



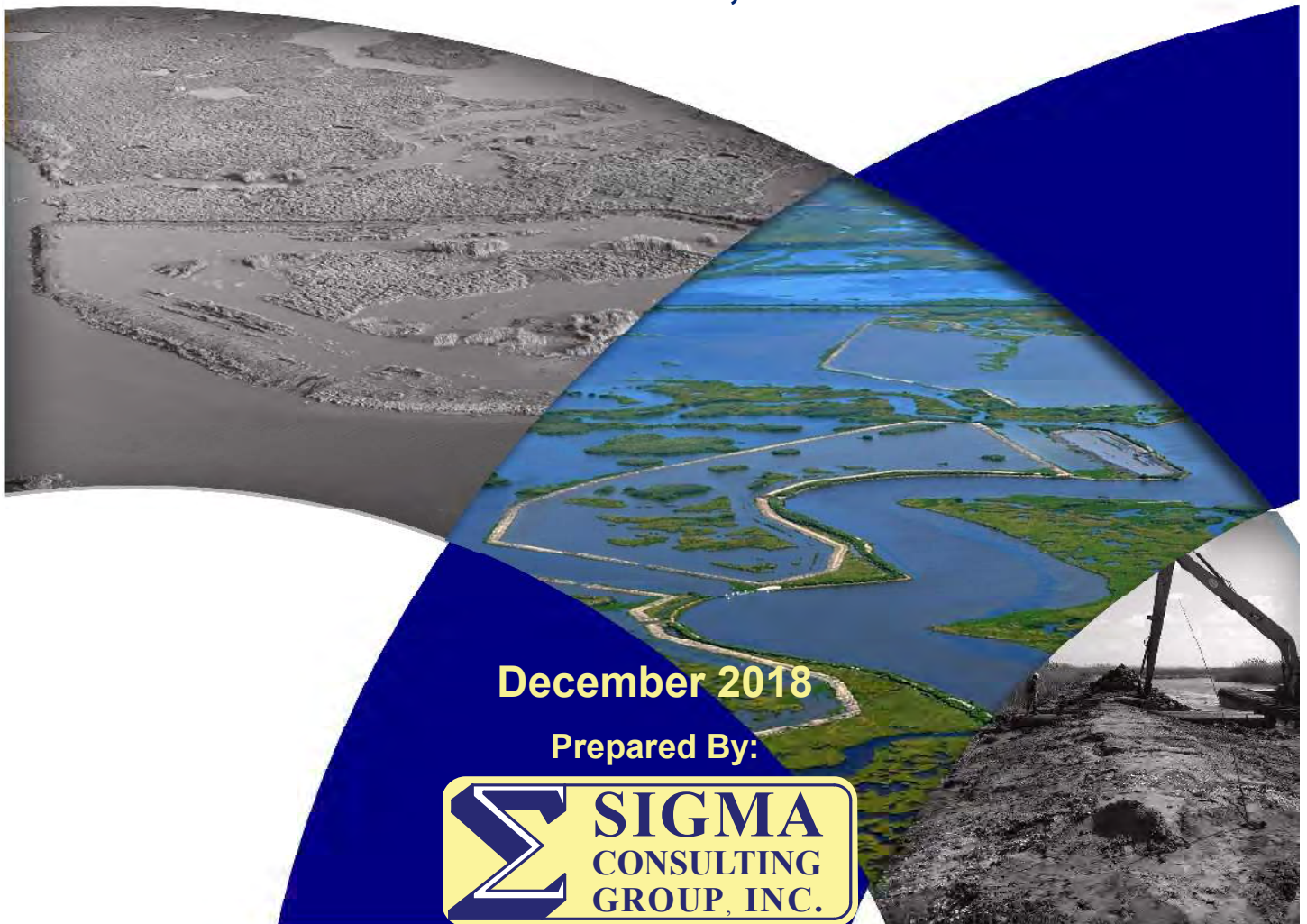
Louisiana Coastal Protection  
and Restoration Authority



# Project Completion Report

## Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72)

### Terrebonne Parish, Louisiana



**December 2018**

**Prepared By:**



**ENGINEERING & SURVEYING**

**10305 Airline Highway | Baton Rouge, LA 70816**

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## 1.0 Project Managers / Contracting Officer

CPRA Construction Project Manager	Adam Ledet, P.E.	985 449-5105
CPRA Project Engineer	Shannon Haynes	225 342-9424
CPRA Monitoring Task Manager	Kenneth Bahlinger	225 342-7382
CPRA Monitoring Task Manager	Bevin Barringer	225 342-4532
Federal Agency Project Manager (USFWL)	Kevin Roy	337 291-3120
Construction Administration/Inspection	Bryan Harmon	225 298-0800

## 2.0 Location and Description of Projects as Approved for Construction by Task Force

The following Project Description and Features Map is as presented in the Final (95%) Design Report dated October 2012. The Lost Lake Marsh Creation and Hydrologic Restoration Project (herein referred to as TE-72) is located in the Terrebonne Basin near the vicinity of Lost Lake as shown in Figure 1. The Louisiana Coastal Wetlands Planning, Protection and Restoration Task Force designated TE-72 as part of the 19th Priority Project List (PPL). The United States Fish and Wildlife Service (USFWS) was designated as the federal sponsor with funding approved on January 20, 2010, through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of 1990 by the United States Congress and the Wetlands Conservation Trust Fund by the State of Louisiana. The Louisiana Coastal Protection and Restoration Authority (CPRA) served as the local sponsor and performed the engineering and design.

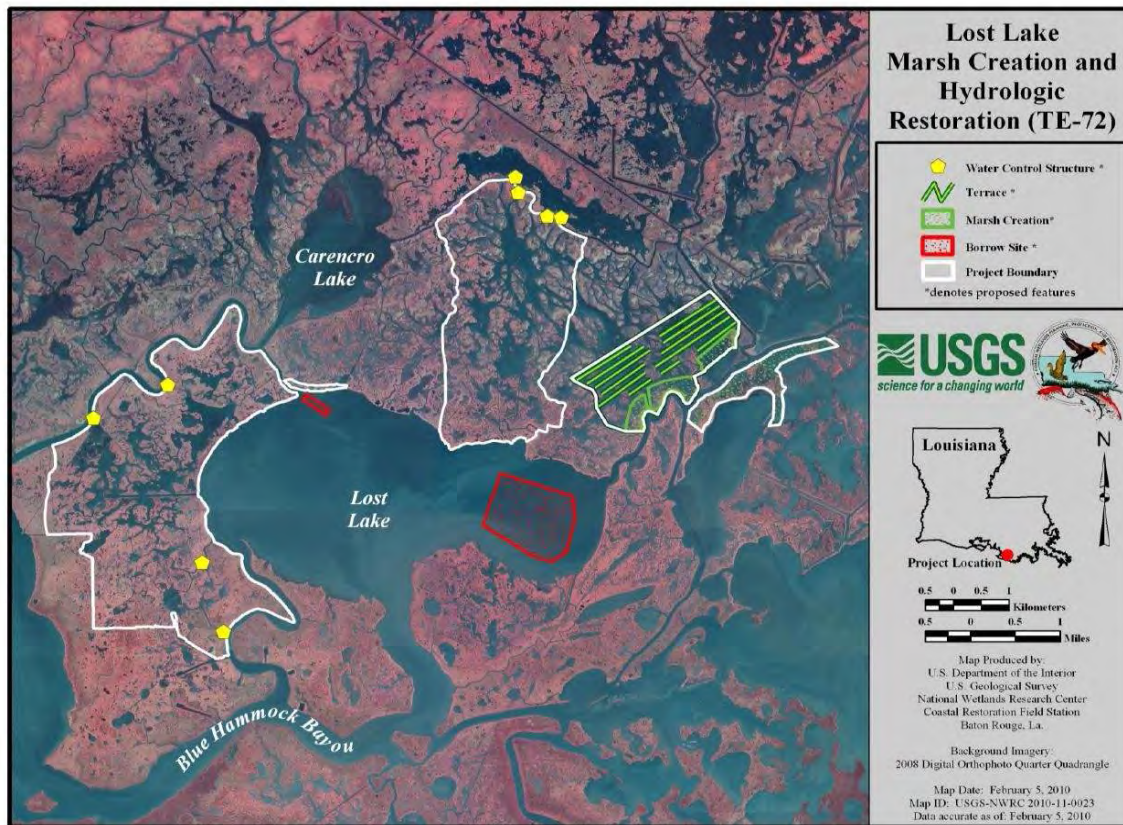


Figure 1: Phase 0 Project Features for TE72

Restoration strategies developed during Phase 0 for this project included the construction of marsh creation areas, earthen terraces, and hydrologic restoration features as shown in Figure 1. The proposed marsh creation features included dredging sediment from Lost Lake to fill open water and broken marsh areas along Bayou Decade and the Lake Pagie lake rim. An earthen terrace field was included in open water north of Bayou Decade in order to minimize damage to the existing marsh caused by local wind-induced waves.

Six fixed-crest weirs and two plugs to the north and west of Lost Lake were proposed to be removed and replaced with variable-crest weir control structures in an effort to increase flow rates of freshwater into the existing marsh while allowing water levels to be maintained during the waterfowl season (i.e., November to January).

### **3.0 Features, Boundaries and Resulting Acreage**

Significant marsh loss has occurred between Lake Pagie and Bayou DeCade to the point that little structural framework remains separating those two waterbodies. Northeast of Lost Lake, interior marsh breakup has resulted in large, interior ponds where wind/wave energy continues to result in marsh loss. Northwest of Lost Lake, interior breakup has occurred as a result of ponding and the periodic entrapment of higher salinity waters during storm events.

The goal of this marsh creation and restoration project is to restore/protect some key features of structural framework (i.e., lake rim and bayou bank) within the area and connect to one of the marsh creation cells recently constructed under the North Lake Mechant Landbridge Restoration Project (TE-44).

Project features included the construction of eight (8) marsh creation cells and associated containment dikes, and two large marsh nourishment areas. The dredge material for the marsh creation areas was obtained from 2 borrow areas located within Lost Lake and pumped via a hydraulic dredge into the various marsh creation areas.

Earthen containment dike gapping has been provided at the viable locations along the marsh creation cells to ensure tidal connectivity and prevent long term ponding within the created marsh areas. In addition, 29,730 linear feet (26 acres) of earthen terraces were constructed to reduce fetch in an area of deteriorated marsh north of Bayou DeCade.

The following table provides a summary project features:

<b>Table 1 AS-BUILT FEATURE QUANTITIES</b>					
<b>BORROW</b>			<b>MARSH NOURISHMENT</b>		
BORROW AREA	VOLUME (cy)	AREA (Ac.)	NOURISHMENT AREA	VOLUME (cy)	AREA (Ac.)
1	5,223,568	390.0	EAST	212,000	130.0
2	256,135	16.4	WEST	613,932	310.0
<b>BA Summary</b>	<b>5,479,703</b>	<b>406.4</b>	<b>MNA Summary</b>	<b>825,932</b>	<b>440.0</b>
<b>MARSH CREATION</b>			<b>EARTHEN CONTAINMENT DIKES</b>		
MARSH CREATION AREA	VOLUME (cy)	AREA (Ac.)	MARSH CREATION AREA	PLAN VOLUME	LENGTH (Ft.)
1/1A	2,511,938	346.9	1/1A	216,395	23,174
1B	1,079,982	112.9	1B	—	5,521
1C	218,612	30.6	1C	—	3,576
2A/D	601,967	78.4	2A/D	74,019	8,406
2B-EAST	23,702	4.0	2B-EAST	14,828	2,515
2B-WEST	391,322	54.4	2B-WEST	62,252	8,325
2C	251,950	39.5	2C	51,945	5,940
3	242,100	51.5	3(CONTAINMENT)	13,530	5,350
			3(STABILIZATION)	24,330	3,747
<b>MCA Summary</b>	<b>5,321,573</b>	<b>718.2</b>	<b>ECD Summary</b>	<b>457,299</b>	<b>66,554</b>

In addition to the marsh creation and nourishment noted above, five (5) water control structures were included as project features. Two (2) existing deteriorated fixed-crest weirs along Big Carencro Bayou were removed and replaced with variable-crest structures. At certain times of the year, Carencro Bayou is an excellent source of fresh water and sediments from the Atchafalaya River/Four League Bay system. However, delivery of that water into the marshes west of Lost Lake was limited by the fixed-crest weirs which limit water exchange. Installing structures with bays/gates will increase freshwater and sediment delivery.

In addition, two (2) existing fixed-crest weirs near Rice Bayou have also been replaced with variable-crest structures to provide flow-through conditions in the system (i.e., water enters the system from Carencro Bayou and exits through the structures near Rice Bayou).

To increase freshwater and sediment delivery into the marshes north of Lost Lake, a new variable-crest weir along Little Carencro Bayou east of Carencro Lake was also constructed.

Specific project construction details for all of the project features are contained in Appendix F “As-Built Drawings”:

## 4.0 Key Project Cost Elements

**Table 2**

<b>Cost Element</b>	<b>CPRA Project Cost Estimates</b>	<b>Cost Incurred as of Construction Completion</b>
Construction	\$25,183,877 <sup>1</sup>	\$28,738,982
E & D	\$1,907,987	
Land Rights	\$75,000	
Construction Administration	\$395,055 <sup>2</sup>	\$385,334.75 <sup>4</sup>
Resident Project Administration	\$544,455 <sup>3</sup>	\$759,470 <sup>5</sup>
Monitoring	\$218,883	N/A to Date
O & M	\$262,6724	N/A to Date
<b>Total</b>	<b>\$30,951,981</b>	<b>\$29,883,787</b>

<sup>1</sup> Cost from TE - 72 Construction Cost Estimate Revised 7/14/14, excludes 25% Contingency

<sup>2</sup> Construction Admin includes estimate for both Contract Services and State Cost

<sup>3</sup> RPA Based on 333 day Construction Supervision Period

<sup>4</sup> Construction Admin includes Project Management and Geotechnical, Excludes State and Federal Cost

<sup>5</sup> RPA Based on actual 680 day Construction Supervision Period

## 5.0 Items of Work

**Table 3**

ITEM No.	Work	UNIT	Estimated Bid Quantity	Estimated Unit Price	Estimated Amount	Unit Price Bid	Bid Amount	As-Built Quantity	Final Amount	
1	Hydraulic Dredge Mobilization and Demobilization (TS-100)	LS	1	\$ 805,000.00	\$ 805,000.00	\$ 500,000.00	\$ 500,000.00	1	\$ 500,000.00	
2	Dredge Pipe Mobilization, Installation Demobilization (TS-101)	LS	1	\$ 4,331,475.00	\$ 4,331,475.00	\$ 1,000,000.00	\$ 1,000,000.00	1	\$ 1,000,000.00	
3	General Mobilization and Demobilization (TS-102)	LS	1	\$ 610,000.00	\$ 610,000.00	\$ 500,000.00	\$ 500,000.00	1	\$ 500,000.00	
4	Surveys (TS-210)	LS	1	\$ 428,678.64	\$ 428,678.64	\$ 735,000.00	\$ 735,000.00	1	\$ 782,850.00	
5	Grade Stakes (TS-220)	EACH	121	\$ 500.00	\$ 60,500.00	\$ 120.00	\$ 14,520.00	108	\$ 12,960.00	
6	Settlement Plates (TS-250)	EACH	7	\$ 1,500.00	\$ 10,500.00	\$ 1,500.00	\$ 10,500.00	6	\$ 9,000.00	
7	Instrumented Settlement Plates (TS-251)	LS	1	\$ 71,649.00	\$ 71,649.00	\$ 30,000.00	\$ 30,000.00	1	\$ 30,000.00	
8	Earthen Containment Dikes (TS-300)	LF	58,720	\$ 24.62	\$ 1,445,686.40	\$ 40.00	\$ 2,348,800.00	60,974	\$ 2,438,960.00	
9	Bank Stabilization Dike (TS-301)	LF	4,509	\$ 18.88	\$ 85,129.92	\$ 60.00	\$ 270,540.00	3,747	\$ 224,820.00	
10	Earthen Terraces (TS-310)	LF	30,000	\$ 4.50	\$ 135,000.00	\$ 45.00	\$ 1,350,000.00	29,730	\$ 1,337,850.00	
11	Channels (TS-330)	EACH	1	\$ 296,070.00	\$ 296,070.00	\$ 125,000.00	\$ 125,000.00	1	\$ 125,000.00	
12	Hydraulic Dredging and Marsh Fill (TS-400) <sup>2</sup>	CY	3,894,526	\$ 4.25	\$ 16,551,735.50	\$ 3.65	\$ 14,215,019.90	3,894,526	\$ 14,215,019.90	
13	55 lb Class Rock (TS-720)	CY	1,390	\$ 125.48	\$ 174,417.20	\$ 75.00	\$ 104,250.00	1,744	\$ 130,762.50	
14	Permanent Warning Signs (TS-800)	EACH	10	\$ 2,000.00	\$ 20,000.00	\$ 550.00	\$ 5,500.00	10	\$ 5,500.00	
15	Aluminum Panels (TS-910)	SF	698	\$ 300.00	\$ 209,400.00	\$ 25.00	\$ 17,450.00	698	\$ 17,450.00	
16	Treated Timber Piles (TS-950)	LF	9,060	\$ 60.00	\$ 543,600.00	\$ 12.50	\$ 113,250.00	8,949	\$ 111,862.50	
17	Treated Timber (TS-955)	MFBM	3.1	\$ 12,000.00	\$ 37,200.00	\$ 70,000.00	\$ 217,000.00	3.1	\$ 217,000.00	
18	Structural Demolition (TS-960)	EACH	4	\$ 31,250.00	\$ 125,000.00	\$ 30,000.00	\$ 120,000.00	4	\$ 120,000.00	
19	Structural Modification (TS-961)	LS	1	\$ 15,000.00	\$ 15,000.00	\$ 10,000.00	\$ 10,000.00	1	\$ 10,000.00	
20	Steel Sheet Pile Wall (TS-970)	SF	16,740	\$ 45.00	\$ 753,300.00	\$ 25.00	\$ 418,500.00	16,740	\$ 418,500.00	
21	Structural Steel (GR 36) (TS-971)	Tons	20.6	\$ 2,500.00	\$ 51,500.00	\$ 10,000.00	\$ 206,000.00	20.6	\$ 206,000.00	
<b>ALTERNATE 1</b>										
22	Dredge Pipe Mob Install and Demob - Addition for Fill Area 2D (TS-101)	LS	1	229,070.00	229,070.00	5,000.00	5,000.00	1	\$ 5,000.00	
23	Surveys - Addition for Marsh Creation Area 2D (TS-210)	LS	1	37,600.00	37,600.00	5,000.00	5,000.00	1	\$ 5,000.00	
24	Earthen Containment Dikes - Deduction Marsh Creation Area 2A (TS-300)	LF	-2,122	24.60	(52,201.20)	40.00	(84,880.00)	-2,122	\$ (84,880.00)	
25	Earthen Containment Dikes - Addition for Marsh Creation Area 2D (TS-300)	LF	3,955	24.60	97,293.00	40.00	158,200.00	3,955	\$ 158,200.00	
26	Hydraulic Dredging and Marsh Fill - Deduction for Marsh Creation Area 2A (TS-400) <sup>2</sup>	CY	-19,231	4.25	(81,731.75)	3.65	(70,193.15)	-19,231	\$ (70,193.15)	
27	Hydraulic Dredging and Marsh Creation - Addition for Marsh Creation Area 2D (TS-400) <sup>2</sup>	CY	344,243	4.25	1,463,032.75	3.65	1,256,486.95	344,243	\$ 1,256,486.95	
<b>CHANGE ORDERS</b>										
28	Abandoned Pipeline Removal	Each	1			\$ 161,630.00	\$ 161,630.00	1	\$ 161,630.00	
29	Woven Geotextile Fabric	SY	30,500			\$ 7.00	\$ 213,500.00	27,767	\$ 194,369.00	
30 <sup>1</sup>	Hydraulic Dredging and Marsh Fill - Additions Over Base Bid	CY	1,178,211			\$ 3.95	\$ 4,653,933.45	1,246,133	\$ 4,922,225.35	
31	Smooth Cordgrass - Plugs	Each	3,747			\$ 2.75	\$ 10,304.25	3,747	\$ 10,304.25	
32	Seashore Paspalum	Each	6,245			\$ 3.00	\$ 18,735.00	6,245	\$ 18,735.00	
33	Roseau Cane	Each	3,747			\$ 4.50	\$ 16,861.50	3,747	\$ 16,861.50	
					<b>Total Estimate</b>	<b>\$28,453,904.46</b>	<b>Total Contract</b>	<b>\$28,655,907.90</b>	<b>Final Value</b>	<b>\$29,007,273.80</b>

<sup>1</sup> As-Built Quantity includes 67,922 CY of addition material dredged and placed in the Marsh Nourishment Area and was utilized to offset Liquidated Damages, no actual payment was made

## 6.0 Construction and Construction Oversight

**Table 4**

Prime Construction Contractor	Weeks Marine, Inc. (WMI)
Sub-Contractor (Survey)	Hydro Terra Technologies, LLC
Sub-Contractor (Structures)	Dupre Brothers Construction Co., Inc.
Sub-Contractor (Small Dredge)	Coastal Dredging Co., Inc.
Original Construction Contract	\$20,579,620.45
Change Orders	\$8,159,361.45
Final Contract	\$28,738,981.90

Construction Admin & Resident Inspection	Sigma Consulting Group, Inc.
Geotechnical Sub Consultant	GeoEngineers, Inc.
Construction Admin & Resident Inspection Fee	\$1,144,804.75

## 7.0 Major Equipment Used

**Table 5**

Equip. No.	Equip. Type	Use	Equip. No.	Equip. Type	Use
8622	CAT 336 Marsh Buggy (Long Reach) (WMI)	Dike Construction	2201/646	JC Deville Bucket Dredge	Dike Construction/Dredge Support
8623	CAT 336 Marsh Buggy (Long Reach) (WMI)	Dike Construction	14188	Scully Cabin Boat	Survey Skiff
8626	CAT 336 Marsh Buggy (Long Reach) (WMI)	Dike Construction	590	Anchor Barge	Dredge Support
8628	CAT 3390E Marsh Buggy (Short Reach) (WMI)	Dredge Support	BT 790	Material/Supply Barge	Dredge Support
8629	CAT 3390 Marsh Buggy (Short Reach) (WMI)	Dredge Support	BT 191	Material/Supply Barge	Dredge Support
8630	CAT 3390 Marsh Buggy (Short Reach) (WMI)	Dredge Support	BT 841	Supply Barge	Dredge Support
8632	CAT 336 Marsh Buggy (Long Reach) (WMI)	Dike Construction	BT 785	Supply Barge	Dredge Support
8636	CAT 330F Marsh Buggy (Short Reach) (WMI)	Dike Construction/Dredge Support		Quarters Barge Trinity	Living Quarters
8638	CAT 336 Marsh Buggy (Long Reach) (WMI)	Dike Construction	26081	Light Plant	Dredge Support
	B&S Long Reach Marsh Buggy (2) Rental	Dredge Support		Airboat (WMI Rental Day-Deep South 1)	Survey/Crew Transportation
	Wilco Long Reach Marsh Buggy	Dredge Support		Airboat (WMI Rental Day-Deep South 3)	Survey/Crew Transportation
(W88)	Wilco Large Pontoon Long Reach	Dredge Support		Airboat (WMI Rental Day-Diamond Pipeline 1)	Survey/Crew Transportation
WMI 14192	Scully Cabin Boat (WMI)	Crew Transportation		Airboat (WMI Rental Day-Diamond Pipeline 2)	Survey/Crew Transportation
WMI 472	Jessie Q Cabin Transport (WMI)	Crew Transportation		Louie C (WMI Rental)	Survey/MCA Construction
WMI 477	James D Cabin Transport(WMI)	Crew Transportation	466	Leslie D Tender Boat (WMI)	Tender Boats-Moving pontoons
WMI 14182	Mud Boat (WMI)	Survey/Crew Transportation	470	Robert B Tender Boat(WMI)	Tender Boats-Moving Pontoons
WMI 14189	Mud Boat (WMI)	Survey/Crew Transportation		Elie Cheramie Tug Boat (WMI Rental)	Dredge Support
BTB 310	Dredge Borinquen 24"	Dredge Support		Diamond Lugger Tug Boat Rental	Dredge Support
BTB 268	Booster Pump and Barge	Dredge Support	221	Skidder Barge	Dredge Support
665	Crane/Crane Barge	Dredge Support			



## 8.0 Construction Sequences and Activities

The project Notice to Proceed was issued with the transmittal of the fully executed contract with an effective date of January 5, 2017. The “as-bid” contract time for this project was 509 calendar days. Additional scope and days were provided under Change Orders 1-4. Under these change orders a total of 105 additional calendar days were added to the contract resulting in an amended contract completion date of September 11, 2018.

The Pre-Construction Conference was held on 1/12/2017 at the CPRA Field Office in Thibodaux, LA. Subsequent to this meeting, but prior to mobilization, several administrative level activities occurred including but not limited to: Notice to Mariners, LA One Call, and the submittal of the Work Plan-Safety Plan-Environmental Plan.

On-site work activities started with the initiation of the Pre-Construction Surveys on 1/27/2017. Equipment and resource mobilization started 2/12/2017 and construction of the first earth containment dike started on 2/15/2017. In advance of the construction start the Resident Project Representative mobilized to the project site on 2/14/2017.

The primary elements of work consisted of; earthen containment dike construction, water control structure demolition and construction, earthen terrace field construction, and marsh creation/dredging. The water control structures were constructed concurrent with the earth containment dike construction and the earth terrace field was constructed concurrent with the marsh creation/dredging.

Access to the Project is only available by boat; the crew transport, materials, equipment, and supplies were staged out of Falgout Marina located on Bayou Decade at LA Hwy 315 approximately 17.5 miles to the east of the project.

The preconstruction and magnetometer survey work was performed by HydroTerra Technologies. The preconstruction survey efforts extended over an approximate 7 month period from 1/27/17-8/14/17. This effort included the staking and layouts of the marsh creation area containment dikes, the earth terrace field, water control structures and associated elements, the two borrow areas, Borrow Area 1 access channel, the dredge pipeline alignment, and grade stakes and settlement plates.

Before any dredge activity could be initiated the marsh creation area containment dikes had to be constructed. The eight marsh creation areas required a total of 66,554 lf of dike, however due to poor foundation soil conditions these dikes had to be constructed in a series of lifts with periodic maintenance. This staged construction effort ultimately required over 300,000 lf of lift work which extended over a period from 2/15/17 to 4/30/18.

Work on the water control structures were initiated by WMI’s structural subcontractor, Dupre Brothers, on March 6, 2017 with demolition work starting at WC-1. The demolition work on the WC Structures; 1, 4, 5, and 6 continued through early April 2017. Reconstruction/construction work started with WC-6 in mid-April 2017 with all work being completed on the five structures by the end of February 2018. Typical work activities included: channel excavation, driving timber piles, driving steel sheet piles, installation of structural steel and treated timber supports, installation of aluminum weir panels, riprap armoring, and warning signs.

The project had two identified borrow areas; borrow area 1 (BA-1) was approximately 450 acres with an estimated 7,460,000cy capacity and borrow area 2 (BA-2) being 16 acres with a 260,000cy capacity. Since BA-2 was establish to provide the dredge material for MCA 3, and this site was located along the northwestern limits of Lost Lake away from the other proposed MCA’s, WMI decided to sub contract this dredge activity to Coastal Dredging. Coastal Dredging was able to mobilize a smaller 16” dredge, the “Gazap”, across the shallow waters of Lost Lake.

This dredge activity occurred from 10/28/17 thru 1/12/18 with the placement of 242,100cy of material within the 51.5 ac MCA-3.

Before the dredge could be mobilized to BA-1, the BA-1 access channel had to be constructed. Excavation on this channel started 1/7/2018 and ended 1/14/2018. The actual arrival and start of the dredge activity out of BA-1 was extended several months due to the dredges prior commitment and contract extensions on a Corps of Engineers Federal Dredge activity on the Atchafalaya River.

On February 20, 2018 the dredge pipeline crew, pipeline, fittings, valves, booster pump, and equipment began to arrive on-site. The pipeline crews began to string together the backbone of a complete manifolded distribution system from BA-1 to MCA-1/1A. This manifolded/valved pipeline was installed to allow for the placement and control of the flow of dredged material to all MCA's associated with BA-1. In advance of the upcoming dredge activity the installation of the three (3) instrumented settlement plates took place on 3/28/2018.

After being released off the federal project the WMI Dredge "Borinquen" underwent a variety of repairs and maintenance before being mobilized to the project site. The dredge arrived on site May 2, 2018 and dredge activity into MCA-2C started May 3, 2018. The 1st lifts were sequentially placed within MCA's; 2C, 2B East & West, 2A/D and 1/1A. However with the valving system in place, WMI was allowed to pump into multiple basins either concurrently and/or alternating amongst multiple basins within the same day. This was done to facilitate adjusting dredge line discharge points, removal of blockages, basin dewatering, and extending settlement times within a basin to minimize loss of suspended materials.

After the 30 day dewatering and settlement periods the 2<sup>nd</sup> lifts were then initiated within each MCA basin and a similar process as described above was followed. The 2<sup>nd</sup> lift activity on these five (5) MCA's ceased with the completion of MCA 1/1A on 9/25/18.

Once it became apparent that a sufficient volume of dredge material would be available to comply with the project goals for MCA's 1B and 1C an "unconfined" release of material into two designated marsh nourishment areas (MNA's) proceeded. Additionally MCA 1B & 1C were filled concurrently as a single interconnected basin. Dredge pumping into MCA 1B/C and both the eastern and western MNA ceased on 10/9/18.

Within all designated MCA's a total of 5,321,573 CY of material was placed and 718 acres of marsh created. In addition it is estimated that approximately 826,000cy of dredge material was released into the MNA's, and provided significant enhancement to an additional 440 acres.

The last major work effort was the earthen terrace field which was constructed concurrently with the MCA's. Similar to the containment dikes the foundation soil conditions required the terraces to be constructed in numerous lifts with a base foundation being placed first and then additional lifts placed to reach final grade and section. The terrace field construction started on 2/28/18 and was not completed until 10/13/2018. A total of 29,730 lf of earthen terrace were constructed with approximately 125,600 lf of lifts being placed to achieve the required final sections.

The following table summarizes the details/timelines for the various work activities described above with additional details contained in the Contractors Construction Schedule in Appendix A- "Progress Schedules".

**Table 6**

<b>Activity Description</b>	<b>Date</b>	<b>Comments</b>
Notice to Proceed	1/5/2017	Five-Hundred -Nine (509) Calendar Day Contract 5/29/18 Contract End Date
Pre-Construction Conference	1/12/2017	CPRA Thibodaux Field Office
Notice to Mariners & One Call	1/13/2017	
Pre-Construction Submittals	1/27/2017	Misc. Work and Safety Plans
Construction Surveys	1/27/2017	Pre Con Surveys Were Started (HydroTerra Survey Sub)
Mobilization	2/12/2017	Misc. Barges and Equipment
Construction Start	2/15/2017	Containment Dikes
	3/2/2017	Water Control Structures (Dupre Sub-Contractor)
	10/23/2017	Whitson Pipeline Removal
	10/28/2017	MCA 3 Dredging from BA 2(CDC Sub-Contractor)
	1/15/2018	BA 1 Access Channel Construction
	2/20/2018	Dredge Pipeline and Valving
	2/28/2018	Earthen Terraces
	5/3/2018	MCA 2C Dredging from BA 1 (Weeks Marine)
Construction Completion	1/12/2018	MCA 3 Completed
	2/25/2018	All Water Control Structures Complete
	10/13/2018	Earth Terrace Field Complete
	9/24/2018	MCA 2C, 2BWest,2BEast, 2A/D
	10/25/2018	MCA 1/1A
	11/9/2018	MCA 1B/C (includes 30 day wait period)
Final Inspection	11/14/2018	Few Minor Issues Noted
Construction Completion	11/16/2018	Final MCA Dike Gapping Completed
Project Demobilization	11/17/2018	Full Demob from Project Completed
Final Acceptance	11/30/2018	Final As-Builts Approved, Outstanding Items Addressed Extended Contract Time via Change Orders= 614 days, Contract Time Stopped at Day 680

## 9.0 Construction Change Orders and Field Changes

Five changes orders and one field order were issued on this project including the final closeout change order. The following is a brief summary of each:

### Field Orders:

1. A field order was issued in accordance with Section GP-43 "Alteration of the Contract and Compensation" for ordering extra work by application of the unit prices in the contract. Additional quantity of rock rip rap was necessary to be placed at an existing water control structure by MCA 2B West in order to repair a breach that formed around the structure and to stop the erosion occurring due to this flow of water. Field Order No. 1 was executed 8/24/17.

### Change Orders:

1. The purpose of Change Order No. 1 was to increase the Contract Price and Contract Duration to allow for the construction of approximately 225 additional acres of marsh creation above the original contract amount. This change order results in additional quantities for; Surveys, Earth Containment Dikes, Hydraulic Dredging and Marsh Creation, and the addition of new items and quantities for: Woven Geotextile Fabric, Abandoned Pipeline Removal, and Hydraulic Dredging and Marsh Fill Over Base Bid. An increase in Contact Duration by 90 days was also added to account for the additional scope.
2. The purpose of Change Order No. 2 was to increase the Contract Price to allow for the planting of 3,747 Smooth Cordgrass Plugs, 6,245 Seashore Paspalum and 3,747 Roseau Cane Plugs. These plants were proposed to help address and stabilize erosion that was occurring along the earthen stability dike that was constructed as part of MCA 3. This change order resulted in the addition of three (3) new pay items for these vegetative plugs. No additional time was added to the contract for this work.
3. The purpose of Change Order No. 3 was to increase the Contract Price to allow for the placement of 55# Class Rock above the original contract amount as required under Field Order No. 1. No additional time was added to the contract for this work.
4. The purpose of Change Order No. 4 was to increase the Contract Price and Contract duration to allow for the construction of approximately 32 additional acres of marsh creation (MCA 1C) above the current contract amount. The funding for this addition was provided through the Louisiana Oil Spill Coordinator's Office (LOSCO). This change order results in additional quantities for; Surveys, Earth Containment Dikes, and Hydraulic Dredging and Marsh Fill Over Base Bid. An increase in Contact Duration by 15 days was also added to account for the additional scope.
5. The purpose of Change Order No. 5 is to adjust Contract Quantities and Contract Price to conform to Final As-Built Quantities and to allow for additional Hydraulic Dredging and Marsh Fill Over Base Bid (67,922 CY) to be placed to offset Liquidated Damages in lieu of payment of 80 days at \$3,130/day. Based on the As-Built Quantities a total of eight bid items had a quantity under run resulting in a net contract price reduction of \$137,736.00.

Complete details for the above are provided in Appendix B "Construction Change Orders and Field Orders".

## 10.0 Pipeline and Other Utility Crossings

Table 7

Pipeline or Utility Structure	Owner	Representative to Contact
James A. Whitson, Jr. Pipeline	James A Whitson, Jr.	Mr. James A Whitson, Jr, 7660 Woodway, Suite 312, Houston , TX 77063 (713)975-8963
Shell Pipeline	Shell Pipeline Co.	Kevin Arceneaux, Maintenance Supervisor Shell Pipeline Company, LP 1617 Coteau Road Houma, LA 70369 (985) 873-3429

## 11.0 Safety and Accidents

WMI retained a daily Safety and Inspection Log with a daily safety officer assigned. For the long duration of the project most incidents were minor in nature however one serious incident occurred 7/11/18.

Table 8

Incident	Date	Description and Action
Equipment Incident	6/10/2017	Marsh Buggy 8624 capsized into excavation trench resulting in a fuel spill. Fuel spill provisions including sock oil boom were put in place and USCG notified. Marsh Buggy operator was given a breath and urine screening. USCG was on sight when the Marsh Buggy was ultimately righted.
Property Damage	9/21/2017	Property damage report was filed for an offsite damage incident to a camp along Bayou DeCade due to a wake from the transport crew boat Jessie Q. Site was investigated by WNI and Terrebonne Sheriff Water Patrol. Issue was resolved with the camp owner.
Tropical Storm/Hurricanes "Nate"	10/5/2017	Weeks Marine demobilizing on-site Lost Lake equipment (Quarters Barge, bucket dredge, marsh buggy, & boats) to their Houma Yard due to the anticipated hurricane (Nate). Dupre Bros demobilize their equipment from Lost Lake to their yard. Once weather permitted equipment was remobilized back to site 10/10/17.

Property Damage	6/8/2018	Internal Damage to WMI Facilities/Equipment Marsh Buggy 8629 Damaged Dump Shack while relocating. WMI Safety Dept. and Risk Management was notified
Diesel Spill	6/8/2018	Minor spill from Marsh Buggy #2 Containment, Recovery, and Cleanup Implemented. WMI notified Risk Management, Spill Response Management, and HSE Department
Oil Spill	7/2/2018	Hydraulic line malfunction caused roughly 50-60 gallons of Neptune AW68 oil to be spilled. O'Brien's and USCG were notified of the incident. Captain Randy Stewart will be completing the necessary paperwork.
Serious Injury	7/11/2018	WMI Chief Engineer sustained serious injuries while in the process of removing a hydraulic ram cylinder onboard the Borinquen. The ram shifted during the process pinning him against a bulkhead causing injury to the right arm, head, & back. He was transported to a trauma center in New Orleans due to the serious nature of the injuries which ultimately resulted in the amputation of the arm. The accident was investigation by Weeks Marine, USCG, & OSHA. The USCG visited the site on 7/11 and OSHA visited on 7/12 & 13. The RPR noticed WMI that copies of all incident related reports and forms must be provided to CPRA since this could be a long drawn out incident.
Equipment Damage	8/7/2018	SSHO investigated and processed incident and damage reports for yesterday's damage event on the night airboat. The shoreman lost his balance and damaged the airboat's canopy trying to stay on board.
Slip and Fall	8/18/2018	WMI employee falling overboard while on one of the rental air boats and trying to transfer back to a mud boat. Employee was quickly able to get out of the water and did not suffer any injuries. Report was filled out by employee who went into the water after he made it back to the BT-213. Report was emailed to risk management department.

Oil Spill	8/20/2018	Shortly after leaving the dock, the Jessie Q blew a hole in the block which resulted in roughly one quart of oil to be leaked onto the vessel and into the water. Spill pads were used to contain the spill as the Jessie Q Captain waked back to the dock on the other motor. O'Brien's Response Management was contacted and provided information for the spill and the compliance department was contacted. A WMI accident report and a USCG 2692 for the Jessie Q spill was processed and sent to WMI risk management and compliance department.
Oil Spill	10/2/2018	SSHO completed incident reports for two small Clarion 46 oil spill mishaps which occurred at the marsh nourishment area on September 10. Reports for the Weeks 8636 and Weeks 8632 marsh buggies were transmitted to project management and risk management.
Slip and Fall	10/9/2018	SSHO was notified in the morning that a deckhand from the night crew had injured his hand around 3:30 am when he fell while crossing from the Borinquen to the Leslie D. SSHO met the deck hand at the clinic and the doctor treated the hand injury with first aid procedures. The deck hand was released back to modified work duty (to not use his left hand for one week).

**12.0 Project Issues and Discussion**

The project construction was completed consistent with the program goals and expectations. Project issues were limited and typical of coastal restoration work in poor soils and erosive wave action. Earthen containment dike stability was problematic on a short reach where embankment height exceeded foundation support capacity/stability. This issue was addressed with the addition of geotextile fabric under change order No. 1.

Another issues was erosion that occurred along the southern boundary of MCA 3 at its interface with Lost Lake. Erosive forces were anticipated in the project design due to the long unobstructed fetch distance across the lake when the area is subject to strong southerly winds and high tides. A stabilization dike was utilized in this area however within a few weeks of completion of this MCA construction, this basin was subject to 2-3 weeks of strong southerly winds. These winds occurred in the winter months before vegetation could be established and resulted in substantial loss of the containment dike.

Change Order No. 2 was processed to install some vegetative plantings however significant dike erosion continued before most of those plantings could take hold. The area was monitored over the next several months and it appeared that the erosion stabilized due to the “self-armoring” of the dike from the small shells that fell out of the lake bottom earthen material that had been utilized for the dike construction. As the season passed into summer the area naturally developed a good stand of vegetative cover and the erosion has not progressed.

### 13.0 Significant Construction Dates

Table 9

Activity Description	Date	Comments
Bid Opening	10/13/2016	CPRA Baton Rouge
Contract Execution	1/3/2017	Contract Value \$20,597,620.45 (base bid + Alt 1)
Notice to Proceed	1/5/2017	Five-Hundred -Nine (509) Calendar Day Contract 5/29/18 Contract End Date
Pre-Construction Conference	1/12/2017	CPRA Thibodaux Field Office
Mobilization	2/12/2017	Misc. Barges and Equipment
Construction Start	1/27/2017	Containment Dikes
Final Inspection	11/14/2018	Few Minor Issues Noted
Construction Completion	11/16/2018	Final MCA Dike Gapping Completed
Project Demobilization	11/17/2018	Full Demob from Project Completed
Final Acceptance	11/30/2018	Final As-Builts Approved, Outstanding Items Addressed Extended Contract Time via Change Orders= 614 days, Contract Time Stopped at Day 680

### References

The Lost Lake Marsh Creation and Hydrologic Restoration Project TE-72 Improvement Plans and Technical Specifications signed and sealed by Shannon M. Haynes, PE dated August 29, 2016 were the governing documents utilized for the construction of this project.