

# APPENDIX B

## HYDROLOGIC AND HYDRAULIC STUDY

## **Post Road Channel Improvement**

For:

The City of Carencro, Louisiana

Prepared by:

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## Overview

The Post Road wastewater treatment facility lies upstream from the City of Carencro, Louisiana. The plant has been the primary wastewater facility of the City of Carencro for the past 30+ years. On the southern boundary of the pond exists an unnamed drainage channel which serves a western portion of Carencro as well as unincorporated areas of Lafayette Parish. The channel continues east and discharges into the Beau Bassin Coulee. The Beau Bassin Coulee traverses through the heart of the City of Carencro and eventually discharges into the Vermilion River just north of the City of Lafayette. C.H. Fenstermaker and Associates was tasked with analyzing the unnamed channel for the purpose of developing erosion protection measures in order to prevent an embankment failure which would potentially discharge 16 million gallons of untreated wastewater into the coulee which will flow through the City of Carencro, into the Vermilion River, and then eventually through the city of Lafayette. The project examined approximately 780 feet of the channel that flows along the Post Road Treatment Facility (see Exhibit 1 for project map).

## Scope of Work

For this erosion control project, Fenstermaker has performed an analytical analysis of the channel at the Post Road Treatment Facility to determine the estimated rate of erosion of the existing banks.

There were three alternatives considered for this erosion control project. The first alternative was a vegetative planning project. This alternative involved hydroseeding the length of the project in order to increase vegetation within the channel banks to help bolster the soil and aid in preventing erosion. This alternative was dismissed due to the fact that, as shown in [Figure 1](#), significant vegetation already exists along the channel. Despite the amount of current vegetation, significant erosion still continues to occur, therefore this alternative was dismissed. The second alternative involved creating a milder slope for channel banks without having to line the channel with concrete. The concrete-lined channel has a proposed slope of 1.5:1, therefore a minimum 2:1 slope would be required for this alternative. But as shown in [Exhibit 2](#), a 2:1 slope would not be feasible as the channel would not fit between essential structures that currently exist as part of the wastewater treatment facility. The third and final alternative was to remove the bend in the channel near the treatment pond by straightening the channel. For this alternative to be completed, a 60-foot diameter wastewater clarifier on the south side of the channel and existing underground piping would have to be relocated. The cost to relocate this infrastructure would far exceed the cost of concrete-lining the channel at this location.

## Hydraulics

The proposed concrete channel was designed using a water discharge for a 10-year storm frequency.

## Maintenance

Annual maintenance requirements of a concrete channel are generally limited to the removal of debris and sediment deposits. Periodic surface patching and repair of joints should be performed on an as-needed basis. Vegetation should be controlled by being treated with an appropriate herbicide at expansion joints and cracks that permit vegetation to lodge and produce root damage. Brush or other vegetation that obstructs the channel or causes deformation or displacement of the lining should be cut periodically.

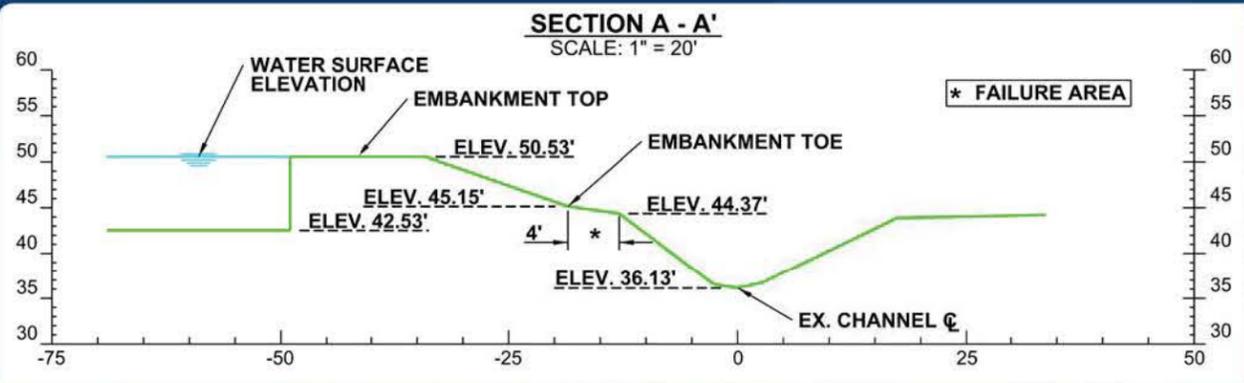
It is estimated that post mitigation, the Post Road concrete-lined channel will need approximately 8 hours of maintenance once a month to perform these routine maintenance requirements. This includes two City of Carencro personnel and one truck needed to complete the maintenance work. **Table 2** below shows an itemized cost for the annual maintenance of the concrete-lined channel.

Item	Cost per Hour	Item Amount	Hours of Service per Year	Total Cost
Labor	\$24.00	2	96	\$4,608.00
Equipment	\$18.00	1	96	\$1,728.00
<b>Annual Maintenance Cost:</b>				<b>\$6,336.00</b>

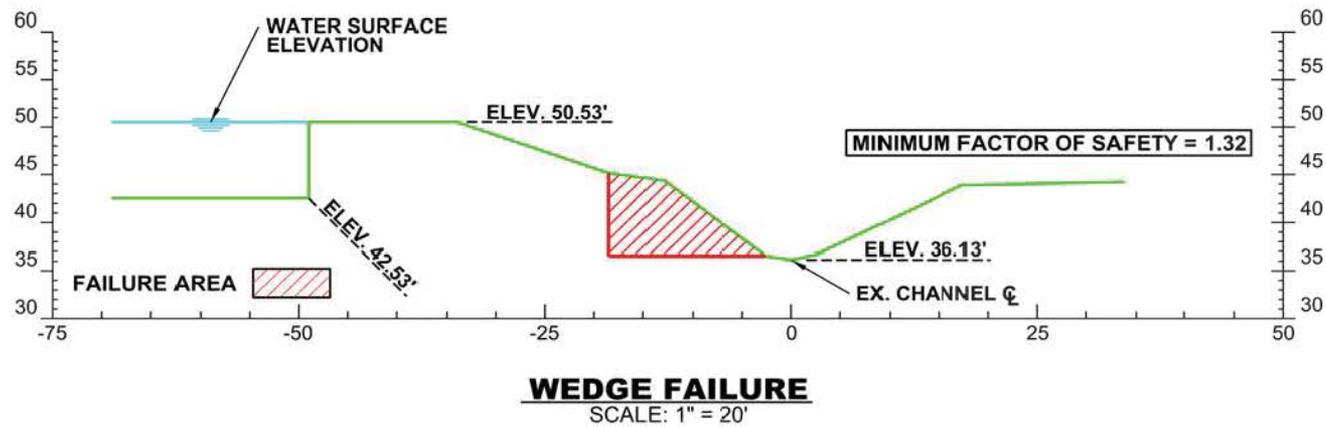
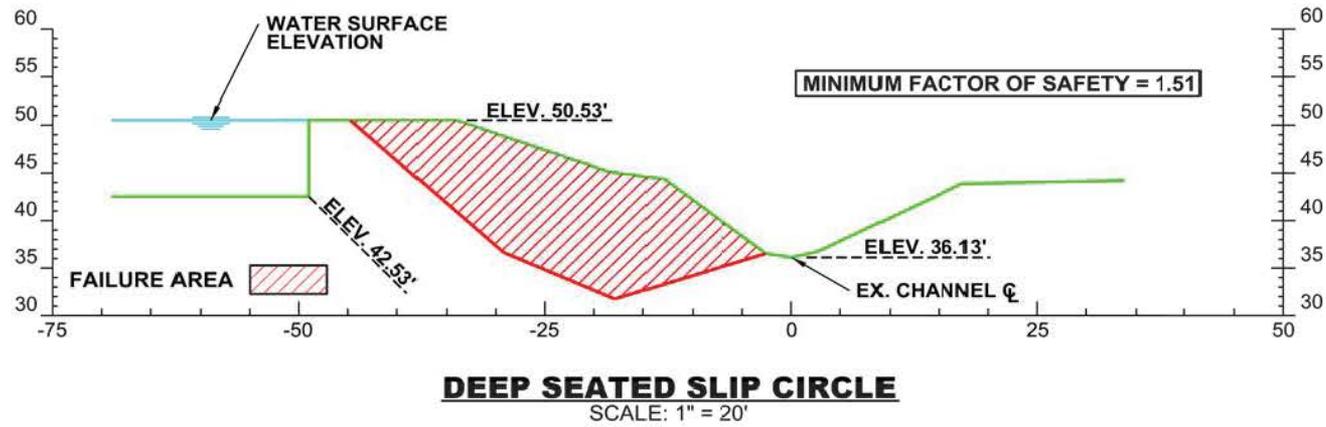
**Table 2: Annual Maintenance Costs**

## Summary

In conclusion, the proposed project will correct erosion issues along the existing channel adjacent to the embankment of the existing wastewater treatment plant, provide continuous stabilization of the channel to prevent further erosion, reduce the risk of an embankment breach which would allow untreated wastewater to enter a natural channel, and decrease the risk of injury to City of Carencro employees who perform routine maintenance duties at the wastewater treatment facility.



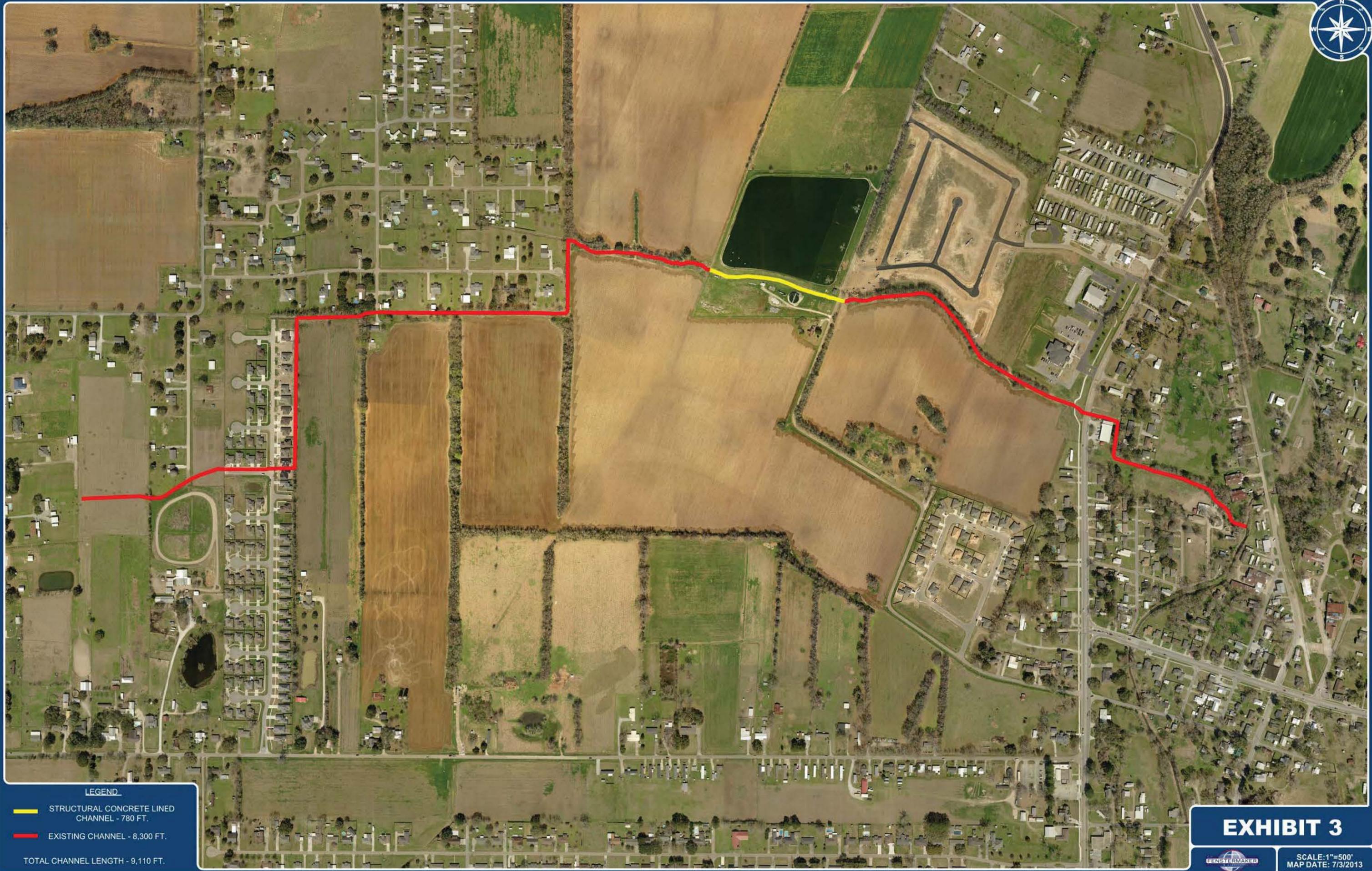
- LEGEND**
- EXISTING CHANNEL CENTERLINE
  - ... EXISTING TOE OF CHANNEL
  - - - EXISTING CHANNEL TOP OF BANK
  - ... EXISTING TOE OF EMBAKMENT
  - PREVIOUS CHANNEL BANK (1998)



## EXHIBIT 2



SCALE: 1" = 20'  
MAP DATE: 7/3/2013



LEGEND

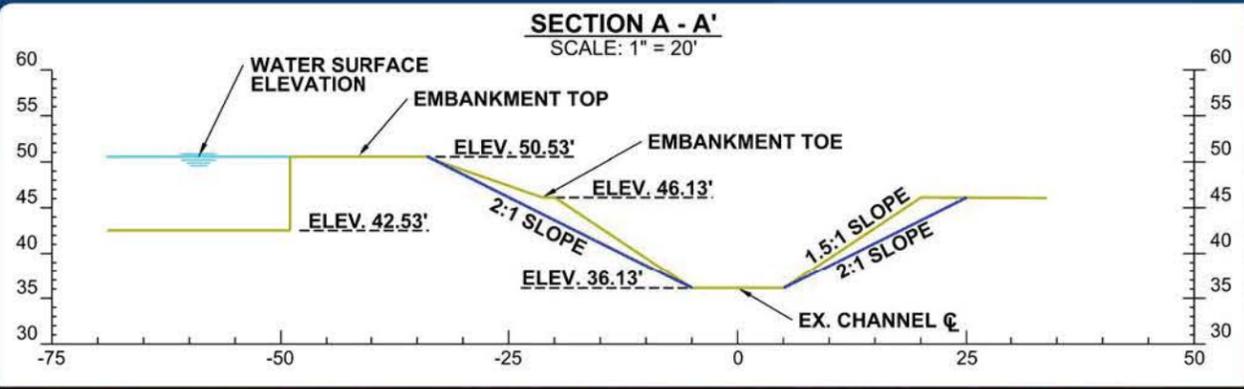
- STRUCTURAL CONCRETE LINED CHANNEL - 780 FT.
- EXISTING CHANNEL - 8,300 FT.

TOTAL CHANNEL LENGTH - 9,110 FT.

EXHIBIT 3



SCALE: 1"=500'  
MAP DATE: 7/3/2013



- LEGEND**
- PROPOSED CHANNEL CENTERLINE
  - PROPOSED TOE OF CHANNEL
  - PROPOSED CHANNEL TOP OF BANK (1.5:1 SLOPE)
  - ALTERNATIVE PROPOSED CHANNEL TOP OF BANK (2:1 SLOPE)