

# **Preliminary Dredging Study**

## **Bar Channel to the Mouth of the Tangipahoa River Tangipahoa Parish, Louisiana**

Prepared for

**Tangipahoa Parish Government**

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DRAFT

## 1 Introduction

A project to maintain the capacity of the channel of the Tangipahoa River for efficient and safe commercial and recreational navigation was first authorized by the Rivers and Harbors Act of 14 June 1880, amended by Section 107 of the Rivers and Harbors Act of 1960, and again by Section 310 of the Rivers and Harbors Act of 1965. (USACE 1975).

Projects for navigation on the Tangipahoa River were undertaken after the Civil War by the US Army Corps of Engineers (USACE) in order to aid commercial trade. Clearing of snags from the mouth at Lake Pontchartrain to Wells Ferry, 16 miles upstream, was completed in 1873 (Perrin 2005). The 1880 act provided for improvement without dredging by removing snags and other obstructions for a distance of 53.5 miles above the mouth. This operation was completed in 1884 (USACE 1975). In recent times, clearing and snagging operations were conducted by the USACE in 1956 and 1995.

The acts in the 1960s approved an 8-foot by 100-foot bar channel between the mouth of the river and the 8-foot contour of Lake Pontchartrain, which was completed in 1971 with maintenance scheduled to be performed every two years (USACE 1975). Dredging was subsequently performed in 1973, 1979, and 1998. In 2012, the US Army Corps of Engineers (USACE) issued a solicitation for maintenance dredging of the Tangipahoa bar channel and other Lake Pontchartrain rivers, but no contract was awarded (USACE 2012).

The reach of the river from the state line to Interstate 12 (I-12) was designated a natural scenic river in the early 1990s. The southern reach from I-12 to Lake Pontchartrain was brought into the Natural and Scenic Rivers program in 1999. The program prohibits channelization, channel realignment, reservoir construction, and commercial clearcut logging within 100 feet of the banks of the Tangipahoa River, but the 1999 bill allows the USACE to clear snags from the southern portion of the reach (Schon 1999).

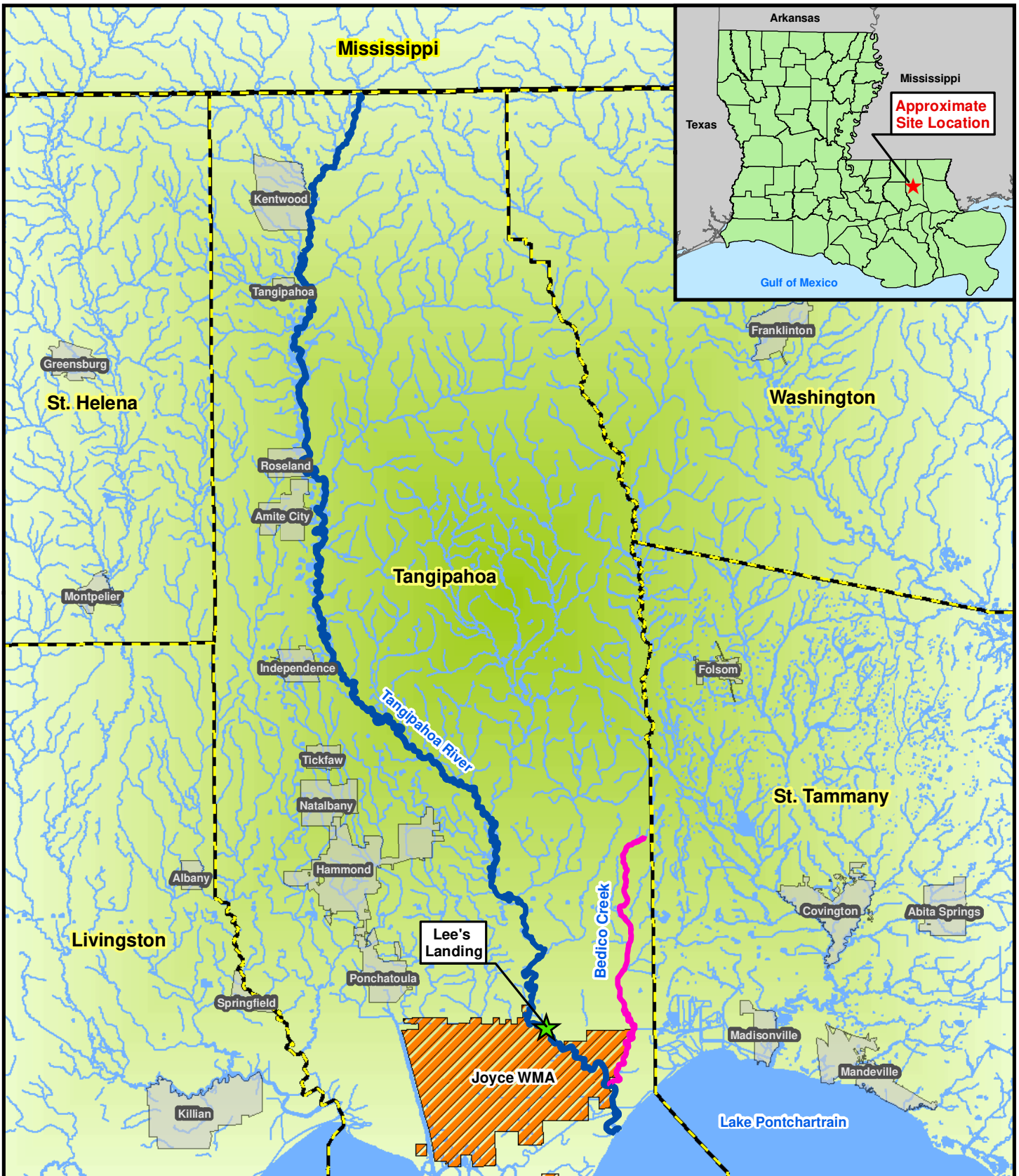
### 1.1 Problem Statement and Purpose of the Project

The Tangipahoa River in Louisiana extends from the Mississippi-Louisiana state line south to Lake Pontchartrain as shown on the vicinity map on **Figure 1**. The lower river, served by a boat launch at Lee's Landing, is open to the public for recreational activities including boating, fishing, and swimming. A number of fishing camps, boat houses, and other recreational structures line the banks of the river and Bedico Creek, a tributary. The river passes through the Joyce Wildlife Management Area (WMA) that allows for year-round recreational activities. The WMA in this area is only accessible by boat.

#### 1.1.1 Existing Conditions

A bar at the mouth of the Tangipahoa was formed by river sediment discharge and is exacerbated by the flat shore slope of Lake Pontchartrain. A channel through the bar has been dredged several times, but funding for maintenance dredging has been scarce since 1971.





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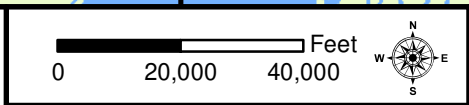


Figure 1: Project Vicinity

**Tangipahoa Dredge Study**

**Legend:**

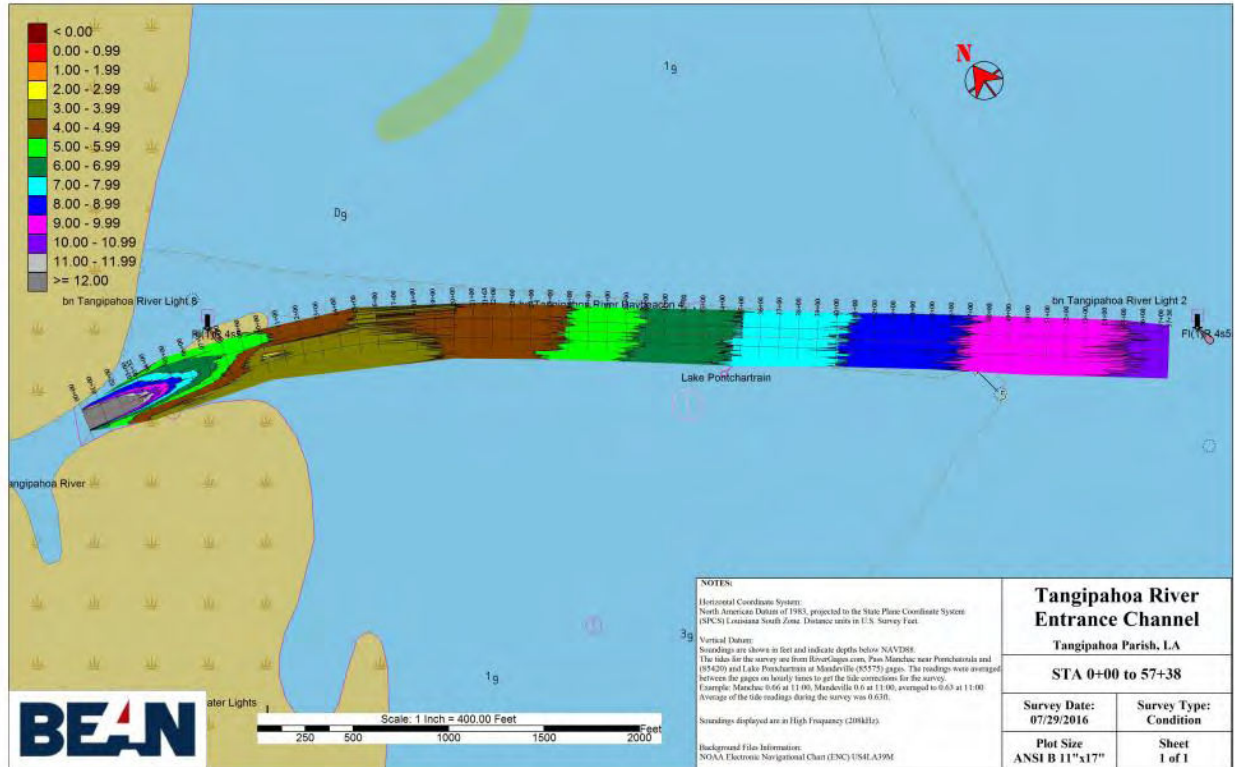
- Tangipahoa River
- Bedico Creek
- Joyce WMA
- Lee's Landing

Map prepared from public and proprietary spatial data. ELOS Environmental, LLC does not warrant its accuracy or completeness. This map should not be used to establish legal boundaries or specific locations.

Tangipahoa River Bar Channel  
Preliminary Dredging Study

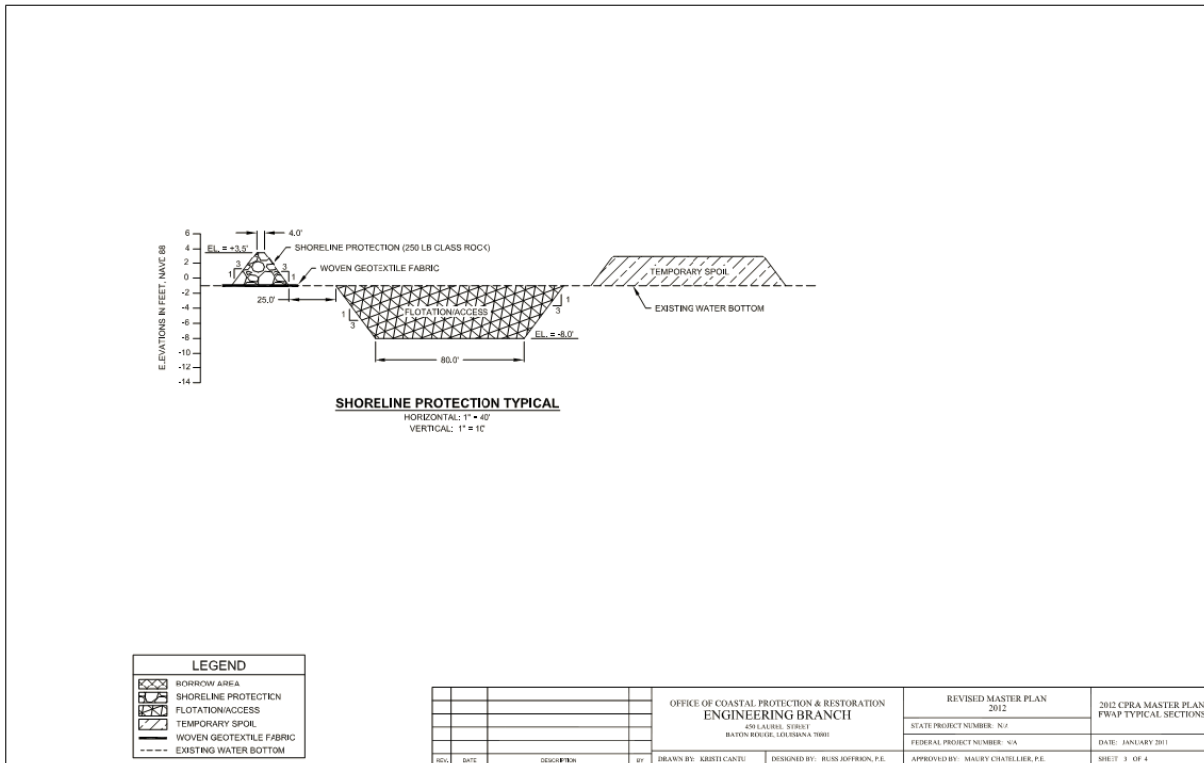
Wave action and storms shift shoreline and lake sediments that fill in the channel. These forces may flatten the bar, but they do not sweep it away.

The controlling depth of the bar channel is 1 foot Mean Lower Low Water (NOAA 2016). The bar channel extends approximately 5,800 feet to the overhead power lines. A hydrographic survey of the bar channel was conducted on July 29, 2016. The results of the survey, shown on **Exhibit 1**, illustrate that the water depths at the bar range from -3 to -5 feet and exceed -12 feet in the river channel once the bar has been cleared.



**Exhibit 1 – Hydrographic Survey of the Bar Channel (July 29, 2016)**

The shoreline of Lake Pontchartrain adjacent to the mouth of the river experiences erosion at a rate of 5 to 15 feet per year from wave energy, sea level rise, and subsidence. A shoreline protection project that created approximately 9,000 linear feet of rock breakwater 300-400 feet off the shore was completed in April 2013. The project was funded by the Coastal Impact Assistance Program (CIAP) and cost approximately \$6 million to permit and construct. Since it was installed, the US Fish and Wildlife Service (USFWS) estimates that the project has created 243.31 acres of new habitat (USFWS 2016). A conceptual plan of the breakwater is provided as **Exhibit 2**.



**Exhibit 2 – Conceptual Design for Shoreline Protection Breakwater**

**1.1.2 Site Investigations**

A site investigation was executed on July 22, 2016 to perform channel probes along the bar channel alignment and gather lake bed surface samples of the sediment. An additional site investigation was undertaken on July 29, 2016 to perform a hydrographic survey of the bar channel.

The results of both of these investigations are summarized here. The complete report is provided in **Appendix A**.

The bar channel is approximately 5,800 feet long. The channel template as indicated by the USACE set of plans provided as an attachment to the report in **Appendix A** is 100 feet wide to elevation -10. This dimension conflicts with a representation depicted by the USACE NOD Operations Manager PowerPoint presentation dated June 23, 2016, also attached to the report provided in **Appendix A**, where the bar channel dimension is shown as 60 feet wide to -8.0 feet elevation. The channel was last dredged in 1998 under contract DACW29-98-C-0067 to -8 feet by 100 feet wide, which is third set of reported dimensions for the channel.

The surface samples and probes that were performed revealed the sediments to be primarily composed of soft silts and clays on the surface overlying some slightly denser clayey material

with some shell and very fine sand intermixed. The outer one-half of the bar channel is primarily very soft silt and clay with little evidence of fine sand and shell (See Attachment 5 in **Appendix A**). The actual estimated retention ratio can only be determined after the final configuration of the desired placement area is selected.

### **1.1.3 Future Conditions**

In an e-mail to ELOS, a member of the 2017 Coastal Master Plan update team, stated that a one-mile extension of the breakwater to Pass Manchac is being considered. The Master Plan team will also evaluate a project called the Northeast Lake Pontchartrain Shoreline Protection project (001.SP.103). This project would construct 20,000 feet of shoreline protection from east of the river into St. Tammany Parish (CPRA 2016).

### **1.1.4 Problem Statement**

The lack of maintenance dredging of the bar channel causes issues for navigation between Lake Pontchartrain and the lower Tangipahoa River. Recreational boating and commercial vessels are hindered by the shallow depths at the bar. Emergency responders, US Coast Guard, and other authorities are also challenged by the controlling depths, putting the public using the river and the properties along it at risk.

The eroding shoreline is not only creating land loss in Tangipahoa Parish, which negatively impacts property values and local revenues, it is also adversely affecting the wetlands inside the shore. Material for shoreline stabilization and marsh restoration is at hand, but foreshore borrow areas must be strategically located in order not to interfere with existing or proposed shoreline protection measures or cause unforeseen consequences. For example, the channel built for flotation and access for the shoreline protection project of 2013 shown in **Exhibit 1** had to be backfilled in order to avoid undermining the breakwater after construction. Combining a dredge project with restoration measures, as is being done by the USACE in the lower Mississippi River delta, is the most effective way of achieving two complementary goals, namely safe navigation and coastal protection and restoration.

## **1.2 Purpose of the Project**

The purpose of the project is to provide access and safe navigation between Lake Pontchartrain and the Lower Tangipahoa River and beneficially use the dredged material to protect the eroding shoreline of Lake Pontchartrain and the interior wetlands of Tangipahoa Parish.

## **1.3 Potential Benefits**

The fish, wildlife, and boating resources of Louisiana generate substantial benefits. People depend on these resources for recreation, employment, and as a source of food for their families. These valuable resources not only contribute to the standard of living and economic health of state residents, but also to the common good through state and local tax revenues. The Lower Tangipahoa River is an essential component of the fish, wildlife, and boating network of the Lake Pontchartrain Basin.

The lower river is not accessible by road; therefore, these economic benefits and the real estate values of the camps and boat houses that line the banks are dependent upon access and safe and efficient navigation in the river and the lake.

### **1.3.1 Recreational Boating**

The primary recreational activity on the Lower Tangipahoa River is boating. The Louisiana Department of Wildlife and Fisheries (LDWF) reported that recreational boaters spent approximately \$543 million in total trip expenditures in 2006 and another \$438 million in annual craft expenditures. Total craft and trip spending per boat in Louisiana equaled \$3,064 in that year.

These data are based on vessels registered through LDWF and do not include non-resident boaters or larger craft that are documented by the US Coast Guard (Southwick 2008). Every year between 2005 and 2011, LDWF registered approximately 6,000 active motorboats in Tangipahoa Parish (LDWF 2012).

### **1.3.2 Commercial Fisheries**

Navigation in the Tangipahoa River and Lake Pontchartrain supports freshwater commercial fishing activities. In the fiscal year ending June 2014, 182 Resident Commercial Fishermen and Resident Vessel licenses were sold in Tangipahoa Parish. Two resident oyster dredge, 5 oyster harvester, 92 resident crab trap, 28 resident hoop net, and 45 resident shrimp trawling licenses were sold in Tangipahoa Parish in that same year (LDWF 2015).

The dockside value of all freshwater finfish in Louisiana in 2006 was \$4.4 million generating retail sales of \$29 million and 441 jobs. Freshwater shellfish that were wild caught was worth \$1.3 million at the dock and generated retail sales of \$9 million and 129 jobs (Southwick 2008).

### **1.3.3 Other Fish and Wildlife Activities**

Tangipahoa River navigation also supports fish and wildlife activities such as recreational fishing, hunting, and wildlife viewing along the river and Lake Pontchartrain. In 2015, LDWF sold 40,025 recreational licenses for activities related to fish and wildlife. Over 10,000 licenses were issued to Tangipahoa residents for basic fishing and 4,000 for basic hunting (LDWF 2016a).

The lower Tangipahoa River passes through the northeast section of Joyce WMA. Access into the interior of the property is limited and there are no roads that lead into the swamp. Access by outboard motor is limited to the Tangipahoa River and Bedico Creek, a tributary of the river, and the upper reaches of two nearby bayous. Two public boat launches provide access to the river, Lee's Landing on the Tangipahoa just north of the WMA boundary, and Traino Landing on Bedico Creek. Game animals on Joyce WMA include white-tailed deer, waterfowl, rabbit and squirrel. Freshwater fishing for largemouth bass, sunfish, and catfish is also popular. Resident waterfowl, including wood ducks, mottled ducks, hooded mergansers, and black-bellied whistling ducks, are found on the area year-round (LDWF 2016a). Manchac WMA is

approximately 3.5 miles south of the mouth of the Tangipahoa River along the lakeshore and Maurepas WMA 10 miles beyond that. Permits for hunting on WMAs for Tangipahoa residents totaled 1,125 (LDWF 2016b).

Economic impacts of Louisiana recreational fishing, migratory bird (duck) hunting, and wildlife viewing for 2006 are provided in **Table 1**.

Other activities in and around the Tangipahoa River that provide economic benefits are alligator and fur harvests, and reptile and amphibian collecting. In the fiscal year ending 2014, LDWF sold one license to a resident fur dealer, two licenses to alligator parts dealers, 16 licenses to resident reptile and amphibian collectors, and 6 to resident reptile and amphibian dealers (LDWF 2015). The economic benefits from these activities are also provided in **Table 1**.

**Table 1. Economic Impacts of Fish and Wildlife Activities in Louisiana, 2006.**

Activity	Retail Sales (millions)	Jobs	State and Local Tax Revenues (millions)	Federal Tax Revenues (millions)
Freshwater Recreational Fishing (Total)	\$ 543	10,389	\$ 64	\$ 58
Freshwater Recreational Fishing (LA Residents Only)	\$ 542	9,388	\$ 59	\$ 53
Migratory Bird Hunting (Total)	\$ 93	2,043	\$ 11	\$ 10
Migratory Bird Hunting (LA Residents Only)	\$ 83	1,784	\$ 10	\$ 9
Wildlife Viewing (Total)	\$ 312	6,199	\$ 32	\$ 31
Wildlife Viewing (LA Residents Only)	\$ 276	5,363	\$ 27	\$ 28
Alligator Harvests	\$ 57	714	\$ 5	\$ 5
Fur Harvests	\$ 2	24	\$ 0.14	\$ 0.14
Reptile and Amphibian Collecting	\$ 0.72	11	\$ 0.07	\$ 0.06

Source: Southwick 2008.

Note: These values have not been adjusted for double counting of boat purchases within the economic benefits of boat-dependent activities.

### 1.3.4 Public Safety and Emergency Response

The camps and boat houses that line the banks of the Lower Tangipahoa River cannot be accessed by road. Therefore, public safety officials and emergency responders are dependent upon waterborne transportation to reach these properties, inhabitants, and people boating on the river. The existing bar impedes access of larger vessels and reduces the efficiency of public safety and emergency response operations. Improved access and safe navigation will reduce

the public dollars spent in these operations and also reduce insurance rates. Demand for property in the area will continue to grow yielding higher tax revenues.

### **1.3.5 Habitat Restoration and Shoreline Protection**

The construction of a breakwater in 2013 running parallel to the shoreline southwest of the mouth of the river has already built 243.31 acres of new marsh habitat (USFWS 2016) through natural accretion of material between the shore and the breakwater. The proposed dredging of the bar channel offers an opportunity to augment the success of the 2013 project by beneficially using the dredge material to restore habitat in a similar manner, which in turn will reinforce shoreline protection.

This material could also be used beneficially to support another shoreline protection project that is being considered in the 2017 Coastal Master Plan. Project No. 001.SP.103 is described as 20,000 linear feet of shoreline protection on the western shore of Lake Pontchartrain, east of the Tangipahoa River in Tangipahoa and St. Tammany Parishes (CPRA 2016).

A one-mile extension of the breakwater project from its southwestern terminus to Pass Manchac is also being considered in the 2017 Master Plan (Brett McMann, e-mail message to ELOS, July 28, 2016). Although transporting the material this distance may not be economically feasible, the project is indicative of the value to coastal restoration that the Master Plan team of scientists and officials place upon shoreline protection in Lake Pontchartrain, and the interest in continuing the work.

## **2 Alternatives Considered**

Several conceptual alternatives were developed and considered for the dredging and disposal of dredged material.

Because the project benefits depend upon the beneficial use of dredged material, deep water disposal was briefly considered, but dismissed because it would not achieve this goal.

The No Action Alternative was also considered, but it was dismissed because it would not achieve the goals of the project or address the demonstrated needs.

### **2.1 Dredging Plan**

The dredging plan is the same as that proposed by the US Army Corps of Engineers (USACE) in 2012 as shown on the drawings provided in **Appendix B**. This plan consists of dredging the bar channel from the mouth of the Tangipahoa River for a distance of 5,800 feet into Lake Pontchartrain. The bottom will be 100 feet wide with 1:6 side slopes and the channel will be dredged to a depth of -10 Mean Low Gulf (MLG) stopping at the 8-foot contour. This plan is the same for all alternatives considered except for the No Action Alternative.

The dredge would be accomplished using a hydraulic cutterhead and would be expected to yield approximately 87,000 cubic yards of material.



## 2.2 Alternative Placement Areas

Three alternative areas for placement of the dredged material were considered.

### 2.2.1 Area 1

The first placement option considered is the area that is southwest of the entrance to the Tangipahoa River as shown on **Figure 2**. It would be defined on the northeastern limit by a line that stretches from the northern lobe of the rock dike to a point on land just to the north of that lobe, a distance of about 250 feet. The eastern limit would be defined by the rock dike and the western limit would be the shoreline. The southwestern limit would be open to allow material to flow along the western side of the breakwater for its entire length. The 250-foot opening along the northeast limit would be closed with a temporary earthen dike to prevent material from flowing northeast toward the navigation channel. The borrow material for this temporary containment would come from within the placement area and likely be constructed with a marsh buggy excavator.

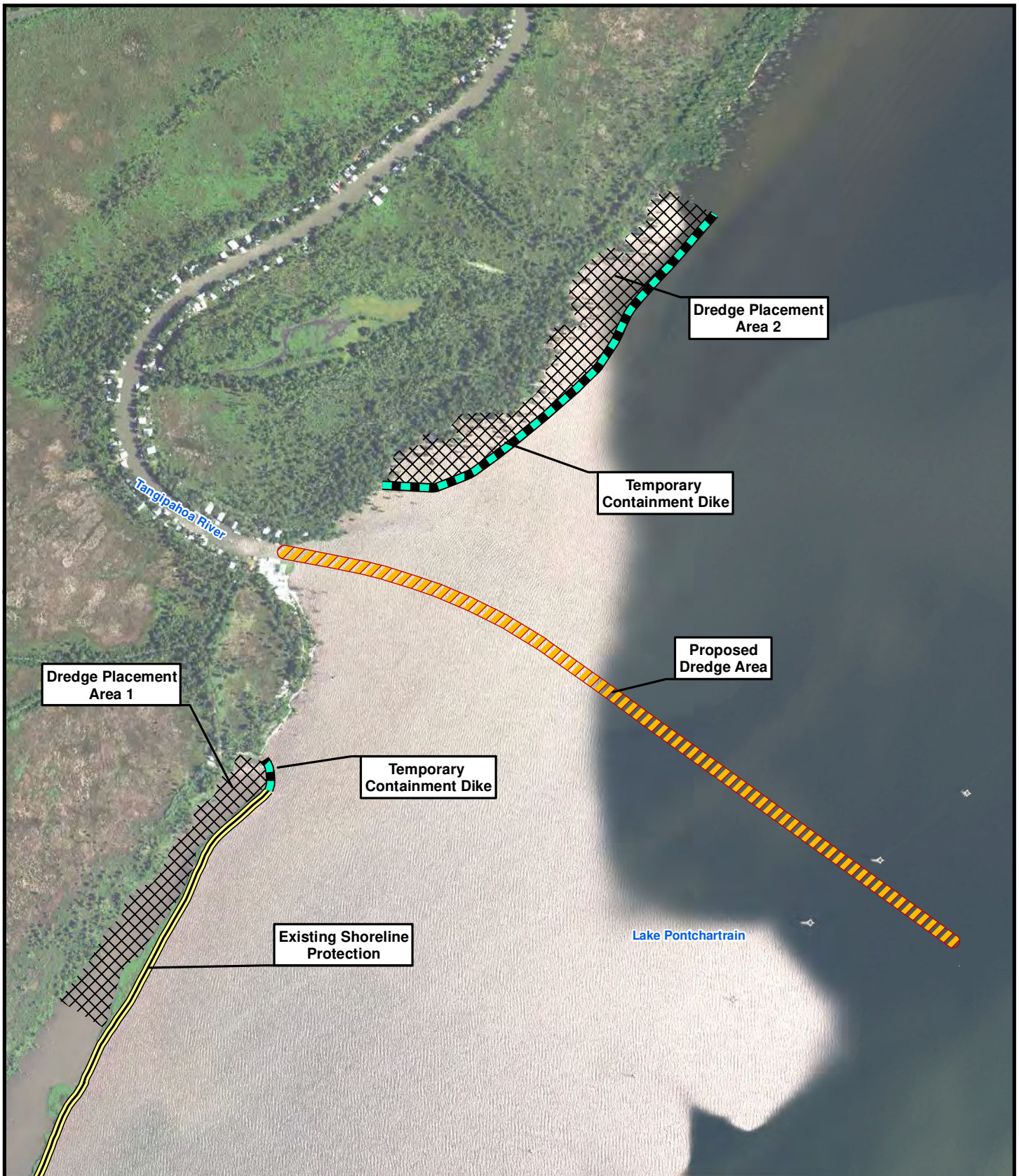
### 2.2.2 Area 2

The second placement option considered is the area to the northeast of the entrance channel along the old cypress shoreline (**Figure 2**). There is no existing containment in this area to retain the dredged material within a particular footprint. The budget estimate provided in **Table 2** assumes that the containment dike would be constructed with a clamshell bucket dredge. It would tie into the shoreline 600 – 800 feet northeast of the navigation channel and proceed in a northeasterly direction for approximately 3,000 feet. The eastern limit would be the temporary earthen containment dike while the western limit would be the old cypress shoreline. The containment area of Option 2 would also be open on the northern limit to facilitate flow of the fines and sediment toward the northeast. The width of the placement area is about 300 feet.

### 2.2.3 Area 3

The third option would be placement of material along the lakeside face of the rock dike to the southwest. There are at least two significant reasons why this would not be conducive to long term sustainability of the beneficial use of this material. The dredged material placement would occur in a wave climate that is much more active than the more quiescent conditions behind the rock dike. Settlement of the fines will be limited at best and evidence of the material placement to any noticeable degree in the future will be difficult to see. If an accretion of material occurs in the short term along the face of the breakwater, the turbulence associated with a storm wave crashing against the rocks will quickly dissolve the feature as it eats away at the soil. In this analysis for creating sustainable habitat, Area 3 was not chosen as a viable alternative placement location and was dismissed from further consideration.





  
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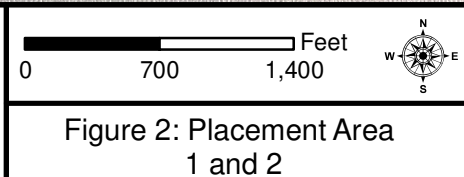
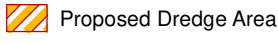
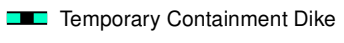

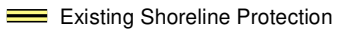


Figure 2: Placement Area  
 1 and 2  
**Tangipahoa Dredge Study**

**Legend:**

-  Proposed Dredge Area
-  Temporary Containment Dike
-  Dredge Placement Area
-  Existing Shoreline Protection

Map prepared from public and proprietary spatial data. ELOS Environmental, LLC does not warrant its accuracy or completeness. This map should not be used to establish legal boundaries or specific locations.

## 2.3 Proposed Alternative

The alternative proposed for further study and implementation is the dredge plan as described and placement of the dredged material in both Area 1 and Area 2. The combined use of both areas could provide the benefit of placing the material with the lower retention ratio from the outer half of the channel behind the breakwater while placing the material with the higher retention ratio within the temporary containment on the north side of the channel. This approach would provide the benefit of sustainability from the more consolidated sediments of the feature behind the sacrificial earthen dike to the north while preserving the capacity of the placement area to the southwest for the finer, lower retention ratio material for future dredging events along the bar channel. In addition, the finer sediments with the corresponding lower transportation cost would be placed on the longer slurry lines while the coarser and heavier material with a slightly higher dredge and transportation cost would be transported on a shorter average line length.

The estimated cost of the proposed alternative is provided in **Table 2**.

**Table 2. Estimated Cost of Proposed Alternative (Budget Estimate Only)**

Item	Units	Quantity	Unit Cost	Extended Cost
Planning and Permitting	Lump Sum	1	\$75,000	\$75,000
Mobilization and Demobilization	Lump Sum	1	175,000	175,000
Preparation of Placement Area 1	Lump Sum	1	28,000	28,000
Preparation of Placement Area 2	Lump Sum	1	292,500	292,500
Dredging of Outer Half of Channel and Placement in Area 1	Cubic Yard	19,000	6.25	118,750
Dredging of Inner Half of Channel and Placement in Area 2	Cubic Yard	68,000	5.25	357,000
Degrading Temporary Containment at Area 1	Cubic Yard	1	10,500	10,500
<b>Total</b>				<b>\$1,056,750</b>

## 3 Environmental Consequences

Dredging of the bar channel would affect approximately 13 acres of open water habitat and lake bottom. Placement of the dredged material as proposed would impact approximately 6 acres of open water habitat and a small amount of newly created marsh behind the breakwater on the southwest side of the river (Area 1). The proposed alternative would impact approximately 20 acres of open water habitat to the northeast (Area 2).

### 3.1 Changes in Habitat

The habitat in Area 1 is already in transition from open water habitat to marsh as sediments accrete behind the breakwater. The proposed alternative would accelerate the restoration of Area 1 to marsh by the introduction of additional sediments. Temporary containment by an

earthen dike to prevent material from flowing northeast toward the navigation channel would encourage revegetation. The temporary containment dike would be partially degraded after placement of the material in order to allow for natural water flow and sediment transport across the placement area.

The habitat in Area 2 was originally cypress swamp that has been converting to open water as the shoreline has eroded away. Although the remaining cypress trees are able to grow in standing water, soils that are saturated but not flooded for a period of one to three months after seedfall are required for germination of this species. The introduction of wet-muck as a seedbed in Area 2 would be expected to encourage regeneration and reverse the transition to open water. Area 2 could also be considered for cypress plantings to accelerate the restoration of swamp forest at the shoreline. The temporary containment dike would be exposed to lake energy along its length and would naturally degrade over time.

### **3.2 Wetlands and Other Waters of the US**

The proposed project would create a net benefit to wetlands and other waters of the US by replacing open water with marsh and swamp forest habitats. Therefore, it is not expected that compensatory mitigation for impacts to the wetlands and other waters in the placement areas would be assessed.

### **3.3 Threatened and Endangered Species**

The proposed changes in habitat would have a negligible effect on wildlife, aquatic resources, and essential fish habitat, and a potential benefit from the restoration of swamp forest and marsh. Threatened and endangered (T&E) species such as the West Indian manatee (*Trichechus manatus*), Kemp's ridley sea turtle (*Lepidochelys kempii*) and the Atlantic sturgeon, Gulf subspecies (*Acipenser oxyrinchus (=oxyrinchus) desotoi*) may be present in Lake Pontchartrain near the dredging site, but less likely in the placement areas, where the waters are very shallow. No designated critical habitat for these species is located within the proposed project area; therefore, no permanent impacts would be caused to these species.

### **3.4 Cultural Resources**

Consultation with the Louisiana State Historic Preservation Office (LSHPO) and appropriate tribal authorities would be conducted to determine that no adverse effects to cultural resources and tribal lands would occur from the proposed project.

### **3.5 Temporary Impacts**

Construction of the proposed alternative would result in minor temporary impacts to Lower Tangipahoa properties, recreational boating and fishing, water quality, noise, and other related resources. Migratory birds and aquatic species that are mobile would lose use of the construction area temporarily, but substitute habitat is abundant nearby. Monitoring for T&E species to avoid inadvertent impacts from construction activities would be conducted.



#### **4 Permitting**

Prior to construction, coordination with federal, state, and local authorities would be implemented to secure the necessary permissions and authorizations for the proposed alternative. At a minimum, a joint permit to secure authorization of Coastal Use and beneficial use of dredge, Section 404/10 permit from the USACE, New Orleans District, for excavation and fill in wetlands and other waters of the US, and a Water Quality Certification (WQC) from LDEQ will be required. The requirements this joint permit also includes coordination with the LSHPO and tribal authorities for cultural resources and with the USFWS for T&E species and migratory birds. Although it is not expected that compensatory mitigation for impacts to the wetlands and other waters in the placement areas would be assessed, mitigation measures for unavoidable impacts to the other protected resources will have to be determined by the agencies and implemented by the applicant in order to secure the necessary permits.

#### **5 Public Input**

This preliminary study is being made available to the public in as a digital download through the Tangipahoa Parish website, in hard copy at the Tangipahoa Planning Department at 15485 West Club Deluxe Road, Hammond, LA 70403 and at the Ponchatoula Branch of the Tangipahoa Parish Library, 380 North Fifth Street, Ponchatoula, LA 70454.

The public is encouraged to submit written comments on the proposed plan to ELOS Environmental, LLC, 43177 East Pleasant Ridge Road, Hammond, LA 70403, Attention L. Maloney or by email at [lmaloney@elosenv.com](mailto:lmaloney@elosenv.com).

These comments will be addressed in the final document.

#### **6 Conclusion**

The lack of maintenance dredging of the bar channel at the mouth of the Tangipahoa River causes issues for navigation between Lake Pontchartrain and the lower river. Recreational boating and commercial vessels are hindered by the shallow depths at the bar. Emergency responders, USCG, and other authorities are also challenged by the controlling depths, putting the public using the river and the properties along it at risk. A project to provide access and safe navigation between Lake Pontchartrain and the Lower Tangipahoa River and beneficially use the dredged material to protect the eroding shoreline of Lake Pontchartrain and restore wetlands of Tangipahoa Parish has been proposed.

In addition to safe navigation, habitat restoration, and shoreline protection, the proposed project would also provide potential benefits to Lower Tangipahoa River properties, recreational boating and fishing, commercial fisheries, public safety/emergency response, and the economic values derived from these activities.

A preliminary study was conducted to consider alternatives for the proposed project and an alternative consisting of the USACE 2012 dredge plan and placement in areas on both sides of the river mouth is proposed for implementation. This alternative would cause negligible to minor impacts to some protected resources. It is not anticipated that compensatory mitigation for impacts to wetlands and other waters would be assessed given that the proposed alternative would replace open water habitat with marshland and swamp forest, two types of valuable wetland habitats.

Prior to construction, coordination with federal, state, and local authorities would be implemented to secure the necessary permissions and authorizations for the proposed alternative.

## **7 List of Preparers**

Ancil Taylor, Vice-President, Bean Consulting LLC  
Luke Watkins, President, ELOS Environmental, LLC  
Lynn Maloney, Senior Environmental Scientist, ELOS Environmental, LLC  
Flynn Daigle, Environmental Scientist, ELOS Environmental, LLC

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DRAFT

APPENDIX A

Initial Observations of Potential Beneficial Use Sites

**TANGIPAHOA PARISH, LA.**

**ELOS ENVIRONMENTAL, L.L.C.**

**INITIAL OBSERVATIONS OF POTENTIAL BENEFICIAL USE  
SITES FOR TANGIPAHOA RIVER BAR CHANNEL DREDGING**

**PREPARED FOR:  
ELOS ENVIRONMENTAL L.L.C.  
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**BEAN CONSULTING LLC  
619 ENGINEERS ROAD  
BELLE CHASSE, LA 70037  
ATTN: ANCIL TAYLOR  
ATAYLOR@CFBEAN.COM**

**DATE AUGUST 8, 2016**



## TABLE OF CONTENTS

INTRODUCTION .....	2
BACKGROUND DATA .....	2
GENERAL DESCRIPTION OF THE DREDGING AREA .....	2
GENERAL DESCRIPTION OF THE PLACEMENT AREAS .....	3
BUDGET COST ESTIMATE.....	5

### Attachments

1. USACE Plans for North Shore Rivers and Bayous Constructed Federal Projects
2. Bathymetric survey – Tangipahoa River Bar Channel
3. Cross sections of the Tangipahoa River Bar Channel
4. End area and Volume Computation of the Tangipahoa River Bar Channel
5. Satellite (Proximity View) Dredge area and Placement Option 1
6. Satellite View northern end of Placement Option 1
7. Satellite View Placement Option 2

### Figures (Pictures)

1. Photo of sediment from Tangipahoa Bar Channel
2. Description of site probes and sediment samples.

## INTRODUCTION

Bean Consulting LLC [BCLLC] is a seven year old subsidiary of C.F. Bean, LLC [BEAN] headquartered in Belle Chasse, Louisiana. Bean traces its history back to the 1930's originating in south Louisiana as a full service dredging contractor. With more than seventy years of operations representing more than \$1.7 billion of contracting across the globe in virtually every aspect of the dredging and marine industry, Bean brings a wealth of experience in coastal restoration and marsh renourishment / creation. Much of that experience gained along the Gulf Coast for the United States Army Corps of Engineers in the Mobile, New Orleans, Galveston and Jacksonville Districts along with numerous local public and private entities.

## BACKGROUND DATA

BCLLC was asked to review the overall scope of work associated with the dredging of the Tangipahoa River Bar Channel as a borrow source and for the beneficial placement of the dredged material along various reaches of the shoreline in the vicinity of the bar channel. A site investigation was executed on July 22, 2016 to perform channel probes along 5800 feet of the bar channel alignment and gather lake bed surface samples of the sediment. An additional site investigation occurred on July 29, 2016 to perform a hydrographic survey of the bar channel. The results of both of these investigations are attached.

## GENERAL DESCRIPTION OF THE DREDGING AREA

The bar channel is approximately 5800 feet long. The channel template as indicated by the USACE set of plans attached is 100 feet wide to elevation -10. This dimension conflicts with a representation depicted by the USACE NOD Operations Manager, Ray Newman's PowerPoint presentation dated June 23, 2016 where the bar channel dimension is shown as 60 feet wide to -8.0. This .ppt file is also attached. The channel was last dredged in 1998 under contract DACW29-98-C-0067 to -8 by 100 feet wide, yet another dimension in itself.

The surface samples and probes that were gathered on July 22<sup>nd</sup> revealed the sediments to be primarily composed of soft silts and clays on the surface overlying some slightly denser clayey material with some shell and very fine sand intermixed. The outer ½ of the bar channel is primarily very soft silt and clay with little evidence of fine sand and shell. (See Figure 1 to the right)

The retention ratio of dredged material to material measured in the placement area will be much greater with the material removed from the inner ½ of

Figure 1



the channel than the outer ½ of the channel. The actual estimated retention ratio can only be determined after the final configuration of the desired placement area plan is chosen.

Figure 2

<b>Tangipahoa River Bar Channel Sediment Samples</b>				
<b>Sample #</b>	<b>STA</b>	<b>Depth</b>	<b>Field Notes</b>	<b>Observation Notes</b>
1	7+00	6.5	Soft top, push to 8ft, sandy mud with shells	Vso upper layer with So slightly sandy silt and clay, some shells
2	9+55	3.5	No probe	Vso sandy, shelly silt and clay.
3	13+40	3.5	No probe	Shelly silt and clay. Slight fine sandy silt.
4	14+40	3.5	Soft top, push to 8ft, stiffer mud and less sand	Vso upper layer, slightly stiffer clay with some silt, very fine sand, some shells at bottom.
5	24+20	4.5	Stiff sand, push to 5.5ft	very fine sandy silt. More dense and slightly higher wet S.G.
6	34+00	7.5	Soft push down to 11.5ft, mud	slightly sandy shelly silt and clay. Sand is very fine. Less shell fragments.
7	44+20	8	Soft push down to 13.5ft, mud	Vso silt and clay. Some very fine sand.
8	55+00	10	Easy push down to 15.5ft, mud	Vso silt and clay. Some very fine sand.

## GENERAL DESCRIPTION OF THE PLACEMENT AREAS

Three placement areas have been discussed and reviewed with two of the three proposed in this initial observation.

Option 1 is the area that is southwest of the entrance to the Tangipahoa River. (See Attachment 5) It would be defined on the NE limit by a line that stretches from the northern lobe of the rock dike to a point on land just to the north of that lobe, a distance of about 250 feet. (See Attachment 6) The eastern limit would be defined by the rock dike and the western limit would be the shoreline. The southwestern limit would be open to allow material to flow along the western side of the rock dike for its entire length. The 250 foot opening along the NE limit would be closed with a temporary earthen dike to prevent material from flowing northeast toward the navigation channel. The borrow material for this temporary containment would come from within the placement area and likely be constructed with a marsh buggy excavator.

Option 2 is the area to the NE of the entrance channel along the old cypress shoreline. (See Attachment 7) There is no existing containment in this area to retain the dredged material within a particular footprint. This rough budget estimate assumes the containment dike would be constructed with a clamshell bucket dredge. It would tie into the shoreline 600 – 800 feet NE of the navigation channel and proceed in a NE direction for approximately three thousand feet. The eastern limit would be the temporary earthen containment dike while the western limit would be the old cypress shoreline. Again, the containment area in Option 2 would also be open on the northern limit to facilitate flow of the fines and sediment toward the northeast. The width of the placement area is about 300 feet.

Option 3 would be placement of material along the lakeside face of the rock dike to the southwest. There are at least two significant reasons why this would not be conducive to long term sustainability of the beneficial use of this material. The dredged material placement would occur in a wave climate that is much more active than the more quiescent conditions behind the rock dike. Settlement of the fines will be limited at best and evidence of the material placement to any noticeable degree in the future will be difficult to see. If an accretion of material occurs in the short term along the face of the rock dike, the turbulence associated with a storm wave crashing against the rocks will quickly dissolve the feature as it eats away at the soil. In this analysis for creating sustainable habitat, Option 3 was not chosen as a viable alternative.

The combined use of both optional areas 1 & 2 could provide the benefit of placing the material with the lower retention ratio, outer ½ of the channel behind the rock dike while placing the material with the higher retention ratio within the temporary containment on the north side of the channel. This approach would provide the benefit of sustainability from the more consolidated sediments of the feature behind the sacrificial earthen dike to the north while preserving the capacity of the placement area to the SW for the finer, lower retention ratio material for future dredging events along the bar channel. In addition, the finer sediments with the corresponding lower transportation cost would be placed on the longer slurry lines while the coarser and heavier material with a slightly higher dredge and transportation cost would be transported on a shorter average line length. The budget estimate below assumes that approach would be the placement plan chosen.

A large, light gray, stylized letter 'R' is positioned diagonally across the lower half of the page, serving as a watermark.

**BUDGET COST ESTIMATE**

This budget estimate is intended to provide a ROM for the scope of work described above. Adjustments in assumptions, placement area plans, dredging limits can certainly change the budget estimate.

<b>Dredging of the Tangipahoa River Bar Channel (Budget Estimate Only)</b>					
<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Quantity</b>	<b>Estimated Cost</b>	<b>Cost Extended</b>
1	Mobilization and Demobilization	Lump Sum	1	\$175,000	\$175,000
2	Option 1 Placement Area Preparation	Lump Sum	1	\$28,000	\$28,000
3	Option 2 Placement Area Preparation	Lump Sum	1	\$292,500	\$292,500
4	Dredging of the outer 1/2 of the Bar Channel and placement in Option area 1	per Cy	19000	\$6.25	\$118,750
5	Dredging of the inner 1/2 of the Bar Channel and placement in Option area 2	per Cy	68000	\$5.25	\$357,000
6	Degrading temporary containment on Option Area 1	Lump Sum	1	\$10,500	\$10,500
<b>Total</b>					<b>\$981,750</b>

Approved by:

Date: August 8, 2016

---

Ancil Taylor  
 Vice President  
 Bean Consulting LLC  
 (504) 259 1801



# Northshore Rivers & Bayous Constructed Federal Projects

**Ray Newman**  
**Operations Manager**

Operations Division  
Southeast Waterways  
504-862-2050  
Raymond.C.Newman@usace.army.mil



US Army Corps of Engineers  
**BUILDING STRONG**<sup>®</sup>



1

04/25/2012

# Federal O&M General Appropriation ( Annual)

- ▶ Provided under Energy and Water Development Bill – Congress
- ▶ Channel Surveys of Authorized Projects – Funded!
- ▶ Dredging – Authorized reaches only for navigation and recreation.
- ▶ Clearing and Snagging – Authorized reaches.



# Northshore Rivers Authorizations

River/Bayou	Depth/Width/Reach	Survey
Tchefuncta/ Bogue Falaya	10' X 125' Bar to Mile 3.5 8' X variable Mile 3.5 to Mile 14	0 ft. (Bog) 2016
Tangipahoa River	8' X 60' Bar Channel Clearing & Snagging Mile 0-53.5	2 ft. (Bar) 2016
Bayou Lacombe	8' X 60' Bar Channel Clearing & Snagging Mile 0-8.2	5 ft. (Bar) 2016
Bayou Bonfouca	10' X 60' Bar to Mile 7 (Slidell)	6 ft. 2016

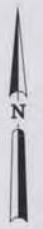
**Note: All projects listed authorized for the purpose of navigation and recreation (except Bonfouca – nav only)**

[http://www2.mvn.usace.army.mil/eng2/edsd/proj\\_maps/pmap.htm](http://www2.mvn.usace.army.mil/eng2/edsd/proj_maps/pmap.htm)



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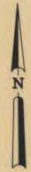
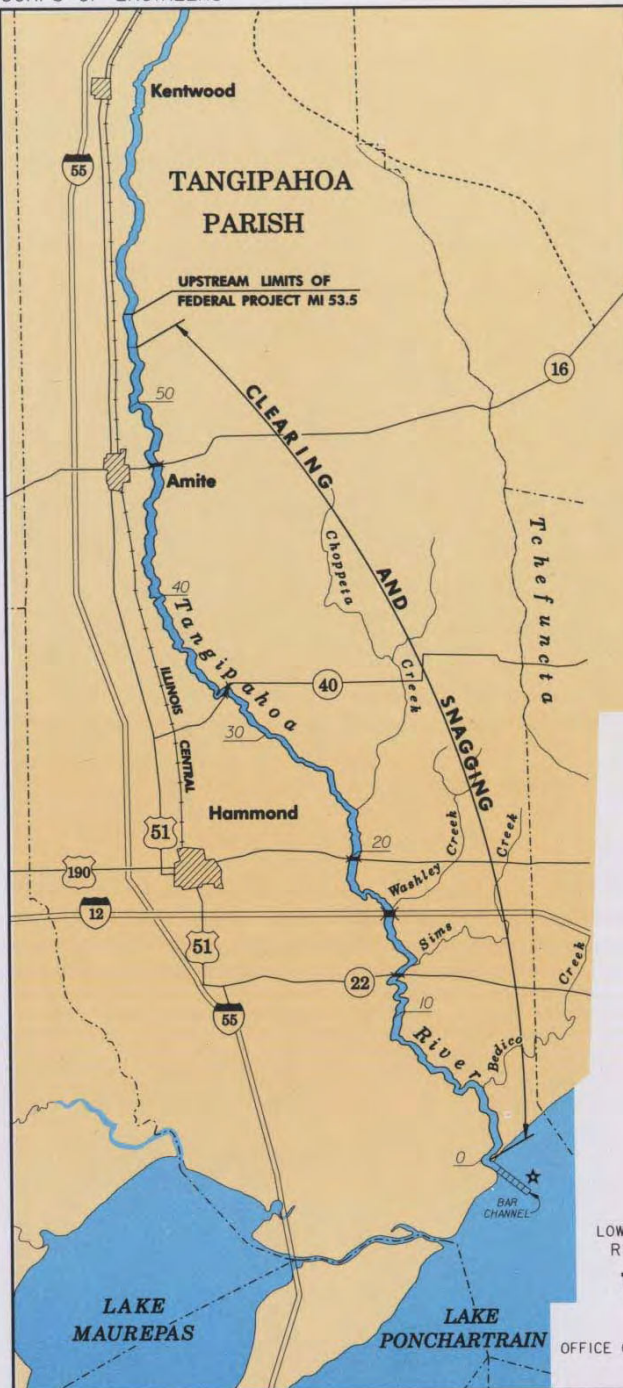




**LEGEND**  
 ■ improvements completed



LOWER MISSISSIPPI VALLEY DIVISION WORK  
 RIVER AND HARBOR IMPROVEMENTS  
**CHEFUNCTE RIVER  
 AND BOGUE FALIA, LA.**  
 SCALES AS SHOWN  
 OFFICE OF THE DISTRICT ENGINEER, NEW ORLEANS, LA.  
 REVISED 30 SEPTEMBER 1993



**LEGEND**

▬ Improvements completed

**SCALES**

MILES  
2 0 2 4 6 8

KILOMETERS  
2 0 2 4 6 8

LOWER MISSISSIPPI VALLEY DIVISION WORK  
RIVER AND HARBOR IMPROVEMENTS  
**TANGIPAHOA RIVER, LA.**

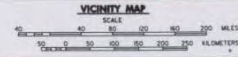
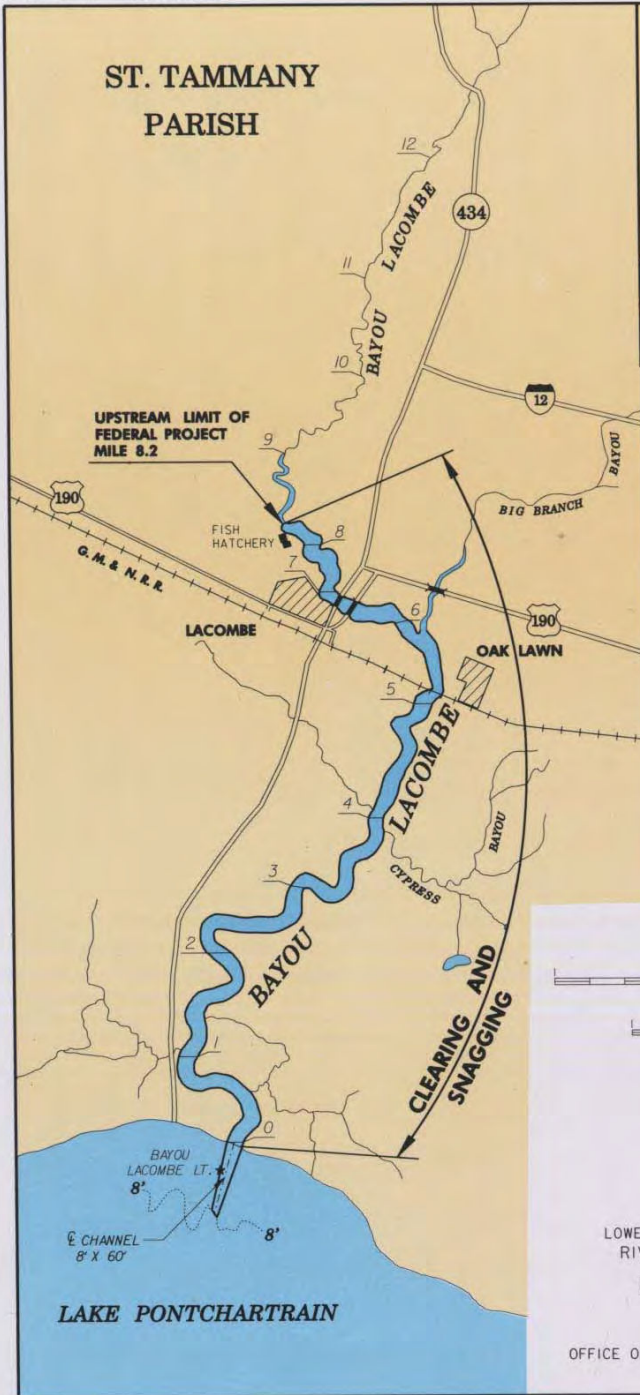
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REVISED 30 SEPTEMBER 1993



**BUILDING STRONG®**



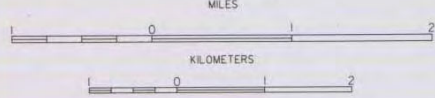
# ST. TAMMANY PARISH



### LEGEND

Improvements completed

### SCALES



LOWER MISSISSIPPI VALLEY DIVISION WORK  
RIVER AND HARBOR IMPROVEMENTS

## BAYOU LACOMBE, LA.

SCALES AS SHOWN

OFFICE OF THE DISTRICT ENGINEER, NEW ORLEANS, LA.  
REVISED 30 SEPTEMBER 1993



# BUILDING STRONG®



# Project History/Funding

River/ Bayou	Year Constr.	Maint. Year	Remarks
Tchefuncta Bogue Falaya	1959	1972	Bar Channel
Tangipahoa River	1971	1998	Bar Channel (1995 clear & snag)
Bayou Lacombe	1938	1972	Bar Channel
Bayou Bonfouca	1931	1972	





# Other Federal Programs

- ▶ Silver Jackets Program (est. 2014)
  - Multi-agency State and Fed.
  - Geared toward local communities
  - Investigative – Develop Solutions
- ▶ [www.silverjackets.nfrmp.us/](http://www.silverjackets.nfrmp.us/)
- ▶ Corps New Orleans District – contact:
  - Christopher (Nick) Simms
  - [Christopher.N.Simms@usace.army.mil](mailto:Christopher.N.Simms@usace.army.mil)
  - (504)862-2128



## Other Federal Programs (Cont.)

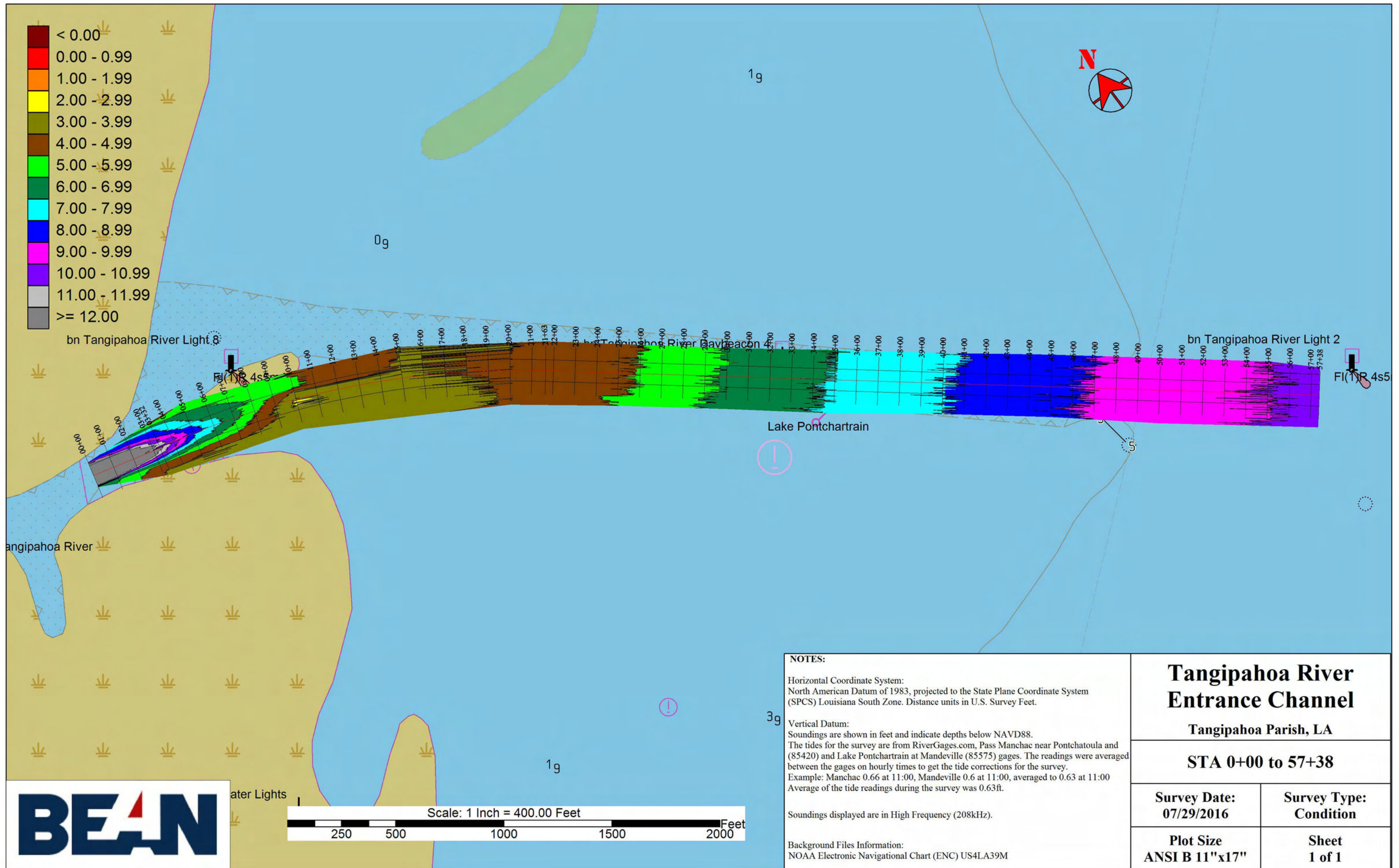
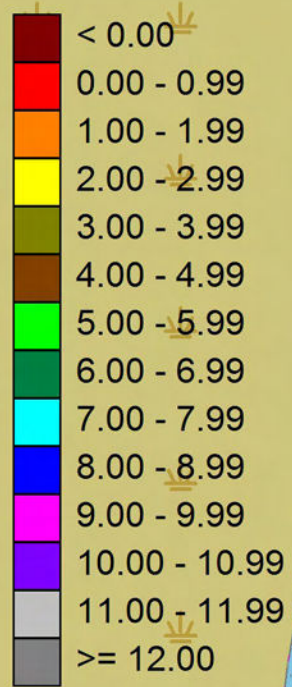
- ▶ Continuing Authorities Program - CAP
  - Investigation and Construction
  - \$10M Maximum (Federal Share)
  - Includes Flood Control Projects
- ▶ <http://planning.usace.army.mil/toolbox/search.cfm>
- ▶ Corps New Orleans District – contact:
  - Sarah Bradley
  - [Sarah.C.Bradley@usace.army.mil](mailto:Sarah.C.Bradley@usace.army.mil)
  - (504)862-1723



# Questions????







**NOTES:**

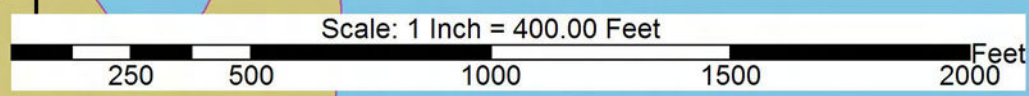
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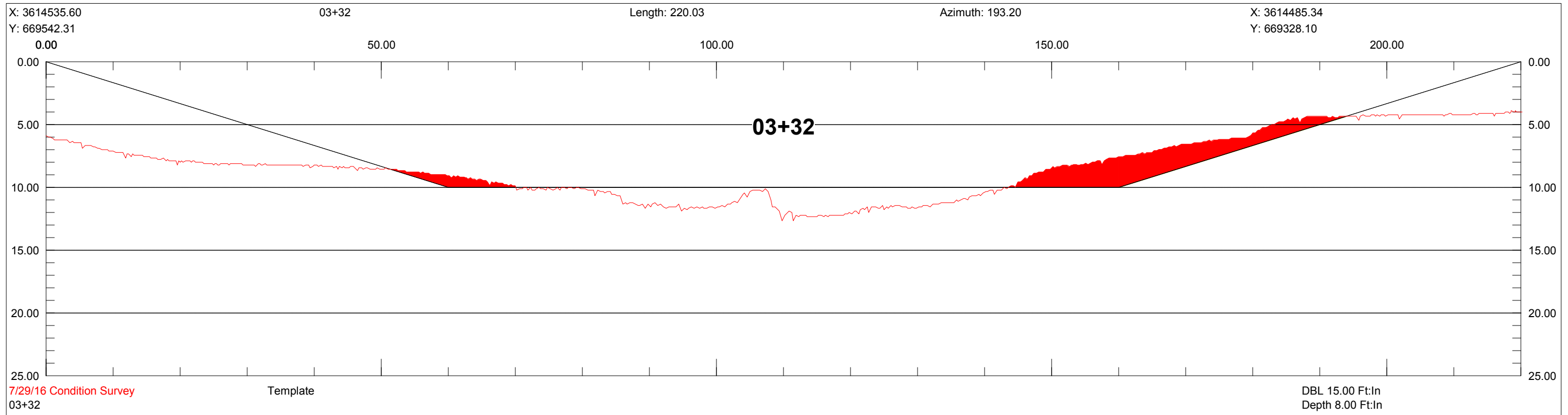
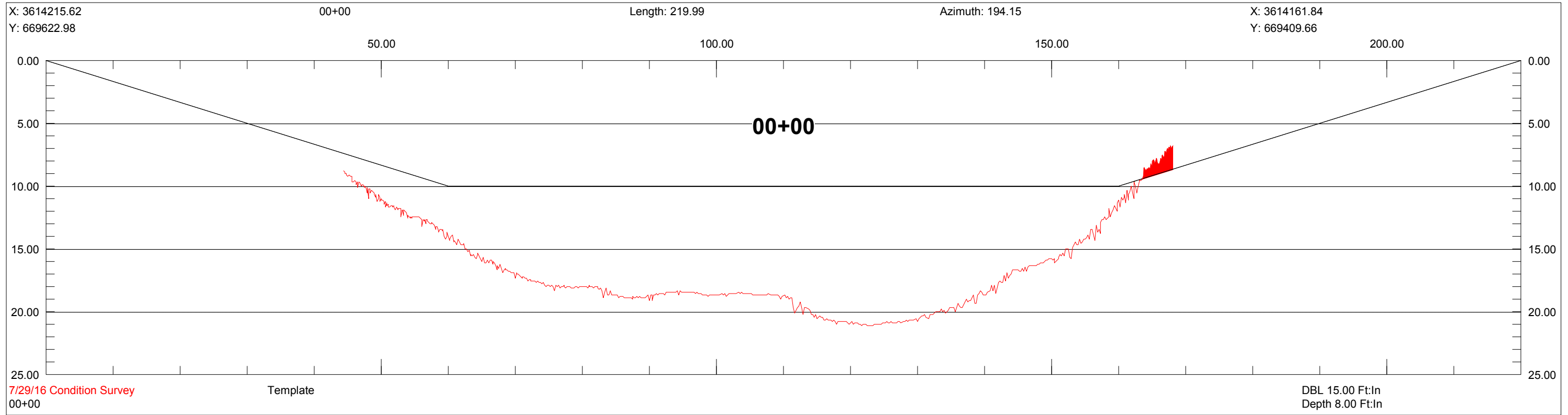
Vertical Datum:  
Soundings are shown in feet and indicate depths below NAVD88.  
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Example: Manchac 0.66 at 11:00, Mandeville 0.6 at 11:00, averaged to 0.63 at 11:00  
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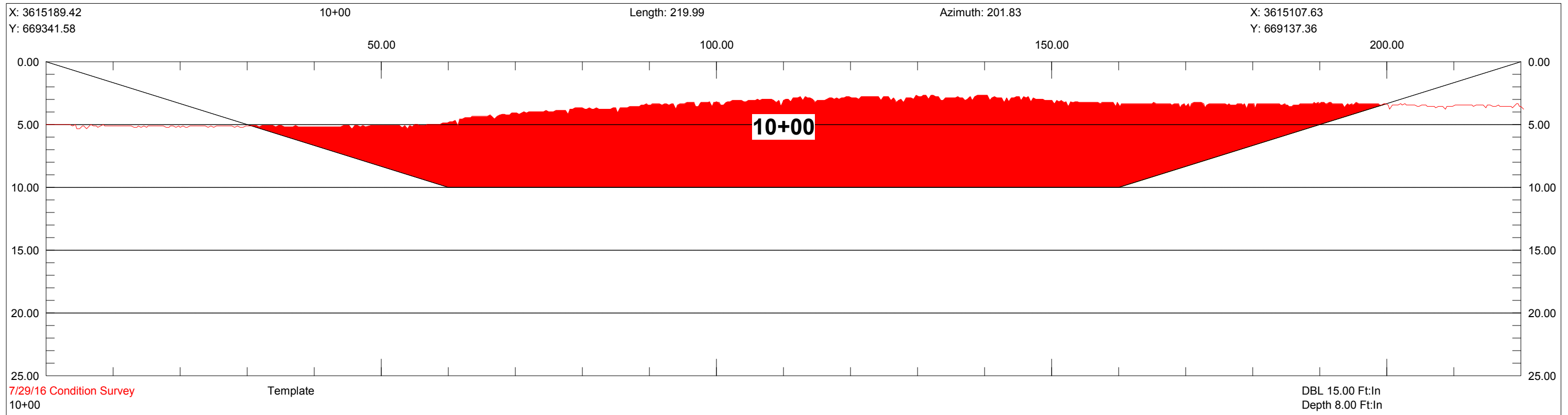
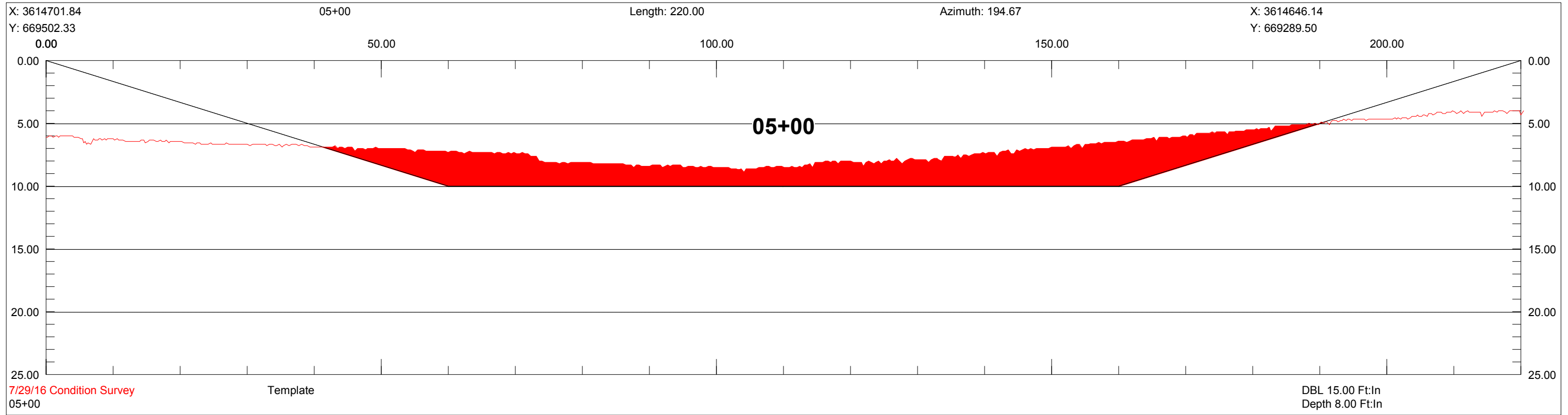
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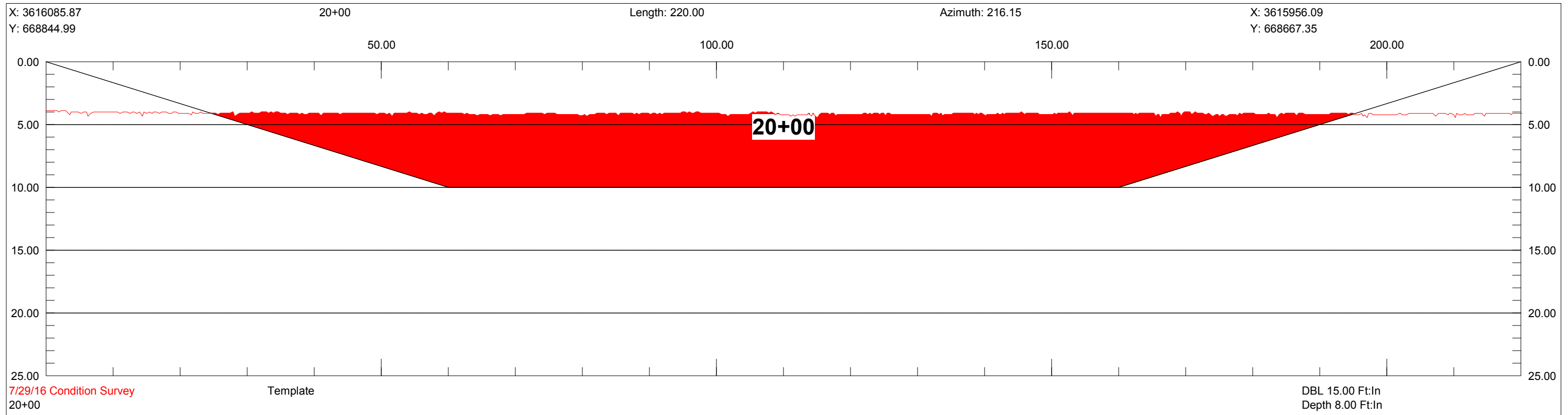
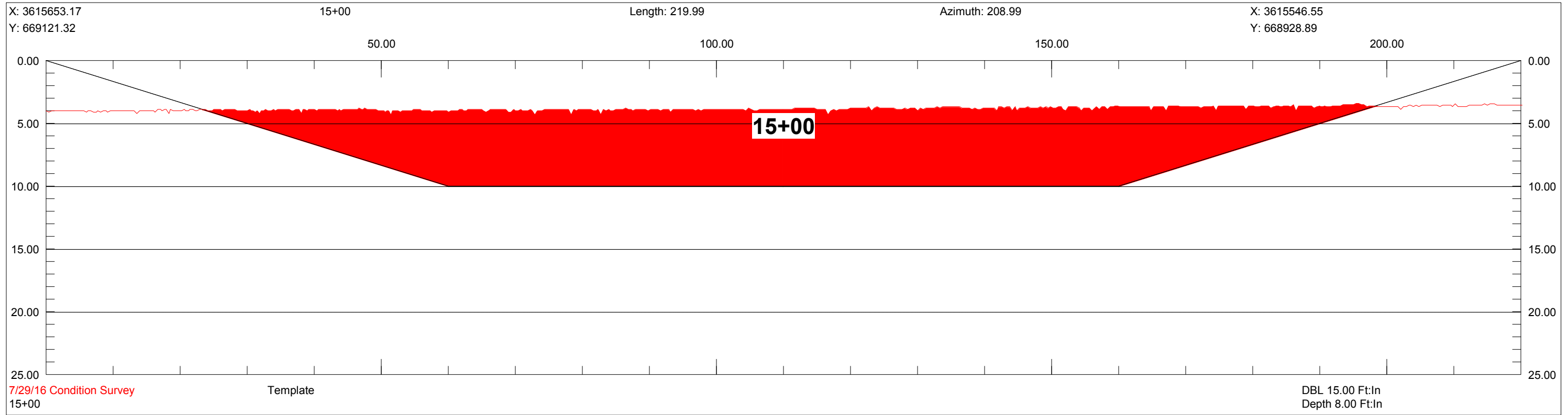
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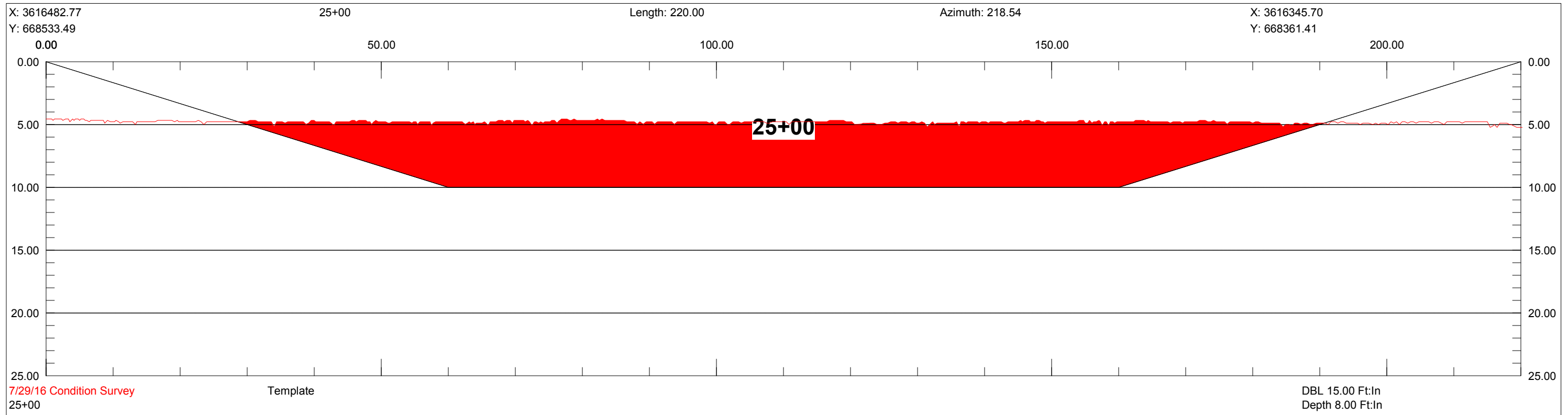
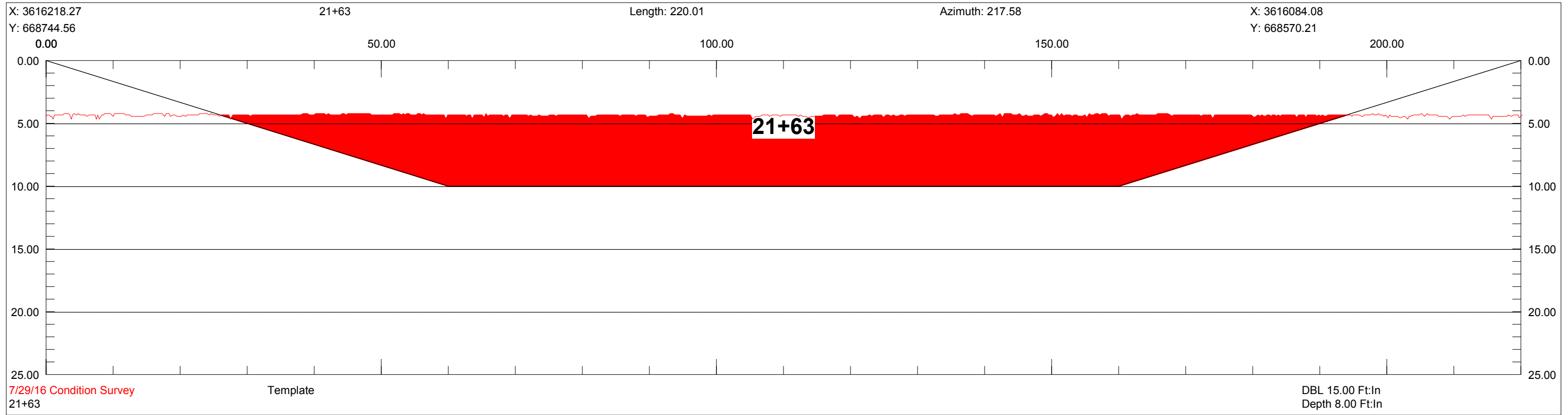
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Tangipahoa Parish, LA	
<b>STA 0+00 to 57+38</b>	
<b>Survey Date:</b> 07/29/2016	<b>Survey Type:</b> Condition
<b>Plot Size</b> ANSI B 11"x17"	<b>Sheet</b> 1 of 1



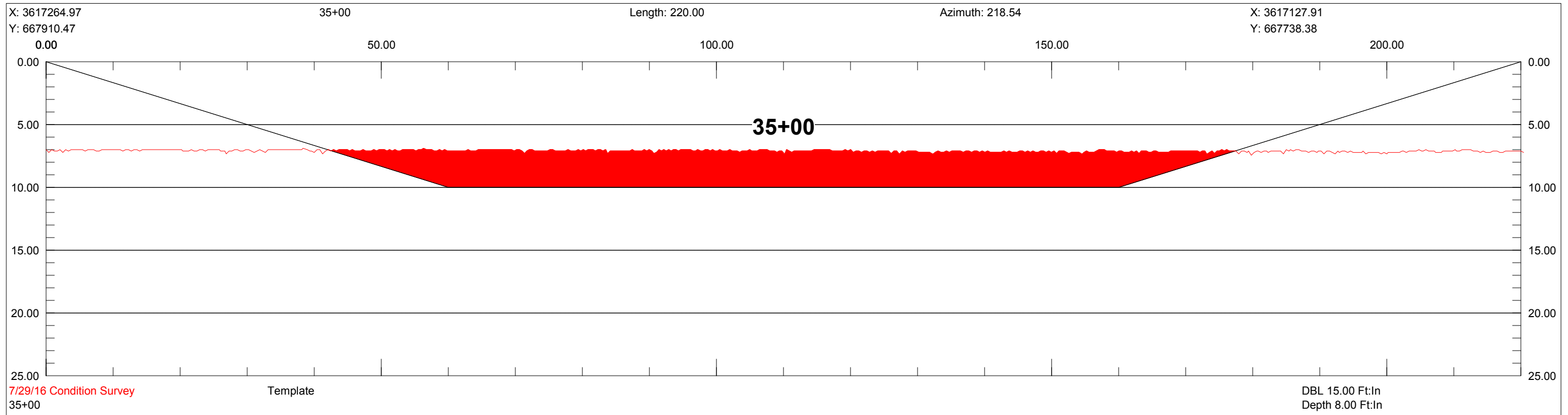
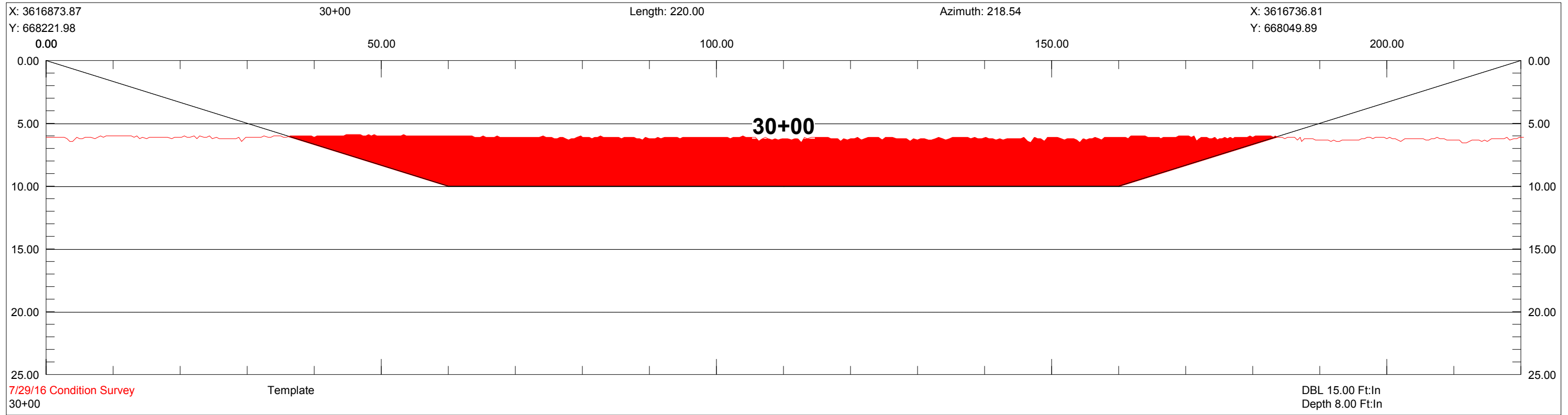


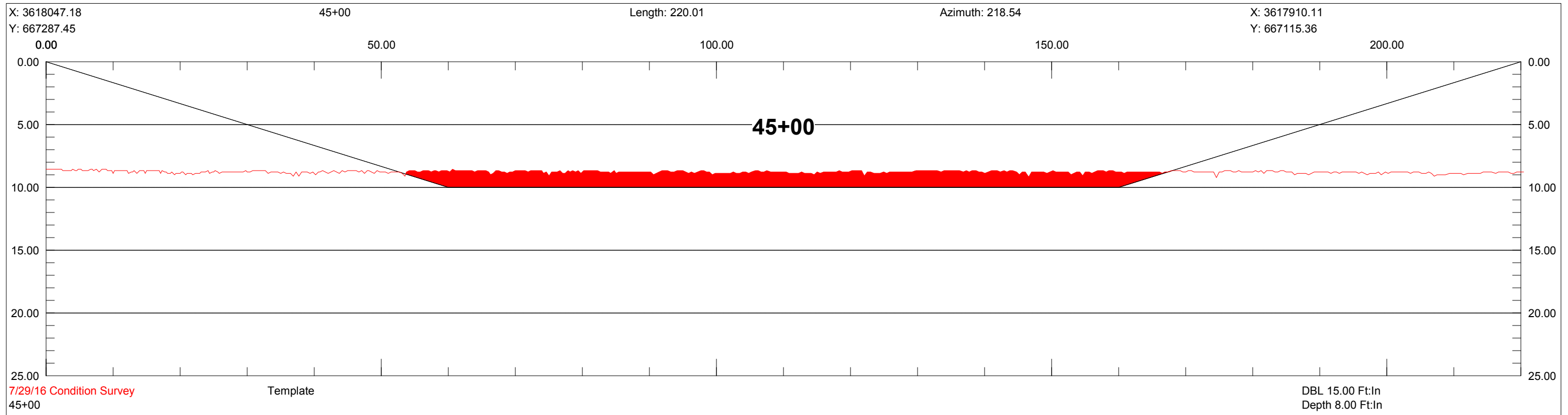
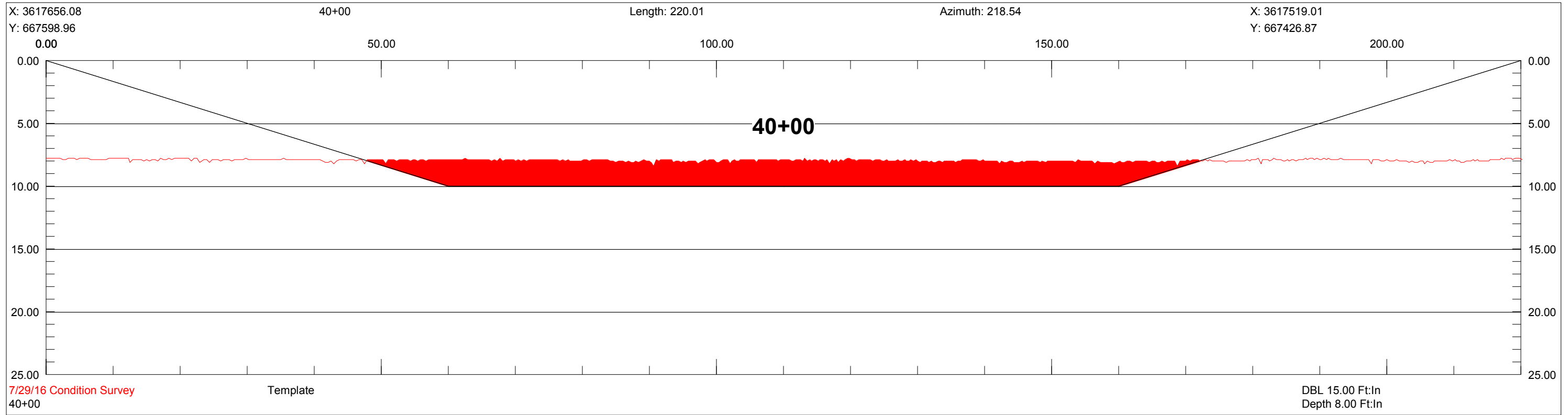


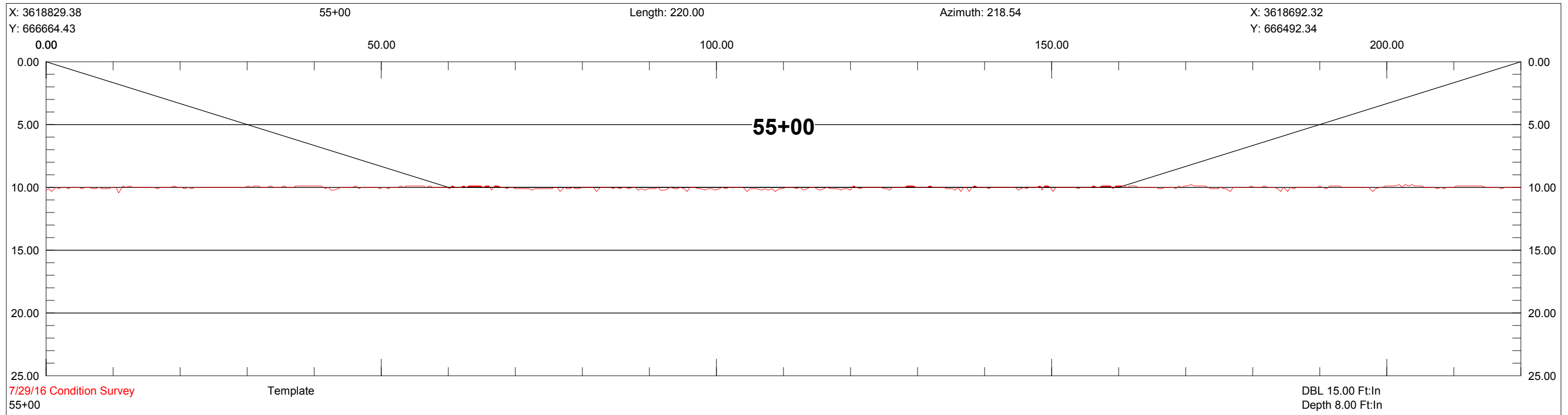
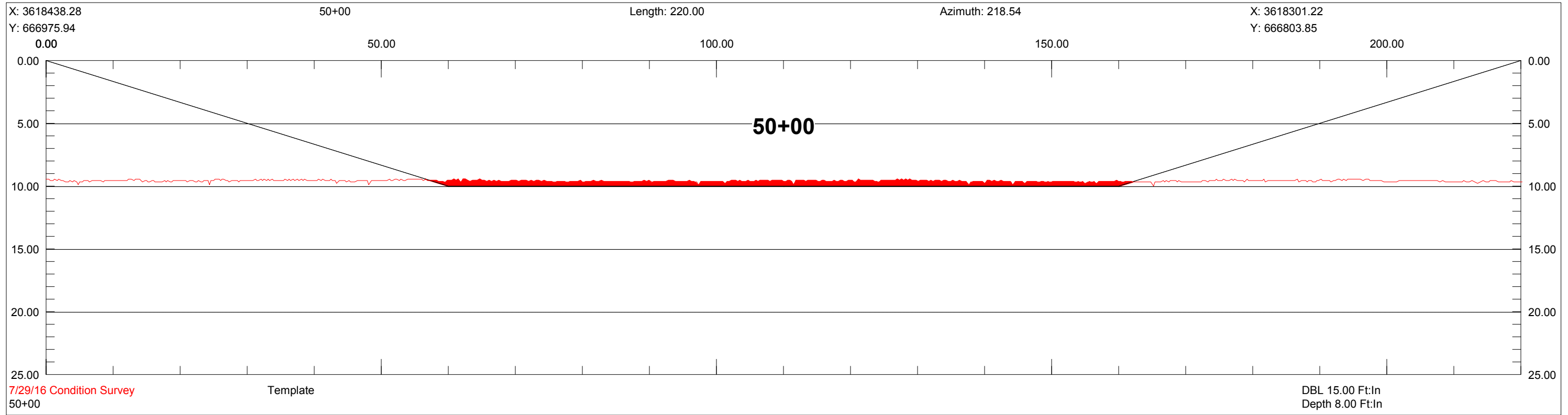


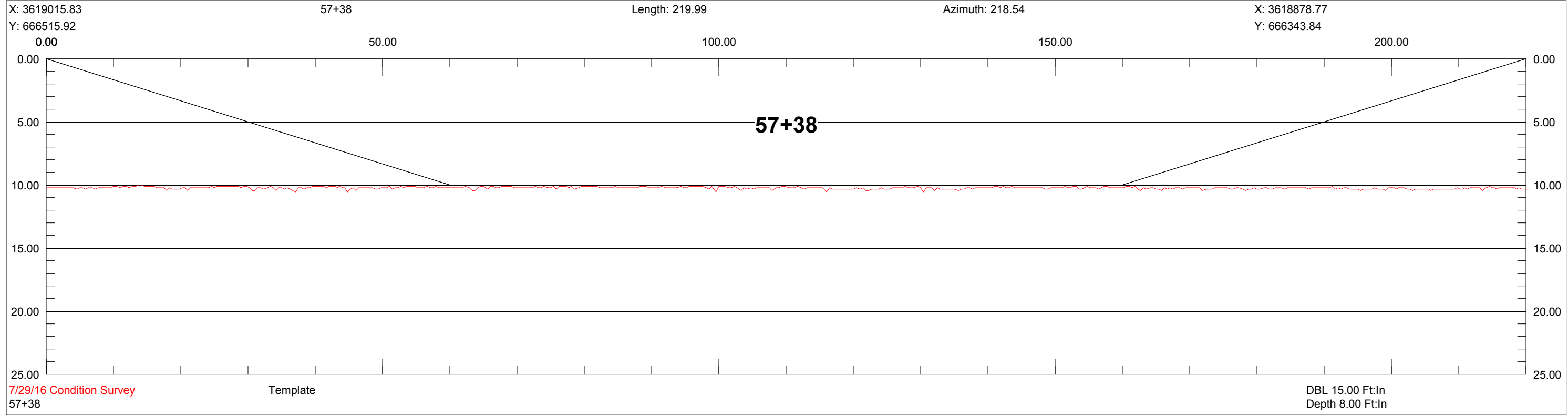












07/29/2016

Tangipahoa River Entrance Channel

STA 0+00 to 57+38

Volume Report Plan: Method: Average End Area No Segments 8/2/2016 19:33:14  
 Areas: Sq Feet, Volumes: Cu Yards

Section	Area	V1		Area	V2	
		Vol	Accum Vol		Vol	Accum Vol
00+00	5.11	0.00	0.00	0.00	0.00	0.00
03+32	78.51	513.77	513.77	0.00	0.00	0.00
05+00	302.34	1185.96	1699.73	0.00	0.00	0.00
10+00	869.24	10819.41	12519.14	0.00	0.00	0.00
15+00	847.01	15849.20	28368.35	0.00	0.00	0.00
20+00	794.56	15159.92	43528.27	0.00	0.00	0.00
21+63	765.53	4721.14	48249.41	0.00	0.00	0.00
25+00	682.30	9023.09	57272.50	0.00	0.00	0.00
30+00	481.64	10777.28	68049.78	0.00	0.00	0.00
35+00	343.29	7638.21	75687.99	0.00	0.00	0.00
40+00	229.88	5307.23	80995.22	0.00	0.00	0.00
45+00	132.01	3350.87	84346.09	0.00	0.00	0.00
50+00	45.89	1647.27	85993.36	0.00	0.00	0.00
55+00	1.99	443.33	86436.70	0.00	0.00	0.00
57+38	0.00	8.77	86445.47	0.00	0.00	0.00

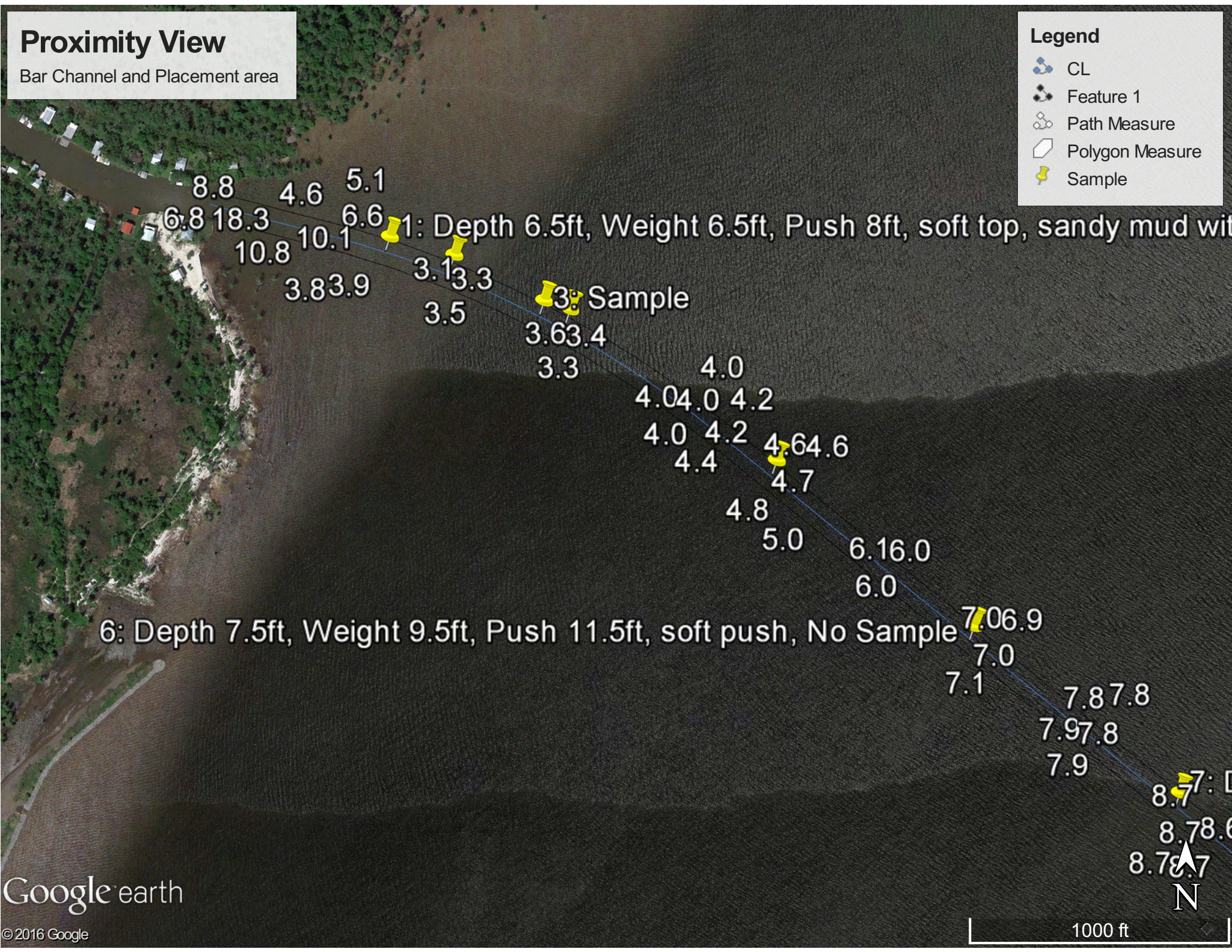


# Proximity View

Bar Channel and Placement area

## Legend

- CL
- Feature 1
- Path Measure
- Polygon Measure
- Sample










# Option 1

Placement area

**Legend**

-  CL
-  Feature 1
-  Path Measure
-  Polygon Measure
-  Sample

Google earth

© 2016 Google



600 ft

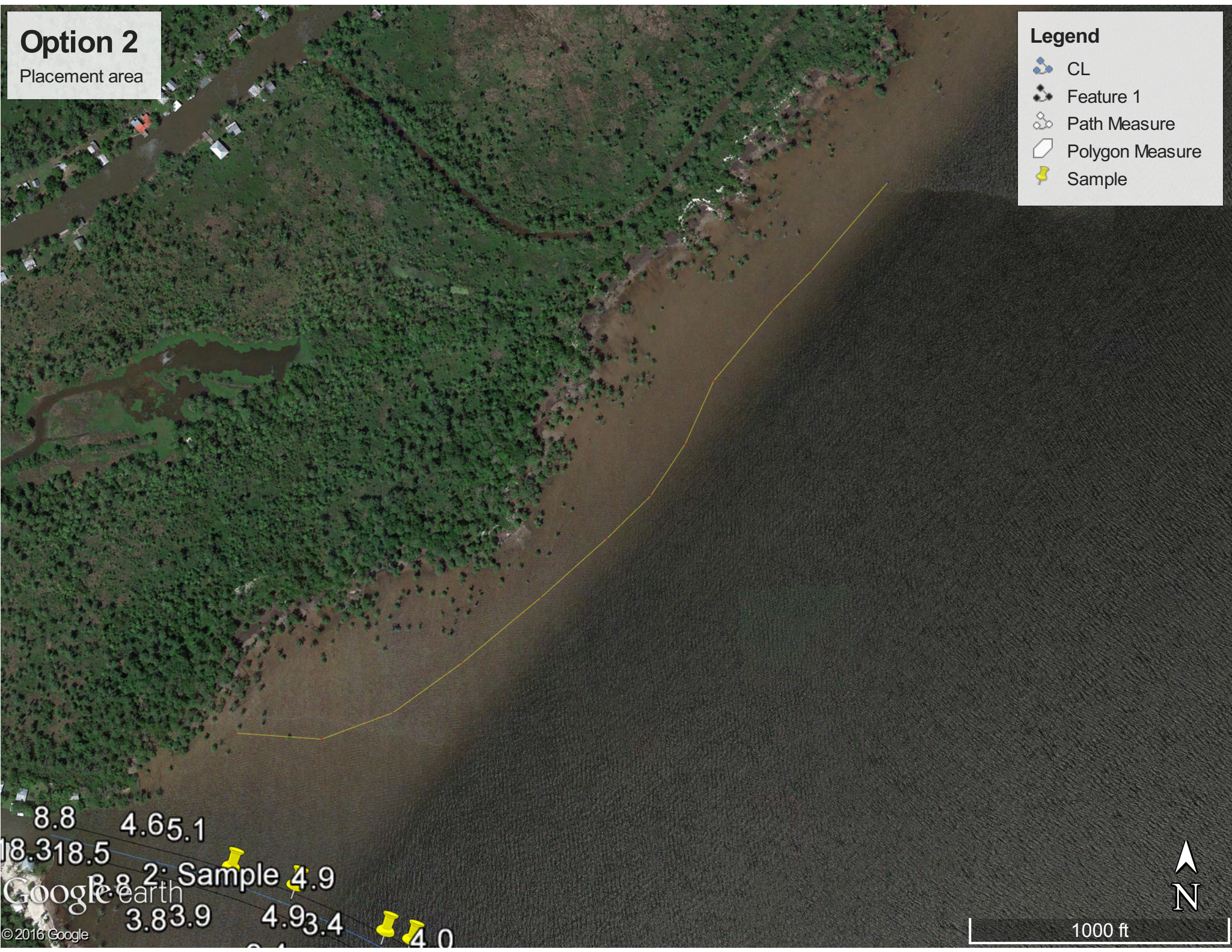


# Option 2

Placement area

## Legend

- CL
- Feature 1
- Path Measure
- Polygon Measure
- Sample



8.8 4.65.1  
18.318.5  
Google Earth Sample 4.9  
3.83.9 4.93.4  
4.0

1000 ft





APPENDIX B

2012 USACE Tangipahoa River Bar Channel Dredge Plans



C/L STATION	EASTING	NORTHING
0+00.00	3,614,155.73	669,516.32
(-)3+63.36	3,614,510.47	669,435.21
(-)21+95.00	3,616,150.98	668,657.13
(-)57+69.92	3,618,947.30	666,429.88



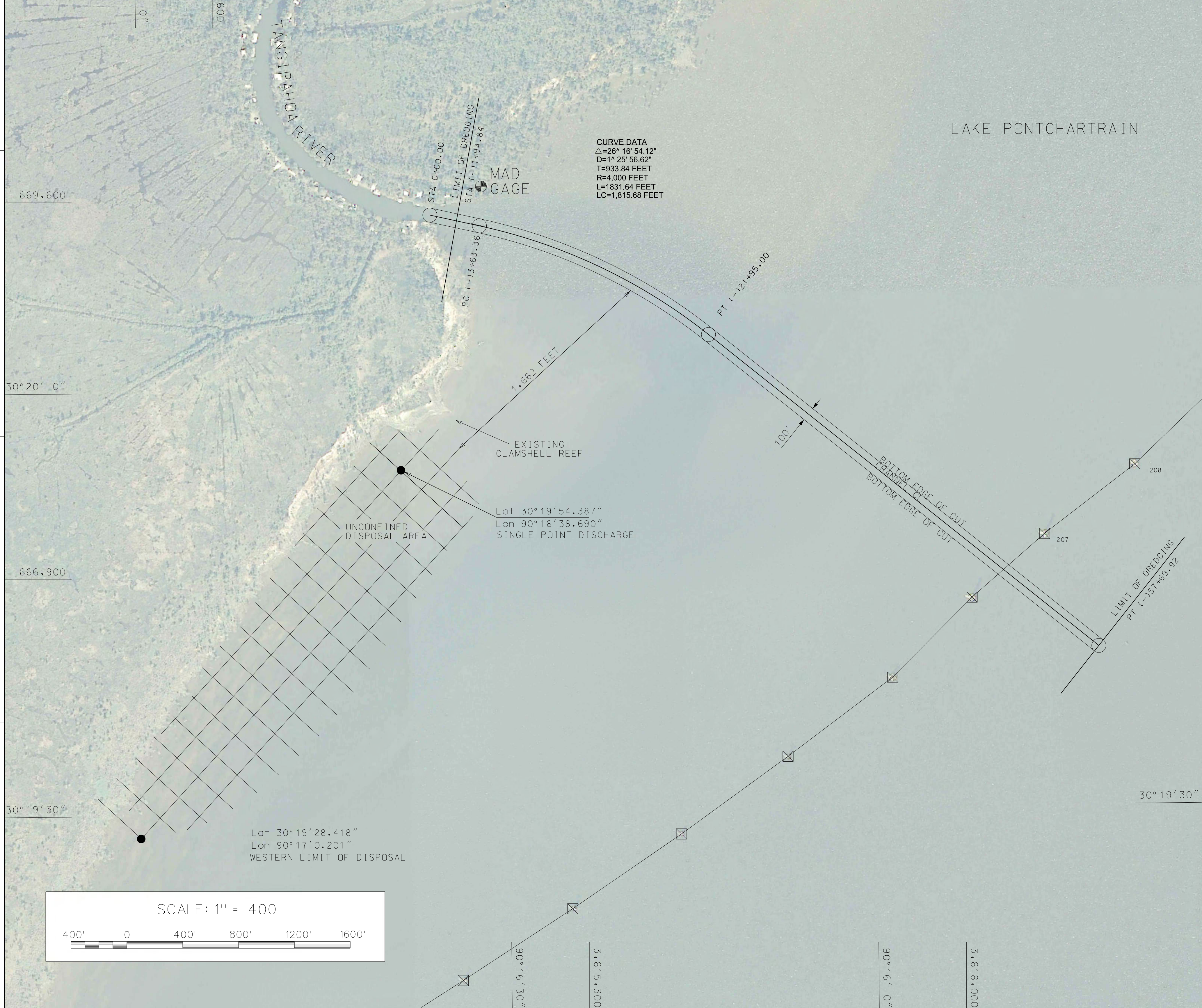
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: TRESSA SHINE	DATE: AUGUST 2012
DRAWN BY: KAO	SOLICITATION NO.:
CHECKED BY: KAO	CONTRACT NO.:
APPROVED BY: J.A. BINET	FILE NUMBER: H-16-48802
DESIGNED BY:	PILOT DATE: 30 MAY 2012
FILE NAME: 48802m05.dgn	ANSI D

LAKE PONTCHARTRAIN TRIBUTARIES  
 BAYOU LACOMBE, TANGIPAHOA,  
 AND TOHEFUNCTE RIVER BAR CHANNELS  
 MAINTENANCE DREDGING  
 ST. TAMMANY AND TANGIPAHOA PARISHES, LA  
 TANGIPAHOA RIVER BAR CHANNEL  
 PLAN VIEW

SHEET  
 IDENTIFICATION  
**C-05**

- NOTES:
1. ALL MATERIAL DREDGED FROM THE BAR CHANNEL SHALL BE DEPOSITED SOUTH OF THE EXISTING CLAMSHELL REEF.
  2. DISPOSAL IS UNCONFINED.
  3. NO EQUIPMENT OR STOCKPILING OF ANY TYPE WILL BE ALLOWED ON EITHER THE EXISTING CLAMSHELL REEF OR ADJACENT LAKESHORE.
  4. ALL ELEVATIONS ARE IN FEET AND REFER TO MEAN LOW GULF (MLG) UNLESS OTHERWISE SPECIFIED.
  5. GROUNDLINE ELEVATIONS SHOWN ARE TAKEN FROM A SURVEY DATED 7 JANUARY 2009.
  6. TOPOGRAPHY SHOWN WAS PREPARED FROM AERIAL PHOTOGRAPHS FLOWN 2008.
  7. REQUIRED CHANNEL DIMENSIONS ARE 100 FOOT BOTTOM WIDTH 1:6 SIDE SLOPES, TO AN ELEVATION OF (-) 10.0 FEET.



CURVE DATA  
 $\Delta = 26^\circ 16' 54.12''$   
 $D = 1^\circ 25' 56.62''$   
 $T = 933.84$  FEET  
 $R = 4,000$  FEET  
 $L = 1831.64$  FEET  
 $LC = 1,815.68$  FEET

SCALE: 1" = 400'







