

State of Louisiana Coastal Protection and Restoration Authority

2017 Annual Inspection Report

for

LITTLE LAKE SHORELINE PROTECTION / DEDICATED DREDGING NEAR ROUND LAKE (BA-37)

State Project Number BA-37 Priority Project List 11

October 31st, 2017 Lafourche Parish

Prepared by:

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I. Introduction

The Little Lake Shoreline Protection/Dedicated Dredging near Round Lake (BA-37) Project is a shoreline protection and marsh creation project located in the central Barataria Basin in Lafourche Parish, Louisiana. The project area lies along the southwestern shoreline of Little Lake and extends from Breton Canal to Plumb Point (See Appendix A).

The Little Lake Shoreline Protection/Dedicated Dredging near Round Lake (BA-37) project is co-sponsored by the National Marine Fisheries Service (NMFS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The project was authorized by Section 303(a) of Title III Public Law 4101-646, the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) enacted on November 29, 1990, as amended. The project was approved on the eleventh (11th) Project Priority List.

The property associated with the Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project is owned by Clovelly Lands, a subsidiary of General Agricultural Services, Ltd.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project (BA-37) 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 recommend any corrective actions considered necessary. Should it be determined that corrective actions are needed, the CPRA shall provide, in the annual inspection report, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies, and an assessment of the urgency of such repairs (O&M Plan, 2008). 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. In addition to the three (3) year budget, a spreadsheet has been included showing the baseline O&M funding, current approved O&M funding levels, and the twenty (20) year projected expenditures for the remaining project life. The three (3) year and twenty (20) year projections for operation and maintenance are shown in Appendix C. A summary of past operation and maintenance projects completed since construction of the Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project is outlined in Section IV.

The annual inspection of the Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project (BA-37) took place on July 24, 2017. In attendance were Benjamin Hartman and Glen Curole of CPRA, Donna Rogers and Brandon Owens with NMFS, and Randy Moertle representing the landowner. The attendees met at the Clovelly Canal Boat Launch and traveled to the project area by boat. The annual inspection began at approximately 09:30 am at the west

end of the rock shoreline protection at Segment 1 near Breton Canal and ended at the southeast end of the rock dike near John the Fool Bayou. The field trip included a visual inspection of the 24 rock dike segments of the shoreline protection, all warning signs, and the outer edges of the marsh creation area. The marsh creation area was viewed from the Tennessee Gas Pipeline, the southwest corner of the marsh fill area, the southern containment boundary, and along the south shoreline of Round Lake. The inspection ended at approximately 11:30 AM.

III. Project Description and History

The project consisted of constructing 25,976 linear feet of shoreline protection rock dike in open water along the Little Lake shoreline and using dredged material from Little Lake to create/nourish 920 acres of marsh along the Little Lake shoreline.

The project area is characterized by open water areas and fragmented intermediate marsh with a high rate of marsh loss due to shoreline erosion, subsidence, and pipeline and oilfield access canal construction. The purpose of the project is to reduce erosion along the Little Lake shoreline, create new marsh in the open water areas, and maintain and nourish the existing, deteriorated marsh.

The principle project features include:

• Shoreline Protection – 25,976 feet of rock dike constructed in 24 segments along the shoreline. Rock lifts are summarized below. The rock dike was constructed on a geotextile fabric base. Fish dips (20' openings in the dike) are located between the segments with a 2-ft thick, 40-ft wide rock scour pad constructed at each dip flush with the existing bottom. Galvanized steel settlement plate riser pipes were installed in each rock segment.

Segments 1 - 24: Two lifts DOTD Class 250-lb, EL 2.5' NAVD88 (first lift to EL 1.0'), 3.5' crown width, 4:1 front slope and 2:1 back slope

Segments 10 – 20: Third lift Corps Class R650, EL 3.5' NAVD88, 2.0' crown width, 2:1 front and back slopes

Segments 21 and 22: Third lift Corps Class R650, EL 4.0' NAVD88, 2.0' crown width, 2:1 front and back slopes

Segments 23 and 24: Third lift Corps Class R650, EL 4.0' NAVD88, 3.5' crown width, 4:1 front slope and 2:1 back slope

• Marsh Creation/Nourishment – Approximately 920 acres was filled with dredge material cut from Little Lake with a target fill height of EL 2.1' NAVD88 (min EL 1.8' and max EL 2.4'). Actual fill elevations varied across the site; however, the average elevation (derived from the individual grid elevations) of the as-built marsh creation

area was EL 2.3' NAVD88. For specific as-built elevations of marsh creation area grid points, see Project Completion Report and As-Built Drawings (2007). The in-place fill volume was computed as 3,463,089 cubic yards based on the as-built surveys. The estimated volume of material cut from the borrow area was 3,818,213 cubic yards.

Additionally, 17,000 Spartina alterniflora (smooth cordgrass) plugs were planted in the marsh creation area in the Spring of 2017.

The Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project (BA-37) has a twenty-year (20 year) project life which began in March 2007. Attached is the three (3) year projected budget for the project (See Appendix C).

IV. Summary of Past Operation and Maintenance Projects

Below is a summary of completed maintenance projects and operation tasks performed since completion of the Little Lake Shoreline Protection/Dedicated Dredging near Round Lake Project (BA-37).

May 2008 – Survey of marsh creation area was performed by Shaw Coastal, Inc. The marsh elevations at the grid points within the marsh creation area as well as top elevations of the 24 rock dike settlement plates were collected. This survey represents the first of the scheduled O&M surveys to be performed but is actually the second post-construction survey. The first post-construction survey was performed by Shaw Coastal, Inc. in May 2007 with remaining construction funds immediately following acceptance of the project. The actual surveying consultant costs associated with the 2008 survey was \$36,007.28.

July 2009 – Survey of marsh creation area was performed by Shaw Coastal, Inc. The marsh elevations at the grid points within the marsh creation area as well as top elevations of the 24 rock dike settlement plates were collected. This survey represents the second of the scheduled O&M surveys to be performed but is actually the third post-construction survey. The actual surveying consultant costs associated with the 2009 survey was \$42,590.40.

July 2010 – A survey of marsh creation area was performed by Morris Hebert, Inc. The marsh elevations and the grid points within the marsh creation area as well as the top elevations of the rock dike settlement plates were collected. This survey represents the third of the scheduled O&M surveys to be performed but is actually the fourth post-construction survey. The actual surveying consultant costs associated with the 2010 survey is 23,500.

September 2011 – Survey of the marsh creation area, rock dike, and settlement plates was performed by Morris Hebert, Inc. The marsh elevations and the grid points within the marsh creation area, the profile of the rock dike sections, as well as the tops elevations of the rock dike settlement plates were collected. This survey represents the last of the scheduled O&M surveys to be performed post-construction. The actual surveying consultant cost associated with the 2011 survey was \$60,013.23.

November 2016 – Survey of the marsh creation area, rock dike 1 & 2, and settlement plates was performed by Morris Hebert, Inc. The marsh elevations and the grid points within the marsh creation area, the profile of the rock dike sections, as well as the tops elevations of the rock dike settlement plates were collected. A magnetometer survey of the area around Rock Dike No. 1 and 2 was also conducted. The actual surveying consultant cost associated with the 2016 survey was \$67,799.10.

Winter 2017 – A maintenance event is tentatively scheduled 2017-2018 winter. This scope will include removing rock from Rock Dike No. 1 and 2 to construct a nearby project feature named "Perpendicular Rock Dike", which will provide protection to adjacent land and reduce navigational hazards. The rock will be degraded to -2.0 ft NAVD88 (previous natural water bottom contour) on all of Rock Dike No. 1 and 870.00' of Rock Dike No. 2.

V. Inspection Results

Rock Segments 1 - 24 (Photos 1 - 30, Appendix B)

All rock segments were visually inspected by boat. It appears that all rock segments have experienced some degree of settlement with the most obvious settlement on the western end of the project (Segments 1 through 8), where only two (2) rock lifts were made during construction. Segments 10 through 24 received a third lift during construction and appear to be in good to fair condition.

Currently, Rock Segments 1 and 2 have no marsh or vegetation along its southern edge, only open water. The fringe marsh that once separated Brusle Lake and Bay L'Ours, located just south of Segments 1 and 2 had eroded following Hurricane Katrina in 2005. This land loss occurred during construction of the project and the rock segments were installed as designed and contracted. Due to the liability associated with the rock dike being below the water surface during high tides and the lack of existing marsh behind the structure, NMFS and CPRA had decided to degrade Segment 1 and part of Segment 2, because the eastern edge of Segment 2 still protects the marsh behind Segment 3 from wave action. In the 2015 inspection report, CPRA had decided against recovering the rock riprap and installing at another location, instead electing to degrade the rock dike to a safe elevation along the lake bottom. This method was seen as more cost effective than recovering the rock riprap. However, 2016 discussions between the NOAA representative and CPRA rehashed the possibility of recovering the rock and building a Perpendicular Rock Dike branching off Segment 2 where the degrading terminates. The increased cost (although shared) of additional surveying and obvious alternative construction has been considered and deemed justifiable. The last survey of the entire rock shoreline was conducted in 2011. A complete Pre-Design survey of the rock on Segments 1 & 2 was concluded in February 2016 and with additional surveying conducted November 2016. The cost of constructing this project feature is reflected in the 3-year budget.

The spoil material broadcasted behind the rock dike segments during construction appear to be in good condition and has fully vegetated. Also, it appears that the SAV (submerged aquatic vegetation) behind the rock segments continues to increase from past inspections.

Marsh Creation Area (Photos 27 – 30, Appendix B)

We were only able to visually inspect the marsh creation area from the perimeter of the project and marsh fringe along Round Lake and the southern containment dike. The fill material in the marsh creation area appeared to be in very good condition and fully vegetated. The latest post-construction survey of the fill area was completed in 2016. Below is a table showing the average grid elevations from 2006, the year construction was completed, through 2016. The final post-construction survey of the marsh fill area was conducted in 2016 and is shown in Figure 1. In 2016, CPRA conducted design surveys for degrading Segment 1 and 2 dikes in conjunction with the marsh surveys previously planned for 2017, with cost savings from eliminating additional administrative & mobilization/demobilization costs.

The average grid elevations for the marsh creation area surveys are shown in the table below.

Survey	Average Grid Elevation (FT, NAVD88)
As-Built (May-Aug 2006)	2.2
Post-Construction (May 2007)	1.49
Post-Construction (May 2008)	1.40
Post-Construction (June 2009)	1.14
Post-Construction (July 2010)	1.23
Post-Construction (Sept 2011)	1.18
Post-Construction (November 2016)	1.27

Table 1 Average Marsh Grid Elevation by Year

VI. Conclusions and Recommendations

As observed during post-construction surveys and visual inspections of the rock dike structure along the southern marsh of Little Lake and Round Lake, all of the rock dike segments have experienced some settlement. Over time, the settlement of the rock dike in the vicinity of Segments 1 and 2 has presented potential hazardous navigation conditions because the dike extends out into open water in an area without land behind it. A combination of high tides causing the rock dike to become submerged and the lack of a marsh shoreline behind both segments has resulted in a decision by NMFS and CPRA to degrade Segment 1 and part of Segment 2. Design surveys for degrading these segments were completed in February 2016. The current plan is to recover the rock rip rap for use in the construction of a Perpendicular Rock Dike near Segment 3; additional surveys for the creation of the new feature were completed in November 2016. Construction is anticipated to start in late 2017 to early 2018.

The marsh creation area appears to be completely vegetated and the post-construction surveys indicate elevations are approaching the average marsh elevation for the area. The final post-construction survey for the marsh creation area is scheduled for year 15 (2022) of the project life. There are no other funds allocated for the marsh creation portion of the project other than the surveying of the area grid points.

2017 Annual Inspection Report

Little Lake Shoreline Protection / Dedicated Dredging

State Project No. BA-37

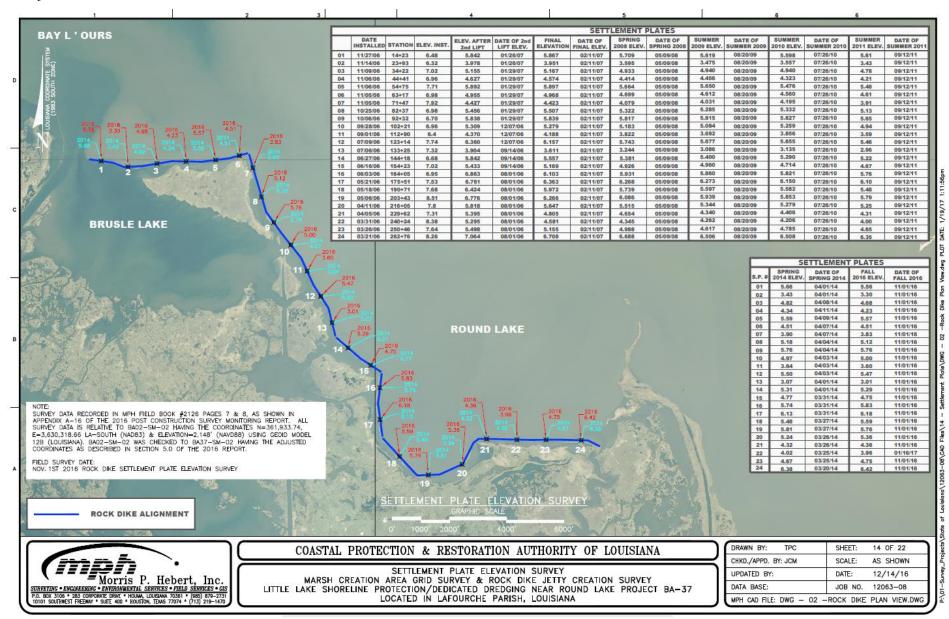


Figure 1. Rock Dike Settlement Plate Data

	Settlement Plate Elevation Comparison July 2010 and Novermber 2016																							
S.P. #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2010 Ele.	5.6	3.56	4.94	4.32	5.48	4.56	4.2	5.33	5.83	5.26	3.83	5.66	3.14	5.29	4.71	5.82	6.15	5.58	5.85	5.28	4.41	4.21	4.79	6.51
2011 Ele.	5.45	3.16	4.61	4.22	5.43	4.37	3.69	4.98	5.62	4.86	3.46	5.42	2.87	5.22	4.61	5.62	6.04	5.33	5.69	5.15	4.09	3.82	4.54	6.28
Δ Ele.	-0.15	-0.4	-0.33	-0.1	-0.05	-0.19	-0.51	-0.35	-0.21	-0.4	-0.37	-0.24	-0.27	-0.07	-0.1	-0.2	-0.11	-0.25	-0.16	-0.13	-0.32	-0.39	-0.25	-0.23

Table 2 Settlement Plate Elevation Comparison

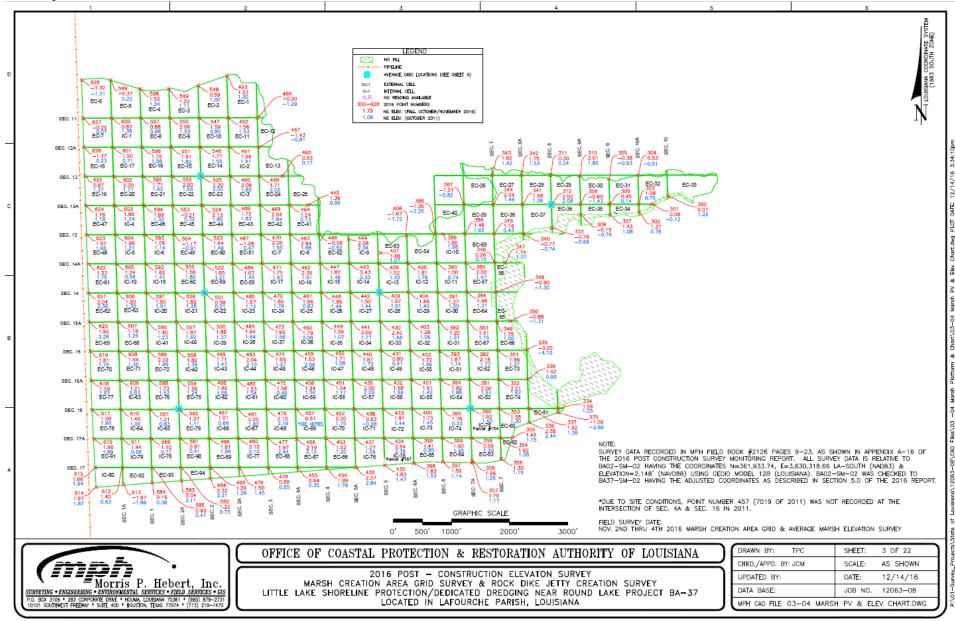
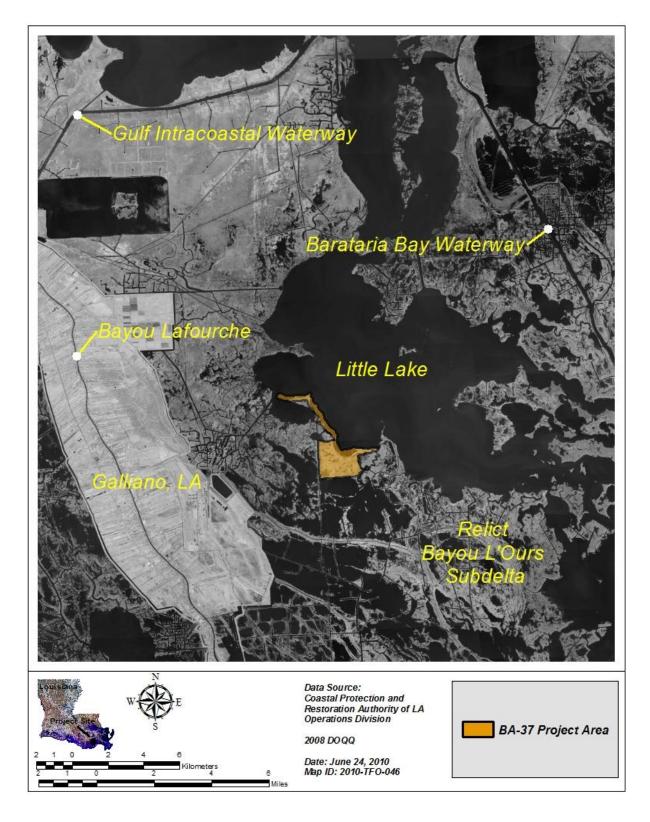


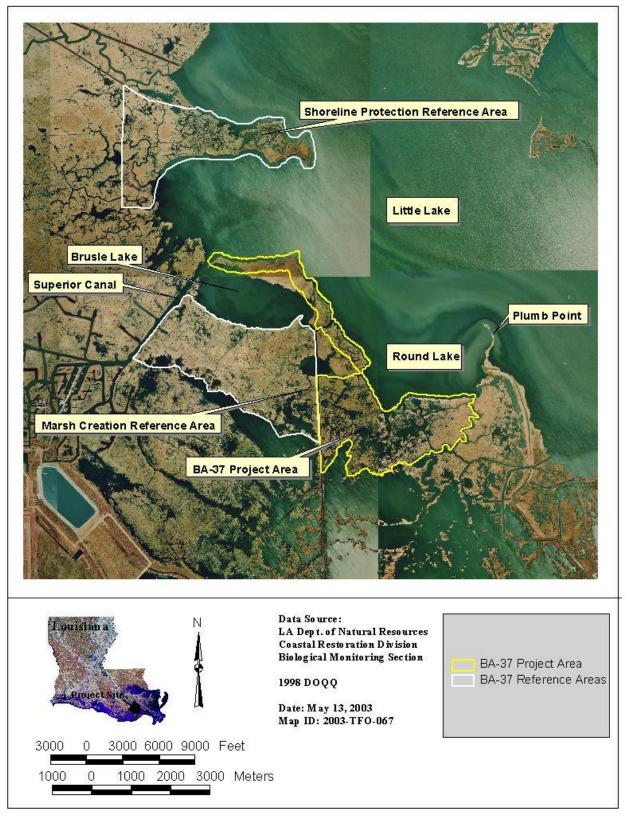
Figure 2. Marsh Creation Area Grid Surveying showing October 2011 and November 2016 Elevations

Appendix A

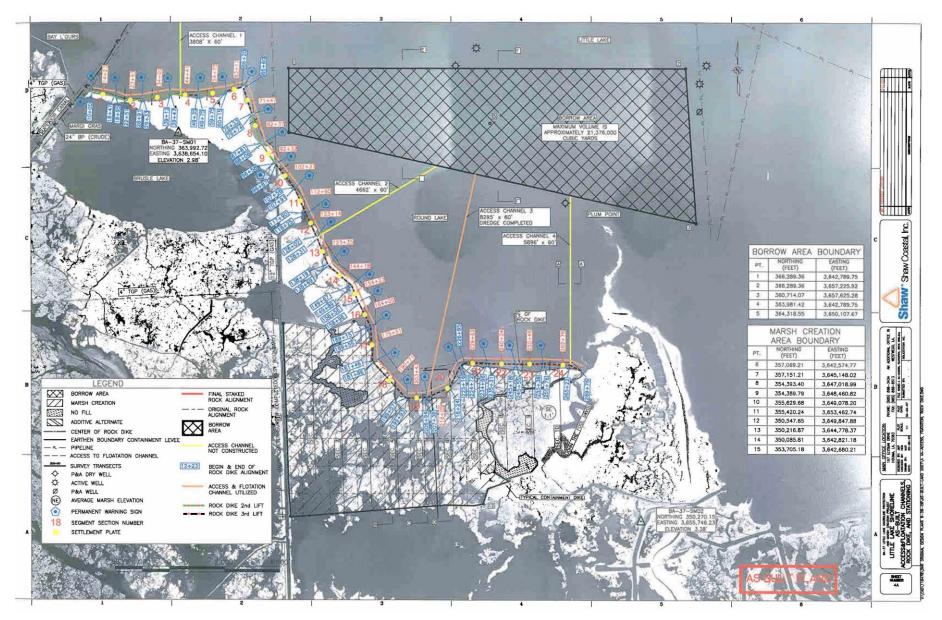
Project Features Map



Vicinity Map of Little Lake Shoreline Protection / Dedicated Dredging Near Round Lake Project (BA-37)



Location Map of Little Lake Shoreline Protection / Dedicated Dredging Near Round Lake Project (BA-37)



As-Built Project Features - Little Lake Shoreline Protection / Dedicated Dredging Near Round Lake Project (BA-37)

Appendix B

Photographs



Photo 1: Beginning of the rock dike (Segment 1) near Sta. 10+00 at the entrance of Breton Canal.



Photo 2: Beginning of rock dike (Segment No.2) looking southward.



Photo 3: Low area along the rock dike (Segment No.2) near Sta. 23+93.



Photo 4: View of the end of rock dike (Segment No.2)



Photo 5: View of the rock dike Segment No.3 looking north (inspection went through fish dip)



Photo 6: View of land remnants behind rock dike Segments No. 2 & No. 3.



Photo 7: View of beginning of rock dike Segment No. 3.



Photo 8: View of the rock dike (Segments No. 3 & No. 4) and warning sign looking eastward.



Photo 9: View of the rock dike (Segments No. 4 & No. 5) looking south



Photo 10: View of the rock dike (Segment No.6 & No. 7) and warning sign looking southwest.



Photo 11: View of the rock dike (Segment No. 7 & No. 8) looking south.



Photo 12: View of the rock dike (Segment No. 9) looking southwest.



Photo 13: View of the rock dike (Segment No.9 & No. 10) looking southwest.



Photo 14: View of the rock dike and bent warning sign (Segment No. 10 & No. 11) looking southwest.



Photo 15: View of the rock dike (Segment No. 11 & No. 12) looking southwest.



Photo 16: View of the rock dike (Segment No. 12 & No. 13) looking southwest.



Photo 17: View of the rock dike and warning sign between Segment No. 13 & No. 14.



Photo 18: View of the rock dike (Segment No. 14) looking southward.

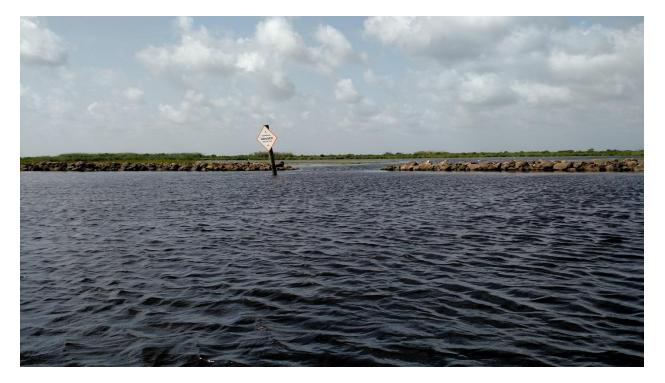


Photo 19: View of the rock dike (Segment No. 14 & No. 15) looking southward.



Photo 20: View of the rock dike near Segment No. 15 & No. 16 looking southward.



Photo 21: View of the rock dike (Segment No. 16) looking southwest.



Photo 22: View of the rock dike between Segment No. 16 & No. 17 looking southwest.



Photo 23: View of the rock dike between Segment No. 17 & No. 18 looking southwest.



Photo 24: View of the rock dike (Segment No. 18) looking southward.



Photo 25: View of the rock dike between Segment No. 19 & No. 20 looking southward.



Photo 26: View of the rock dike between Segment No. 20 & No. 21 looking eastward.



Photo 27: View of the rock dike between Segment No. 21 & No. 22 looking eastward.



Photo 28: View of the rock dike between Segment No. 22 & No. 23 looking south east.



Photo 29: View of the rock dike & warning sign between Segment No. 23 & No. 24 looking south.



Photo 30: View of the rock dike, marsh, and open water just inside the opening of the southern containment dike (Segment No. 24) looking southward.

Appendix C

Three Year Budget Projection

LITTLE LAKE SHORELINE PROTECTION & DEDICATED DREDGING / BA37 / PPL11 Three-Year Operations & Maintenance Budgets 07/01/2017 - 06/30/2020

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Hartman	NMFS	Babin
	2017/2018	2018/2019	2019/2020
Maintenance Inspection	\$-	\$ 22,097.00	\$ 22,760.00
Administration (CPRA)	\$ 42,918.00	\$ -	\$ -
Administration (NMFS)	\$ 4,500.00	\$ 10,000.00	\$ 10,000.00
Maintenance/Rehabilitation			
17/18 Description	Degrade 1900' of rock dike Inpection included in CPRA	on the northern end of proje	ect near Breton Canal.
E&D/Survey	\$ 9,270.00		
Construction			
Construction Oversight			
Sub Total - Maint. And Rehab.	\$ 742,670.00		
18/19 Description:			
E&D		\$ -	
Construction		\$ -	
Construction Oversight		\$ -	
	Sub Total - Maint. And Rehab.	\$	
19/20 Description:			
E&D			\$ -
Construction			\$ -
Construction Oversight			\$-
		Sub Total - Maint. And Rehab.	\$-
	2017/2018	2018/2019	2019/2020
Total O&M Budgets	\$ 790,088.00	\$ 32,097.00	\$ 32,760.00
	<u> </u>		÷ 52,: 00.00
O&M Budget (3-yr Tota	al)		<u>\$ 854,945.00</u>
Unexpended O&M Fu			<u>\$ 1,106,801.00</u>
Remaining O&M Budg			\$ 251,856.00

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: <u>BA-37 Little Lake Shoreline Protection / Dedicated Dredging Near Round</u> Lake

FY 17/18 – Administration (NMFS) CPRA Administration:		\$ 4,500 \$ 42,918
Maintenance:		\$742,670
E&D:	\$ 9,270	
Pre-Design Survey:	\$ 31,250	
Marsh Survey:	\$ 31,250	
Construction:	\$667,700	
Construction Oversight:	\$ 65,700	

Operation and Maintenance Assumptions:

Maintenance Event No.1 - to degrade approximately 1,900 linear (Segment No.1 and 2) of existing rock dike from Breton Canal southward.

<u>Construction:</u>	* * * * * *
Mobilization/Demobilization:	\$ 55,000
(Lump Sum)	
Rock Recovery/Placement:	\$450,000
(9,000 tons @ \$50/ton)	
Flotation Dredging:	\$ 20,000
(Lump Sum)	
Geotextile Fabric:	\$ 22,500
(4,500 sq.yd. @ \$5/sq.yd.	
Warning Signs:	\$ 14,000
Settlement Plates:	\$ 500
Surveys:	<u>\$ 50,000</u>
·	
Construction Cost:	\$607,000
Contingency (10%):	<u>\$ 60,700</u>
Total Estimated Construction Cost:	\$667,700
	. ,
Engineering, Design and Construction Oversight:	
Engineering/Design:	\$ 46,350 80% Completed
	(\$9,270 remaining)
	(+-,8)
(7.5% Construction)	
Surveying:	\$ 27,000 Completed
(Field Work – 7 days @ \$3,250/Day)	I IIII
(Data Processing/Report: - 50 hrs @ \$85/hr.)	
Permitting:	\$ 3,000 Completed
i onnitting.	

(\$3,000)	¢	40.500
Construction Inspection: (450 hrs @ \$110/hr.)	\$	49,500
Construction Admin:	\$	16,200
(120 hrs. @ \$135/hr.)		
NMFS Admin:	\$	4,500
(30 hrs @ \$150/hr.)	anaiaht. A	70 470
Total Engineering/Design, Construction Ov	ersignt: \$	/9,4/0
<u>CPRA Direct Costs</u>		
Maintenance Event No.1:		
Engineer $4 - 80$ hrs. @ $60/hr. =$	\$ 4,800	
Engineer 6 – 20 hrs. @ $73/hr. =$	\$ 1,460	
Engineer 7 – 10 hrs @ $79/hr$. =	\$ 790	
C C C C C C C C C C C C C C C C C C C	\$ 7,050	
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>	
	\$ 2096	
Report:	+	
CPRA Engineer $6 - 60$ hrs. @ \$73/hr.	\$ 4,380	
Total Direct CPRA Costs:	\$13,625	
CPRA Indirect Costs		
Maintenance Event No.1:		
Engineer $4 - 80$ hrs. @ $127/hr. =$	\$10,160	
Engineer $6 - 20$ hrs. @ \$155/hr. =	\$ 3,100	
Engineer 7 – 10 hrs @ $$168/hr. =$	\$ 1,680	
	\$ 14,940	
Inspection:	φ11,210	
CPRA Engineer 3 – 12 hrs@ \$127/hr.:	\$ 1,528	
CPRA Engineer 6 – 12 hrs @ $$127/hr$.	\$ 1,856	
CPRA Scientist $4 - 10$ hrs @ \$168/hr.	\$ 1,676	
	<u>\$ 1,070</u> \$ 5,060	
Report:	ψ 5,000	
CPRA Engineer 6 –. 60 @ \$155/hr.	\$ 9,293	
Cr Kr Engineer 0 –. 00 @ \$155/11.	ψ 9,293	
Total Indirect CPRA Costs:	\$29,293	

FY 18/19 –		
Administration (NMFS)	\$ 10	,000
O&M Inspection & Report	\$ 22	,097
CPRA Administration:	\$	0

\$

Maintenance:	
E&D:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

Operation and Maintenance Assumptions:

Increase of 3% for inflation on inspection/report.

CPRA Direct Costs

Total Direct CPRA Costs:	\$ 6,870
$$4,511 \times 3\% =$	\$4,646
Report:	
\$2,159 x 3% inflation =	\$2,224
Inspection:	

CPRA Indirect Costs

Inspection:	
\$5,212 x 3% =	\$ 5,368
Report:	
\$9,572 x 3% =	\$ 9,859

Total Indirect CPRA Costs: \$15,227

FY 19/20 -

Administration (NMFS)		\$ 10,000
O&M Inspection & Report		\$ 22,760
CPRA Administration:		\$ 0
Maintenance:		\$ 0
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	

Operation and Maintenance Assumptions:

Increase of 3% for inflation on inspection/report.

CPRA Direct Costs

Inspection:	
\$2,224 x 3% inflation =	\$2,291
Report:	
\$4,646 x 3% =	\$4,785
Total Direct CPRA Costs:	\$ <u>7,076</u>

0

CPRA Indirect Costs

Inspection:	-
\$5,368 x 3% =	\$ 5,529
Report:	
\$9,859 x 3% =	\$10,155

Total Indirect CPRA Costs: \$15,684

2017-2020 Accounting

Approved CWPPRA Budget (LANA Report):	\$ 1,498,723
Total Expenditures (LaGov):	\$ 391,922
Unexpended Funds:	\$ 1,106,801