FINAL

Coastal Protection and Restoration Authority of Louisiana

State of Louisiana
Coastal Protection and Restoration Authority

2016 Annual Inspection Report

for

BRADY CANAL HYDROLOGIC RESTORATION PROJECT (TE-28)

State Project Number TE-28
Priority Project List 3

April 20, 2015
Terrebonne Parish

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I. Introduction

The Brady Canal Hydrologic Restoration Project consists of 7,653 acres located in the Terrebonne Basin, within the Bayou Penchant - Lake Penchant watershed in Terrebonne Parish, Louisiana. The project is bounded by Bayou Penchant, Brady Canal, and Little Carencro Bayou to the north, Bayou Decade and Turtle Bayou to the south, Superior canal to the east, and Little Carencro Bayou and Voss Canal to the west (Appendix A – Project Features Map).

The Brady Canal Project is a hydrologic restoration project consisting of the installation and maintenance of a fixed crest weir with barge bay, a rock plug, several variable crest weir structures, earthen embankments and overflow banks, rock dikes, rock armored earthen embankments and rock armored channel liners. These structures were designed to reduce the adverse tidal affects and saltwater intrusion into the project area and to promote freshwater introduction for better utilization of available freshwater, and retain sediments, as well as to encourage re-establishment of emergent and sub-aquatic vegetation in eroded areas (Folse, August 2003)

The Brady Canal Hydrologic Restoration Project (TE-28) is co-sponsored by the Natural Resource Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The 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 (3^{rd}) Priority Project List.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Brady Canal Hydrologic Restoration Project (TE-28) is to evaluate the constructed project features, identify any deficiencies, and prepare a report detailing the condition of the project features including recommendations for corrective actions, as needed. Should it be determined that corrective actions are required, CPRA shall provide in the inspection report, a detailed cost estimate for engineering, design, bidding, construction oversight and supervision, project contingencies, and an assessment of the urgency of such repairs (LDNR_CRD; Pyburn and Odom, 2002 OM&R Plan). The annual inspection report also contains a summary of the completed maintenance projects and an estimated projected budget for the upcoming three (3) years for operations, maintenance and rehabilitation. The three (3) year projected operations and maintenance budget is shown in Appendix C. A summary of completed operation and maintenance projects are outlined in Section IV of this report.

An inspection of the Brady Canal Hydrologic Restoration Project (TE-28) was held on April 20, 2016 with cloudy skies and mild temperatures. In attendance for the inspection were Benjamin Hartman and Todd Hubbell from CPRA, Doug Baker and Quin Kinler from NRCS, Francis Fields with Apache Minerals, Inc. and Josh Soileau with ConocoPhillips. The inspection began at the intersection of Bayou Decade and Turtle Bayou at 9:15 a.m.,

progressed along the perimeter of the project area including the lake rim of Jug Lake, and concluded along Brady Canal near the Apache Camp around 11:30 a.m.

The field inspection included a complete visual inspection of all constructed features within the project area. Photographs of all project features were taken during the field inspection and are shown in Appendix B. Staff gauge readings, where available, were documented and used to estimate approximate water elevations, elevations of rock weirs, earthen embankments, and other project features.

III. Project Description and History

The Brady Canal Hydrologic Restoration project is bisected by the Mauvais Bois Ridge, resulting in different hydrologic regimes to the north and south of the ridge. The northern section of the project area receives freshwater and sediments which are provided by over-bank flow from Bayou Penchant, Little Carencro Bayou, and Brady Canal (USDA/NRCS 1995). The Mauvais Bois Ridge forms a barrier through the project area reducing the outflow of freshwater to the southern portion of the project area. Freshwater and sediment retention in the southern portion of the project area has diminished due to unimpeded through-flow and tidal exchange combined with a lack of freshwater introduction from the north (USDA/NRCS 1995). In addition, oilfield access canals extending from within the project area to the Bayou Decade levee ridge have also increased tidal exchange and provided direct routes for saltwater intrusion and a reduction in freshwater and sediment retention (USDA/NRCS 1995).

Major changes to the hydrology of the Penchant Basin, both natural and human induced, have resulted in a complex hydrologic setting (USDA/NRCS 1995). Under natural hydrologic conditions, the Penchant Basin is confined by natural levee ridges and is open to the west and southwest where it connects with the Lower Atchafalaya River, Atchafalaya Bay, and Fourleague Bay. Historically, this hydrologic setting produced an estuarine system created by freshwater introduction in the upper basin and tidal exchange with the bays. Over time, hydrologic conditions in the Penchant Basin were altered by the construction of numerous canals, levees, local water management structures, and major public works projects. Some of the major projects that have contributed to the change in the hydrologic conditions of the basin are the Atchafalaya Basin Floodway, the Avoca Island Levee project along the Lower Atchafalaya River, the Gulf Intracoastal Waterway (GIWW), the Bayou Chene, Boeuf, and Black Projects, the rock weir at Wax Lake, and the Houma Navigation Canal (USDA/NRCS 1995).

The objective of the Brady Canal Hydrologic Restoration Project is to maintain and enhance existing marshes in the project area by reducing the rate of tidal exchange and improving the retention of introduced freshwater and sediment (Folse T., 1998). Specific goals of the project are to (1) decrease the rate of marsh loss, (2) maintain or increase the abundance of plant species typical of a freshwater and intermediate marsh, (3) decrease variability in water level within the project area, (4) decrease variability in salinities in the southern portion of the project, (5) increase vertical accretion within the project area and (6) increase the frequency of occurrence of SAV within the project area. (Folse T., 1998)

The Brady Canal Hydrologic Restoration Project (TE-28) was completed in July 2000 and involved the installation of the following project features:

Structure 6 – fixed crest weir with barge bay
Structure 7 – rock plug
Structure 10 – stabilization rock armored channel liner
Structure 14 – fixed crest weir with variable crest section
Structure 20 – stabilization rock armored channel liner
Structure 21 – fixed crest weir with three (3) variable crest sections
Structure 23 – fixed crest weir with two (2) variable crest sections
Structure 24 – fixed crest weir
4,405 linear ft. – rock armored earth embankment
3,660 linear ft. – rock dike
8,531 linear ft. – Earthen embankment
Maintenance of existing over-flow banks (21,600 ft.)

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of maintenance projects and operation tasks performed since the completion of the Brady Canal Hydrologic Restoration (TE-28) project.

Under Article II of the Brady Canal Cost Share Agreement, the landowners, ConocoPhillips, formerly Burlington Resources and the Apache Minerals Corporation were granted in-kind service credits to repair existing earthen embankments within the project area. Below is a description of work and cost associated with the maintenance performed by the landowners:

In Kind Service Credits

7/30/2007 – Apache Corporation contracted Dupre Brothers Construction, Inc. of Houma, La. to repair several breaches along the east bank of Jug Lake and reinforce earthen embankment tie-ins adjacent to variable crest weir structures #21, #23, and #24. The repairs were completed on 7/30/2008 at a total cost of $9,103.12

9/30/2006 – Conoco Phillips contracted Dupre Brothers, Inc. of Houma, La. to repair several breaches along Carencro Bayou, Little Carencro Bayou and Brady Canal using material from adjacent bayous. The total cost for refurbishment and repair of these breaches was $25,890.

9/20/2006 - Apache Corporation contracted Frisco Construction Co. Inc. of Houma, La. to repair breaches and refurbish low areas of the spoil banks along the east bank of Jug Lake and embankment tie-ins adjacent to structures #21, #23 and #24. The repairs were completed on 9/20/2006 at a total cost of $9,265.

10/31/2003 - Apache Corporation contracted Berry Bros. General Contractors to completed 5,050 linear feet of levee refurbishment along the west bank of Jug Lake. The cost for the levee refurbishment including construction oversight was $34,284.87. Following the levee refurbishment, Shaw Coastal performed an as-built survey of the repairs at a cost of $5,100.60. The total project cost for this maintenance event was $39,385.47.

8/15/2003 – ConocoPhillips, formerly Burlington Resources, completed the repair of two (2) large breaches along Little Carencro Bayou following Hurricane Lili. The maintenance project was completed on 8/15/2003 at a total cost of $31,642.57, including construction oversight and administration.

10/21/2002 - Apache Corporation contracted Frisco Construction Co. to repair and restore the existing levee embankment along Turtle Bayou, Superior Canal, and along the west bank of Jug Lake. This work was completed at a total cost of $5,310,.

Brady Canal Breach Repair Project (2003) – LDNR: This maintenance project was completed on August 13, 2003 and included the installation of approximately 9,667 tons of riprap along the north bank of Bayou Decade, 2,325 linear feet of levee refurbishment and earthen breach repair along Turtle Bayou and Superior Canal, and replacement of a timber pile on the navigational aid structure at Weir 6. The cost associated with the engineering, design and construction of the 2003 Brady Canal Breach Repair Project is as follows:

Construction:	$471,329.65
Engineering & Design:	$ 54,473.00
Bidding:	$ 4,100.00
Construction Administration:	$ 8,020.00
Construction Oversight:	$ 49,635.00
As-built Survey and Drawings:	$ 12,873.00
Project Total:	$600,430.65

Brady Canal 2012 Maintenance Project – This maintenance project began in October 2013. It included the refurbishment of 13,900 linear feet of earthen embankment along the perimeter of Jug Lake, rock armoring of the embankment tie-ins adjacent to the three (3) water control structures in Jug Lake, replacement of two (2) timber dolphins at Structure No. 6, three (3) warming signs at Structure No. 10, and a breach repair/closure adjacent to an existing timber bulkhead at the intersection of Carencro Bayou and Brady Canal. The total project costs associated with surveying, engineering, design, and construction of the 2012 maintenance project are as follows:

Construction:	$1,353,636.25
Surveying:	$ 60,303.00
Engineering & Design:	$ 99,958.76

Construction Admin/Inspections:	$ 179,386.38
Total Project Cost:	$1,693,284.39

Structure Operations: In accordance with the operation schedule outlined in the Operation and Maintenance Plan, Structures #14, #21, and #23 have been operated twice annually beginning in April 2002. Below is a summary of costs incurred for structure operations:

03/02	Pyburn & Odom	$9,772.50
09/02	CEEC	$4,674.00
03/03	CEEC	$4,022.58
09/03	CEEC	$3,612.93
03/04	Shaw Coastal	$4,676.18
09/04	Shaw Coastal	$5,365.25
03/05	T. Baker Smith	$8,804.83
09/05	T. Baker Smith	$8,886.60
03/06	T. Baker Smith	$7,668.59
09/06	T. Baker Smith	$9,970.37
03/07	T. Baker Smith	$8,602.12
09/07	T. Baker Smith	$9,203.61
03/08	T. Baker Smith	$7,595.99

Prior to the scheduled operations in September 2008, the CPRA entered into an agreement with Apache Minerals for the landowner to assume responsibility of operating all water control structures associated with the Brady Canal (TE-28) project. The cost proposal submitted by Apache to complete this work in accordance with terms of the agreement is $12,000, annually, through 2017.

Navigational Aids Maintenance:
Currently, CPRA has an agreement with Pharo Marine – Automatic Power, Inc. for inspections, diagnostic testing and repair of the navigation aid lights at Structure No.6. The lights are inspected quarterly and repaired as needed. This contract was awarded in August 2014 and extends for one year with an option of extending for an additional three (3) years through 2017.

V. Inspection Results

Structure 6 – Fixed Crest Weir with Barge Bay

Overall, Structure 6 appears to be in good condition. The bank tie-ins are stable and there are no signs of erosion or breaching around the steel bulkhead or rock tie-ins. The timber navigational aid supports, signs and lights are visible and appear to be in good condition. The navigational aid structures are inspected quarterly through a state-wide contract with Pharo-Marine Automatic Power, Inc. and no major maintenance has been reported. The gauge reading from the CPRA continuous recorder, located just north of Structure No. 6 indicated

that the water elevation was +2.40' NAVD88 at 10:30 a.m. No maintenance will be required at Structure No.6. (See Appendix B, Photos 1 through 3)

Structure 7 – Rock Plug

Structure 7 appears to be in good condition with no obvious settlement, breaches, or defects other than heavy vegetation on and around the rock plug. The warning signs and supports located on both sides of the structure were in good condition. At this time, Structure 7 will not require maintenance.

Structure 10 – Stabilization Rock Armored Channel Liner

Structure No.10 appears to be in fair to good condition. The rock tie-ins to the bank on both sides of the structure appear to be thin and were mostly submerged which is attributed to settlement and high water during inspection. The center depth of the rock channel liner was approximately 7.0 feet. Based on the gauge reading near Structure No. 6, the elevation of the rock sill would be approximately -5.5' NAVD; these measurements remain unchanged from the previous year. The constructed sill elevation was -4.75', indicating that structure has settled approximately 1 foot. All of the timber piling and warning signs appear to be in good condition (See Appendix B, Photos 4 through 6)

Structure 14 – Fixed Crest Weir w/ Variable Crest Section

This structure appears to be in fair condition. There was no visible damage to the railings, platform, steel bulkhead or warning signs. As on previous inspections, we did note that the earthen embankment tie-ins on both sides of the structure were experiencing significant erosion with very little, if any, material remaining on the bayou side of the structure. Although there was little landmass on the bayou side of the structure, the marsh side did have enough material to prevent the embankment from breaching. The erosion of the embankment has worsened over the last few years and will require some corrective action within the next couple of years. ConocoPhillips regularly maintains the earthen overflow banks along Carencro Bayou and may be able to dredge material from the bayou to reconstruct the embankment tie-in. It was rumored that ConocoPhillips had performed work to repair the northern tie-in however there are no obvious discrepancies between the 2016 and 2015 sets of pictures. CPRA will coordinate with ConocoPhillips for a possible repair of the tie-ins during their next levee maintenance event. At this time, we will continue to monitor this site for breaches and work with ConocoPhillips on a method of repair. Also, as noted on the previous inspection report, the camp owner just south of Structure 14 had installed a vinyl bulkhead along the front of his camp. The bulkhead extends north and ties into the southern end of the steel bulkhead on the south side of Structure 14, effectively solving the erosion issue on that side of the structure. (See Appendix B, Photos 7 through 9)

Structure 20 – Stabilization Rock Armored Channel Liner

This structure is in good overall condition. As noted in previous annual inspections, there has been some settlement of the rock riprap on the bank tie-ins and submerged crest of the

structure. In 2012, it was determined the crest of the submerged channel liner has settled to a depth of -5.7' NAVD88, which translates to approximately 1.0' of settlement since construction. During the 2016 inspection, the depth of water at the center of the rock channel liner was approximately 8.5', which translates into crest elevation of -6.1' elevation. The water levels at the time of the inspection was +2.4' NAVD. From our calculations, Structure No. 20 has experienced approximately 1.35' settlement since the structure was constructed in 1998. All other warning signs and timber supports are in good condition. The refurbishment of Structure No. 20 was excluded from the 2012 Maintenance Project, but the earthen embankment was capped with riprap up to the structures eastern embankment tie-in. At this time, Structure No. 20 is in good condition and no maintenance will be required. (See Appendix B, Photo 10)

Structure 21 – Fixed Crest Weir w/ Three (3) Variable Crest Sections

Overall, Structure 21 is in very good condition. There is no visible damage to the steel bulkhead, railings, platform or the warning signs and their timber supports. As part of the 2012 Maintenance Project, Structure 21 had both of its embankment tie-ins refurbished and then armored with 50 linear feet of rock riprap to prevent any further erosion around the ends of the structure. There has not been any visual settlement of the riprap following the completion of the maintenance project. Structure 21 will not require maintenance. (See Appendix B, Photos 11 through 13)

Structure 23 – Fixed Crest Weir w/ Two (2) Variable Crest Sections

Overall, Structure 23 is in good condition. There is no visible damage to the steel bulkhead, railings, platform, or the warning signs and their timber supports. As part of the 2012 Maintenance Project, Structure 23 had both of its embankment tie-ins refurbished and then armored with 50 linear feet of rock riprap in each direction to prevent any further erosion around the ends of the structure. There has not been any visual settlement of the riprap following the completion of the maintenance project. Structure 23 has been restored to its original constructed condition and will not require maintenance. (See Appendix B, Photos 12 through 14)

Structure 24 – Fixed Crest Weir

Overall, Structure No. 24 is in good condition. There is no visible damage to the steel bulkhead, railings, platform, or the warning signs and their timber supports. However, the hull of a small recreational fishing vessel is lodged against the structure and may cause damage or access problems in the future. As part of the 2012 Maintenance Project, Structure No. 24 had both of its embankment tie-ins refurbished and armored with rock riprap on both sides to prevent any further erosion around the ends of the structure. There has not been any visual settlement of the riprap following the completion of the maintenance project. Structure No. 24 has been restored to its original constructed condition and will not require maintenance. (See Appendix B, Photos 15 through 17)

Bulkhead at head of Brady Canal

Overall, the structure is in good condition, there is no apparent damage to the submerged bulkhead, it was barely visible. The north eastern tie-in, whose breach had been and recently repaired, looked stable with an abundance of vegetation. There is a mobile camping trailer atop a barge located directly in front of the repaired section and may present navigation problems in the future. (See Appendix B, Photo 33)

Earthen Embankments

The inspection of the earthen embankments began with the west bank of Turtle Bayou and progressed along Superior Canal, the dead end canal off of Superior Canal, Bayou Decade, Jug Lake, through Voss Canal, Bayou Carencro, and concluded along Brady Canal at the Apache Camp location. The earthen embankments along Turtle Bayou and Superior Canal are in good condition. There are visual variations in the elevation and various vegetative species, but no noticeable breaches in the embankment. However, in one location along Turtle Bayou and the embankment was overtopped approximately 3/10 of a foot (See Appendix B, Photos 18). Overtopping occurred nearby in one other location; across the channel from breach 7, 100 to 200 continuous feet of embankment were submerged (See Appendix B, Photo 19). On the west side of Jug Lake, the high water was observed overtopping a single location approximately 10' wide (See Appendix B, Photo 25). Earthen embankments along Bayou DeCade and Voss Canal are also in good condition. These areas have experienced some erosion, but with little to no change observed since the previous inspections. The sites of overtopping will be monitored closely on future site visits and may require remedial action.

As part of the 2012 Maintenance Project, approximately 13,900 linear feet of earthen embankment around the rim of Jug Lake was refurbished. In previous years, we noted that large cut banks had developed along the face of the newly constructed embankment. Over the past two years, the top of the embankment has vegetated, but there is still a substantial cut bank facing Jug Lake. There are no recommendations for corrective action at this time, but we will continue to monitor on future site visits. (See Appendix B, Photos 26 through 30)

Rock Armored Embankments

The rock plug known as "Breach 7" is located along an existing oil field access canal connected to Superior canal is in good condition. There was no observed settlement along the length of the embankment and no erosion or washouts around the embankment tie-ins. There are no recommendations for corrective action at this time, but it will continue to be monitored on future inspections. (See Appendix B, Photos 31 and 32)

The rock closure adjacent to an existing timber bulkhead at the intersection of Carencro Bayou and Brady Canal identified as Breach 6 was closed as part of the 2012 Maintenance Project. A geotextile fabric was used to line the breach before it was filled with rock riprap. There was no visual settlement of the riprap or erosion of the bank tie-in at the time of the inspection. Landowners did not request to stop at this site. No maintenance will be required at this location.

The rock armored embankments and rock dikes along the north bank of Bayou Decade and Voss Canal are in good condition. The rock dike along Bayou Decade between Jug Lake and Turtle Bayou appear to be in fair condition with isolated low areas and moderate settlement of

rock riprap (See Appendix B, Photos 20 through 24). The earthen embankment with rock revetment west of Structure 7 along Bayou Decade appears to be in good condition with no apparent settlement. The earthen embankment with rock revetment beginning at the intersection of Bayou Decade and Voss Canal had some initial settlement after construction but has experienced little change since previous inspections. Despite some minor deficiencies, the rock armored embankments appear to be functioning as intended and no maintenance will be required at this time.

VI. Conclusions and Recommendations

Overall, as noted in Section 5 above, the condition of the Brady Canal Hydrologic Restoration (TE-28) project was good with only minor defects such as the eroded bank tie-in on the north side of the steel bulkhead at Structure 14, minor settlement of the rock liners (Structures 10 and 20), cut banks along the face of the earthen embankment along the rim of Jug Lake, and minor settlement and displacement of the rock dike along the north bank of Bayou Decade. The washout on the east side of the submerged weir on Brady canal has been repaired. New overtopping was recorded in two locations each along Turtle Bayou and Jug Lake but may have only been visible during high water; GPS positions have been recorded for future inspection. These noted defects are not considered severe and will not require maintenance at this time. However, we will continue to monitor these areas of concern on future site visits to determine if any changes have occurred.

References:

Folse, T. August 2003. Monitoring Plan for the Brady Canal Hydrologic Restoration Project (TE-28), Louisiana Department of Natural Resources, Coastal Restoration Division, 16pp.

Louisiana Department of Natural Resources – Coastal Restoration Division and Pyburn and Odom, Inc. 2002. Operation, Maintenance and Rehabilitation Plan for the Brady Canal Hydrologic Restoration Project (TE-28)

United States Department of Agriculture – Natural Resources Conservation Service 1995. Project Plan and Environmental Assessment for the Brady Canal Hydrologic Restoration Project.

Appendix A

Project Features Map

Photo 1: view of Structure No.6, a fixed crested weir with barge bay and navigational aids and signage on both sides of the structure.

Photo 2: view of navigational aids and signage at Structure No.6

Photo 3: view of west side navigational aids and signage at Structure No.6

Photo 4: view of warning signs at the entrance of the rock rip rap channel liner (Structure No.10). Several of the warning signs and timber piling were replaced in 2012.

Photo 5: view of south bank of the rock rip rap channel liner (Structure No.10).

Photo 6: view of the north bank of the rock rip rap channel liner (Structure No.10).

Photo 7: view of the south section of the steel sheetpile wall and new constructed vinyl sheetpile installed by the adjacent camp owner.

Photo 8: an overall view of the variable crested weir with stop log bay (Structure No.14)

Photo 9: view of the north section of the steel sheetpile wall and bank tie-in at Structure No.14. The structure is a variable crest weir with a single stop log bay.

Photo 10: View of Structure No.20, a rock rip rap channel liner, and warning signs located along the north bank of Jug Lake.

Photo 11: view of rock rip rap revetment on the north side Structure No. 21, a variable crested weir with three (3) stop log bays. The earthen embankment was refurbished and the rock rip rap revetment was installed in 2012.

Photo 12: view of rock rip rap revetment on the north side Structure No. 21.

Photo 13: view of rock rip rap revetment on the south side Structure No. 21.

Photo 12: View of the rock armament of the earthen embankment on the south side of Structure No.23. The earthen embankment was refurbished and the rock armor installed in 2012.

Photo 13: Overall view of Structure No.23, variable crested weir structure.

Photo 14: View of the rock armament of the earthen embankment on the north side of Structure No.23. The earthen embankment was refurbished and the rock armor installed in 2012.

Photo 15: View of south bank tie-in of Structure No.24 located along the north bank of Jug Lake. The ebankment was refurbished and the rock riprap apron was installed during the 2012 Maintenance Project.

Photo 16: View of north bank tie-in of Structure No.24 located along the north bank of Jug Lake. The embankment was refurbished and rock riprap apron was installed during the 2012 Maintenance Project.

Photo 17: A full view of Structure No.24 located along the north bank of Jug Lake.

Photo 18: View of high water overtopping in Turtle Bayou

Photo 19: View of high water overtopping in Turtle Bayou

Photo 20: View of the rock armored embankment along the north bank of Bayou Decade near the mouth of Turtle Bayou. The rock armament was installed under the 2003 Maintenance Project. This structure was identified as Breaches 1 through 4.

Photo 21: View of the rock armored embankment along the north bank of Bayou Decade.

Photo 22: View of the rock armored embankment along the north bank of Bayou Decade.

Photo 23: View of the rock armored embankment along the north bank of Bayou Decade.

Photo 24: View of the rock armored embankment along the north bank of Bayou Decade near Jug Lake.

Photo 25: View of the overtopped portion of earthen embankment on the west bank of Jug Lake

Photo 26: View existing earthen embankment along the south side of Jug Lake. This section of the embankment was refurbished in 2012.

Photo 27: View existing earthen embankment along the south side of Jug Lake.

Photo 28: View existing earthen embankment along the south side of Jug Lake.

Photo 29: View existing earthen embankment along the south side of Jug Lake.

Photo 30: View existing earthen embankment along the south side of Jug Lake.

Photo 31: View of rock plug closure located along an existing location canal west of Superior Canal. This Structure was constructed under the 2003 Maintenance Event, identified as Breach 7

Photo 32: View of rock plug closure located along an existing location canal west of Superior Canal.

Photo 33: view of breach closure adjacent to an existing timber bulkhead at the head of Brady Canal

Appendix C

Three Year Budget Projection and Worksheets

Brady Canal/ TE-28 / PPL 3 (2016-2019)
Three-Year Operations & Maintenance Budgets

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Adam Ledet	*NRCS*	*B. Babin*

	2016/2017	2017/2018	2018/2019
Maintenance Inspection			
Structure Ops/ Nav Aid	$ 22,000.00	$ 22,000.00	$ 22,000.00
CPRA Administration	$ 28,958.00	$ 29,826.00	$ 30,721.00
Maintenance/Rehabilitation		$ -	$ -

16/17 Description:

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

17/18 Description: Overflow bank repairs.

E&D	$ -
Construction	$ 50,000.00
Construction Oversight	$ 8,085.00
Sub Total - Maint. And Rehab.	$ 58,085.00

18/19 Description:

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

	2016/2017	2017/2018	2018/2019
Annual O&M Budgets	**$ 50,958.00**	**$ 109,911.00**	**$ 52,721.00**

2016 - 2019 O &M Budget (3 yr Total)	**$ 213,590**
Unexpended O & M Funds	**$918,759**
Remaining O & M Budget (Projected)	**$705,169**

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: TE-28 Brady Canal Hydrologic Restoration

FY 16/17 –

CPRA Administration			$ 28,958
Operation/Navigational Aid:			$ 22,000**
Maintenance:			$ 0
E&D:	$	0	
Construction:	$	0	
Construction Oversight:	$	0	

Operation and Maintenance Assumptions:
Structure Operations: 3 – structures are operated twice annually by landowner for a total $15,000**, OCPR Navigational Aid inspection, maintenance and repairs: $7,000**

CPRA Direct Costs

Structure Operations and Nav-Aid Maintenance:

Engineer 4 – 30 hrs @ $60/hr. =	$ 1,800
Engineer 6 – 10 hrs @ $73/hr. =	$ 730
	$ 2,530 x 3% Inflation = $ 2,606

Inspection:

CPRA Engineer 3 – 12 hrs@ $60/hr.:	$ 720
CPRA Engineer 6 – 12 hrs @ $73/hr.	$ 876
CPRA Scientist 4 – 10 hrs @ $50/hr.	$ 500
	$ 2,096 x 3% Inflation = $ 2,159

Report:

CPRA Engineer 6 – 60 hrs. @ $73/hr.	$ 4,380 x 3% Inflation = $4,511

Total Direct CPRA Costs: **$9,276**

CPRA Indirect Costs

Structure Operations and Nav-Aid Maintenance:

Engineer 4 – 30 hrs @ $127.30/hr. =	$ 3,819
Engineer 6 – 10 hrs @ $154.88/hr. =	$ 1,549
	$ 5,368 x 3% Inflation = $ 5,529

Inspection:

CPRA Engineer 3 – 12 hrs@ $127.30/hr.:	$ 1,528
CPRA Engineer 6 – 12 hrs @ $154.88/hr.	$ 1,859
CPRA Scientist 4 – 10 hrs @ $106.08/hr.	$ 1,061
	$ 4,448 x 3% Inflation = $ 4,581

Report:
CPRA Engineer 6 – 60 hrs. @ $154.88/hr. $ 9,293 x 3% Inflation = $ 9,572

Total Indirect CPRA Costs: **$19,682**

FY 17/18 –

CPRA Administration		$ 29,826
Operation/Navigational Aid:		$ 22,000**
Maintenance:		$ 58,085
E&D:	$ 0	
Construction:	$ 50,000	
Construction Oversight:	$ 8,085	

Operation and Maintenance Assumptions:
Structure Operations: 3 – structures are operated twice annually by landowner for a total $15,000**, OCPR Navigational Aid inspection, maintenance and repairs: $7,000**

CPRA Direct Costs
Structure Operations and Nav-Aid Maintenance:
$ 2,606 x 3% Inflation = $ 2,684
Inspection:
$ 2,159 x 3% Inflation = $ 2,224
Report:
$4,511 x 3% Inflation = $4,646

Total Direct CPRA Costs: **$9,554**

CPRA Indirect Costs
Structure Operations and Nav-Aid Maintenance:
$ 5,529 x 3% Inflation = $ 5,695
Inspection:
$ 4,581 x 3% Inflation = $ 4,718
Report:
$ 9,572 x 3% Inflation = $ 9,859

Total Indirect CPRA Costs: **$20,272**

Overflow Bank Maintenance

Construction Allowance: **$50,000**

CPRA Coordination: **$ 8,085**

CPRA Direct Costs

Engineer Intern 2 – 40 hrs @ $40/hr. =	$ 1,600
Engineer 6 – 15 hrs @ $73/hr. =	$ 1,095
	$ 2,695

CPRA Indirect Costs

Engineer Intern 2 – 40 hrs @ $80/hr. =	$ 3,200
Engineer 6 – 15 hrs @ $146/hr. =	$ 2,190
	$ 5,390

FY 18/19 –

CPRA Administration			$ 30,721
Operation/Navigational Aid:			$ 22,000**
Maintenance:			$
E&D:	$	0	
Construction:	$	0	
Construction Oversight:	$	0	

Operation and Maintenance Assumptions:
Structure Operations: 3 – structures are operated twice annually by landowner for a total $15,000**, OCPR Navigational Aid inspection, maintenance and repairs: $7,000**

CPRA Direct Costs

Structure Operations and Nav-Aid Maintenance:	
$ 2,684 x 3% Inflation =	$ 2,765
Inspection:	
$ 2,224 x 3% Inflation =	$ 2,291
Report:	
$4,646 x 3% Inflation =	$4,785
Total Direct CPRA Costs:	**$9,841**

CPRA Indirect Costs

Structure Operations and Nav-Aid Maintenance:	
$ 5,695 x 3% Inflation =	$ 5,865
Inspection:	
$ 4,718 x 3% Inflation =	$ 4,860

Report:

$ 9,859 x 3% Inflation =	$10,155
Total Indirect CPRA Costs:	**$20,880**

2016-2019 Accounting

Expenditures (LaGov):	$2,296,831.32
NRCS MIPR:	$ 94,083.00
Total Expenditures:	**$2,390,914.32**
Current O&M Funding (LANA Report):	**$3,309,673.00**
Current Unexpended O&M Funds:	**$ 918,758.68**