
NRCS Administration:	\$ 268,400
Operation/Navigational Aid:	\$ 0
Maintenance:	\$2,204,382
E&D Construction Oversight:	\$ 215,007
Construction:	\$1,989,375

Operation and Maintenance Assumptions:

Maintenance Event No.1

Removal of geotextile fabric protecting containment dike and recap existing breakwaters to original design elevation.

Removal of Geotextile Fabric

Assumption: 15 working days to remove fabric

Estimated Construction cost:

Mob/Demob (lump sum)	\$ 50,000
Equipment Barge: (160 hrs @ \$100/hr.)	\$ 16,000
Tug Boat: (60 hrs @ \$150/hr.)	\$ 9,000
Excavator: (15 days @ \$1,500/day)	\$ 22,500
Contractor personnel: (4 persons-12 hrs/day = 720 hrs @ \$50/hr (Avg.)	\$ 36,000
Estimated Construction Cost:	\$133,500
Contingencies (25% Const.)	<u>\$ 33,375</u>
Total Construction Cost:	\$166,875

Refurbish Existing Breakwaters to Design Elevation

Mob/Demob (Lump Sum):	\$ 150,000
Construction Surveys (Lump Sum):	\$ 75,000
Rock Riprap: (13,700 tons @ \$90/ton)	\$1,233,000
Estimated Construction Cost:	\$1,458,000
Contingencies (25% Const.)	<u>\$ 364,500</u>
Total Construction Cost:	\$1,822,500

Engineering and Design:

Plans and Specifications (7.138%):	\$ 142,007
Surveying: (7 days @ \$4,500/day)	\$ 0 (Completed)
Permitting:	\$ 5,000
Construction Admin: (200 hrs @ \$100/hr.)	\$ 20,000
Construction Inspection: (600 hrs. @ \$80/hr.)	\$ 48,000
Total E&D/Construction Oversight:	\$ 215,007

Maintenance Event No.1 Estimated Project Budget: \$2,204,382

Marsh Platform Plantings (NRCS): \$ 265,000

CPRA Direct Costs

Maintenance Event No.1

Engineer 7 – 20 hrs @ \$79/hr.	\$ 1,580
CPRA Engineer 6 – 40 hrs @ \$73/hr.	\$ 2,920
CPRA Engineer 4 – 300 hrs @ \$60/hr.	<u>\$18,000</u>
	\$22,500

Inspection:

CPRA Engineer 3 – 12 hrs@ \$60/hr.:	\$ 720
CPRA Engineer 6 – 12 hrs @ \$73/hr.	\$ 876
CPRA Scientist 4 – 10 hrs @ \$50/hr.	<u>\$ 500</u>
	\$ 2,096

Report:

CPRA Engineer 6 – 60 hrs. @ \$73/hr.	\$ 4,380
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Total Direct CPRA Costs: \$28,976

CPRA Indirect Costs

Maintenance Event No.1

Engineer 7 – 20 hrs @ \$167.61/hr.	\$ 3,352
CPRA Engineer 6 – 40 hrs @ \$154.88/hr.	\$ 6,195
CPRA Engineer 4 – 300 hrs @ \$127.30/hr.	<u>\$38,190</u>
	\$47,737

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
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Total Indirect CPRA Costs: \$61,478

FY 17/18 –

NRCS Administration	\$	0
O&M Inspection & Report	\$	20,823
Operation/Navigation Aid:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	0
Construction Oversight:	\$	0

Operation and Maintenance Assumptions:

O&M Inspection and Report – 3% inflation

CPRA Direct Costs

Inspection:

CPRA Engineer 3 – 12 hrs@ \$60/hr.:	\$ 720
CPRA Engineer 6 – 12 hrs @ \$73/hr.	\$ 876
CPRA Scientist 4 – 10 hrs @ \$50/hr.	<u>\$ 500</u>
	\$ 2,096

Report:

CPRA Engineer 6 – 60 hrs. @ \$73/hr.	\$ 4,380
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Total Direct CPRA Costs: \$ 6,476 x 3% = \$ 6,670

CPRA Indirect Costs

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: **\$13,741 x 3% = \$14,153**

FY 18/19 –

NRCS Administration:		\$ 146,000
CPRA Administration:		\$ 14,095
O&M Inspection & Report		\$ 21,446
Operation/Navigational Aid:		\$ 0
Maintenance:		\$
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	

Operation and Maintenance Assumptions:

O&M Inspection and Report – 3% Inflation

CPRA Direct Costs

Total Direct CPRA Costs: \$ 6,670 x 3% Inflation = \$ **6,870**

CPRA Indirect Costs

Total Indirect CPRA Costs: \$14,153 x 3% Inflation = \$ **14,576**

CPRA Administration for Plantings: \$ **14,095**

Marsh Platform Plantings (NRCS): \$ **146,000**

2016-2019 Accounting

Expenditures (LaGov):	\$ 100,398.83
NRCS MIPR:	\$ 11,007.00
COE Administration:	\$ 9,380.00
Total Expenditures:	\$ 120,785.83

Current O&M Funding (LANA Report): \$ 2,900,021

Current Unexpended O&M Funds: \$ **2,779,235**