



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

2017 Annual Inspection Report

for

**CAERNARVON OUTFALL
MANAGEMENT
(BS-03a)**

State Project Number BS-03a
Priority Project List 2

November 2017
Plaquemines Parish

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**2017 Annual Inspection Report
for
Caernarvon Outfall Management
(BS-03a)**

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I. Introduction

The Caernarvon Outfall Management Project (State Project No. BS-03a) was approved on the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Second Priority Project List. The project is located to the south and west of Big Mar, a body of water which formed as the result of a failed agricultural impoundment. The project features are located entirely in Plaquemines Parish, and the project outfall area encompasses 15,556 acres in Plaquemines Parish. Project features are located on a number of streams in the outfall area. A map of the project area is included in Appendix A.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Caernarvon Outfall Management Project (BA-03a) is to evaluate the constructed project features to identify any deficiencies and to prepare a report detailing the condition of project features and recommending corrective actions needed. Should it be determined that corrective actions are needed, CPRA shall provide a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan May 15, 2003). The annual inspection report also contains a summary of maintenance projects 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 Caernarvon Outfall Management Project are outlined in Section IV.

This annual inspection of the Caernarvon Outfall Management Project (BA-03a) was performed on June 6th, 2017 and June 14th, 2017. Weather on June 6th, 2017 consisted of cloudy skies and rain, a temperature of approximately 84°F, and winds out of the NNE at around 2 ½ knots. Taking part in the June 6th, 2017 inspection were: David Chambers and Erin Plitsch of CPRA, the non-federal sponsor; Ron Boustany of NRCS, the federal sponsor; and Rob Buck of SeaTow, the operations and maintenance contractor. The Annual Inspection sign-in sheet for June 6, 2017 is included as Appendix E. All accessible structures were visited, but detailed inspection and photo documentation was not completed due to the inclement weather on June 6, 2017; an additional inspection was then completed on June 14, 2017. Weather on June 14, 2017 consisted of partly cloudy skies, a temperature of approximately 85°F, and winds out of the South at around 4 knots. Taking part in the June 14th, 2017 were: Clay Worley of CPRA, the non-federal sponsor; and Rob Buck of SeaTow, the operations and maintenance contractor. On the dates of the inspections, the diversion structure was closed. The Marsh Gage reading was +0.70 and +0.80 feet NGVD and the River Gage reading was approximately +11.80 and +10.60 feet NGVD on June 6, 2017 and June 14, 2017; respectively, although the numbers and markings on the gage near the water surface were illegible due to fouling from the river. Except as otherwise noted, the photographs included in Appendix B were taken at the time of the June 14, 2017 inspection.

Note: R. E. Buck Inc. DBA SeaTow Westbank, the O & M contractor for this diversion and the outfall project are often called upon to conduct specific inspections and perform maintenance tasks periodically between these annual inspections.



III. Project Description and History

The Caernarvon Freshwater Diversion Structure on the east bank of the Mississippi River near Big Mar, was placed into operation in August 1991. The Caernarvon structure was funded by the Water Resources Development Act and constructed for the purpose of diverting Mississippi River water through Big Mar into the marshes to the south and west of Big Mar. Since the early 1900's, these marshes had deteriorated, largely due to being isolated from direct river influxes by the construction of levees. This isolation, with the resultant absence of minerals and nutrients formerly regularly deposited during high river stages, caused a net loss of the organic soils prevalent in the project area. The specific mechanisms causing the soil loss included natural subsidence, erosion, salt water intrusion and oxidation.

In addition to the losses due to Mississippi River levee construction, the increased construction of navigation and oil/gas canals in the project area contributed to the problem. These straight canals provided a perfect avenue for saltwater intrusion, and the canals' high water velocity led to increased erosion rates.

An earlier hurricane also contributed to the loss of wetlands in the project area. In 1965, storm surges from Hurricane Betsy traveled over the above-discussed canals, and the forested swamp area in the northern part of the project area was destroyed by salt stress as the salt water from the storm surge became trapped behind Tigers Ridge.

From 1932 to 1990, approximately 5,550 acres of land in the project area were converted to open water via the above-discussed mechanisms. By 1978, saltwater intrusion had transformed the project area from a primarily intermediate marsh to primarily a brackish marsh. In addition, Hurricane Katrina (2005) caused significant damage to the entire project area.

The Caernarvon Freshwater Diversion Structure was intended to counter some of the mechanisms causing wetlands loss in the project area, primarily saltwater intrusion. Specifically, the Caernarvon structure was intended to increase wildlife and fisheries productivity, enhance emergent marsh vegetation growth, and reduce marsh loss.

The structure has a design discharge capacity of approximately 8,000 cubic feet of freshwater per second. Presently, 80% of the diversion water exits to the southeast via Bayou Mandeville into Lake Lery. With 80% flowing to the southeast of Big Mar, only 20 % flows to the more-deteriorated marshes to the southwest of Big Mar. Prior to Hurricane Katrina, Gustav (2008) and Ike (2008), those percentages were closer to 66%—34%, respectively. An additional problem is that, prior to the present Caernarvon Outfall Management Project, much of the flow of water to the southwest channeled rapidly to the lower reaches of the basin and did not inundate the interior marshes as was originally intended. The present project promotes better utilization and distribution of water from the Caernarvon Freshwater Diversion Structure. As designed, project features allow water from the channels to flow into the marsh interior and cause the water to be retained in the marsh for a longer period of time.



The Caernarvon Diversion Outfall Management Project took one year to complete, starting on June 11, 2001 and completing on June 14, 2002. Because of change orders and other contractual issues, the Final Acceptance was not made until September 10, 2002. The Outfall Project receives fresh water from the Mississippi River through the Caernarvon Diversion Structure located on the east bank of the Mississippi River near the St. Bernard / Plaquemines Parish line. The Outfall Project benefit area consists of 18,200 acres and is bounded by the Forty Arpent Canal levee to the north and west, and by Lake Lery, Bayou Mandeville, and the Caernarvon Canal to the east. The southern boundary is a composite of undifferentiated marsh, Reggio Canal, the Pipeline Canal, and River aux Chenes.

The objective of the Outfall Project is to promote better utilization and distribution of freshwater and nutrients from the Mississippi River, introduced in the project area by the Caernarvon Structure, during low-diversion discharge periods. Management of the outfall will allow the water from existing channels into the interior of the marshes. Placement of plugs and culverts along with designated spoil bank restoration is expected to enhance water retention and distribution within the project area.

The project features are listed below:

Inspection photos of the features are shown in Appendix B of this report. Elevations are NAVD 88.

A. Site/Structure #13 – Rockfill channel plug with riprap armor located along the west bank of Bayou Mandeville. The plug is set at an elevation of +4.0 ft. and is 100 ft. long x 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes one (1) 48” diameter corrugated aluminum pipe which passes through the rockfill plug at an invert elevation of -3.5 ft. with an aluminum combination gate attached to the pipe on the interior side of the marsh. A timber walkway to the gate is at elevation +4.0 ft.

B. Site/Structure #25 – Earthen and rockfill channel plug with riprap armor located on the Forty Arpent Canal near Big Mar. The plug is set at an elevation of +4.0 ft. and is 169 ft. long x 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes two (2) 48” diameter corrugated aluminum pipes which pass through the plug at an invert elevation of -4.0 ft. Earth fill was placed on each side of the rock plug. Aluminum sluice gates are attached to the end of each pipe on the exterior side of the marsh. A timber walkway to the gates is at elevation +4.0 ft.

C. Site/Structure #26 – Earthen channel plug with riprap armor plate located along Reggio Canal spoil bank. The plug is set at an elevation of +4.0 ft. and is 154 ft. long x 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes four (4) 48” corrugated aluminum pipes, which pass through the earthen plug at an invert elevation of -4.0 ft. Aluminum sluice gates are attached to the end of each pipe on the exterior side of the marsh. The pipes and gates are supported by a timber pile system. A timber walkway is installed at an elevation of +4.0 ft.

D. Site/Structure #32 – Riprap channel plug across an unnamed channel that flowed into west side of Lake Lery. The plug is 117 ft. long x 6 ft. wide and the plug crest is set at elevation



+4.0 ft. The 70-ft. stretch of channel from the plug eastward to Lake Lery has 2-ft. thick riprap placed on both channel banks.

E. Site/Structure #40 – Earthen and rockfill channel plug with riprap armor along the Reggio Canal spoil bank. The plug is 142 ft. long x 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48” diameter corrugated aluminum pipes that pass through the embankment at an invert elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire structure is capped with an 18” thick layer of riprap. Aluminum sluice gates are attached to the ends of the aluminum pipes on the exterior side of the marsh. The pipe and gates are supported by a timber pile system and a timber walkway to the gates is installed at an elevation of +4.0 ft.

F. Site/Structure #50 – Rockfill channel plug with riprap armor along the west bank of Bayou Mandeville. The plug is 55 ft. long x 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes one (1) 48” diameter corrugated aluminum pipe through an aggregate embankment at an invert elevation of -3.5 ft. The embankment is capped with an 18” thick layer of riprap. An aluminum combination gate is attached on the pipe end on the interior side of the marsh. The pipe and gate are supported by a timber pile system. A timber walkway to the gate is installed at an elevation of +4.0 ft.

G. Site/Structure #51 – Riprap plug across a pipeline channel that flows into Bayou Mandeville. The plug is approximately 150 ft. long x 30 ft. wide. The plug crest is set at elevation +4.0 ft. This was an existing structure during the construction of the BS-03a Project and will be maintained by the pipeline company.

H. Site/Structure #52 – Rockfill channel plug with riprap armor along DP Canal spoil bank. The plug is 100 ft. long x 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48” diameter corrugated aluminum pipes through the embankment at an invert elevation of -3.0 ft. The embankment is capped with an 18” thick layer of riprap. Aluminum combination gates are attached to the end of each pipe on the interior side of the marsh. The two pipes are supported by a timber pile system. A timber walkway to the gates is installed at an elevation of +4.0 ft.

I. Site/Structure #54 – Earthen and rockfill channel plug with riprap armor located at the intersection of Reggio Canal and Promise Land Canal. The plug is 140 ft. long x 150 ft. wide. The crest of the structure is 10 ft. wide and is set at elevation +4.0 ft. The plug includes two (2) 48” diameter corrugated aluminum pipes through the earth fill portion of the embankment at an invert elevation of -4.0 ft. Earth fill was placed at each side of the rockfill. The entire embankment is capped with an 18” thick layer of riprap. Aluminum sluice gates are attached to the end of each pipe on the exterior side of the marsh. The pipes and gates are supported by a timber pile system. A timber walkway to the gates is installed at an elevation of +4.0 ft. The existing spoil bank on the south side of Promise Land Canal was degraded in three locations on the west side of Structure #54. The excavated material was placed on each side of the cuts on the existing spoil bank.

J. Site/Structure #56 – Rock riprap channel plug across an unnamed channel on the east side of the Reggio Canal. The plug is 208 ft. long and the side slopes of the plug are 3 horizontal to 1 vertical. The crest of the structure is 6 ft. wide and is set at an elevation of +4.0 ft.

K. Site #57 – Consists of 5,315 linear ft. of spoil bank restoration along the entire west side of the Reggio Canal between Site #40 and Site #54. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12-ft. top width and 3 horizontal to 3 vertical side slopes. The entire length of embankment has been seeded to enhance the growth of vegetation and protect disturbed soil conditions.

L. Site #58 – Consists of 5,244 linear ft. of spoil bank restoration along the west side of Bayou Mandeville between the Delacroix Canal and Site #13. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12-ft. top width and 1 horizontal to 1 vertical side slopes. The entire length of embankment has been seeded to enhance the growth of vegetation and protect disturbed soil conditions.

M. Site/Structure #60 – Rockfill channel plug at the intersection of Reggio Canal and an existing pipeline canal. The plug is 200 ft. long x 100 ft. wide. The crest of the structure is 10 ft. wide and set at an elevation of +4.0 ft. The adjacent earth plug with riprap armor includes two (2) 36” diameter corrugated aluminum pipes through the earth plug at an invert elevation of -3.0 ft. The entire length of the plug is capped with an 18” layer of riprap. Aluminum combination gates are attached to the end of each aluminum pipe on the interior side of the marsh. The pipes and gates are supported by a timber pile system. A timber walkway to the gates is installed at elevation +4.0 ft.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance

The inspection team recorded no breaches in the spoil banks at the time of the 2017 inspection. However, there has been noticeable erosion along the banks as a result of increased boat traffic. This is evidenced by the occasions of soil being washed from the roots of small trees and shrubs that then fall inward to the water. Site #52 has a breach on the east side of the structure that has been growing since it was last plugged in 2011. The contractor has plugged breaches at Sites #13 and #60 using material from Site #32 which is no longer operational and is now under the jurisdiction of the Lake Lery Shoreline Protection Project (BS-16).

The O & M Contractor implements a maintenance schedule that keeps the project features in good operating condition. The new O & M Contractor will perform inspection and maintenance tasks in accordance with the same schedule. Some of the O & M tasks include: lubricating and periodic operation of each structure, cleaning and maintaining the wooden platforms, and spraying of the area for unwanted vegetation and insects. Periodic inspections of all project features also are performed and deficiencies are corrected.

2017 Structure Operations

The structure operation calls for sluice gates to remain open except during waterfowl season, when the gates at structures #52 and #60 may be operated at the discretion of the landowner. Combination gates are to operate passively as designed year-round; however, some were not in the lowered position, probably because adjacent breaches and/or low areas have rendered the structures ineffective. The contractor continues to perform periodic O & M of each of the gated structures; this includes cleaning and maintaining the timber platforms and periodic inspections as directed by CPRA.

In May 2014, the contract for operation of the main diversion structure was re-bid, with the operation and maintenance of the outfall structures included. That contract went into effect on July 1, 2014 and has been renewed for 2015. Upon agreement with both parties, the contract may be renewed annually over a three year period. The current three year period will end on June 30th, 2017.

V. Inspection Results (See Appendix B for photos of each site)

The diversion structure was not flowing during the inspection, so the project area was not subjected to diversion flows. When flowing, the diverted waters exit Big Mar on the southern end along a stretch of submerged or failed canal bank. Structure #32 was omitted from the inspection, because Hurricane Katrina rendered the structure ineffective, and the shallow depth of Lake Lery rendered the structure inaccessible via outboard-powered boat. The spoil created by the Delacroix Canal dredging in 2011 has vegetated with shrubs, tall grasses, and willow trees.

- A. Site/Structure # 13** –The combination gate was in the up/open operating position to allow maximum uninterrupted tidal exchange into the marsh. The gate has a slight tilt, but it was not affecting the function. The timber walkway still lays separated from its support beam at one end and the boards are uneven. There was a wood plank in place to connect the timber walkway to the rock dike. The rock from Site #32 used to plug the breach has settled and the breach has reopened. (See Photo Nos. 1 - 3)
- B. Site/Structure # 25** – The inspection team did not attempt to inspect this feature as the site was inaccessible. (No Photo)
- C. Site/Structure # 26** – The gates were in the open position allowing water flow. There is vegetation covering about 50% of the earthen/rock closure, some has been cleared since the last inspection. The flow meter at this site was damaged during Isaac in September 2012. The decision was made to no longer monitor flow at this gate. The structure and outfall appear to be in good condition. The boardwalk on the back side of the structure is partly covered with water hyacinth. (See Photo Nos. 4 & 5)
- D. Site/Structure # 32** – The team did not inspect this feature. Hurricane Katrina devastated that portion of the lake rim rendering this structure ineffective. It is now being incorporated

into the restored lake rim under the Lake Leary Shoreline Protection Project (BS-16). (No Photo)

- E. Site/ Structure # 40** – The inspection team did not attempt to inspect this feature as the site was inaccessible. (No Photo)
- F. Site/Structure # 50** – The combination gate was in the up/open position. The breach in the rock dike was repaired with material from Site #32 and remained intact. The boardwalk remained bowed with one plank that was not attached to the support beams. There was vegetation covering approximately 70% of the rock dike. (See Photo Nos. 6 & 7)
- G. Site/Structure #51** – The inspection teams did not attempt to inspect this feature. (See Photo No. 8 from a site visit in 2016)
- H. Site/Structure #52** – The two combination gates were in the open position. A breach previously repaired by the dredging contractor had re-opened and was between 20-25 feet in width and estimated to be about 7 feet deep. The breach was allowing unimpeded flow between the channel and marsh. The boards were uneven when walked on and detached in some areas. (See Photo Nos. 9 - 11)
- I. Site/Structure # 54** – The gates remain in the open position. No flow was visible through the culverts. The flow meter at this site was removed in December 2014 based on the decision to discontinue flow monitoring at this structure. The rocks have been cleared of most vegetation, although water hyacinths were abundant around the structure. (See Photo Nos. 12 - 14)
- J. Site/ Structure # 56** –There were large shrubs on approximately 50% of the rock dike. The water was at the crest of the rock dike and no flow was visible. One warning sign was still severely leaning and needs to be up-righted and cleaned (Hurricane Katrina damage). (See Photo No. 15)
- K. Site # 57** – The spoil bank along the side of Reggio Canal was well vegetated with trees, shrubs, and grasses. No gaps were noted, however, erosion was noted along the spoil bank, washing soil from the roots of trees. (No Picture)
- L. Site # 58** – The inspection teams did not attempt to inspect this feature. (See Photo No. 16 from a site visit in 2016)
- M. Site/Structure # 60** – The two combination gates were in the up/open position. Overall condition of the structure was good. The small breach on the east side of the structure has been repaired using material from Site #32. There was a low area of rocks on the east side of the backside of the structure where it appears rocks have been moved from the dike into the adjacent water. (See Photo Nos. 17 - 19)

VI. Conclusions and Recommendations

Project Condition

CPRA concludes that the outfall management project needs evaluation by both federal and state parties to determine the effectiveness of the culverts and plugs. Many of the sectors outlined in the original project no longer have distinct borders. A maintenance event of this project would include using rock or sheet piling to close gaps and fill failure areas to reestablish the sector boundaries.

The CWPPRA project South Lake Lery Marsh Creation and Shoreline Restoration (BS-16) has completed construction. Although budget constraints have modified the Lake Lery shoreline rehabilitation for the western shoreline, the rock closure (structure #32) was incorporated into this project. The project modification removed the marsh fill cell located behind the western shoreline. Site #32 was overlaid with an earthen berm shoreline restoration feature under BS-16.

Priority Gap Closures

There is a gap at Site #52 which has been growing in size over the past few years. It is estimated to be 20 to 25 feet in width and the depth of the water is estimated to be around 7 feet. CPRA and NRCS discussed with the contractor the possibility of using material from site #32 to plug the breach.

Structures

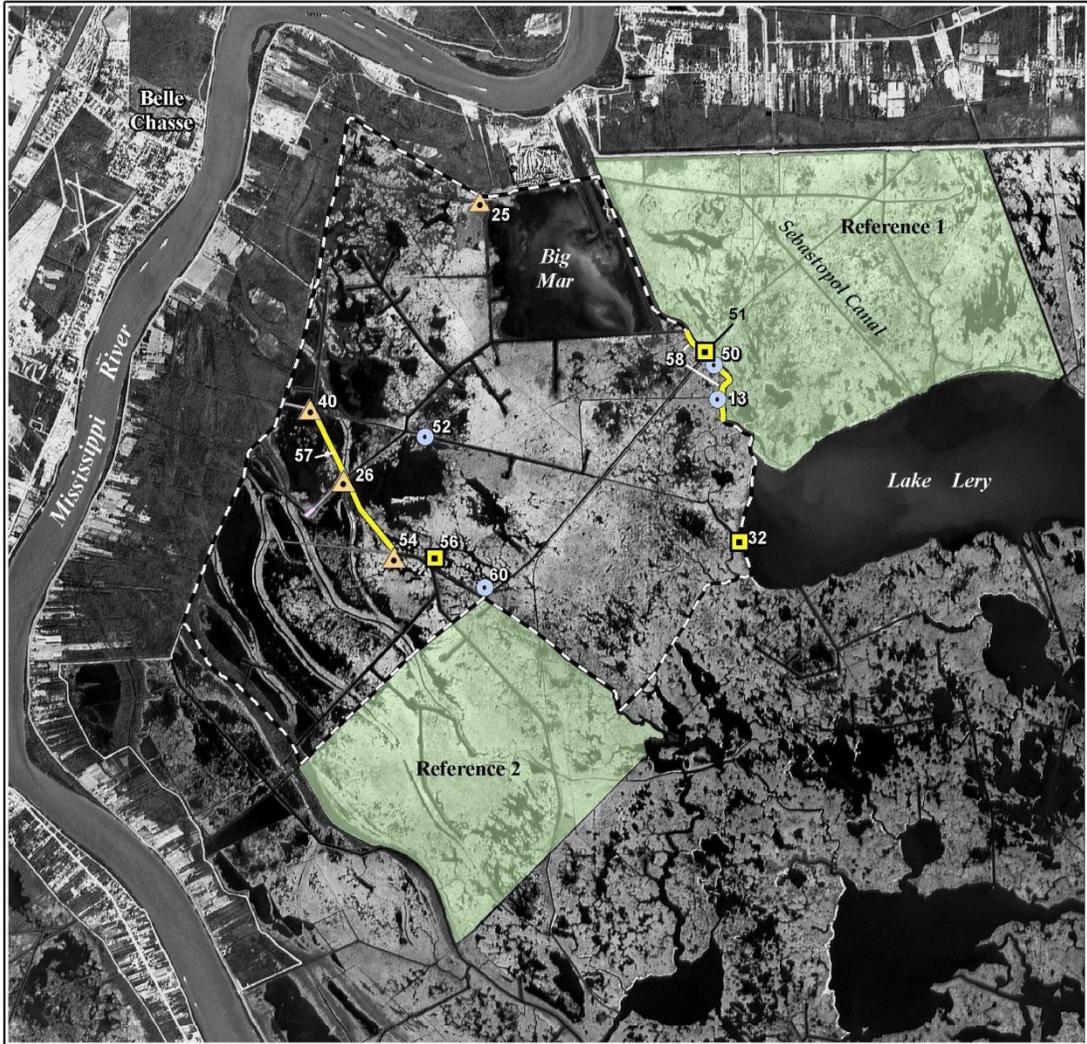
Another recommendation is to repair the decks at structures #13 and #50. The deck at structure #13 is not attached to the supports at one end, and the deck at structure #50 is bowed with one plank detached.

The warning sign at site #56 needs to be cleaned and have the piling re-driven in an upright position.



APPENDIX A

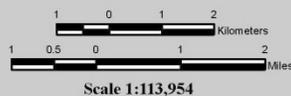
Project Features Map



Caernarvon Diversion Outfall Management (BS-03a)



- Culvert With Interior Combination Gate
- Culvert With Exterior Sluice Gates
- Rock Riprap Plug
- Spoil Bank Restoration
- Project Reference Area
- Project Boundary



Map ID: USGS-NWRC 2005-04-0066
Map Date: July 14, 2005

Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Baton Rouge, LA

Image Source:
2000 SPOT Imagery

APPENDIX B

Photographs



Photo No. 1, Site 13



Photo No. 2, Site 13



Photo No. 3, Site 13



Photo No. 4, Site 26



Photo No. 5, Site 26



Photo No. 6, Site 50



Photo No. 7, Site 50



Photo No. 8, Site 51 (07-05-2016)



Photo No. 9, Site 52



Photo No. 10, Site 52



Photo No. 11, Site 52



Photo No.12, Site 54



Photo No. 13, Site 54



Photo No. 14, Site 54



Photo No. 15, Site 56



Photo No. 16, Site 58 (07-05-2016)



Photo No. 17, Site 60



Photo No. 18, Site 60



Photo No. 19, Site 60

Appendix C

Three-Year Operations & Maintenance Budgets

Caernarvon Outfall Management (BS-03a)																						
Federal Sponsor: NRCS																						
Construction Completed : September 10, 2002																						
Current Approved O&M Budget June 2009	Year 0 FY03	Year - 1 FY 04	Year -2 FY05	Year -3 FY06	Year -4 FY07	Year -5 FY08	Year -6 FY09	Year -7 FY10	Year -8 FY11	Year -9 FY12	Year -10 FY13	Year -11 FY14	Year -12 FY15	Year -13 FY16	Year -14 FY17	Year -15 FY18	Year -16 FY19	Year - 17 FY20	Year -18 FY21	Year -19 FY22	OCPR Project Estimate Project Life Budget	CWPPRA Allocated Money Currently Funded (Sum YR 0 to YR 19)
State O&M	\$3,870	\$3,971	\$4,074	\$4,180	\$265,424	\$4,400	\$4,514	\$4,632	\$4,752	\$301,775	\$5,002	\$5,133	\$5,266	\$5,403	\$343,113	\$5,687	\$5,835	\$5,987	\$6,143	\$56,773	\$1,045,934	\$1,045,934
Corps Admin																					\$0	\$0
Federal S&A																					\$0	\$0
Total																					\$1,045,934	\$1,045,934
Projected O&M Expenditures																						
Maintenance Inspection																\$5,687	\$5,835	\$5,987	\$6,143	\$6,302	\$29,954	\$17,509
General Maintenance																					\$0	\$0
Structure Operation																\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000	\$150,000
Federal S&A																\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000	\$15,000
State S&A																\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000	\$30,000
E&D																					\$0	\$0
Surveys																					\$0	\$0
Construction																					\$0	\$0
Construction Oversight																					\$0	\$0
Total					\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$70,687	\$70,835	\$70,987	\$71,143	\$71,302	\$354,954	\$212,509
Page 1																						
Total O&M Expenditures from COE Report (Inception to present)		\$713,093.87	LanaReport Apr2017		Current O&M Budget less COE Admin										\$1,045,934	Current Project Life Budget less COE Admin					\$1,045,934	
State O&M Expenditures not submitted for in-kind credit		\$0	(State O&M Currently Funded + Fed S&A Currently Funded)											(State O&M Project Life Budget + Fed S&A Project Life Budget)								
Federal Sponsor MIPRs (if applicable) (REQUESTED MONEY)		\$0	Less O&M Expenditures										\$713,094	Total Projected Project Life Budget					\$1,068,048			
Total Estimated O&M Expenditures (as of April 2017)		\$713,093.87	Remaining Available O&M Budget										\$332,840	Project Life Budget Surplus (Shortfall)					(\$22,114)			
Notes:																						
1. The year-by-year figures for the current Approved O&M Budget are based on the BEAST approved at the 6/3/09 Task Force meeting. This spreadsheet was a correction to the BEAST submitted for the Fall 2008 funding requests.																						

Appendix D
Field Inspection Form

FIELD INSPECTION CHECK SHEET

Project No. / Name: Caernarvon Outfall Management BS-03a

Date of Inspection: June 6 & 14 2017 Time: 9:30 AM

Structure No. See Report Section III

Inspector(s): CPR: David Chambers, Erin Plitsch, Clay Worley

Structure Description: See Report Section III

Water Level: Inside: +0.7-0.8 NGVD Outside: +10.6-11.8 NGVD

Type of Inspection: 2017 Annual Inspection

Weather Conditions: Ptly. Cloudy to Rain, Wind NNE 2.5 knots (6/6/17) and S 4 knots (6/14/17) (0 cfs Diversion)

Item	Condition	Physical Damage	Corrosion	Photo	Observations and Remarks
CMP Culverts Earthen / Rock Embankment	Good	Minor	None	Appendix B	Culverts appear to be clear. Water surface elevations were 0-1 feet below the crest of the structures. Scale of scouring at tie-ins needs to be reviewed and level of severity determined. Breach present at site #52.
Water Control Gates	Good	None	Moderate	Appendix B	All water Control Gates appear to be in good condition. The O&M contractor has been reportedly lubricating, cleaning, and operating all gates on a scheduled basis. Gears on the gates are clean. Bolts holding gearbox to the gate structure are stainless steel.
Rock Canal Closures	Good	See Remarks	N/A	Appendix B	The overall condition of the canal closures is good with some areas of erosion where the rock meets the earthen embankment.
Timber Piling at Culverts	Good	None	None	Appendix B	Structure #13 is listing at the timber piles settle unevenly. All other timber pilings are in good condition.
Timber walkways at Culverts	Good	See Remarks	N/A	Appendix B	The timber support posts for the timber walkways settled excessively causing the 2x6 timber walkway to bend and twist. Minor monthly maintenance is requested. Minor damage consists of bowing deck boards.
Spoilbank Restoration	Fair	Minor	N/A	Appendix B	Vegetation (grasses, shrubs, and trees) has flourished along the banks. Minor scouring is evident at shoreline/water surface interface. CPR needs to check with Delacroix Corp on the conditions of their marsh management permit.

Appendix E

Annual Inspection Sign-In Sheet

