



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

### **Office of Coastal Protection and Restoration**

## **2010/2011 Annual Inspection Report**

for

### **EAST MUD LAKE MARSH MANAGEMENT PROJECT (CS-20)**

State Project Number CS-20  
Priority Project List 2

February 7, 2011  
Cameron Parish

Prepared by:

Darrell J. Pontiff, P.E.  
CPRA/ Office of Coastal Protection and Restoration  
Lafayette Field Office  
635 Cajundome Blvd.  
Lafayette, LA 70596

## **Table Of Contents**

I. Introduction.....	1
II. Inspection Purpose and Procedures.....	1
III. Project Description and History.....	2
IV. Summary of Past Operation and Maintenance Projects.....	5
V. Inspection Results .....	6
VI Conclusions and Recommendations .....	9

## **Appendices**

Appendix A	Project Features Map
Appendix B	Photographs
Appendix C	Three Year Budget Projections
Appendix D	Field Inspection Notes
Appendix E	Map showing areas to be monitored

## **I. Introduction**

The East Mud Lake Marsh Management project area consists of 8,054 acres (3,222 ha) located in the Calcasieu/Sabine Basin in Cameron Parish, Louisiana. The project is bounded by the southern Apache Louisiana Minerals, Inc. Company property line to the south, La. Hwy. 27 to the west, the Sabine National Wildlife Refuge north of Magnolia Road, and an existing step levee and property line near Oyster Bayou to the (See Appendix A).

The East Mud Lake Marsh Management Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended and approved on the third Priority Project List. The Mud Lake Project has a twenty –year (20 year) economic life, which began in April 1996.

## **II. Inspection Purpose and Procedures**

The purpose of the annual inspection of the East Mud Lake Marsh Management Project (CS-20) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan, 2004). 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 completion of the Mud Lake Project are outlined in Section IV.

An inspection of the East Mud Lake Marsh Management Project (CS-20) was held on February 7, 2011 under sunny skies and cold temperatures. In attendance were Stan Aucoin and Patrick Landry from OCPR, Dale Garber and Charles Slocum representing NRCS, and Garry Johnson representing Lonnie Harper and Associates. The annual inspection began at approximately 10:00 a.m. at Structure #17 and ended at Structure #13 at approximately 12:45 p.m.

The field inspection included a complete visual inspection of most of the project features. Conditions of features not inspected on this visit were verified by Mr. Scott Rosteet of Apache Louisiana Minerals, Inc. Staff gauge readings where available were used to determine approximate elevations of water, rock weirs, earthen embankments, steel bulkhead structures and other project features. Photographs were taken at each project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

### III. Project Description and History

The East Mud Lake Marsh Management Project (CS-20) was completed in April 1996 and involved the installation and maintenance of six variable crest culverts with flap gates, three variable crest culverts with slots, one gated culvert, five culverts with flap gates, one variable crest box structure, two earthen plugs, approximately 5,000 linear feet of shoreline repair on E. Mud Lake, and approximately 40,600 linear feet of levee repair along part of the project area boundary (the step canal). These structures are designed to assist drainage, stabilize salinity and water levels and allow ingress and egress of fisheries species. The principle project features of the East Mud Lake Marsh Management Project include the following:

- ES-6- 2- 36" x 40' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side. The weir inlet has 2- 4" vertical slots, each with a 3" x 6" x 6' vertical timber stop log. The weir inlet has a total of 52- 3" x 6" x 4'-7" timber stop logs. ES-#6 replaces an existing structure.
- ES-7- 2- 36" x 40' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side. The weir inlet has 2- 4" vertical slots, each with a 3" x 6" x 6' vertical timber stop log. The weir inlet has a total of 52- 3" x 6" x 4'-7" timber stop logs. ES-#7 replaces an existing structure.
- ES-8- 2- 36" x 40' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side. The weir inlet has 2- 4" vertical slots, each with a 3" x 6" x 6' vertical timber stop log. The weir inlet has a total of 52- 3" x 6" x 4'-7" timber stop logs. ES-#8 replaces an existing structure.
- ES-9a- 1- 36" x 25' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side and aluminum flap gate on the north side. The weir inlet has a total of 26- 3" x 6" x 4'-11" timber stop logs. ES-# 9A replaces an existing structure.
- ES-9b- 1- 48" x 30' corrugated aluminum pipe (8 gauge), with aluminum canal gate on the south side and aluminum flap gate on the north side. ES-# 9B replaces an existing structure.
- ES-5- 1 - 36" x 35' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side. The weir inlet has a total of 26 -3" x 6" x 4'-11" timber stop logs. ES-#5 replaces an existing structure.
- ES-11- 1 -36" x 35' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the south side and aluminum flap gate on the north side. The weir inlet has a total of 26- 3" x 6" x 4'-11" timber stop logs. ES-# 11 replaces an existing structure
- ES-4 - 5 - 36" corrugated aluminum pipe with aluminum variable crest weir on the west side and aluminum flap gate on the east side. ES-#4 is an existing structure installed by FINA.
- ES-3- 1 - 36" corrugated aluminum pipe with aluminum variable crest weir on the north side and aluminum flap gate on the south side. ES-#3 is an existing structure installed by FINA.
- ES-1- 1 - 36" x 40' corrugated aluminum pipe (10 gauge), with 10' aluminum variable crest weir inlet on the north side and aluminum flap gate on the south side.

The weir inlet has a total of 26- 3" x 6" x 4'-11" timber stop logs. ES-#1 is a new structure.

ES-17- 1 - 65' sheetpile structure with one (1) 7' wide variable crest weir/boat bay. The weir has a total of 12- 4" x 6" x 6'-11" timber stop logs. ES-#17 is a new structure.

ES-13- 1 - 160' steel sheetpile bulkhead with two (2) 7' wide variable crest weirs and two (2) 7' aluminum flap gates. The weir inlet has a total of 26- 4" x 6" x 6'-11" timber stop logs. ES-#13 is a new structure.

ES-14-15- approximately 5,000 linear feet of earthen embankment constructed along the Mud Lake Shoreline.

ES-16- earthen plug

ES-19- 1 - 24" x 30' corrugated aluminum pipe (12 gauge), with aluminum flap gate on the west side. ES-#19 replaces an existing structure.

ES-20- 1 - 24" x 30' corrugated aluminum pipe (12 gauge), with aluminum flap gate on the west side. ES-#19 replaces an existing structure.

ES-21- 1 - 24" x 30' corrugated aluminum pipe (12 gauge), with aluminum flap gate on the west side. ES-#19 replaces an existing structure.

ES-22- 1 - 24" x 30' corrugated aluminum pipe (12 gauge), with aluminum flap gate on the west side. ES-#19 replaces an existing structure.

ES-29- 1 - 24" x 30' corrugated aluminum pipe (12 gauge), with aluminum flap gate on the west side. ES-#19 replaces an existing structure.

ES-29a- earthen plug

40,600 linear ft. – levee refurbishment along the Step Canal

The Calcasieu Ship Channel is 1 mi (1.6 km) east of the project area and provides an avenue for high salinity water (4–32 ppt) and rapid water movement into the East Mud Lake project area via West Cove, Oyster Bayou, and Mud Bayou. These connections facilitate increases in turbidity and scouring within the project area. The construction of La. Hwy 27 in 1936 reduced the input of freshwater from the west (USDA-SCS 1994). In the 1950's, portions of the project area were impounded by construction of Magnolia Road and a levee system on the north, east, and south (figure 1). Analysis of aerial photos of the project area indicates a marsh loss rate of 76 ac/yr (30.4 ha/yr) from 1953 to 1983 (USDA-SCS 1992). Excluding Mud Lake, the land to open water ratio deteriorated from 99:1 in 1953 to 70:30 by 1983.

Another problem in the project area is flooding of the marsh for prolonged time periods. Construction of La. Hwy. 27 to the west and La. Hwy. 82 to the south have decreased avenues for drainage from the western and southern areas of the project. This has lead to prolonged periods of high water levels and "ponding," which has resulted in the deterioration of the vegetation (USDA-SCS 1994). Subsidence and sea level rise have also exacerbated the problem, resulting in a relative water level increase of 0.25 in/yr (0.64 cm/yr) from 1942 to 1988 (Penland et al. 1989). The East Mud Lake project addresses these problems by increasing the total number of drainage outlets for the area.

The project area has been divided into two hydrologically separate Conservation Treatment Units (CTUs) that are managed independently (figure 1). CTU 1 contains Mud Lake and is managed passively. Structures and features in CTU 1 consist of vegetative plantings, earthen

plugs, culverts with flap gates and variable-crest culverts. The variable-crest culverts at stations 6, 7, and 8 are set at 6 in (15 cm) below marsh level with vertical slots open except when salinities exceed 15 ppt. The variable-crest culvert at station 13 is set at 6 in (15 cm) below marsh level (BML) with flap gates locked open except when salinities exceed 7 ppt.

CTU 2 is actively managed and has drawdown capabilities in order to encourage shallow water areas to revert to emergent vegetation. Two drawdown events were planned for the first five years of the project. Structures and features present in CTU 2 consist of vegetative plantings, variable crest culverts with flap gates, a gated culvert, and a variable-crest box structure (figure 1). Phase I emphasizes curtailing marsh erosion and reclaiming emergent marsh by implementing a partial drawdown from February 15-July 15. All flap gates at variable-crest culverts 1, 3, 4, 5, 9a, and 11 are allowed to operate with all stop logs removed. Stoplogs are set at 12 in (30.48 cm) above marsh level (AML) on the variable crest box structure at station 17. The screw gate at station 9 is opened and the flap gate allowed to operate.

Phase II, the maintenance phase, emphasizes stabilization of salinity and water levels while ensuring ingress and egress of fisheries species. During this phase of operation, flap gates at stations 3, 4, 5, 9a, 9b, and 11 are locked open. Stoplogs are set at 6 in (15 cm) below marsh level at stations 1, 3, 4, 9a, and 11 while at station 5, one bay is set at 6 in (15 cm) BML and one bay at 12 in (30.48 cm) BML. The screw gate at station 9b is opened and all stop logs removed from station 17. To protect marsh vegetation during periods of high salinity, the ingress gates are closed when salinity inside the project area exceeds 15 ppt at stations 3 or 5.

Vegetation plantings were installed through a cooperative effort by the Louisiana Department of Natural Resources (LDNR), Soil and Water Conservation District, and Natural Resource Conservation Service (NRCS) from June 5 through July 8, 1995. A total of 7,200 *Spartina alterniflora* (smooth cord grass) trade gallons were planted along the step levee in CTU 2 (figure 2). The cut bank configuration of most of the Mud Lake shoreline limited plantings to 480 plants in areas adjacent to structures 17, 13, and the earthen plug west of structure 17 in CTU 1.

Construction was completed May 1, 1996. The project objectives are to prevent wetland degradation by reducing vegetative stress, thereby improving the abundance of emergent and submergent vegetation and to stabilize the shoreline of Mud Lake through vegetative plantings. Specific goals are to (1) decrease the rate of marsh loss, (2) increase vegetative cover along the shoreline of East Mud Lake, (3) increase percent cover of emergent vegetation in shallow open-water areas, (4) increase abundance of vegetation in presently vegetated portions of the project area, (5) reduce water-level fluctuations to within 6 in (15 cm) BML to 2 in (5.08 cm) AML and salinity levels to 15 ppt or less, (6) decrease the duration and frequency of flooding over emergent marsh, (7) decrease the mean salinity in CTU 2, and (8) increase vertical accretion in CTU 2. Maintaining fisheries abundance is not a specific goal as addressed in the project documentation. However, because of concerns regarding potential fishery impacts, it has been included in the monitoring plan.

The area east of CTU 2, south of Oyster Bayou and Mud Bayou (reference area 1), was selected as the best reference area for the evaluation of the water level, salinity, and fisheries monitoring elements. The area north of Magnolia Road (reference area 2) is a suitable reference area for the evaluation of the vegetative, accretion, water-level, salinity, fisheries, and soil monitoring elements. The project area and both reference areas are classified as brackish marsh (Chabreck and Linscombe 1988) and contain mainly organic Bancker and Creole soils with ridges of Mermentau soils (USDA-NRCS 1995). All are directly influenced hydrologically by the CSC and are dominated by *Spartina patens* (marsh hay cord grass).

#### IV. Summary of Past Operation and Maintenance Projects

**General Maintenance:** Below is a summary of completed maintenance projects and operation tasks performed since April 1996, the construction completion date of the East Mud Lake Marsh Management Project (CS-20).

**December-1999 LDNR:** This maintenance project included the installation of approximately 600 tons of stone riprap around Structure #4, aluminum fabrication and installation of flap gate lifting devices and a stop log channel repair at Structure #4, approximately 950 linear feet of earthen levee repair, and placement of approximately 100 tons of stone riprap at Structures 6, 7, 8, 9a & 9b. Construction was completed in December 1999. The costs associated with the engineering, design and construction of the East Mud Lake Maintenance Project are as follows:

Construction:	\$113,848.21
Engineering & Design:	\$ In house
Construction Oversight/As built surveys:	<u>\$ 11,902.28</u>

**TOTAL CONSTRUCTION COST: \$125,750.49**

(Does not include costs associated with in-house design.)

**March 2010 M&M Electric:** This maintenance project included complete replacement of Structure No.4 (five barrel 48 inch diameter structure, 2,300 tons of 30# class rock) and general repairs with 30# class rock installation at Structure Nos. 1, 3, 5, 6, 7, 8, and 11. Total rock placement at all of these structures was approximately 1,500 tons. Other maintenance included repairs to structure 9a & 9b (gear box, flap gate) and 175 LF of pile cap replacement at structure No.13. Construction was completed in February 2011. The costs associated with the engineering, design and construction of the 2010 East Mud Lake Maintenance Project are as follows:

Engineering & Design:	\$ 116,307.00
Construction:	\$1,415,327.00
Construction Oversight/As built surveys:	<u>\$ 121,890.00</u>

**TOTAL CONSTRUCTION COST: \$1,653,524.00**

**Structure Operations:** In accordance with the operation schedule outlined in the Operation and Maintenance Plan, structures were manipulated as required by Apache personnel. A contract between OCPR and Apache Louisiana Minerals, Inc. for operation of the structures has been executed effective April 2007.

## **V. Inspection Results**

### **ES-6 – 2-36" culverts with stop logs, and a 4" fish slot**

The overall condition of Structure No. 6 appears to be very good. Water level gauges weren't available near the structure. Water was flowing out of the project at the time of the inspection. The timber piles, stop logs, grating, etc. are in good condition after completion of the recent maintenance event. (Photos: Appendix B, Photo 1).

### **ES-7 – 2-36" culverts with stop logs, and a 4" fish slot**

Structure No. 7 appears to be in very good condition. Water was flowing out of the project at the time of the inspection. The timber piles, stop logs, grating, etc. are in good condition after completion of the recent maintenance event. (Photos: Appendix B, Photo 2).

### **ES-8 – 2-36" culverts with stop logs, and a 4" fish slot**

Structure No. 8 appears to be in very good condition. Water level gauges were unavailable. Water was flowing out of the project at the time of the inspection. The timber piles, stop logs, grating, etc. are in good condition after completion of the recent maintenance event. (Photos: Appendix B, Photo 3).

### **ES-9a – 1- 36" culvert w/ stop logs & flap gate**

Structure No. 9a is in good condition. All items requiring repair were accomplished through the recent maintenance event. (Photos: Appendix B, Photos 4 & 5).

### **ES-9b – 1- 48" culvert w/ sluice gate and flap gate**

Structure No. 9b is in good condition. All repairs have been made to the structure during the recent maintenance event. (Photos: Appendix B, Photos 4 & 5).

### **ES-11 – 1- 36" culvert w/ stop logs & flap gate**

The structure is in good condition. The maintenance event that was just completed rectified all of the items needing repair. (Photos: Appendix B, Photo 6).



**ES-5 – 1- 36" culvert w/ stop logs & flap gate**

The structure itself is in good condition. All repairs have been made to the structure during the recent maintenance event. (Photos: Appendix B, Photo 7).

**ES-4 – 5- 48" culverts w/ stop logs & flap gates**

This structure was completely replaced with a new 48 inch diameter five barrel drainage structure, including timber supports, and rock armoring. The pre-existing structure No. 4 was abandoned in place by driving steel sheet piles through the mid-section of the culverts. Staff gauge readings were not available. (Photos: Appendix B, Photos 8 & 9).

**ES-3 – 1- 36" culvert w/ stop logs & flap gates**

This is also a pre-existing structure that was incorporated into the CS-20 Project. Water was flowing out to the exterior marsh. All of the items requiring repair or replacement were incorporated in the recent maintenance event. The metal grating located at the inlet and outlet channel will be replaced with timber walkways. (Photos: Appendix B, Photo 10).

**ES-1 – 1- 36" culvert w/ stop logs & flap gates**

This structure is in good condition. All of the items requiring repair or replacement were incorporated in the recent maintenance event. Water was flowing out to the exterior marsh. (Photo: Appendix B, Photo 11).

**ES-17 – variable crest weir w/ boat bay**

The sheet pile cap is severely rusted out on both sides of the structure. The locking tabs on the landing side of the stop log slots are missing. The warning sign is missing. The padlocks on the stop log locking devices have rusted and cannot be operated. The metal pile cap covers are rusted out. Erosion is also occurring on each end of the sheet pile wall. OCPD and NRCS agree that maintenance work is required to replace sign and pile cap on sheet pile wall, check elevation of staff gages, replace metal pile cap covers, replace padlocks, and replace locking tabs, however due to budget constraints were not undertaken with the maintenance event of 2010. Consideration is also being given to replacing the entire sheet pile wall in the future. (Photos: Appendix B, Photo 12).

**ES-13 – sheet pile bulkhead w/ 2 variable crested weirs & flap gates**

This structure is in good condition after completion of the recent maintenance event. All items requiring repair or replacement have been done. (Photos: Appendix B, Photo 13).

**ES-19, 20, 21, 22, & 29 – 24” culverts w/ flap gates**

These structures were not directly inspected on this inspection as agreed jointly by OCPR and NRCS personnel. According to Mr. Rosteet, they are in working order and functioning as designed. OCPR and NRCS agree that no maintenance is required at this time.

**ES-29a – earthen plug**

Due to logistics, this plug also was not directly inspected on this trip. According to Mr. Rosteet, it is stable and functioning as designed. OCPR and NRCS agree that no maintenance is required at this time.

**ES-14 - 15 – 5,000 linear feet of earthen embankment on E. Mud Lake**

See ES-29a comments.

**40,600 linear feet of Levee Refurbishment along the Step Canal**

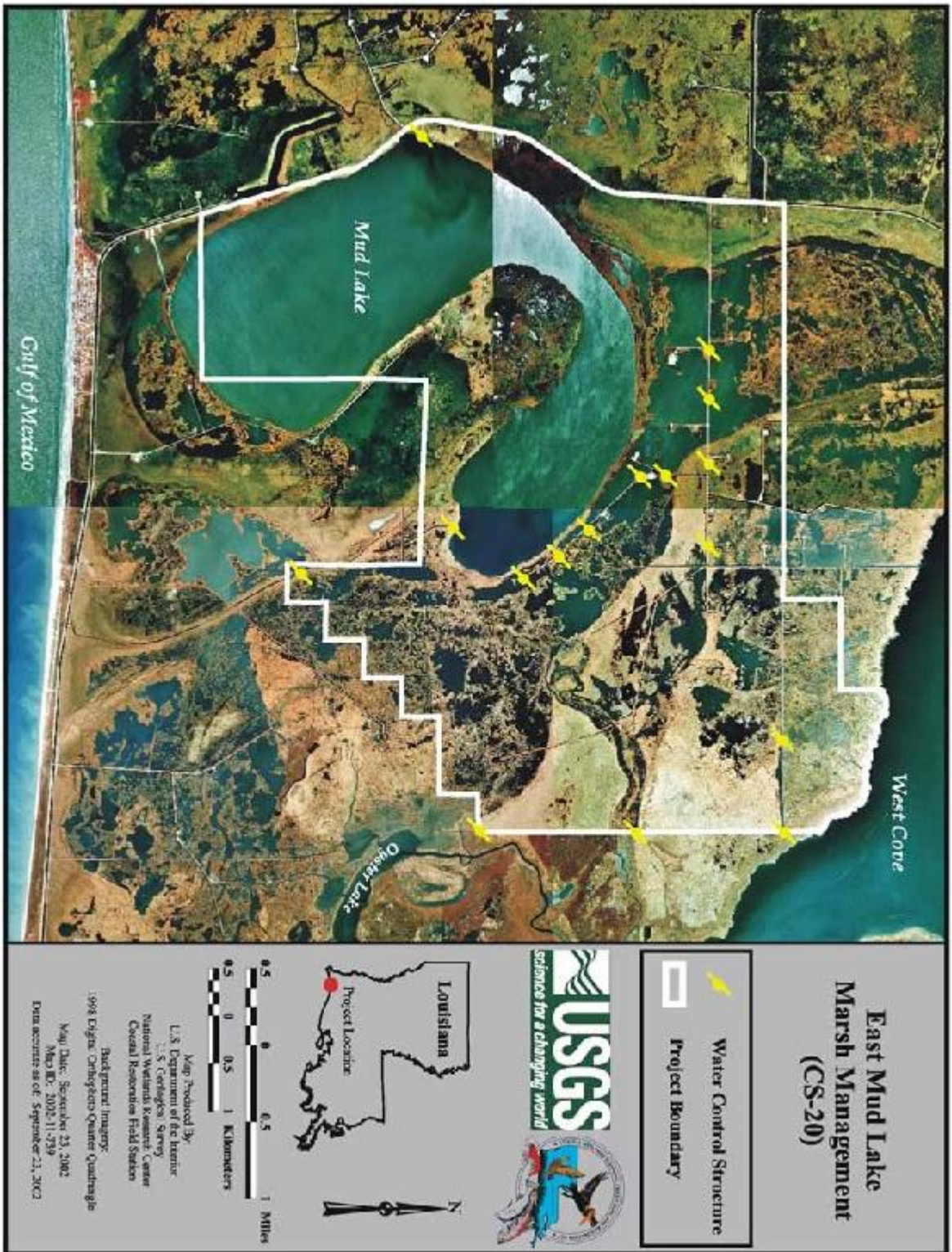
The inspection of the earthen levee consisted of a visual inspection of the entire length of levee along the Step Canal. The repaired sections and cleaning of the Step Canal have increased water flow in these areas. (Photos: Appendix B, Photo 7).

**VI. Conclusions and Recommendations**

Overall, the East Mud Lake Marsh Management Project is in good condition and functioning as designed after completion of the maintenance event performed by M&M Electric. No further maintenance should be required for the remainder of the project life.

## **Appendix A**

### **Project Features Map**



## **Appendix B**

### **Photographs**



Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20



**Photo No.1** Structure No. 6



**Photo No. 2** Structure No. 7





**Photo No. 3, Structure No. 8**



**Photo No. 4, Structure No. 9a & 9b**





**Photo No. 5, Structure No. 9a & 9b**



**Photo No. 6, Structure No. 11**





**Photo No. 7, Structure No. 5**



**Photo No. 8, Structure No. 4**





**Photo No. 9, Structure No. 4**



**Photo No. 10, Structure No. 3**





**Photo No. 11, Structure No.1**



**Photo No. 12, Structure No. 17**



**Photo No. 13, Structure No. 13**

## **Appendix C**

### **Three Year Budget Projection**

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

**E. MUD LAKE/ CS-20 / PPL 2**

**Three-Year Operations & Maintenance Budgets 07/01/2011 - 06/30/2014**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Darrell Pontiff	Stan Aucoin	NRCS	Stan Aucoin

	2011/2012 (-16)	2012/2013 (-17)	2013/2014 (-18)
<b>Maintenance Inspection</b>	\$ 6,086.00	\$ 6,269.00	\$ 6,457.00
<b>Structure Operation</b>	\$ 6,500.00	\$ 6,500.00	\$ 6,500.00
<b>State Administration</b>			\$ -
<b>Federal Administration</b>			\$ -

**Maintenance/Rehabilitation**

11/12 Description:

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

12/13 Description:

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

13/14 Description:

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

	2011/2012 (-16)	2012/2013 (-17)	2013/2014 (-18)
<b>Total O&amp;M Budgets</b>	<b>\$ 12,586.00</b>	<b>\$ 12,769.00</b>	<b>\$ 12,957.00</b>

<b>O &amp; M Budget (3 yr Total)</b>	<b>\$ 38,312.00</b>
<b>Unexpended O &amp; M Budget</b>	<b>\$ 704,008.00</b>
<b>Remaining O &amp; M Budget (Projected)</b>	<b>\$ 665,696.00</b>

## **Appendix D**

### **Field Inspection Form**



Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 1

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stop logs and Flap

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			11	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Walkway	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?

Are there any noticeable breaches?

Settlement of rock plugs and rock weirs?

Position of stoplogs at the time of the inspection?

Are there any signs of vandalism?

Yes



Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 3:

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplogs and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			10	
Stop Logs	Good				
Hardware	Good				
Timber Piles/ Walkway	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				
Channel	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 4:

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: 5-48 Inch Culverts w/stoplogs and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			8	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Flap Gates	Good			9	
Signage / Supports	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 5

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			7	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Walkway	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 6

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			1	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Outlet Pipes	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 7

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			2	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Inlet/Outlet Pipe	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 8

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			3	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages					
Inlet/Outlet Pipe	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 9A & 9B

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flap, Sluice Gate with Flap

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good				
Stop Logs	Good				
Hardware Sluice Gate	Good Good			4&5	
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 11

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: Culvert w/stoplog and Flapgate

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			6	
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Walkway	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	Good				
Signage / Supports	Good				
Staff Gages	Good				
Rip Rap (fill)	Good				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?



Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 13

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: VCW with Flap

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Good			10	
Steel Grating	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables					
Signage / Supports	Good				
Staff Gage	Good				
Rip Rap (fill)	N/A				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

Annual Inspection Report  
EAST MUD LAKE MARSH MANAGEMENT  
State Project No. CS-20

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-20 E. Mud Lake

Date of Inspection: February 7, 2011 Time:

Structure No. 17

Inspector(s): Stan Aucoin, Pat Landry (OCPR)  
Dale Garber, Charles Slocum (NRCS), Garry Johnson (LGH)

Structure Description: VCW with Boat Bay

Water Level Inside: Outside:  
Weather Conditions: Sunny and cold

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Poor		Yes	12	Steel sheet pile and cap show signs of corrosion. Pile cap needs to be replaced.
Steel Grating	Good				
Stop Logs	Fair				The locking tabs on the stop log slots are missing.
Hardware	Poor		Yes		Padlocks corroded and need to be replaced.
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Poor				Need to be replaced.
Cables	Good				
Signage / Supports	Poor				Warning sign is missing.
Staff Gages	Good				Check elevation of staff gages.
Rip Rap (fill)	N/A				
Earthen Embankment	Good				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

## **Appendix E**

### **Locations to be Monitored**