



Coastal Protection and  
Restoration Authority of Louisiana

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

**2015 Annual Inspection Report**

for

**Penchant Basin Natural Resource  
Plan, Increment No. 1 (TE-34)**

State Project Number TE-34  
Priority Project List 6

September 21, 2015  
Terrebonne Parish

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## **I. Introduction**

The Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) is located in Terrebonne Parish, Louisiana and is bounded on the north by the Gulf Intracoastal Waterway (GIWW), to the east by a north/south line from Lake Decade to the GIWW, to the south by Lake Mechant and Lost Lake, and to the west by a north/south line from Lost Lake to Avoca Island (CWWPRA, February 2008). (Appendix A – Project Features Map)

The Penchant Basin consists of a dynamic and variable-component landscape shaped by deltaic abandonment, initiation of a new delta via the Atchafalaya River and anthropogenic landscape alterations (NRCS, April 2007). To the north, a vast area of freshwater floating marshes transitions south to intermediate and brackish marshes, all of which have experienced some of the highest land loss rates in the state. While the freshwater floating marshes have been studied extensively, the exact cause of the high rates of deterioration remain somewhat elusive. The losses have been attributed to a combination of elevated water levels, increase flows from the Atchafalaya and GIWW and associated water quality impacts, hydrologic alterations, stagnation in some areas that have been isolated from riverine influence and nourishment, and herbivory (O’Neil 1949, Sassar 1994. Coastal Environments, Inc. 1997, Swarzenski 2003). To the south, loss to intermediate and brackish marshes can be contributed to natural deltaic abandonment process of subsidence accelerated by channelization and alteration of hydrology, sea level rise, saltwater intrusion (USDA-SCS, 1984).

The Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) is intended to reduce water levels in the northwestern portion of the project by diverting freshwater southeastward to where it is needed (CWWPRA, 2008). The goals of the project are to eliminate erosion and re-establish emergent marsh along the southern bank of Bayou Chene at the intersection of Bayou Penchant, to transfer water, sediment and nutrients from the Atchafalaya River to the lower Penchant Basin tidal marshes to offset saltwater intrusion and subsidence, to maintain the integrity of the northern bank of Bayou Decade and increase nourishment to the deteriorating upper Penchant Basin marshes by providing an exchange of freshwater through the system (NRCS and CPRA, April 2007)

Increment No. 1 of the Penchant Basin Natural Resource Plan has a twenty-year (20 year) project life, which began in August 2011. The principle project features include foreshore rock dikes and marsh creation at the intersection of Bayou Chene and Bayou Penchant, a weir with a boat bay and flap-gates at the intersection of Bayou Penchant and Brady Canal, a weir with flap-gates along Superior Canal, rock riprap revetment and two (2) fixed crest weirs along north bank of Bayou Decade from Voss Canal to Lost Lake.

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

The purpose of the annual inspection of the Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) Project is to evaluate the constructed project features in order to identify any deficiencies. The inspection results are used to prepare a report detailing the condition of the

project features and recommending any corrective actions considered necessary. Should it be determined that corrective actions are needed, the CPRA shall provide in the report, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies, as well as an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects, which were completed since the completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance, and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since construction of the project is outlined in Section IV.

The annual inspection of Penchant Basin Natural Resource Plan – Increment 1 (TE-34) project took place May 28, 2015. In attendance were Brian Babin, Todd Hubbell, and Adam Ledet with CPRA, and Doug Baker with NRCS. The inspection began around 9:45 am near the rock dike and marsh creation area at the intersection of Bayou Chene and Bayou Penchant. We proceeded to the weirs at Brady Canal and Superior Canal; then to the rock revetment along Bayou Decade, and ended at Lost Lake. The trip included a visual inspection of the project features, structures and outer edges of the marsh creation areas. Photographs of the inspection are located in Appendix B.

### **III. Project Description**

The following completed, structural components jointly accepted by CPRA and NRCS will require operation, maintenance, repair, and/or rehabilitation throughout the twenty (20) year life of the project.

- Approximately 6,667 linear feet of foreshore rock dike along the southern bank of Bayou Chene at the mouth of Bayou Penchant. The rock dike was constructed to an maximum overbuild elevation of 4.0' NAVD 88 and target elevation of +3.5' NAVD88; with 4 (H):1(V) side slopes from Station 0+00 to 07+50 along east dike and 3(H):1(V) from Station 08+00 to the end, and a top width of 3.0'.
- Approximately 30 acres of marsh creation along the southern bank of Bayou Chene at the mouth of Bayou Penchant. The target marsh elevation in this location is approximately 2.0' NAVD 88.
- 92' steel sheet pile weir with a ten (10) foot wide boat bay and six (6) - 5' x 5' flap gated openings at the intersection of Brady Canal and Bayou Penchant.
- 85' long steel sheet pile weir with six (6) - 5' x 5' flap gated openings along Superior Canal.
- Approximately 14,500 linear feet of earthen embankment armored with rock riprap along the north bank of Bayou Decade from Voss Canal to the mouth of Lost Lake. The earthen embankment was constructed to an elevation of +4.0' NAVD 88 with 6:1 side slopes and a 10' wide earthen embankment crest and 6'.

rock revetment crest. The rock riprap revetment is approximately 2' thick, 10' wide base and 6:1 side slopes along the canal face of the earthen embankment.

- Structure No.5 – 139 linear feet steel bulkhead weir with 10' wide boat bay. The top elevation of the bulkhead was constructed to an elevation of 0.9' NAVD 88. The crest of the boat bay was constructed to -4.0' NAVD 88. A rock scour pad above a geotextile fabric was constructed along both sides of the steel bulkhead to an elevation of -4.0' NAVD with 3:1 side slopes.
- Structure No.4 – 120 linear feet steel bulkhead with 10' wide boat bay. The top elevation of the bulkhead will be constructed to an elevation of 0.9' NAVD 88. The crest of the boat bay will be constructed to -4.0' NAVD 88. A rock scout pad above a geotextile fabric will be constructed along both sides of the bulkhead to an elevation of -4.0' NAVD with 3:1 side slopes.

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

To date, there have been no maintenance events or project features that require routine maintenance. This section of the report will be used to reference all maintenance activities on future inspection reports.

#### **V. Inspection Results**

##### Rock Dike and Marsh Creation Area

Upon arrival at the marsh creation sites and rock dike on both sides of Bayou Penchant near Bayou Chene, we noticed that the entire rock dike and marsh creation areas were under water due to high river stages. From the existing USGS gauge located in Bayou Penchant, the stage at the time of the inspection was 3.75' at 10:00 a.m. We were unable to visually inspect the rock dike and marsh creation areas, but did note that all of the warning signs were in good condition with no obvious damage. We will attempt to schedule the site visit for next year at a time when the river stages are lower and the features are visible. (Appendix B, Photos 1 through 6)

##### Brady Canal Structure

The fixed crest weir with a boat bay and flap-gates at the intersection of Brady Canal and Bayou Penchant was in very good condition with no noticeable defects. The structure was in very good condition and the banks are stable. The recently installed floating debris barriers appear to be functioning well and funneling vegetation and debris through the structure as intended. All signs and supports were in good condition as well. No maintenance will be required at this time. (Appendix B, Photos 7 through 9)

### Superior Canal Structure

The fixed crest weir with flap-gates along Superior Canal was in good condition with no obvious defects or damage. The bank tie-ins are armored and are in very good condition and the flap gates appear to be operating as designed. The floating debris barrier installed on the north side of the structure was in very good condition and working well. The warning signs were all intact without damage. The structure will not require maintenance at this time. (Appendix B, Photos 10 through 12)

### Structure No. 4

The first fixed crest weir with boat bay from Voss Canal along the north bank of Bayou Decade was inundated with water hyacinth and difficult to view or approach. The only visible portion of the structure was the pipe railing attached to the top whaler and the bank tie-ins. Although our view of the structure was limited, we do not expect any damage to the structure since the structure is relatively new and was constructed a couple of years ago. The bank tie-ins are armored and are in good condition. The signs and supports were also in good condition. We hope to get a better view of the structure during the 2016 annual inspection. (Appendix B, Photos 17 through 19)

### Structure No. 5

The fixed crest weir with boat bay closest to Lost Lake along the north bank of Bayou Decade was in good condition with no obvious damage. The steel sheet piling was below the water line at the time of the inspection, but we did not observe any defects. The bank tie-ins on both sides of the structure are armored and are in good condition. The signs and supports were in good condition as well. No maintenance will be required at this time. (Appendix B, Photos 21 and 22)

### Rock Revetment along Bayou Decade

The rock armored embankment along the north bank of Bayou Decade was in good condition with only one obvious flaw at the beginning of Reach 1 near Voss Canal. It appeared that earthen embankment was recently refurbished, but the material was placed without grading and was not uniform (Appendix B, Photo 13). There is no threat of breaching at this time, but we will continue to monitor this in the future. The remaining reaches were in good condition with only minor erosion around the end of Reach 3 near Lost Lake. The earthen embankment itself appears to be well vegetated and stable. No maintenance will be required at this time. (Appendix B, Photos 14 through 16, 20, 23 and 24)

## **VI. Conclusions and Recommendations**

All features of the Penchant Basin Natural Resource Plan – Increment 1 were in very good condition with only minor erosion at the Lost Lake end of the rock armored embankment and the rock embankment tie-in at the beginning of Reach 1 near Voss Canal. There were no features that would require maintenance repairs as a result of the 2015 Annual Inspection. We have noted

that the 2016 inspection should be performed during the year when the Atchafalaya River stage is below 2.5' so that a visual inspection of the rock dike and marsh creation areas at the intersection of Bayou Penchant and Bayou Chene can be performed.

#### References:

O'Neil, T. 1949. The muskrat in the Louisiana coastal Marsh. Louisiana Department of Wildlife and Fisheries, New Orleans. 152 pp.

Sasser, C.E. 1994. Vegetation dynamics in relation to nutrients in floating marshes in Louisiana, USE. 193 pp.

Coastal Environments, Inc., 1997. Watershed plan and environmental assessment for the Lower Penchant Basin, Terrebonne Parish, Louisiana. United States Department of Agriculture, Natural Resource Conservation Service, Partial Draft, July 1997. 49pp.

Swarzenski, C.M. 2003. Surface-water hydrology of the gulf intercoastal waterway in South-Central Louisiana. 1996-99. U.S. Geological Survey. Reston, Virginia. 51 pp.

U.S. Department of Agriculture, Soil Conservation Service. 1984. Lafourche-Terrebonne cooperative river basin study report.

CWPPRA, Natural Resource Conservation Service (NRCS), Louisiana Department of Natural Resources (LDNR), 2008. Penchant Basin Natural Resource Plan, Increment 1 (TE-34) – Fact Sheet.

NRCS-LDNR, 2007. Penchant Basin Natural Resource Plan, Increment 1 (TE-34), Project Information Sheet for Wetland Value Assessment

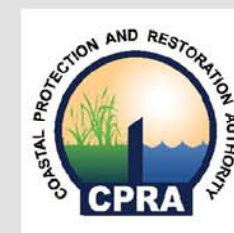
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**Appendix A**  
**Project Features Map**

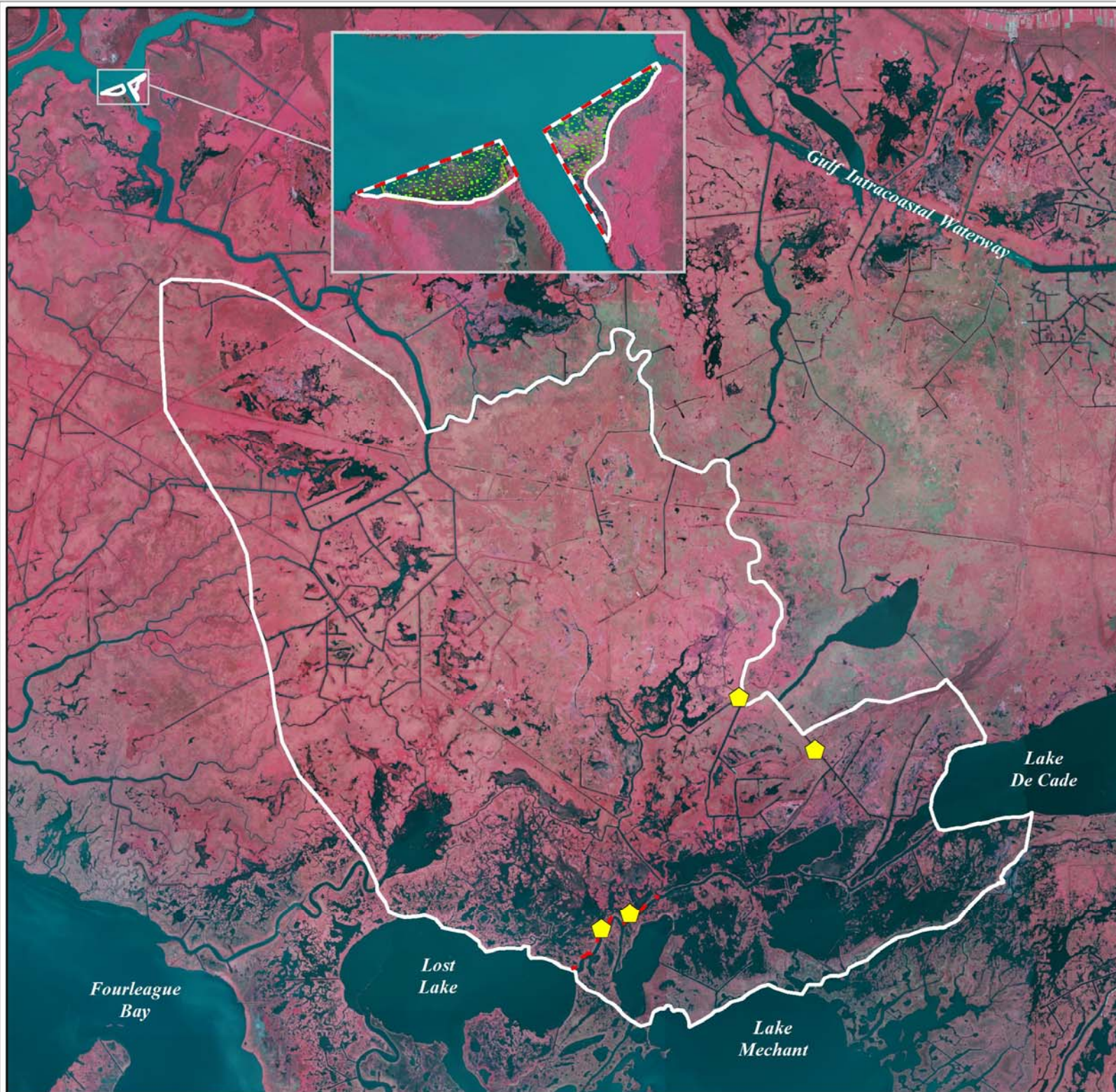


# **Penchant Basin Natural Resources Plan, Increment 1 (TE-34)**

-  Weir
-  Rock Dike
-  Marsh Creation
-  Project Boundary



Source:  
Coastal Protection and Restoration  
Authority of Louisiana  
Imagery:  
2013 National Agriculture  
Imagery Program  
File Path: //RID2015040107/  
Map Date: March 18, 2015



## **Appendix B**

### **Photographs**





Photo 1: View of rock containment and fill area on west side of Bayou Penchant at Bayou Chene near Sta. 22+00.



Photo 2: View of the rock containment and fill area on west side of Bayou Penchant at Bayou Chene near Sta. 20+00.



Photo 3: View of rock containment and fill area tie-in on far west end along Bayou Chene near Sta. 5+00.



Photo 4: View of rock containment along the west bank at the mouth Bayou Penchant near Sta. 28+00.



Photo 5: View of rock containment and fill area on the east side at mouth of Bayou Penchant near Sta. 25+00.



Photo 6: View of rock containment tie-in near Sta. 37+00 along east bank of Bayou Penchant.





Photo 7: View of steel sheetpile weir with flapgates, rock bank protection and floating debris barrier along the north bank of Brady Canal near the Apache Camp.



Photo 8: View of steel sheetpile weir with flapgates, rock bank protection and floating debris barrier along the south bank of Brady Canal near the Apache Camp.



Photo 9: Over all view of the steel sheetpile structure, floating debris barrier, warning signs and rock bank protection across Brady Canal at Bayou Penchant.



Photo 10: View of steel sheetpile weir with flapgates, floating debris barrier and warning signs across Superior Canal.





Photo 11: View of steel sheetpile tie-in to bank and rock riprap protection on the south side of the structure.



Photo 12: View of steel sheetpile tie-in to bank and rock riprap protection on the north side of the structure.





Photo 13: View of rock shoreline revetment at the entrance of Voss Canal along the west bank near Sta. 39+11 of Reach 3.



Photo 14: View of rock revetment along the north bank of Bayou Decade near Sta. 35+00 of Reach 3.



Photo 15: View of rock revetment structure along the north bank of Bayou Decade along Reach 3 near Sta. 10+00.



Photo 16: View of rock shoreline revetment on the north bank of Bayou Decade northeast of Structure No.4 along Reach 2 near Sta. 04+00.





Photo 17: View of rock weir, signage and rock revetment on the north side of Structure No.4 along the north bank of Bayou Decade.



Photo 18: View of the water hyacinth along the face of the Structure No.4. The structure was not visible due to floating vegetation.



Photo 19: View of rock revetment tie-in on the south side of Structure No.4 along the north bank of Bayou Decade. Entire structure was not visible due to water hyacinth.



Photo 20: View of rock revetment along the north bank of Bayou Decade near Sta. 30+00 of Reach 2.





Photo 21: View of steel sheetpile weir and warnings signs at Structure No.5 along the north bank of Bayou Decade.



Photo 22: View of Structure No.5 tie-in to the rock revetment on the south side of the structure along Bayou Decade.



Photo 23: View of rock revetment at the far southern end of Reach No.1 near Lost Lake.



Photo 24: View of rock revetment at the far southern end of Reach No.1 near Lost Lake.

## **Appendix C**

### **Three Year Budget Projection**

**Penchant Basin/ TE-34 / PPL 6 (2015-2018)**  
**Three-Year Operations & Maintenance Budgets**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>B.Babin</i>	<i>NRCS</i>	<i>B. Babin</i>
	<b>2015/2016</b>	<b>2016/2017</b>	<b>2017/2018</b>
<i>Structure Ops/ Nav Aid</i>	\$ -	\$ -	\$ -
<i>CPRA Administration</i>	\$ 20,217	\$ 20,843.00	\$ 21,446.00
<i>Maintenance/Rehabilitation</i>	\$ -	\$ -	\$ -

15/16 Description: Annual Inspection and Report

<i>E&amp;D</i>	
<i>Construction</i>	
<i>Construction Oversight</i>	
<i>Sub Total - Maint. And Rehab.</i>	\$ -

16/17 Description: Annual Inspection and Report

<i>E&amp;D</i>	\$ -
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ -

17/18 Description: Annual Inspection and Report

<i>E&amp;D</i>	\$ -
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ -

	<b>2015/2016</b>	<b>2016/2017</b>	<b>2017/2018</b>
<b><u>Annual O&amp;M Budgets</u></b>	<b>\$ 20,217.00</b>	<b>\$ 20,843.00</b>	<b>\$ 21,446.00</b>

<b><u>2015 - 2018 O &amp;M Budget (3 yr Total)</u></b>	<b>\$ 62,506</b>
<b><u>Unexpended O &amp; M Funds</u></b>	<b>\$1,839,979</b>
<b><u>Remaining O &amp; M Budget (Projected)</u></b>	<b>\$1,777,473</b>



## OPERATIONS & MAINTENANCE BUDGET WORKSHEET

**Project: TE-34 Penchant Basin Natural Resource Plan – Increment 1**

**FY 15/16 –**

Administration		\$	0
O&M Inspection & Report		\$	20,217
Operation/Navigational Aid:		\$	0
Maintenance:		\$	0
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

### **Operation and Maintenance Assumptions:**

#### **CPRA Direct Costs**

##### 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
		<u>\$ 2,096</u>

##### Report:

CPRA Engineer 6 – 60 hrs. @ \$73/hr.	\$	4,380
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Total Direct CPRA Costs: **\$ 6,476**

#### **CPRA Indirect Costs**

##### 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
		<u>\$ 4,448</u>

##### Report:

CPRA Engineer 6 – 60 hrs. @ \$154.88/hr.	\$	9,293
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Total Indirect CPRA Costs: **\$13,741**

**FY 16/17 –**

Administration		\$	0
O&M Inspection & Report		\$	20,843
Operation/Navigational Aid:		\$	0
Maintenance:		\$	
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

**Operation and Maintenance Assumptions:**

O&amp;M Inspection and Report – 3% Inflation

**CPRA Direct Costs****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

**Report:**

CPRA Engineer 6 – 60 hrs. @ \$73/hr.	\$	4,380
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Total Direct CPRA Costs: \$ 6,476 x 3% Inflation = **\$ 6,670****CPRA Indirect Costs****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

**Report:**

CPRA Engineer 6 – 60 hrs. @ \$154.88/hr.	\$	9,293
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Total Indirect CPRA Costs: \$13,741 x 3% Inflation = **\$14,153****FY 17/18 –**

Administration		\$	0
O&M Inspection & Report		\$	21,446
Operation/Navigational Aid:		\$	0
Maintenance:		\$	
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

**Operation and Maintenance Assumptions:**  
O&M Inspection and Report – 3% Inflation

**CPRA Direct Costs**

Total Direct CPRA Costs:                      \$ 6,670 x 3% Inflation = **\$ 6,870**

**CPRA Indirect Costs**

Total Indirect CPRA Costs:                      \$14,153 x 3% Inflation = **\$14,576**

**2015-2018 Accounting**

Expenditures (LaGov):	\$ 15,824.25
NRCS MIPR Expenditure:	\$ 0
<b>Total Expenditures:</b>	<b>\$ 15,824.25</b>

**Current O&M Funding:** **\$1,855,804.00**

**Current Unexpended O&M Funds:** **\$1,839,979.25**