

**Louisiana Division of Archaeology
Report No. 22-6109**

USACE Permit Number MVN 2016-01163-CM

**Phase I Cultural Resource Survey
East Grand Lake
in
Iberville Parish, LA**

Prepared for:

**Louisiana Department of Natural Resources
P.O. Box 94396
Baton Rouge, LA 70804-9396**

&

**Sigma Consulting Group, Inc.
10305 Airline Highway
Baton Rouge, LA 70816**

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February 2019

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Principal Investigator**

December 2018

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ABSTRACT

In October of 2018, ELOS Environmental, LLC (ELOS) conducted a Phase I cultural resource survey of approximately 16.5 acres (6.78 hectares) within the Atchafalaya Basin in Iberville Parish, Louisiana. The Phase I cultural resource survey was completed in fulfillment of the requirements of Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended for the Louisiana Department of Natural Resources, in support of a U.S. Army Corps of Engineers (USACE) permit application (MVN 2016-01163-CM) for the proposed Ecological Swamp Enhancement Project (East Grand Lake) in the Atchafalaya Basin. The purpose of this survey was to locate, evaluate, and record all cultural resources and if possible, make recommendations of eligibility to the National Register of Historic Places (NRHP). Because the proposed project would have direct impacts on several small areas within the much larger Atchafalaya Basin, the project was separated into 13 direct APEs. For each of the 13 direct APEs, a 0.25-mile indirect APE was established. One known archaeological site exists within indirect APE 12. The site (16IV188) is listed on the Louisiana State Historic Preservation Officer (SHPO) database and consists of a human burial just west of Cannon Bayou on the banks of Bayou Sorrel. The site was investigated by Dr. Chip McGimsey, Louisiana State Archaeologist in 2011. At the time of recording, the site was described as eroding into Bayou Sorrel and located approximately 3.0 meters below the surface. ELOS attempted to locate the burial during the Phase I cultural resource survey; however, this effort proved fruitless as water levels were very high. If the burial still exists, it would be located underwater. No previously identified historic structures are located in any of the 13 APEs, and no historic standing structures were identified during the Phase I cultural resource survey. Thus, there are no structures recommended eligible for listing on the NRHP. A total of 63 high probability shovel test pits (STPs) were excavated. No new archaeological sites, cultural resources, or isolated finds were found. Therefore, the proposed East Grand Lake project is unlikely to have any negative effects on historic or cultural resources located within the APE. No further cultural resources work is recommended. A copy this report and all records of this project will be curated with the Louisiana State Historic Preservation Officer (SHPO) in Baton Rouge, Louisiana.

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APPENDICES

APPENDIX A.	Project Plans for the Ecological Swamp Enhancement Project (East Grand Lake) in the Atchafalaya Basin
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ACKNOWLEDGEMENTS

ELOS Environmental, LLC (ELOS) has prepared this report for the proposed Ecological Swamp Enhancement Project (East Grand Lake) in the Atchafalaya Basin for Sigma Consulting Group, Inc. and the Louisiana Department of Natural Resources. Martin J. Healey, M.A., R.P.A. served as the Principal Investigator for this project. The report was authored by Martin Healey, M.A., R.P.A. and Walter Hano, M.A., R.P.A., with contributions by Carey Lynn Perry, Maria Bernard Reid, Brittany Berthelot, Jesse McQuigg, and Flynn Daigle, who served as Project Manager. ELOS would like to thank the Louisiana State Historic Preservation Officer's (SHPO) staff for their guidance and assistance. ELOS would also like to thank the field crew for their hard work and dedication, including: Martin Healey, who served as Field Director, Wren Vicknair, Adam Trahan, and Taston Brookshire. The authors thank ELOS principals, Jay Prather and Lucas Watkins, for their continued support for the Cultural Resource Program.

1.0 INTRODUCTION

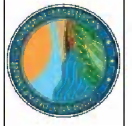
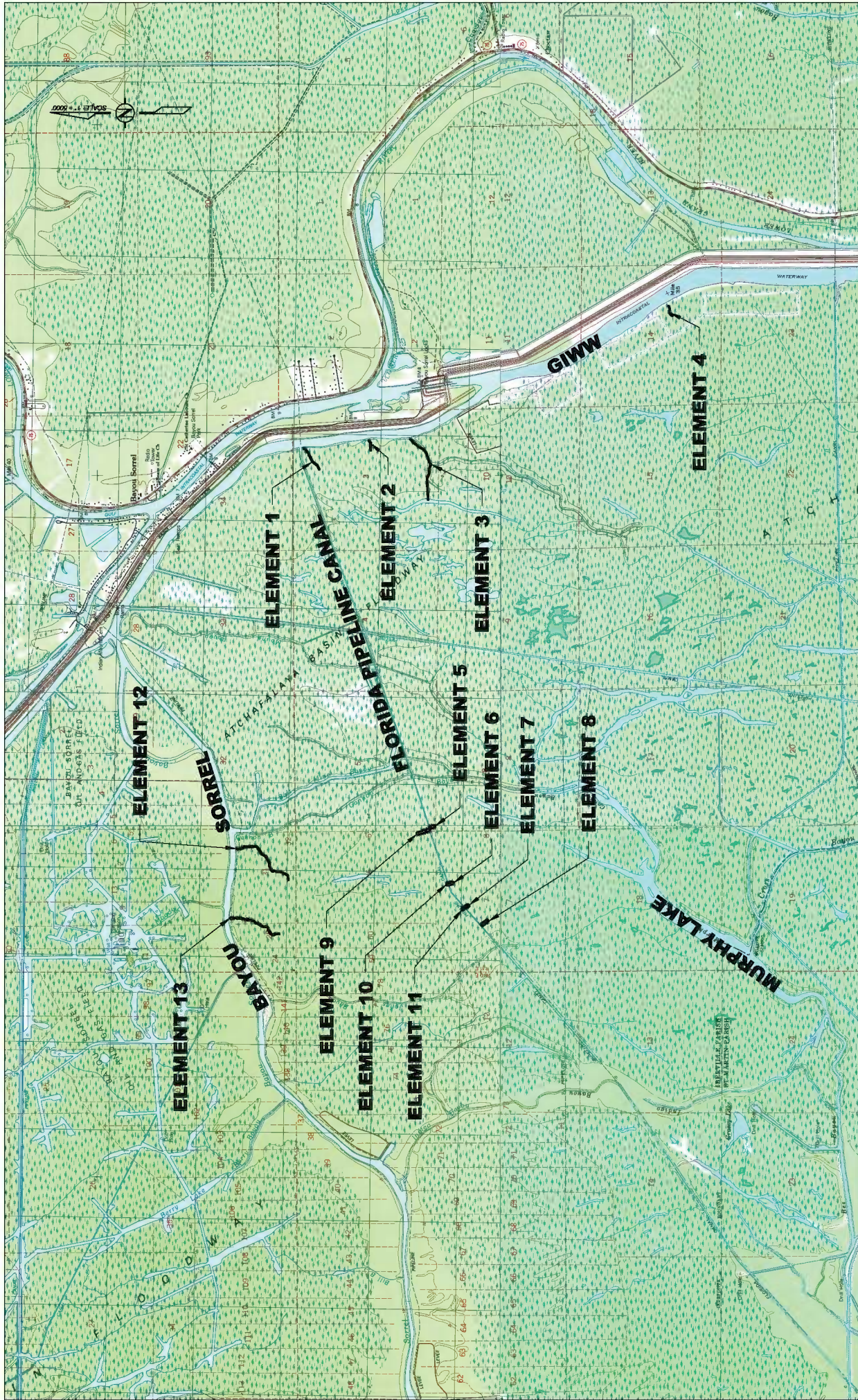
1.1 Project Description and Lead Agency

ELOS Environmental, LLC (ELOS) conducted a Phase I cultural resource survey of approximately 16.5 acres (6.78 hectares) within the Atchafalaya Basin in Iberville Parish, Louisiana. The Phase I cultural resource survey was completed in fulfillment of the requirements of Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, for the Louisiana Department of Natural Resources (LDNR), in support of a U.S. Army Corps of Engineers (USACE) permit application (MVN 2016-01163-CM) for the proposed Ecological Swamp Enhancement Project (East Grand Lake) in the Atchafalaya Basin. In accordance with Section 106 of the NHPA, Federal agencies, such as the USACE, are required to take into account the effects of any permitted action to historic properties, which includes both archaeological resources on the surface or below ground, as well as historic buildings and structures that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

The proposed East Grand Lake Project is located within the Atchafalaya Basin, in Sections 3, 5, 6, 7, 14, 25, 31, and 32, Township 10 South – Range 11 near the town of Bayou Sorrel, Louisiana, and includes Bayou Sorrel, the Gulf Intracoastal Waterway (GIWW), and the Florida Pipeline Canal (**Figure 1**). The LDNR requests Department of the Army authorization to clear, grade, excavate, dredge, and place fill to improve the north to south hydrologic flow in Bayou Sorrel during moderate river stages to improve the circulation and ecological function throughout the back swamp of the East Grand Lake area of the Atchafalaya Basin. Proposed work would take place within 13 distinct Element Areas (existing channels) within the basin (**Figure 1**) and would include shaving and dredging existing spoil banks, clearing, snagging, excavation, dredging, and placement of spoils in designated areas, no higher than 6 feet in elevation, to be planted with native tree species to accomplish the return of positive water conveyance.

Dredging, clearing, and removal of existing trees would take place within flooded portions of the existing channels at Element Areas 1, 2, 3, 4, 12, and 13, and existing trees on the banks would remain (**Figure 2**). Disposal areas, which would create ground disturbance, would be established along the existing channel at these Element Areas; detailed design plans provided by LDNR for each Element Area are provided in **Appendix A**. Dredging would not occur along the remaining unflooded portions of Element Areas 1, 2, 3, and 12; however, clearing and the removal of existing trees would disturb the ground surface (**Figure 3**).

At Element Areas 5, 6, 7, 8, 9, 10, and 11, dredging, clearing, and snagging would be conducted within flooded portions of the existing channels to remove existing trees; all existing trees on the banks would remain (**Figure 2**). Disposal areas, which would create ground disturbance, would also be established along the existing channels at these Element Areas (**Figure 3; Appendix A**).



SIGMA
CONSULTING
GROUP, INC.

Atchafalaya
RIVER BASIN

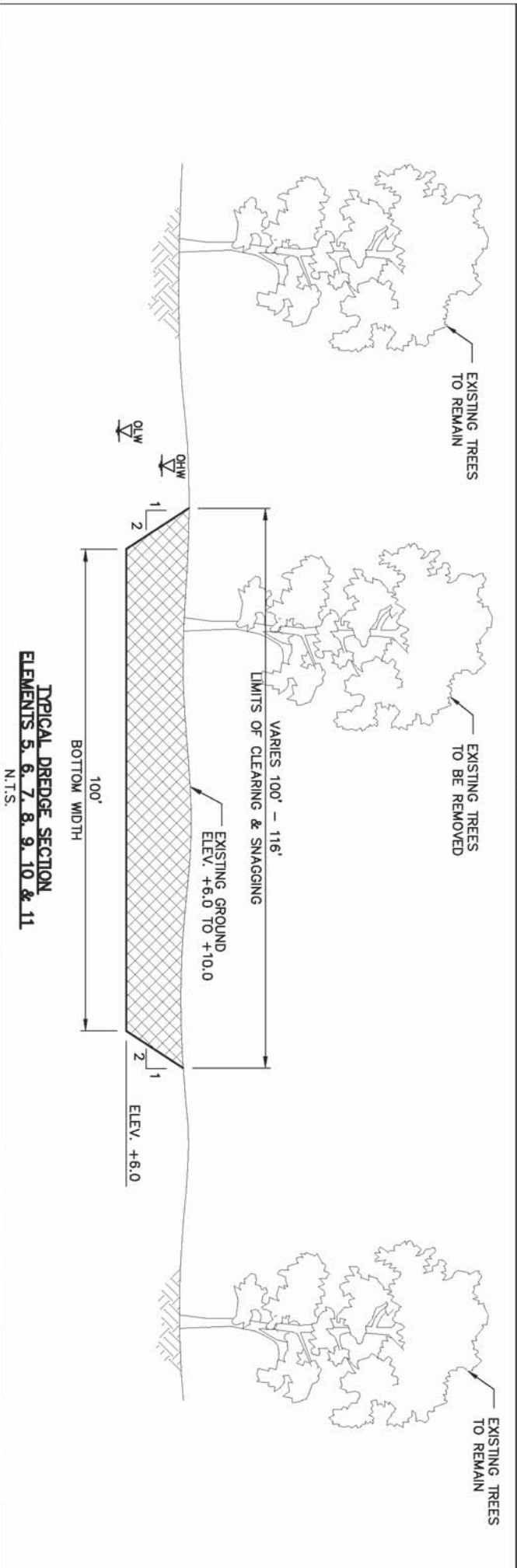
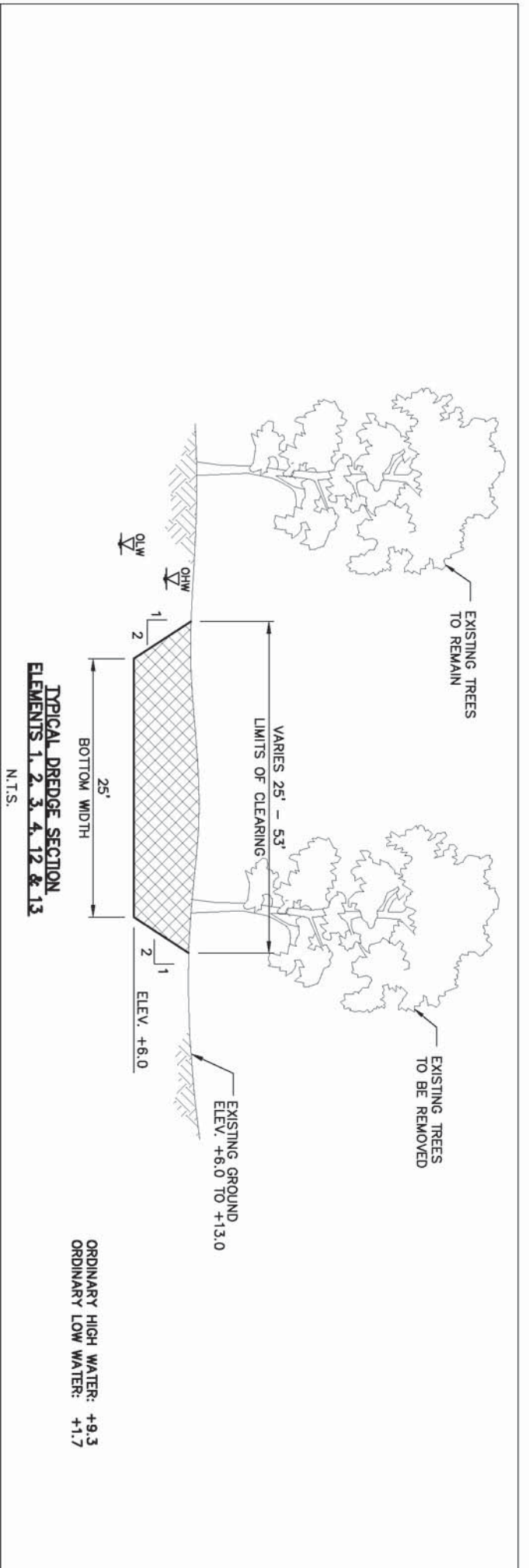
**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

LOCATION MAP

REV.	DATE	DESCRIPTION	BY

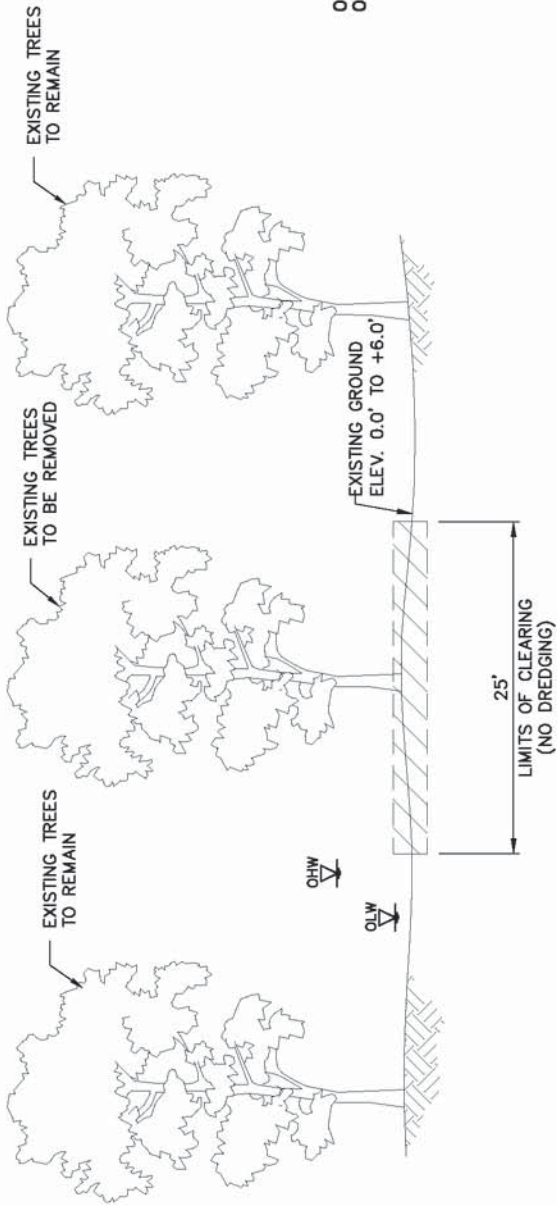
DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR
FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	
WBS NUMBER: F.11000077	
COE PERMIT NUMBER: MVN 2016-01163-CY	DATE: FEBRUARY 2018
SHEET: 2 OF 29	

Figure 1. Proposed Ecological Enhancement



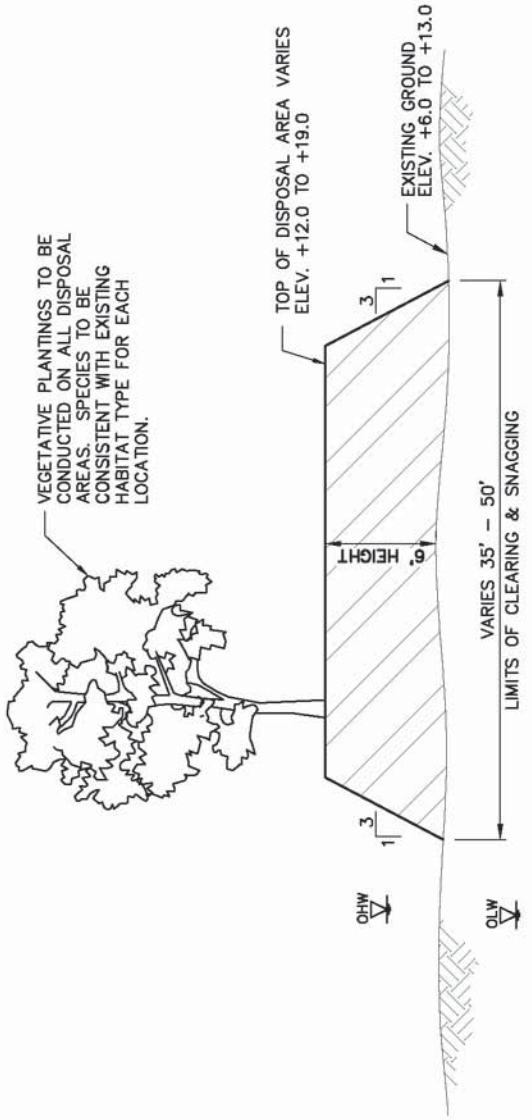
<p>EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA</p>							
<p>DREDGE SECTIONS</p>							
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY	DATE: FEBRUARY 2018

Figure 2. Dredge Sections



ORDINARY HIGH WATER: +9.3
 ORDINARY LOW WATER: +1.7

TYPICAL CLEARING & SNAGGING SECTION
ELEMENTS 1, 2, 3 & 12
 N.T.S.



TYPICAL DISPOSAL AREA SECTION
ALL ELEMENTS
 N.T.S.

SEE PLAN VIEWS FOR DIMENSIONS

REV.	DATE	DESCRIPTION	BY
EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA			
DRAWN BY: D. THYMES		DESIGNED BY: R. LEAR	
CLEARING & DISPOSAL AREA SECTION			
SIGMA CONSULTING GROUP, INC.		WBS NUMBER: F.11000077	
FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83		COE PERMIT NUMBER: MVN 2016-01163-CY	
DATE: FEBRUARY 2018		DATE: FEBRUARY 2018	
SHEET: 5 OF 29			

Figure 3. Clearing and Disposal Area Sections

In total, approximately 25,535 cubic yards of native material will be excavated and re-deposited to complete the proposed project, resulting in approximately 16.5 acres of ground disturbance impacts (**Appendix A**). The LDNR proposes that the area of benefit would be approximately 5,560 acres of swamp habitat through hydrologic restoration.

The purpose of this Phase I cultural resource survey was to locate, evaluate, and record all cultural resources and, if possible, and make recommendations of eligibility to the NRHP. Because the proposed project would have direct impacts on several small areas within the much larger Atchafalaya Basin, the area was separated into 13 direct areas of potential effects APEs (**Figure 4**), which correspond with the proposed Element Areas (see **Figure 1**). For each of the 13 direct APEs, a 0.25-mile indirect APE was established (**Figure 4**).

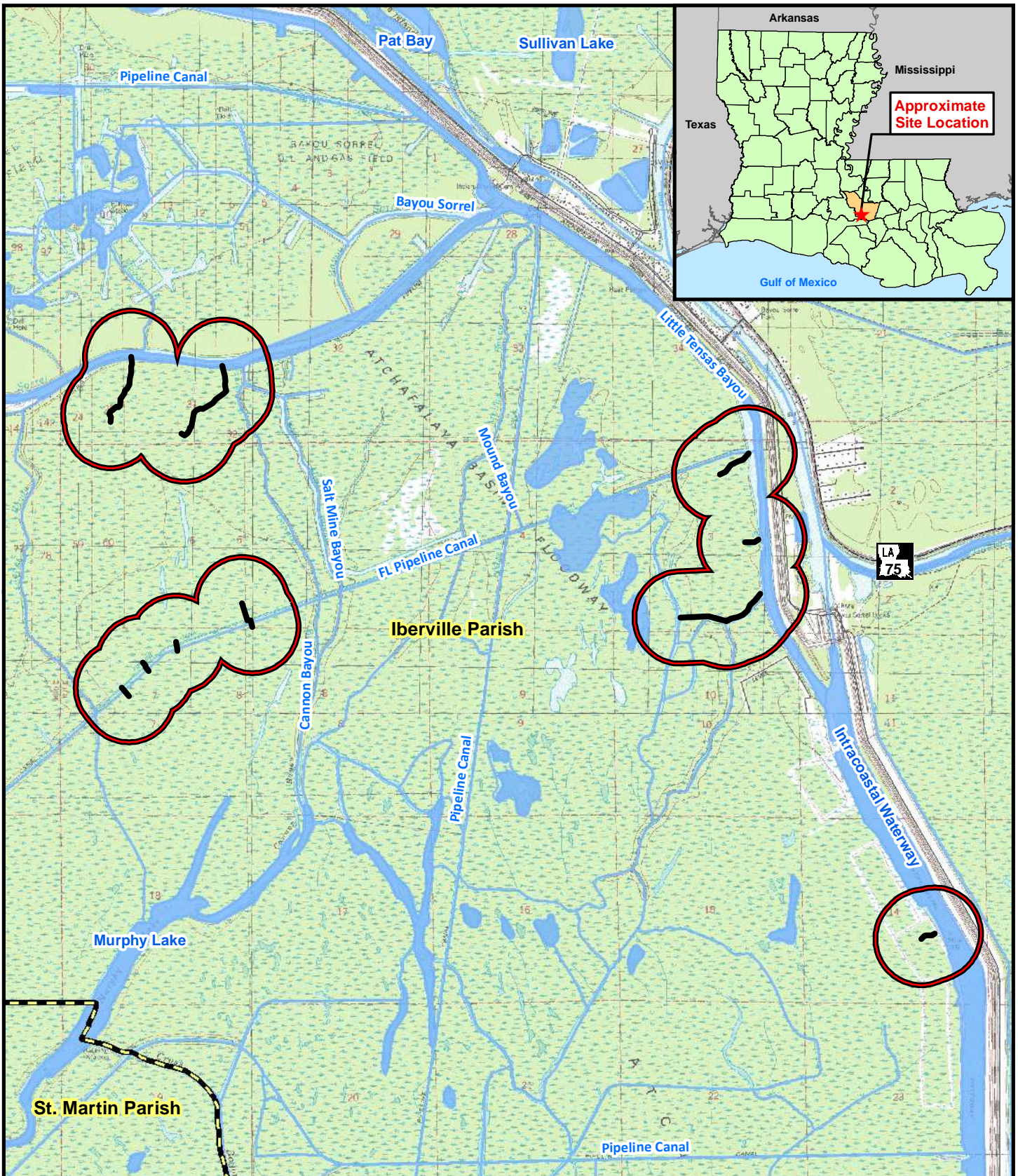
1.2 Key Personnel and Dates of Work

This Phase I cultural resource survey complied with Section 106 of NHPA, as amended by 16 US Code 407f and with its implementing regulations 36 Code of Federal Regulations (CFR) Part 800 and satisfies the NHPA Section 106 requirements for USACE permit number MVN 2016-01163-CM. The assessment was overseen by a professional archaeologist meeting the qualifications as specified in the Secretary of the Interior's Professional Qualification Standards (Federal Register, Vol. 48, No. 190, Thursday, Sept 29, 1983, pp 44738-44739).

ELOS personnel conducted an archaeological field investigation from October 10 to October 11, 2018. Martin Healey, M.A., RPA, served as Field Director, with Wren Vicknair, Adam Trahan, and Taston Brookshire serving as archaeological technicians. The investigation was conducted in accordance with the 2018 Phase I Cultural Resource Survey Guidelines, as established by the Louisiana Office of Cultural Development, Division of Archaeology (DOA). A total of 63 high probability shovel test pits (STPs) were excavated.

1.3 Summary of Report Organization

After this introduction (**Chapter 1.0**), the following chapters in this report describe the land use history (**Chapter 2.0**), previous investigations (**Chapter 3.0**), methods (**Chapter 4.0**), results (**Chapter 5.0**), summary and recommendations (**Chapter 6.0**), and references (**Chapter 7.0**).



0 2,500 5,000 Feet

Figure 4: Direct and Indirect Project APEs

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)
- Parish Boundary
- Highway
- Roadway
- Stream/River
- Waterbody

11 East, 11 South :Range
3,5,7,8,14,25,31,32 :Sections
10 South, 11 South :Township

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

2.0 LAND USE HISTORY

2.1 Natural Setting of Project Area

The project area is located within the Mississippi Alluvial Plain Ecoregion, Inland Swamp and Coastal Marshes subregion of Louisiana, according to the 2018 Louisiana's Comprehensive Archaeological Plan (Girard et al. 2018). The Mississippi Alluvial Plain Ecoregion covers most of the eastern half of northern Louisiana and forms a central corridor through the southern part of the state. The ecoregion encompasses many of the state's major aggrading floodplain landforms and watercourses.

The Inland Swamp and Coastal Marshes subregion represents the transition between freshwater back swamps to fresh, brackish, and saline waters of the deltaic marshes in the state (Girard et al. 2018). The project area lies within the Atchafalaya Basin, which is one of the most extensive bottomland hardwood forest swamps in North America and constitutes a large portion of the Inland Swamp and Coastal Marshes subregion. Habitat types within the project area consist of cypress/tupelo swamp and bottomland hardwood forests. Flora encountered during the October 2018 field investigation include: baldcypress (*Taxodium distichum*), water tupelo (*Nyssa aquatic*), eastern cottonwood (*Populus deltoides*), black willow (*Salix nigra*), water oak (*Quercus nigra*), sweetbay magnolia (*Magnolia virginiana*), blackgum (*Nyssa sylvatica*), American holly (*Ilex opaca*), red maple (*Acer rubrum*), southern wax myrtle (*Morella cerifera*), American sweetgum (*Liquidambar styraciflua*), palmetto (*Sabal minor*), muscadine (*Vitus rotundifolia*), yaupon (*Ilex vomitoria*), slender woodoats (*Chasmanthium laxum*), sawtooth blackberry (*Rubus argutus*), roundleaf greenbrier (*Smilax rotundifolia*) (**Photograph 1**).

2.2 Geomorphology of Project Area and its Potential Effect on Sites

Much of the land within this subregion is low-lying and subject to seasonal flooding (Girard et al. 2018). The surface relief of the project area is relatively flat, with no significant elevation changes or drainage patterns (**Figure 5**). Numerous bayous drain the region with their natural levees providing the only elevated ground (**Figure 5**).

Within this subregion, most cultural resource sites are concentrated along the natural levees (Girard et al. 2018). Channel migration has eroded many landforms, and sediment deposition has buried many others. Regional subsidence has resulted in many older landforms and sites being submerged below the modern surface. Cultural resource sites are primarily affected by erosion and burial by modern sedimentation (Girard et al. 2018).

The natural drainage pattern (**Figure 6**) and ecology has been significantly altered by modern control of the Mississippi River and tributary stream channels. One result is extensive modern sediment deposition in some areas of the swamp (Girard et al. 2018). Within the project area,

soils are poorly drained and include: Carville soils (CF), Convent silt loam (CV), Dowling (DW), Fausse soils (FE), Gramercy silt clay loam (Gr), Levees-Borrow pits complex (LE), and Schriever Clay (Se) (U.S. Department of Agriculture 2017; **Figure 7**). Soils in all areas of this investigation appeared to be fairly uniform. Surface soils averaged 10YR 4/3, which was a brown sandy soil on the surface to approximately 10 to 20 centimeters (cm) in depth. Soils below 20 cm were in the range of 10 YR 5/4 yellowish brown, sandy clay loam to 6/4 light yellowish brown, sandy clay loam. This was typical for all APEs. All shovel test pits (STPs) produced only two soil strata (**Photograph 2**).

2.3 Overview of Historic Land Use and its Potential for Impacts to Sites

The Atchafalaya Basin's cultural history goes back at least 2,500 years, and possibly more than 6,000 years, when Native Americans were living in the Basin along natural levees and bayous during a time when the Mississippi River flowed down the course of the present-day Bayou Teche. Archeological research indicates that many mound sites and villages on natural levees and along bayous within the Basin date from AD 700-1700. It appears that the first widespread movement by people into the middle of the Atchafalaya swamp occurred around AD 500. Settlement remained concentrated on the high natural levees of the major rivers and large bayous.

The Chitimacha Indian tribe is the one identifiable group with the longest historical ties to the Atchafalaya Basin. The original tribal territory was a triangular trace of land subsuming the middle and lower Atchafalaya Basin. A tribal population of 4,000 has been estimated for the year 1650. More than 15 villages were clustered on Bayou Teche, Grand Lake, Grand River, Bayou Plaquemine, and Butte La Rose.

European incursions into what became Louisiana began with the expedition of Hernando De Soto in 1543. In 1682, Rene Robert Cavelier, Sieur de la Salle claimed the Mississippi River and the lands that it drained for France. During the early 1700s, French settlers arrived in the Atchafalaya Basin to engage in fur trading with the Native Americans and launch raids into tribal areas to acquire slaves. In 1703, the British won control over most of what was then known as Acadia (present-day Nova Scotia, Canada). 8,000 French-speaking residents were removed to various colonies of the Eastern seaboard as well as to England, France, and other countries. In 1765, Acadians began moving to Louisiana and settling in New Orleans and along the Teche Ridge. Over time, the Acadians intermarried with other settlers of the area, including Hispanics, Old World and Canadian French, Anglo-Americans, Native Americans, and enslaved Africans, resulting in what ultimately became known as French Creole culture.

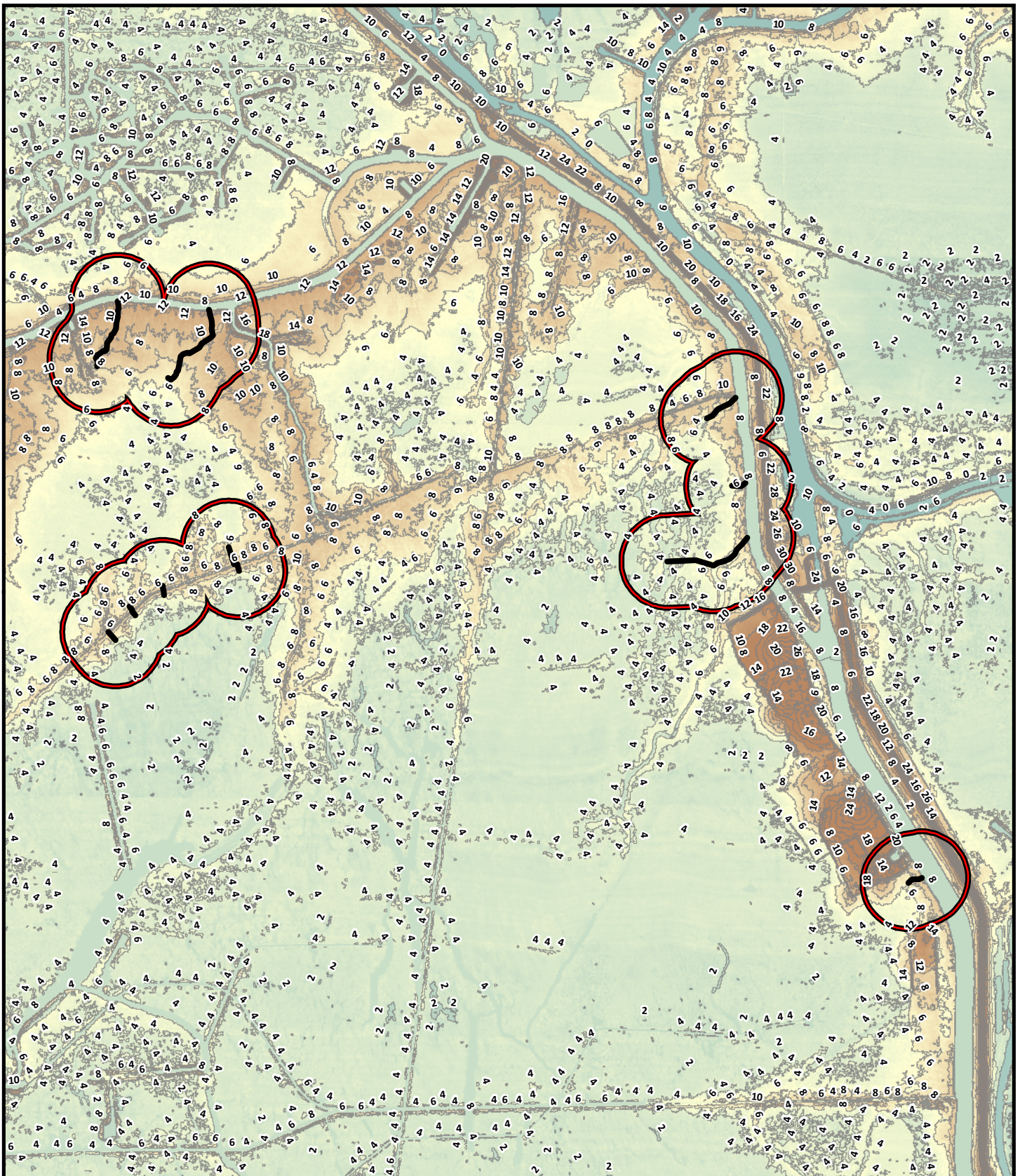
In 1812, statehood was granted to Louisiana officially making it a part of the United States. During the Civil War both the Union and Confederate forces fought for control of the Atchafalaya Basin between 1862 and 1863. The Union wanted to have a strong presence in the area to cut off reinforcements from Texas, and the Confederates wanted the exact opposite.



Photograph 1. Flora Located on North Side of Direct APE 2.



Photograph 2. Photo Showing Two Strata That Was Typical for All STPs



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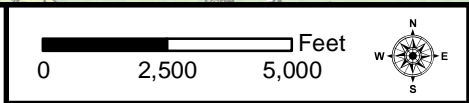


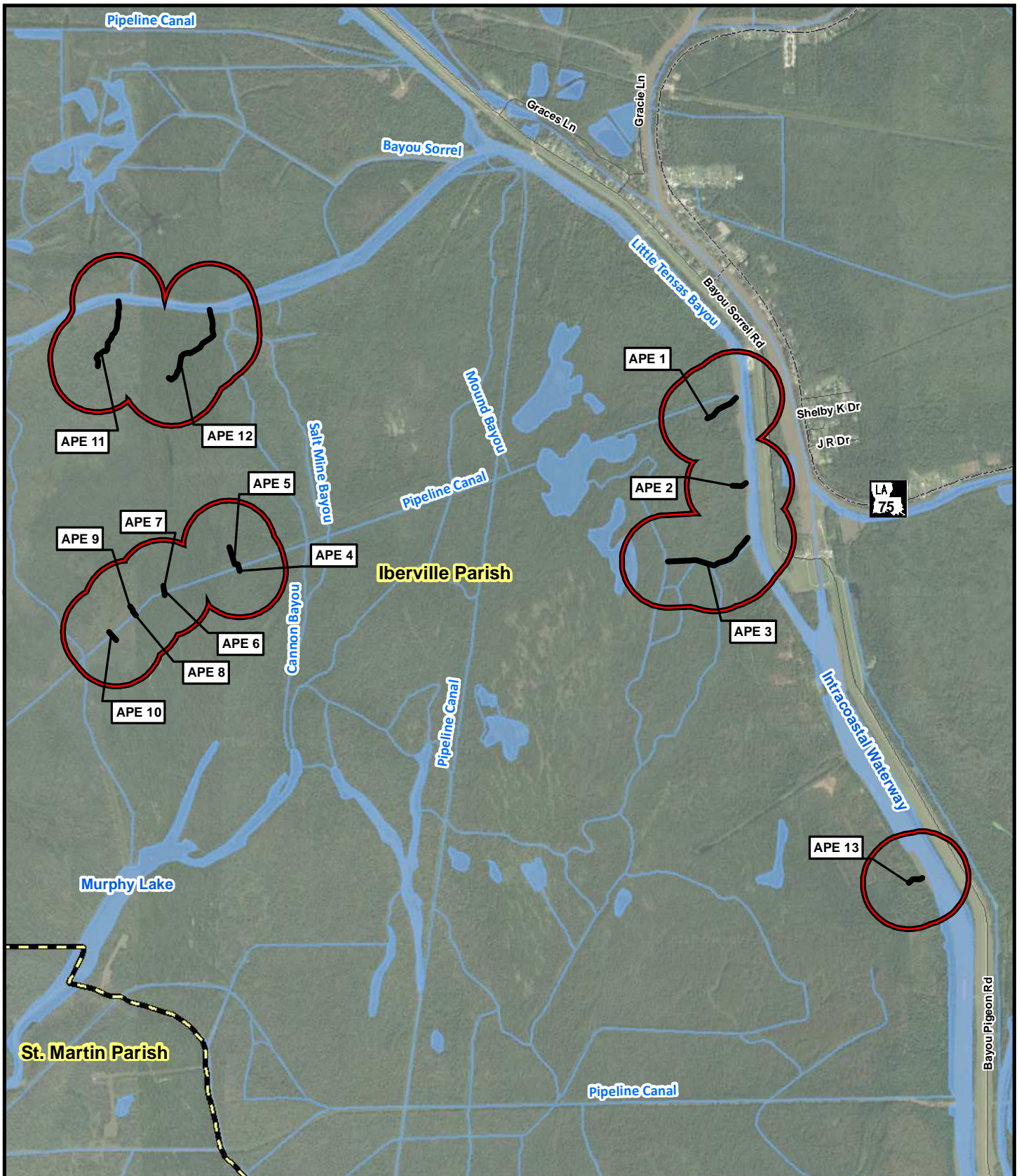
Figure 5: Elevations Map

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Radius)
- Contours
- Higher
- Lower

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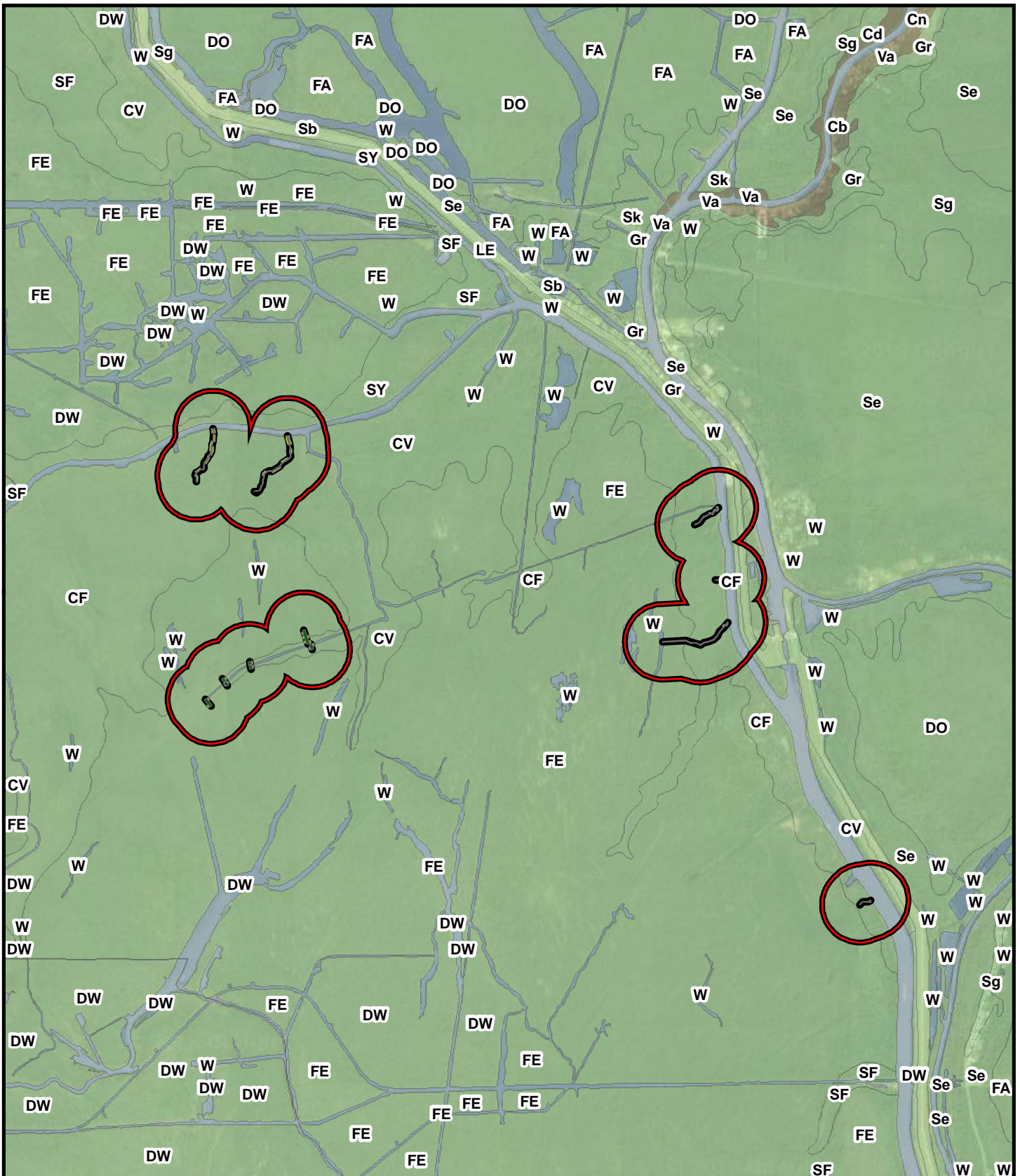
0 2,500 5,000 Feet

Figure 6: Drainage Features in the Project Area
East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)
- ▭ Parish Boundary
- Highway
- Roadway
- Stream/River
- Waterbody

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0 3,000 6,000 Feet

Figure 7: Soils Map

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)
- Hydric
- Non-Hydric
- Water

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By 1864 there was still some acts of violence and occasional guerilla warfare, but no large-scale invasions occurred for the remainder of the war.

Much of the Atchafalaya Basin remains undeveloped, except for timber and some oil and gas exploration (Girard et al. 2018). As previously mentioned, neither historic imagery nor historic topographic maps show any indications of historic structures in the project area. Historic maps of the area did not reveal any historic roads, railroads, or military activity. The land is undeveloped and from the historical resources that were analyzed, it is believed the APEs have not served any significant purpose for some time. The project area is primarily used non-commercially for hunting and fishing.

3.0 PREVIOUS INVESTIGATIONS

ELOS conducted a records search for previously surveyed areas in order to identify cultural resources within the APEs. This research found six records in the Louisiana Cultural Resource Map database within the APEs as shown in **Figures 8, 9, 10, and 11** and in **Tables 1 and 2**. The records are as follows:

- 22-2330, *Phase I Cultural Resources Survey and Archeological Inventory of the Bayou Sorrel Lock Replacement Project, Iberville Parish, Louisiana, 2001*, R. Christopher Goodwin & Associates, Inc. This document presents the results of Phase I cultural resources survey and archeological inventory of the proposed Bayou Sorrel Lock Replacement Project (Contract No. DACW29-97 -D-00 18) in Iberville Parish, Louisiana.
- 22-2331, *Evaluation of the National Register Eligibility of the Bayou Boeuf, Bayou Sorrel, and Berwick Locks and the Calumet and Charenton Floodgates in the Atchafalaya Basin, Louisiana, 2000*, R. Christopher Goodwin & Associates, Inc. This study was undertaken to inventory and to assess the significance of built resources in five locations along the East and West Atchafalaya Basin Protection Levees applying the NRHP criteria for evaluation (36 CFR 60.4 [a-d]). These investigations were conducted in partial compliance with Section 110 of the NHPA. Section 110 of NHPA directs federal agencies to identify, evaluate, nominate, and protect properties under their jurisdiction that are eligible for listing in the NRHP.
- 22-3054 2007 *Annual Report for Management IV and V, Regional Archaeology Program, Museum of Natural Science*, Louisiana State University. This report lists site 16IV4, Bayou Sorrel Mound(s), a multicomponent site which includes both prehistoric and historic components. While not listed as eligible for the NRHP, its research potential is listed as excellent. This site is not within any of the proposed project's APEs.
- 22-2261, *Channel Improvements in the Atchafalaya Basin: Land Use Studies in Assumption, Iberia, Iberville, Pointe Coupee, St. Martin, St. Mary, Terrebonne, and West Baton Rouge Parishes*, R. Christopher Goodwin & Associates, Inc. This land use history

examines various waterways that flow through 183.37 mi of the Lower Atchafalaya Basin, where the U.S. Army Corps of Engineers, New Orleans District, plans construction of channel improvements and alternative barrier levees in eight Louisiana parishes. There are seven standing structures located in the area, and all are located on the eastern bank of Bayou Sorrel. This project examined environmental issues related to the oil and gas industry and identified the Bayou Sorrel Superfund Site in Iberville Parish, which has been remediated but remains under surveillance. This project did not identify any additional cultural sites within areas of this project's APEs.

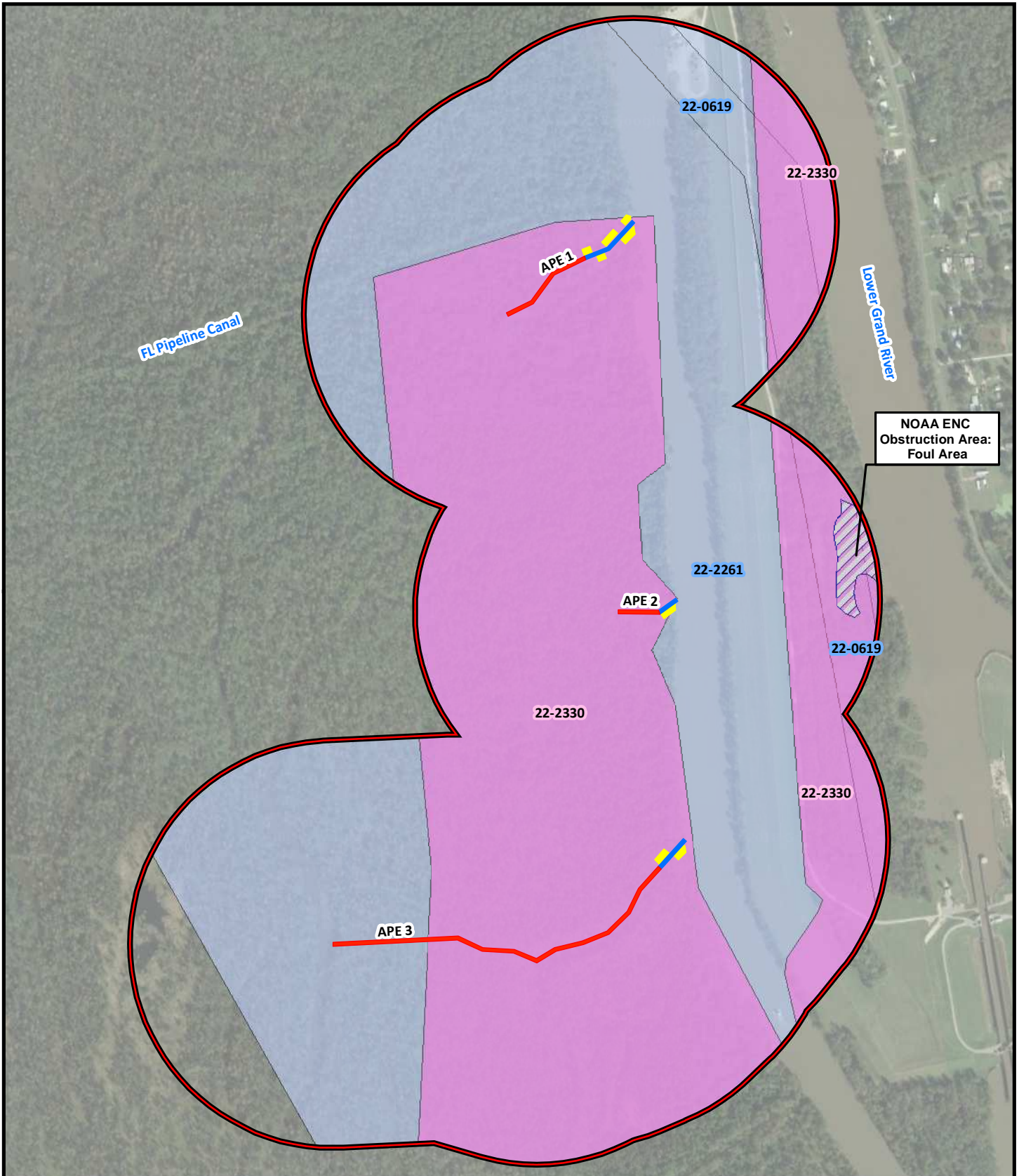
- Beyond the APEs, there are seven standing structures located in the area, and all are located on the eastern bank of Bayou Sorrel.
- Beyond the APEs, there is also a known shipwreck located near the town of Bayou Sorrel.

Table 1: Previous Archaeological Surveys

Louisiana DOA No.	Subject	Type	Year	Reference
22-3054	Annual Report for Management IV and V, Regional Archaeology Program,	Terrestrial	2007	LSU
22-2330	Bayou Sorrel Lock Replacement Project, Iberville Parish, Louisiana	Terrestrial	2001	Kari Krause, et.al.
22-2331	Phase I cultural resources survey and archeological inventory of the proposed Bayou Sorrel Lock Replacement Project	Terrestrial	2001	Kari Krause, et.al.
22-2261	Channel Improvement in the Atchafalaya Basin: Land Use Studies in Assumption	Terrestrial	1999	Ralph Draughon, Jr., et.al.

Table 2: Archaeological Sites Within the Area

Site No.	Site Name	Type	NRHP Eligibility	Comments	Reference
6IV4	Bayou Sorrel Mound(s)	Prehistoric/Historic	Unknown	Mound Complex	Dr. Chip McGimsey 2001
16IV188	Bayou Sorrel Burial	Historic	Unknown	Historic burial	Dr. Chip McGimsey 2001



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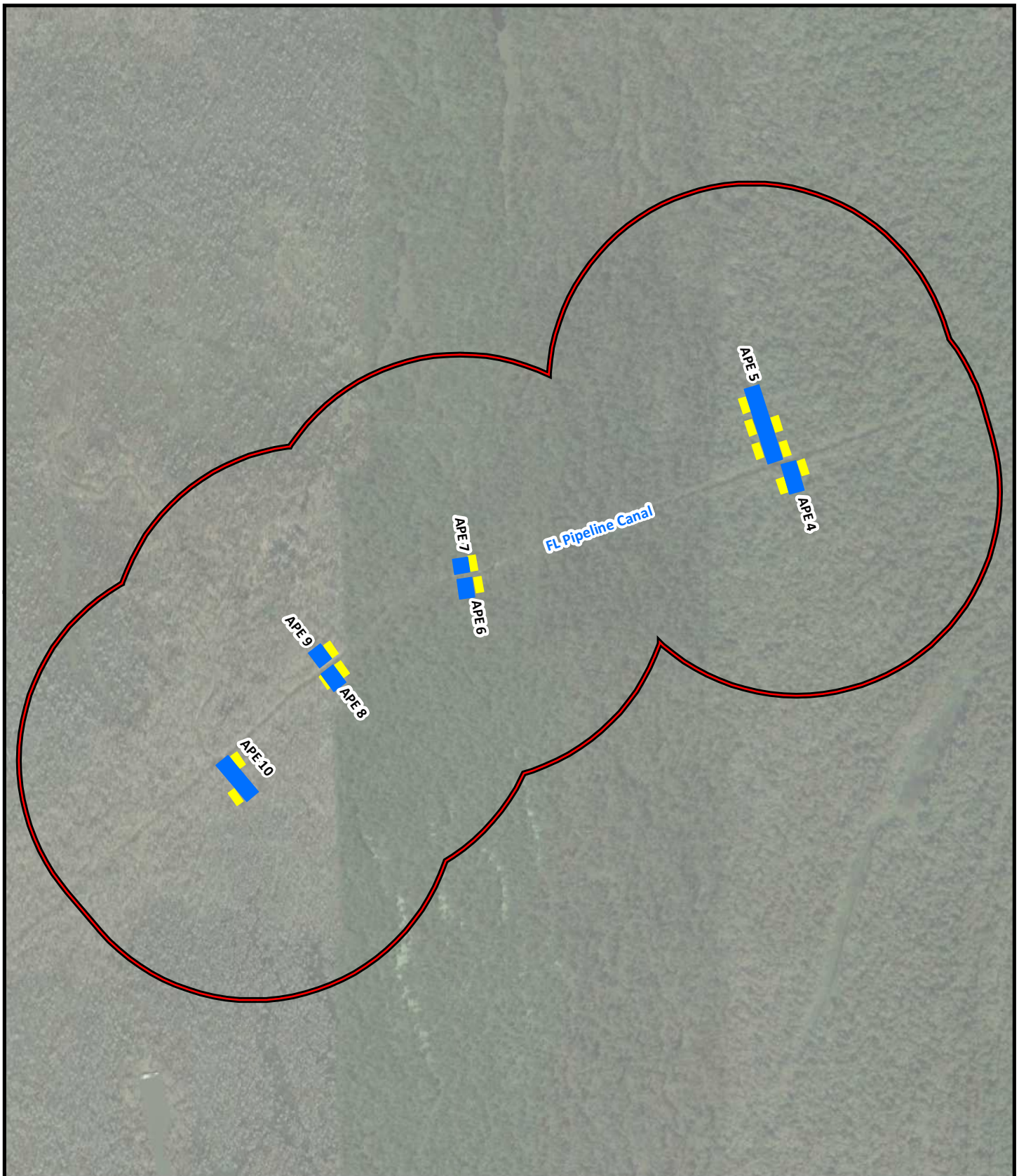
Figure 8: Previous Investigations within APEs 1, 2, and 3

East Grand Lake

Legend:

- Indirect (.25 Mile Radius)
- Phase I Survey
- Reconnaissance or Assessment Survey
- Submerged Data
- Clearing and Snagging
- Clearing and Dredging
- Disposal Area

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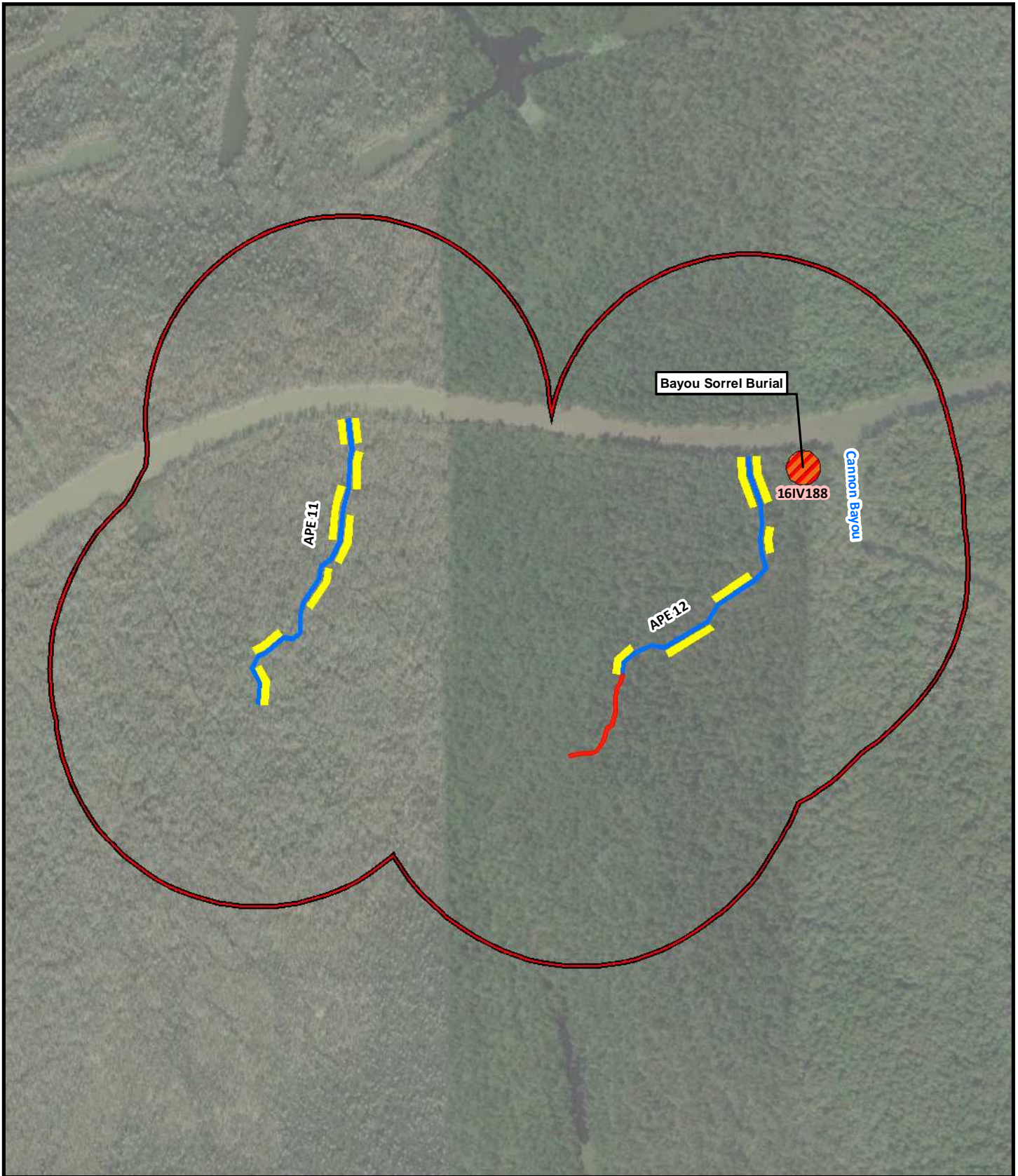
Figure 9: Previous Investigations
 within APes 4, 5, 6, 7, 8, 9, and 10

East Grand Lake

Legend:

- Indirect APE (.25 Mile Radius)
- Clearing and Snagging
- Clearing and Dredging
- Disposal Area

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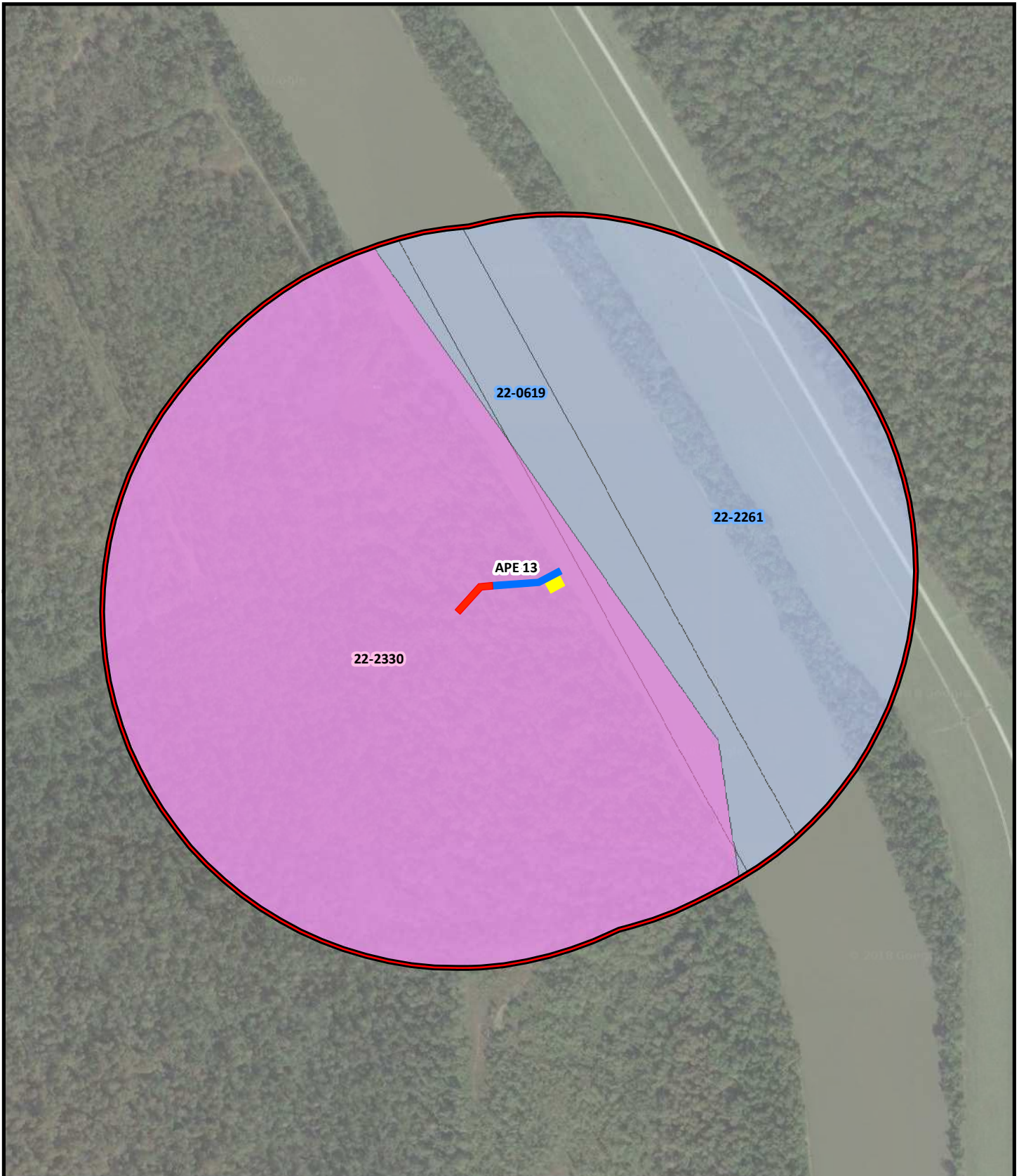
Figure 10: Previous Investigations within APES 11 and 12

East Grand Lake

Legend:

- Indirect APE (.25 Mile Radius)
- Archaeological Site
- Clearing and Snagging
- Cemetary
- Clearing and Dredging
- Disposal Area

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Figure 11: Previous Investigations within APE 13

East Grand Lake

Legend:

- Indirect APE (.25 Mile Radius)
- Phase I Survey
- Clearing and Snagging
- Clearing and Dredging
- Disposal Area
- Reconnaissance or Assessment Survey

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4.0 METHODS

Prior to any fieldwork, ELOS consulted with the Louisiana DOA regarding methodology. During the consultation process, it was agreed that the project would be separated into the 13 direct APEs (see **Figure 4**), due to the large area of the Atchafalaya River Basin and based on the distinct Element Areas associated with the proposed project (see **Figure 1**). A 0.25-mile indirect APE was established for each of the 13 direct APEs, due to the low profile of the restoration activities.

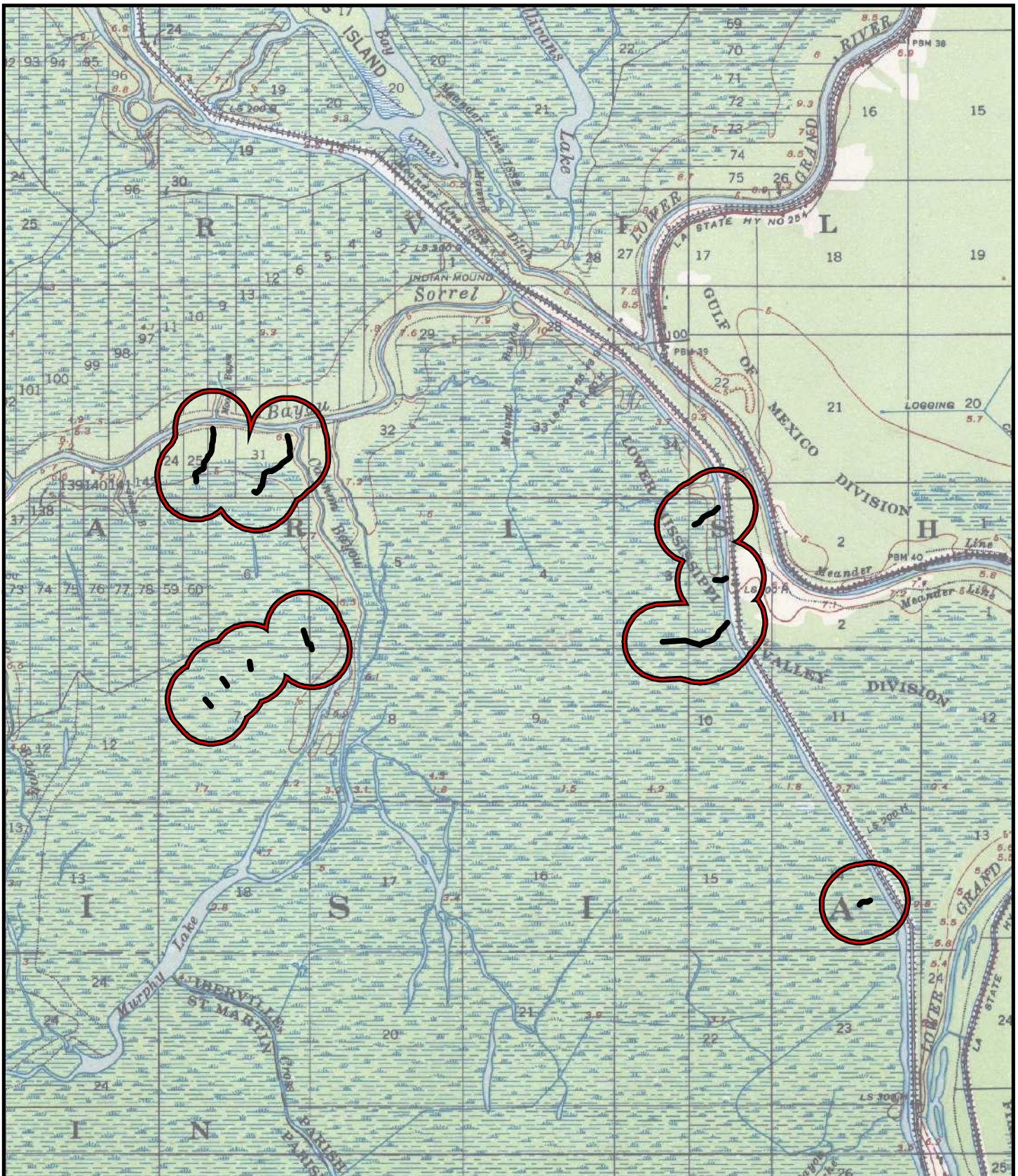
4.1 Standing Structure Survey Methods

ELOS conducted archival research to identify any cultural resources within the direct APEs, but found no such historic roadways, railways, battlefields, or structures located within the boundaries. ELOS utilized archival and current imagery, as well as the U.S. Geological Survey (USGS) quadrangle maps, historic maps, and various books, journals, and databases to identify any potential cultural resources located within the APEs. Neither historic imagery nor historic maps show any indication of historic structures; the only structures revealed on historic topographic maps were located within the indirect APEs and no longer exist (**Figures 12 and 13**). ELOS also reviewed the SHPO cultural resource database for previous surveys and known archaeological sites. Fieldwork consisted of pedestrian surveys and a windshield survey to locate the three structures that appeared on historic maps (**Figures 12 and 13**).

No historic structures remain within any of the APEs; therefore, no historic structure forms were produced for this project.

4.2 Archeological Site Survey Methods

Archaeological site surveys were conducted within the 13 Element Areas proposed for canal improvements and consisted of high-probability systematic grid subsurface shovel testing and pedestrian surveys. A total of 63 STPs were placed in a high probability grid pattern within non-flooded portions of the proposed project area. STP locations were pre-plotted on a grid system, then mapped with Geographical Positioning System (GPS) coordinates to provide systematic coverage of the survey areas. Pre-plotted STP locations were then field-located using a combination of hand-held GPS units, compass, and pacing method. Ground visibility was minimal at most of the STP locations, due to heavy underbrush and a layer of dead foliage. Pedestrian surveys were conducted in areas with increased ground visibility, and canals banks were inspected for surface artifacts and washouts. No STPs were located within the channels that were flooded during the time of the archaeology site surveys in October 2018. In general, most channels where project work is proposed were flooded.



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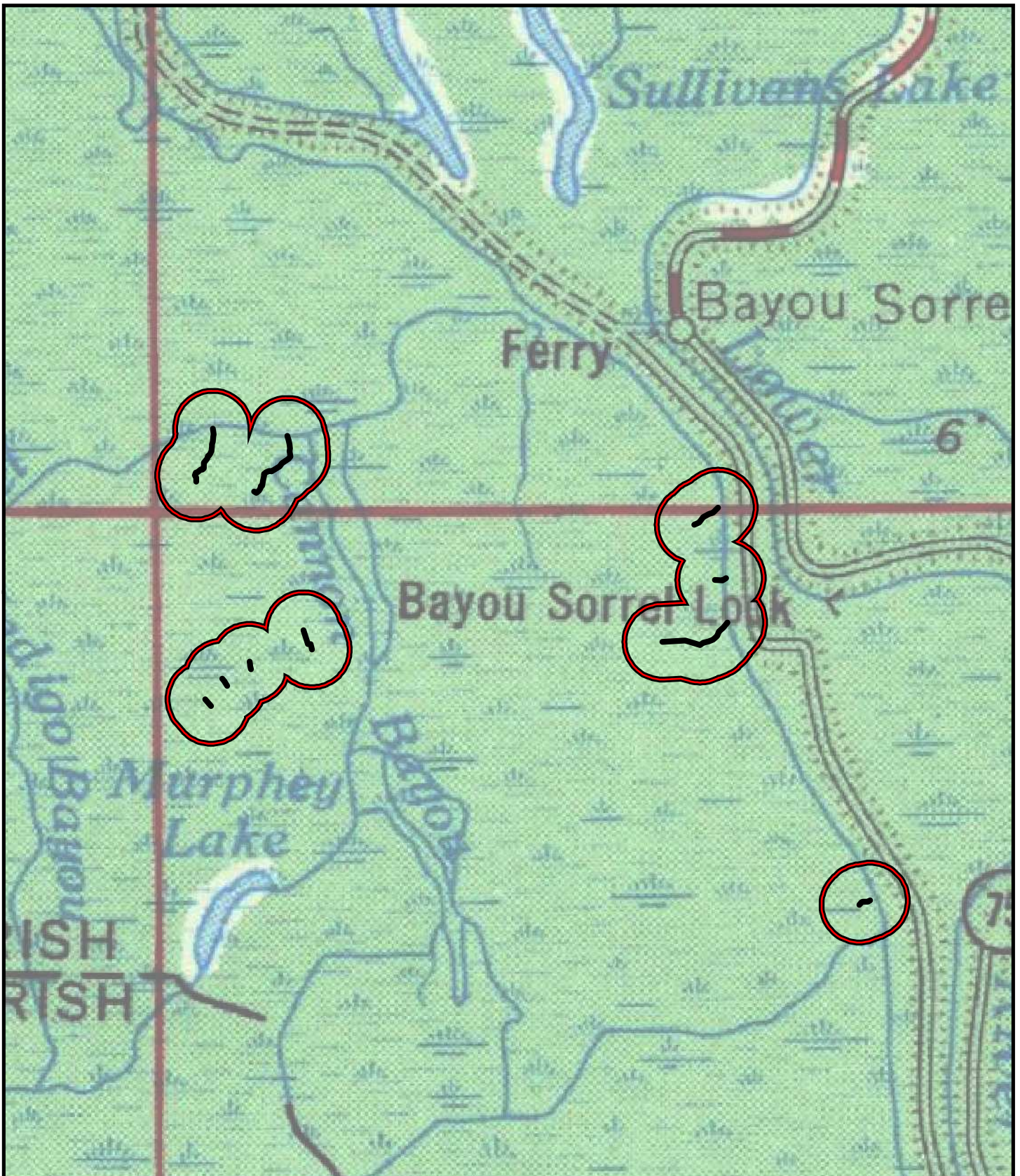
Figure 12: Historic Structures within the Indirect APEs from 1935 Lake Chicot Map

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)

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Figure 13: Historic Structures from 1956 Baton Rouge within the Indirect APEs

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)

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Field crews surveyed each area through shovel testing, where possible, and the entire length of each channel was pedestrian-surveyed even if filled with water. Where the proposed project excavation areas were dry, STPs were conducted. Each STP excavated was 30 cm in diameter and excavated in 10-cm increments to a minimum depth of 50 cm or to water, whichever came first. All excavated soil was screened through 0.25-inch hardware cloth mounted on portable frames. At STP locations where the soil content was too wet or contained too much clay material to permit effective screening, the excavated material was broken up by hand or trowel and visually examined. Soil stratigraphy was recorded for each STP.

4.3 Curation Statement

No artifacts or cultural resources were found during the field survey. Therefore, site delineation techniques or artifact documentation, preservation, and curation techniques will not be discussed. A copy this report and all records of this project will be curated with the Louisiana SHPO in Baton Rouge, Louisiana.

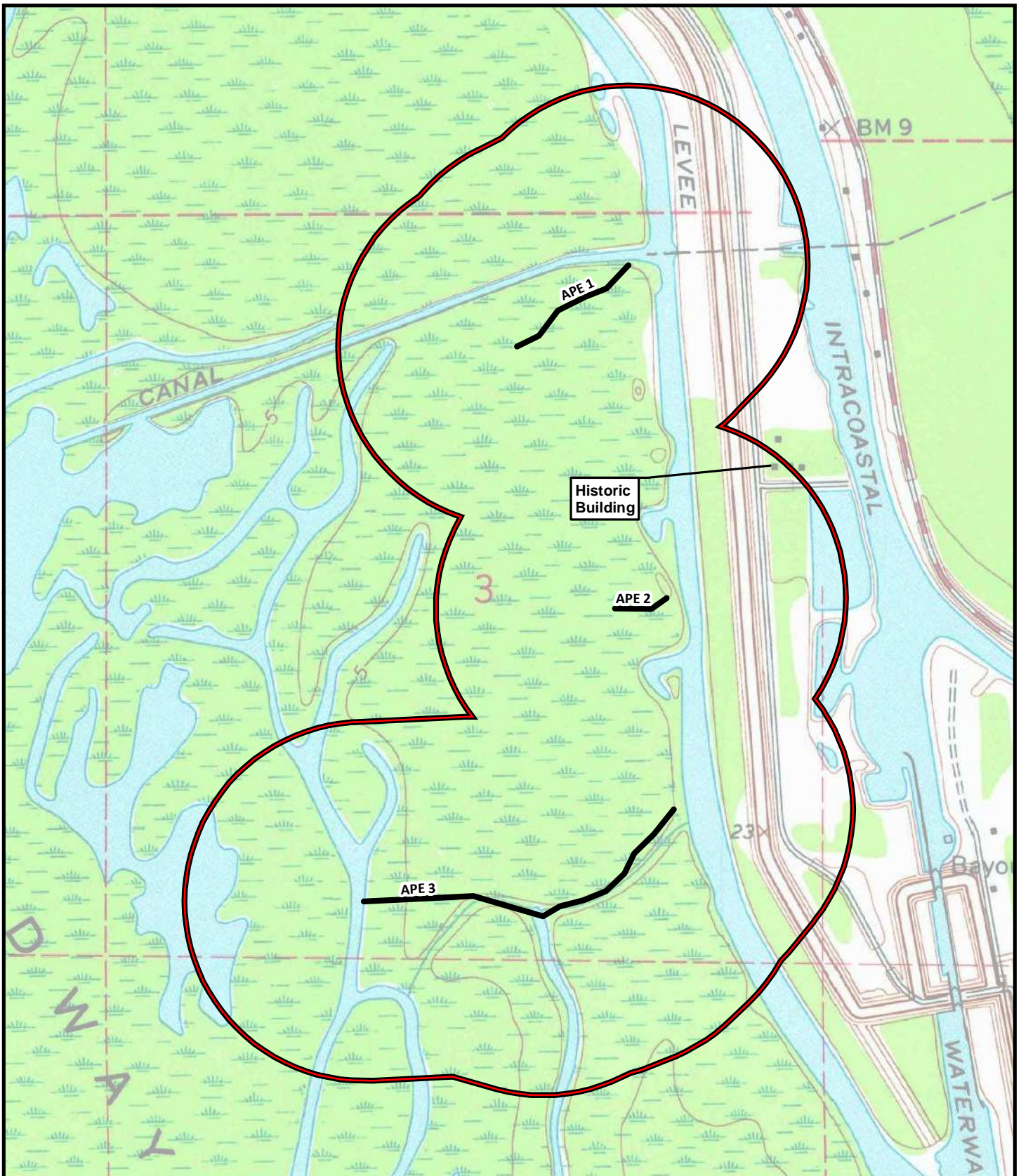
5.0 RESULTS

In October of 2018, ELOS conducted a Phase I cultural resource survey of approximately 16.5 acres within the Atchafalaya Basin. Because the proposed project would have direct impacts on several small areas within the much larger Atchafalaya Basin, the project was separated into 13 direct APEs. For each of the 13 direct APEs, a 0.25-mile indirect APE was established. One known archaeological site exists within the indirect APE 12. The site is listed on the Louisiana SHPO) database site number 16V188 and consists of a human burial just west of Cannon Bayou on the banks of Bayou Sorrel. The site was investigated by Dr. Chip McGimsey, Louisiana State Archaeologist in 2011. At the time of recording, the site was described as eroding into Bayou Sorrel and located approximately 3.0 meters below the surface. ELOS attempted to locate the burial during the Phase I cultural resource survey; however, this effort proved fruitless as water levels were very high. If the burial still exists, it would be located underwater.

No previously identified historic structures are located in any of the 13 APEs, and no historic standing structures were identified during the Phase I cultural resource survey. Thus, there are no structures recommended eligible for listing on the NRHP. A total of 63 high probability STPs were excavated.

5.1 Standing Structure Survey Methods

ELOS conducted an archival search of historic aerials and historic topographic maps to locate structures within or adjacent to the project area in an effort to identify structures that were of 50 years of age or older. ELOS identified three such standing structures on 1969 Bayou Sorrel USGS historic topographic map (**Figure 14**), within indirect APE 12 and conducted a windshield survey



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Figure 14: 1969 USGS Bayou Sorrel Map within APEs 1, 2, and 3

East Grand Lake

Legend:

- Direct APE
- Indirect APE (.25 Mile Radius)

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in an attempt to relocate these structures in hopes to identify and document their basic characteristics. During the windshield survey, it was determined that all three historic structures depicted on historic topographic maps no longer exist. Therefore, no historic building survey forms were produced for this project. This proposed East Grand Lake project would have no adverse effect on historic structures located within the 13 APEs.

The Phase I survey found no evidence of cultural resources 50 years old or older within the 13 direct APEs. It is possible, though highly unlikely, that cultural resources exist at depths not tested due to the limitations of using hand tools. ELOS's recommendation to the SHPO is that no further cultural resource surveys or investigations are needed for the proposed Ecological Swamp Enhancement Project (East Grand Lake). Should intact cultural resources be observed during construction, all work will cease, and an archaeologist will be notified immediately to determine the significance of the cultural resources. All ground disturbing activities in the area will cease if any human remains are uncovered. The local law enforcement agency will be notified immediately upon such discovery and the SHPO will be notified within 72 hours.

5.2 Archeological Survey Results

During the Phase I archaeological survey, no archaeological or historic resources were located within any of the 13 direct APEs. ELOS personnel conducted archival research utilizing historic maps, databases, books and journals and found no reported activities in the area. There were no historic roads or railways in this area.

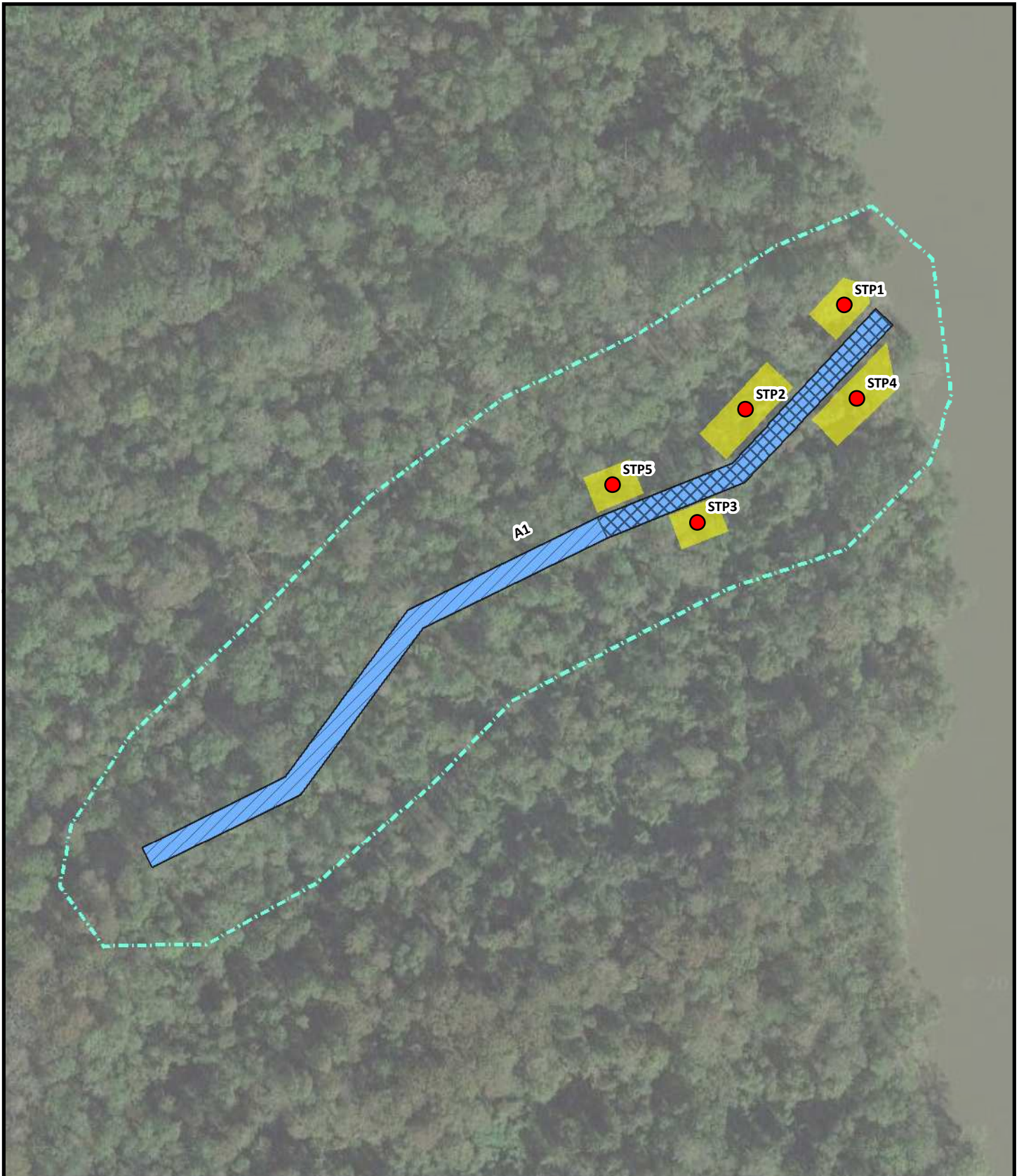
APE 1, 2, and 3 are located on the Little Tensas Bayou to the west of the Bayou Sorrel Locks (see **Figure 6**).

APE 1

APE 1 required five STPs within the proposed disposal areas (**Figure 15**). All STPs were negative, and no cultural material or features were discovered. The entire natural channel was filled with water. Crews conducted a pedestrian survey along the both banks of the existing channel (**Figure 14**).

APE 2

APE 2 required one STP within the proposed disposal area and one judgmental STP within an unflooded portion of the existing channel, which appeared to be a natural levee (**Figure 16**). Upon examination of the soil conditions, it was determined that the feature did not appear to be natural. This feature most likely was the result of earlier dredging operations and was not recorded as a historic feature. Crews conducted a pedestrian survey along the both banks of the existing channel, which could be easily distinguished and contained standing water (**Figure 16**). All STPs were negative, and no cultural material or features were discovered.



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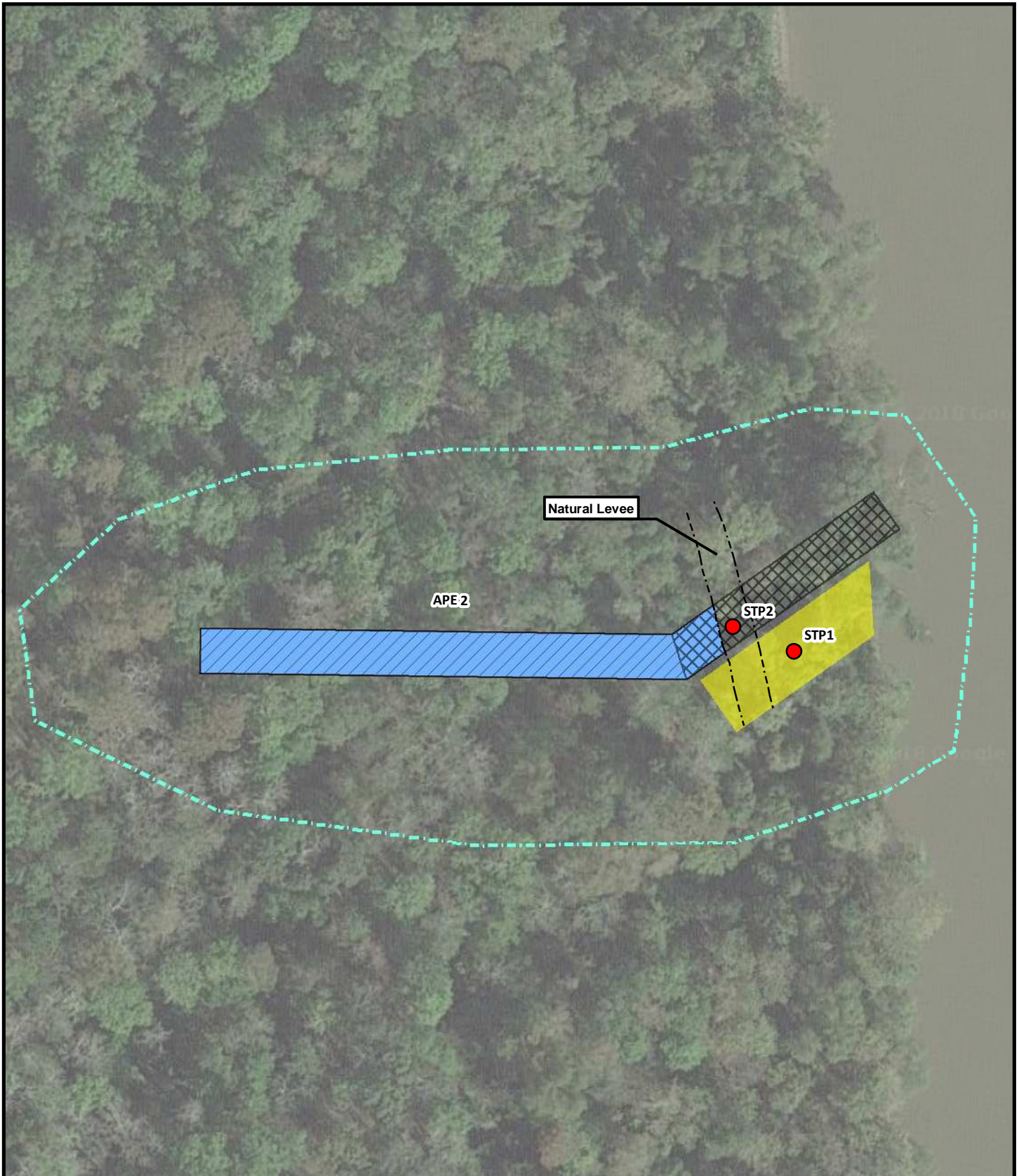
Figure 15: STP and Pedestrian Survey at APE 1

East Grand Lake

Legend:

- STP
- Water Area
- Pedestrian Survey Area
- Disposal Area
- Clearing and Snagging (No Excavation)
- Clearing and Dredging (Excavation)

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Figure 16: STP and Pedestrian Survey at APE 2

East Grand Lake

Legend:

- STP
- Feature Lines
- Water Area
- ▨ Clearing and Snagging (No Excavation)
- ▩ Clearing and Dredging (Excavation)
- Disposal Area
- ⋯ Pedestrian Survey Area

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APE 3

APE 3 required two STPs within the proposed disposal areas (**Figure 17**). All STPs were negative, and no cultural material or features were discovered. The existing channel at APE 3 was filled with water, and crews conducted a pedestrian survey along the both banks of the existing channel (**Figure 17**).

APE 4, APE 5, APE 6, APE 7, APE 8, APE 9, and APE 10 are located along the Florida Pipeline Canal (see **Figure 6**).

APE 4

APE 4 required two STPs within the proposed disposal areas, and one additional judgmental STP was dug within the proposed dredge area (**Figure 18**). The existing channel could not be easily distinguished and did not contain standing water during the survey. A pedestrian survey of the entire area was completed (**Figure 18**). STPs were negative, and no cultural material or features were discovered.

APE 5

APE 5 required five STPs within the proposed disposal areas, and two additional judgmental STPs were dug in the unflooded portion of the proposed dredge area (**Figure 18**). This entire area was also covered by pedestrian survey (**Figure 18**). All STPs were negative, and no cultural material or features were discovered.

APE 6

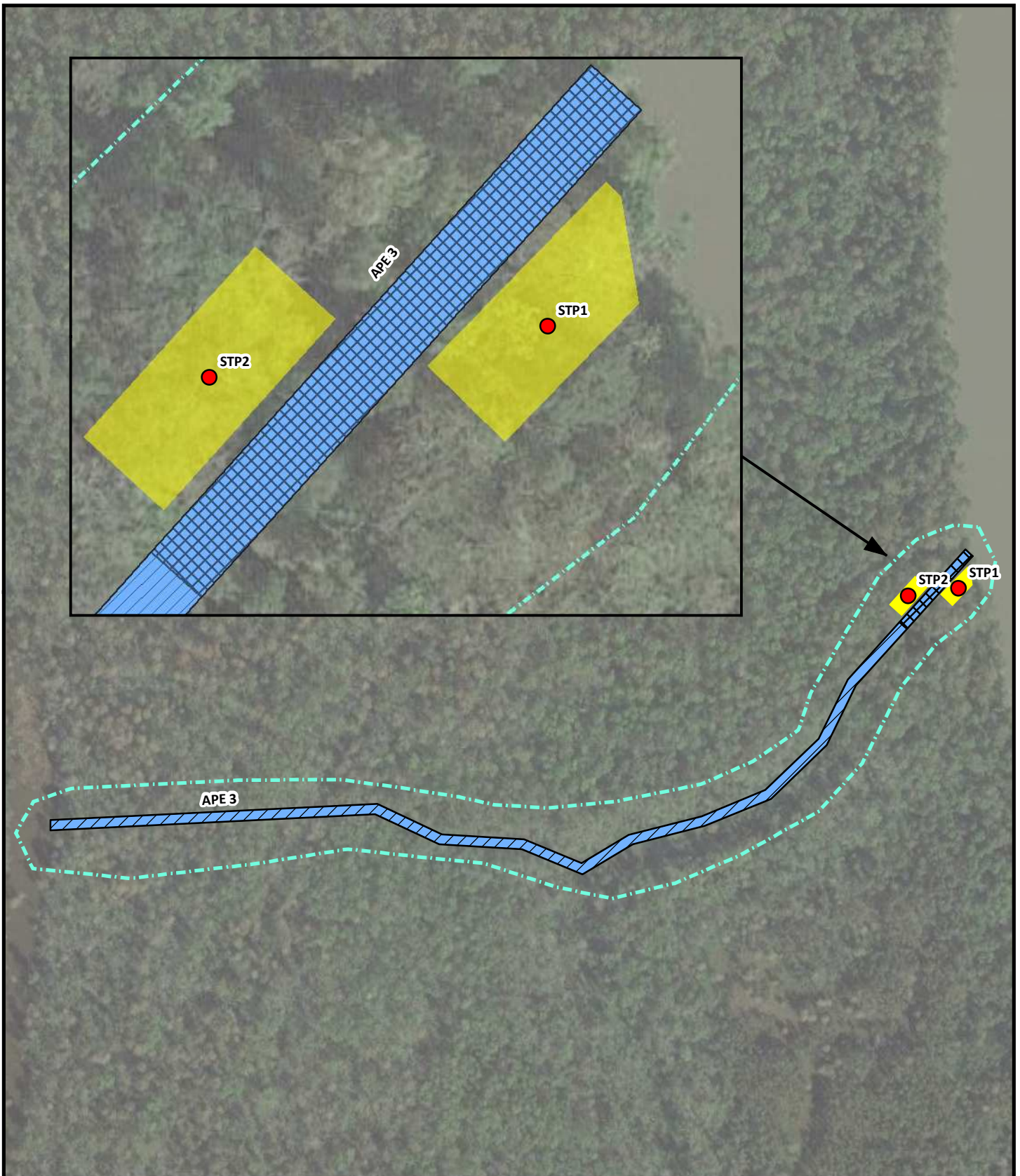
APE 6 required one STP within the proposed disposal area, and one additional judgmental STP was dug in the proposed dredge area (**Figure 19**). APE 6 did not contain standing water, and the entire area was covered by pedestrian survey (**Figure 19**). All STPs were negative and no cultural material or features were discovered (**Figure 19**).

APE 7

APE 7 is located directly across the Florida Pipeline Canal from APE 6 (see **Figure 6**). This APE required one STP within the proposed disposal area, and one additional judgmental STP was dug in proposed dredge area (**Figure 19**). APE 7 did not contain standing water, and the entire area was covered by pedestrian survey (**Figure 19**). All STPs were negative, and no cultural material or features were discovered.

APE 8

APE 8 is located directly across the Florida Pipeline Canal from APE 9 (see **Figure 6**). This APE required two STPs within the proposed disposal area, and one additional judgmental STP was dug in the proposed dredge area (**Figure 20**). APE 8 did not contain standing water, and the entire area was covered by pedestrian survey (**Figure 20**). All STPs were negative, and no cultural material or features were discovered.



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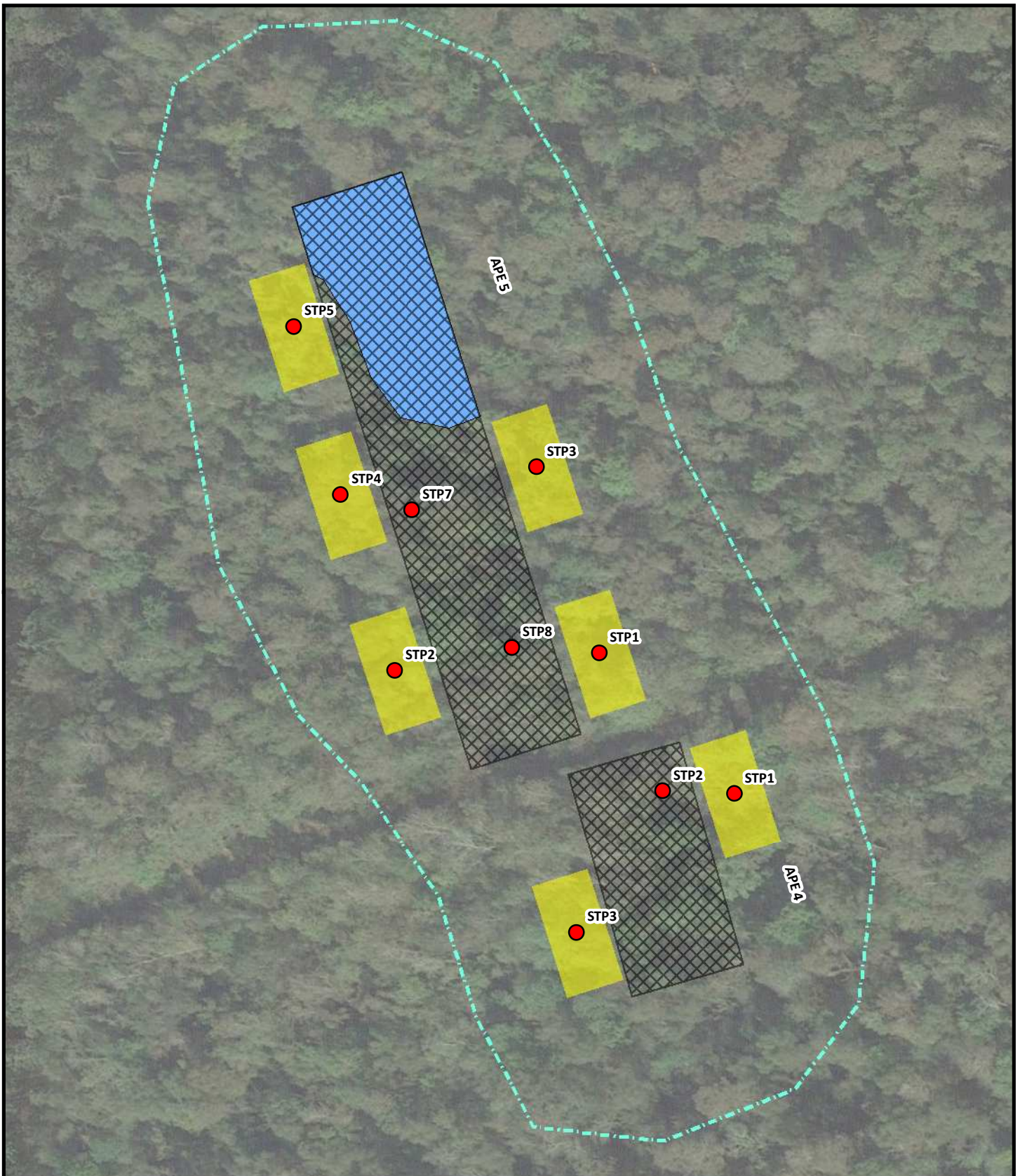
Figure 17: STP and Pedestrian Survey at APE 3

Legend:

- STP
- Disposal Area
- Pedestrian Survey Area
- Water Area
- Clearing and Snagging (No Excavation)
- Clearing and Dredging (Excavation)

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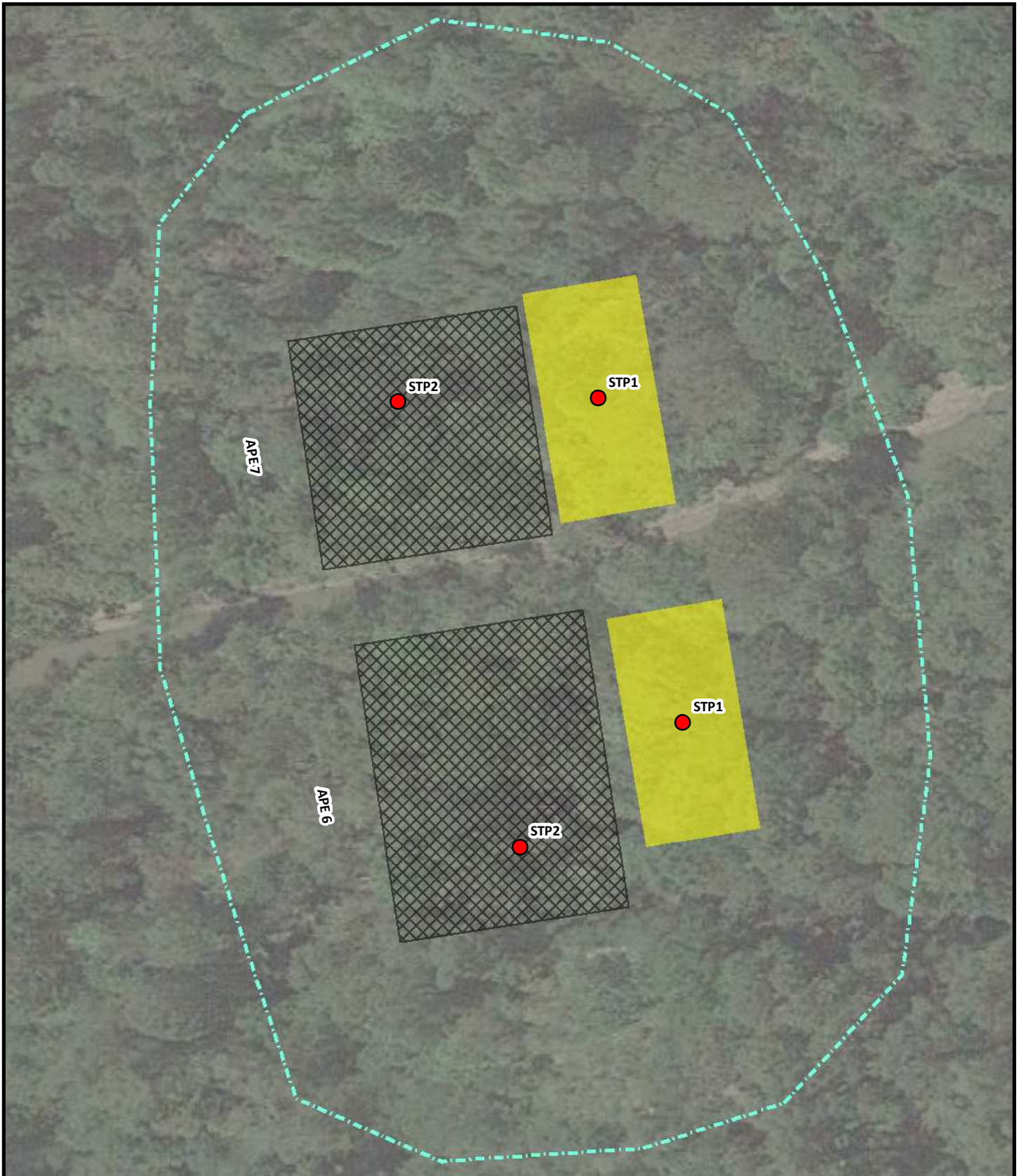
Figure 18: STP and Pedestrian Survey at APE 4 and 5

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Legend:

- STP
- Water Area
- Clearing and Dredging (Excavation)
- Disposal Area
- Pedestrian Survey Area

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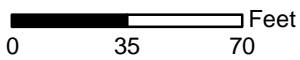


Figure 19: STP and Pedestrian Survey at APE 6 and 7

East Grand Lake

Legend:

- STP
- ▣ Clearing and Dredging (Excavation)
- ▣ Disposal Area
- Pedestrian Survey Area

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Figure 20: STP and Pedestrian Survey at APE 8 and 9

Legend:

- STP
- Clearing and Dredging (Excavation)
- Disposal Area
- Pedestrian Survey Area

East Grand Lake

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APE 9

APE 9 is located directly across the Florida Pipeline Canal from APE 8 (see **Figure 6**). This APE required one STP within the proposed disposal area, and one additional judgmental STP was dug in the proposed dredge area (see **Figure 20**). APE 9 did not contain standing water, and the entire area was covered by pedestrian survey (see **Figure 20**). All STPs were negative, and no cultural material or features were discovered.

APE 10

APE 10 is located further southwest along the Florida Pipeline Canal from APEs 8 and 9 (see **Figure 6**). This APE required two STPs within the proposed disposal areas, and one additional judgmental STP was dug in the proposed dredge area (**Figure 21**). APE 10 did not contain standing water, and the entire area was covered by pedestrian survey (**Figure 21**). All STPs were negative, and no cultural material or features were discovered.

APE 11 and APE 12 are located along Bayou Sorrel (see **Figure 6**).

APE 11

APE 11 is located farthest west on Bayou Sorrel. This APE required 16 STPs within the proposed disposal areas (**Figure 22**). No shovel tests were performed in the proposed dredge area, as the entire existing channel was filled with water. Crews conducted a pedestrian survey along the both banks of the existing channel, which could be easily distinguished and contained standing water (**Figure 22**). All STPs were negative, and no cultural material or features were discovered.

APE 12

APE 12 is located on Bayou Sorrel near the mouth of Cannon Bayou. This APE required 14 STPs within the proposed disposal area (**Figure 23**). No shovel tests were performed in the proposed dredge area, as the entire existing channel was filled with water. Crews conducted a pedestrian survey along the both banks of the existing channel, which could be easily distinguished and contained standing water (**Figure 23**). All STPs were negative, and no cultural material or features were discovered.

The indirect APE associated with APE 12 included one known archaeological site (**Figure 23**). Site number 16IV188, *Bayou Sorrel Burial*, which was recorded in November of 2011 by Dr. Chip McGimsey of the Louisiana DOA. In the State of Louisiana Site Record Form, Dr. McGimsey described the site as an eroding coffin lying approximately 3.0 meters below modern ground surface eroding into the Bayou. This site was described as being located below a tin shed camp, which was located during this Phase I cultural resource survey. However, the Principal Investigator attempted, but was unable, to relocate the site of the grave. A State of Louisiana Site Record Form will be updated and submitted to the SHPO.




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


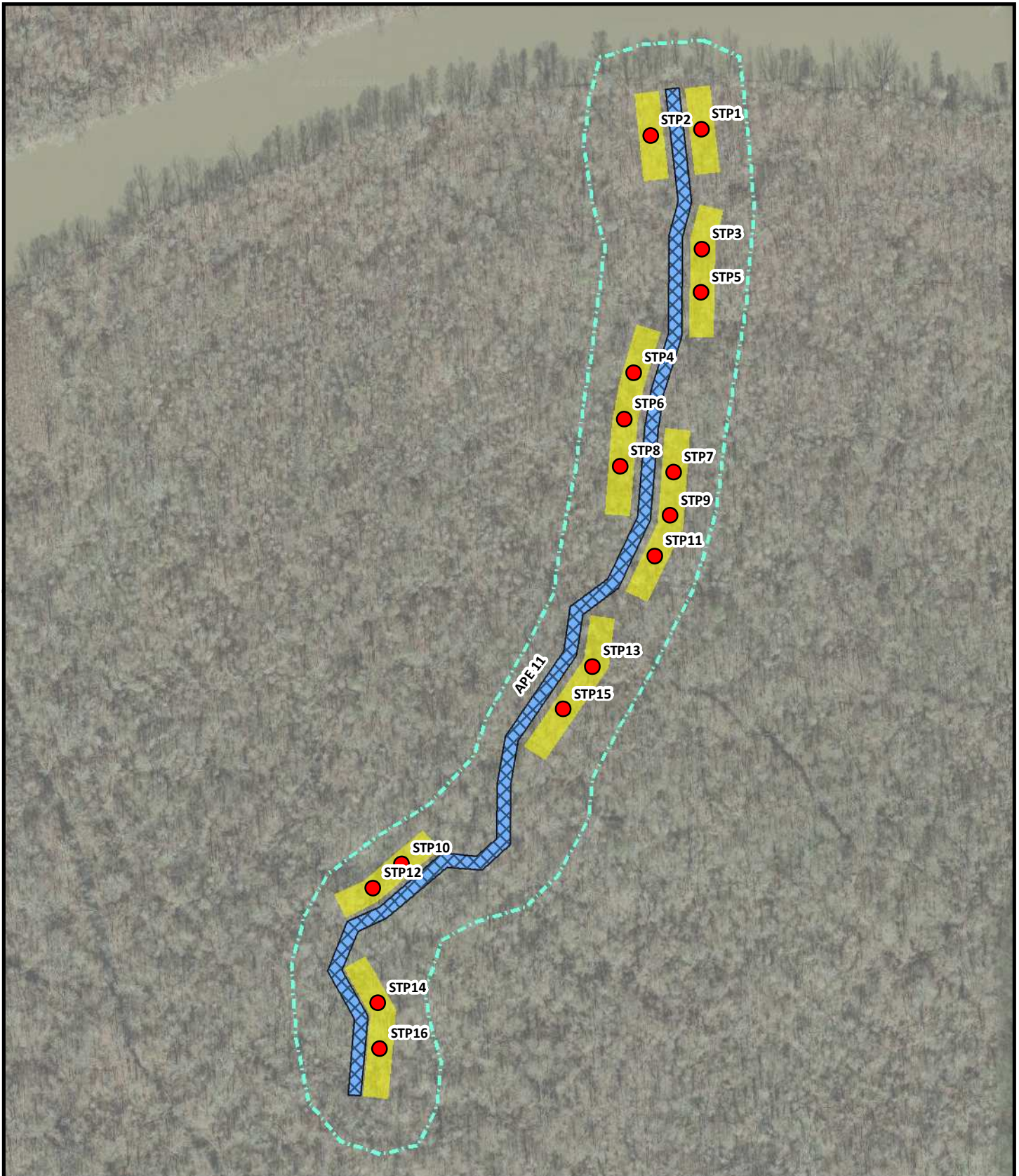
Figure 21: STP and Pedestrian
 Survey at APE 10

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Legend:

- STP
- Clearing and Dredging (Excavation)
- Disposal Area
- Pedestrian Survey Area

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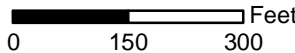

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Figure 22: STP and Pedestrian Survey at APE 11

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Legend:

- STP
- Water Area
- Disposal Area
- Pedestrian Survey Area
- Clearing and Dredging (Excavation)

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Figure 23: STP and Pedestrian Survey at APE 12

East Grand Lake

Legend:

- STP
- Water Area
- Cemetery
- Archaeological Site
- Pedestrian Survey Area
- Clearing and Snagging (No Excavation)
- Clearing and Dredging (Excavation)
- Disposal Area

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Water levels in Bayou Sorrel during the survey were extremely high. As previously noted, in the description of the site, Dr. McGimsey stated the burial was “approximately 3.0 meters below the ground surface”, and this would have put the burial under the current water level. Severe erosion was also observed along the banks of the bayou during this survey. These erosion conditions were also cited in the original site description. It is possible that the burial could have completely eroded into Bayou Sorrel.

According to the Site File for 16IV188, Mr. Orry Mendoza, a life-long resident of the Bayou Sorrel area, provided the location and what information he had on the burial site. Mr. Mendoza first noticed the coffin eroding from the bank 10-12 years ago, and 4-5 years ago there was 3-4 feet of the coffin sticking out from the bank. Mr. Mendoza stated that when first visible they were hand-split cypress planks. Lying on the floor of the coffin were two fragments of a human femur. No other human remains or grave goods were visible at the time of this visit. Mr. Mendoza indicated that a Mr. George Lively lived at this location in the 1930s and 1940s, but he had no information as to whether the burial dates from that time. However, through the research conducted by ELOS personnel it was found that M. George Lively, along with his wife and children, with the exception of two of his sons, are buried at Greenoaks Memorial Park Cemetery in Baton Rouge, LA (Manuel 2004). The two sons that are not buried there are buried at Grace Memorial Park Cemetery in Iberville Parish, LA (Manuel 2004).


The “tin camp” describe in the site file was located. The camp had been abandoned for some time. This camp structure is not mapped on any historic topographic maps of the area. The only historic structure located on historic USGS topographic maps is a structure further west on the Bayou near Jones Bayou (1935 USGS Chicot Lake Topographic Map). Upon examination of the camp, the structure was deemed modern with pressure treated timbers and corrugated tin for walls and roof. It also had aluminum windows and was in a state of disrepair. A tree was lying on the structure causing the roof to cave in. There was also modern garbage at the site, such as 50-gallon plastic drums and a chain link dog pen. No historic artifacts were observed in the area of the camp, although a cast iron well cap was recorded near the camp site. (**Photographs 3, 4, and 5**). Because the camp area was not within the direct APE and no other historical artifacts were located at the camp site during the pedestrian survey of the surrounding area or during the attempt to re-locate the burial site, no further work was done in this area.

APE 13

APE 13 is located along the Little Tensas Bayou (see **Figure 6**). This APE was mostly wet and swampy, with a modern dredge berm near the bank of the bayou. APE 13 required a single STP within the proposed disposal area, which was the only dry area (**Figure 24**). Due to the swampy conditions and thick vegetation, no pedestrian survey was conducted in this location. The STP was negative, and no cultural material or features were discovered.


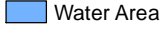
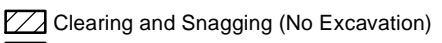
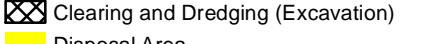
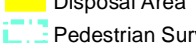
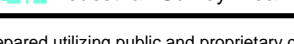



 environmental
<http://elosenv.com/>
 43177 East Pleasant Ridge Road
 Hammond, Louisiana 70403
 P. 985-662-5501, F. 985-662-5504

0 45 90 Feet 
 Figure 24: STP and Pedestrian Survey at APE 13

East Grand Lake

Legend:

-  STP
-  Water Area
-  Clearing and Snagging (No Excavation)
-  Clearing and Dredging (Excavation)
-  Disposal Area
-  Pedestrian Survey Area

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.



Photograph 3: Tin Camp Located in Indirect APE 12.



Photograph 4: Modern 50-Gallon Plastic Barrels Located in Indirect APE 12 Behind Camp.



Photograph 5: Well Located in the Area Behind the Camp in Indirect APE 12.

6.0 SUMMARY AND RECOMMENDATIONS

In October of 2018, ELOS conducted a Phase I cultural resource survey of approximately 16.5 acres within the Atchafalaya Basin. Because the proposed project would have direct impacts on several small areas within the much larger Atchafalaya Basin, the project was separated into 13 direct APEs. For each of the 13 direct APEs, a 0.25-mile indirect APE was established. This Phase I cultural resource survey included a comprehensive literature and records review of pertinent historic documents to develop a historic context for the 13 APEs to determine the presence or absence of cultural resources. The survey utilized a combination of survey methodologies which included systematic subsurface shovel testing, pedestrian survey, and a windshield survey.

The investigation of the indirect APEs, which consisted of the area within a 0.25-mile radius of each of the 13 direct APEs, identified three structures that appear on the 1969 Bayou Sorrel USGS Topographic Quadrangle map (see **Figure 14**). These structures have been destroyed and could not be located. Thus, there are no structures recommended eligible for listing on the NRHP. Since no historic structures were identified within the project area, no historic building survey forms were produced for this project. Therefore, the proposed East Grand Lake project is unlikely to have any negative effects on historic structures located with the APEs. One known archaeological site exists within indirect APE 12. The site is listed on the Louisiana SHPO) database site number

16IV188 and consists of a human burial just west of Cannon Bayou on the banks of Bayou Sorrel. The site was investigated by Dr. Chip McGimsey, Louisiana State Archaeologist in 2011. At the time of recording, the site was described as eroding into Bayou Sorrel and located approximately 3.0 meters below the surface. ELOS attempted to locate the burial during the Phase I cultural resource survey; however, this effort proved fruitless as water levels were very high. If the burial still exists, it would be located underwater.

A total of 63 high probability STPs were excavated within the project's proposed disposal areas and unflooded portions of the proposed dredge areas. The Phase I survey found no evidence of cultural resources 50 years old or older. No new archaeological sites, cultural resources, or isolated finds were found during this investigation. Therefore, the proposed East Grand Lake project is unlikely to have any negative effects on cultural resources located within the APES. Moreover, due to the low-profile nature of this project, it is unlikely to negatively affect the viewshed of any cultural resources. It is possible, though highly unlikely, that cultural resources exist at depths not tested due to the limitations of using hand tools. ELOS's recommendation to the SHPO is that no further cultural resource surveys or investigations are needed for the proposed East Grand Lake project.

Should intact cultural resources be observed during construction, all work will cease, and an archaeologist will be notified immediately to determine the significance of the cultural resources. All ground disturbing activities in the area will cease if any human remains are uncovered. The local law enforcement agency will be notified immediately upon such discovery and the SHPO will be notified within 72 hours.

Reasonable efforts have been made during this investigation to identify and evaluate possible locations of prehistoric or historic archaeological site locations. However, the possibility still exists that evidence of prehistoric and historic resources not identified during ELOS's investigation may still be discovered during ground disturbing activities within the project foot print. Should evidence of archaeological resources be discovered during construction activities, it is recommended that all work in that portion of the project area cease immediately. Evidence of historic resources include: aboriginal or historic pottery, prehistoric stone tools, bone or shell tools, as well as historic archaeological remains. Should questionable materials be uncovered during construction, procedures contained in *ACHP 36 CFR Part 800* will take effect. If human remains are encountered the provisions of the Louisiana Unmarked Human Burial Sites Preservation Act (Revised Statute 8:671-681) should be followed.

A copy this report and all records of this project will be curated with the Louisiana SHPO in Baton Rouge, Louisiana.

7.0 REFERENCES

Athens, William P,

1999, *Channel Improvements in the Atchafalaya Basin: Land Use Studies in Assumption, Iberville, Point Coupee, St. Martin, St. Mary, Terrebonne, and West Baton Rouge Parishes (22-2261)*, R. Christopher Goodwin and Associates, Inc. Report on file with the Louisiana Division of Archaeology.

Athens, William P,

2001, *Phase I Cultural Resources Survey and Archaeological Inventory of the Bayou Sorrel Lock Replacement Project, Iberville Parish Louisiana (22-2330)*. R. Christopher Goodwin and Associates, Inc., Report on file with the Louisiana Division of Archaeology.

Earth Search, Inc

1994, *Cultural Resources Survey of Eabpl Off-Site Borrow Areas, Levee Items E-64, E-76, and E-84a, Iberville, Iberia, and Assumption Parishes, Louisiana*. Prepared by Earth Search, Inc. Prepared for U.S. Army Corps of Engineers New Orleans District.

Girard, Jeff, McGimsey, Chip PhD., and Dennis Jones

2018, *Final Louisiana's Comprehensive Archaeological Plan*. The Louisiana Division of Archaeology.

<https://www.crt.state.la.us/Assets/OCD/archaeology/Section106/Louisiana%E2%80%99s%20Comprehensive%20Archaeological%20Plan%202018.pdf>, accessed December 2018.

Louisiana State University

2007, Annual Report for Management IV and V, Regional Archaeology Program, Museum of Natural Science

Manuel, Joel

2004, Memorial page for George S. Lively (16 May 1871 - 19 August 1965). Find A Grave, database and images (<https://www.findagrave.com>), accessed December 2018.

McGimsey, Chip PhD.

2015, *State of Louisiana Site Record Bayou Sorrel Mound*. Site number 16IV4. The Louisiana Division of Archaeology.

McGimsey, Chip PhD.

2011, *State of Louisiana Site Record Bayou Sorrel Burial*. Site number 16IV188. The Louisiana Division of Archaeology.

United States Department of Agriculture (USDA)

2017 Web Soil Survey. Project footprint data accessed April 5, 2018,

<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

United States Department of Interior, National Park Service

1995, National Register Bulletin, <https://www.nps.gov/nr/publications/bulletins>

United States Geological Service (USGS) Historic Topographic Map Explorer, esri.

2018, Project footprint data accessed, <http://historicalmaps.arcgis.com/usgs/>

1935, Chicot Lake, USGS Topographic Map

1953, Crescent, USGS Topographic Map

1954, Baton Rouge, USGS Topographic Map

1954, Chicot Lake, USGS Topographic Map

1955, Chicot Lake, USGS Topographic Map

1956, Baton Rouge, USGS Topographic Map

1959, Lake Chicot, USGS Topographic Map

1959, Chicot Lake, USGS Topographic Map

1961, Baton Rouge, USGS Topographic Map

1962, Baton Rouge, USGS Topographic Map

1969, Bayou Sorrel, USGS Topographic Map

APPENDIX A.

Project Plans for the Ecological Swamp Enhancement Project (East Grand Lake) in the Atchafalaya Basin

STATE OF LOUISIANA
DEPARTMENT OF NATURAL RESOURCES
ATCHAFALAYA BASIN PROGRAM

EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN

BAYOU SORREL, LOUISIANA
PROJECT NO. 11-431-99-01 PART 83
WBS: F.11000077

STATE OF LOUISIANA
INSET MAP

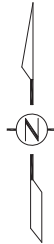


PROJECT LOCATION
IBERVILLE PARISH

STATE OF LOUISIANA
JOHN BEL EDWARDS
GOVERNOR

DIVISION OF ADMINISTRATION
JAY DARDENNE
COMMISSIONER OF ADMINISTRATION

OFFICE OF FACILITY PLANNING AND CONTROL
MARK MOSES
DIRECTOR






PREPARED BY:

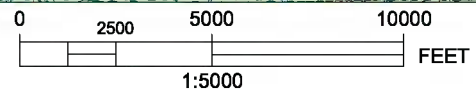
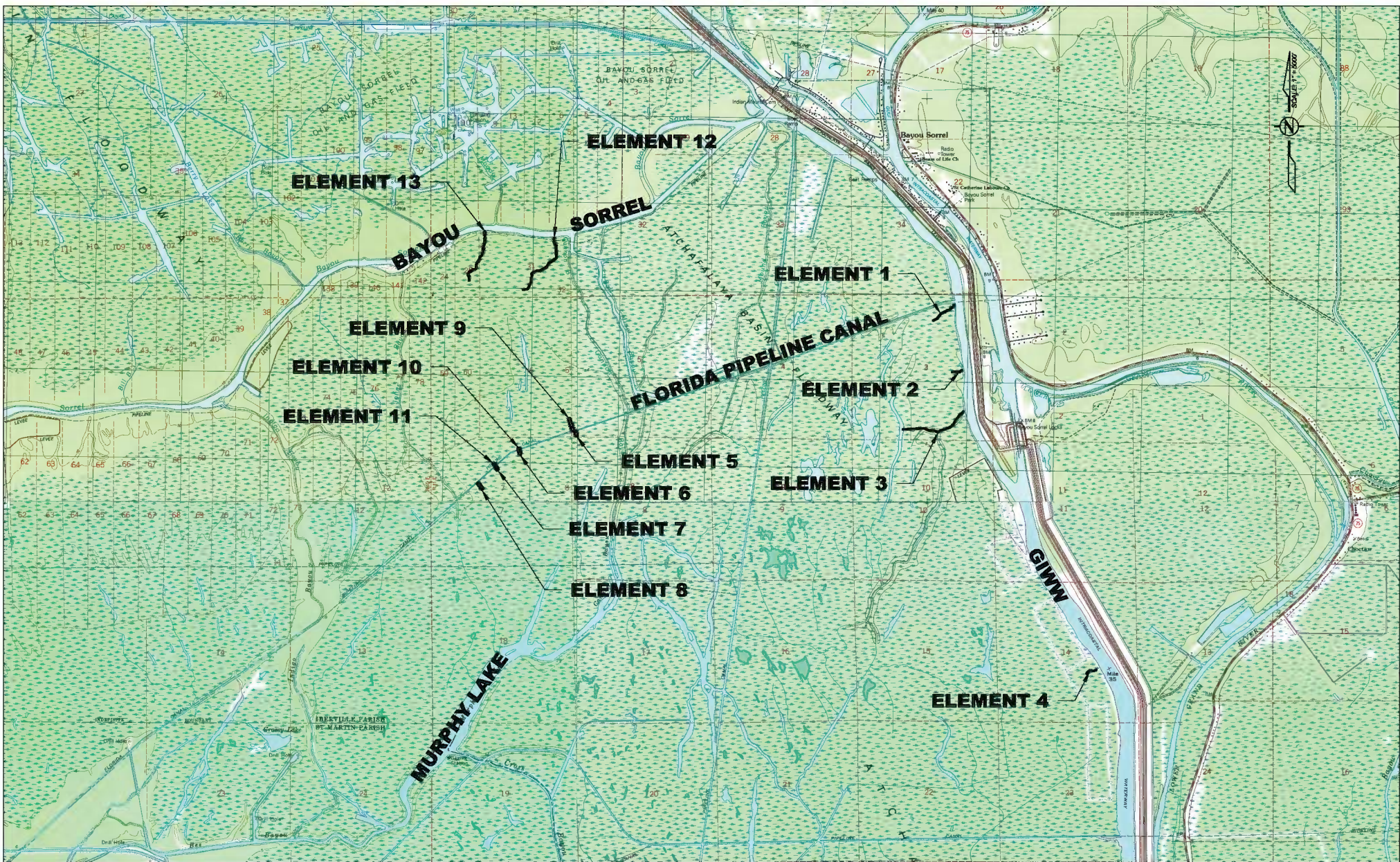


SIGMA CONSULTING GROUP, INC.
10305 AIRLINE HIGHWAY
BATON ROUGE, LA 70816
(225) 298-0800

THESE PLATS ARE FOR
PERMITTING PURPOSES ONLY



				EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA							
				TITLE SHEET		WBS NUMBER: F.11000077		FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83		DATE: FEBRUARY 2018	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: L. AMEDEE	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY		SHEET: 1 OF 29			



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**



LOCATION MAP

WBS NUMBER: F.11000077
 FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
 COE PERMIT NUMBER: MVN 2016-01163-CY

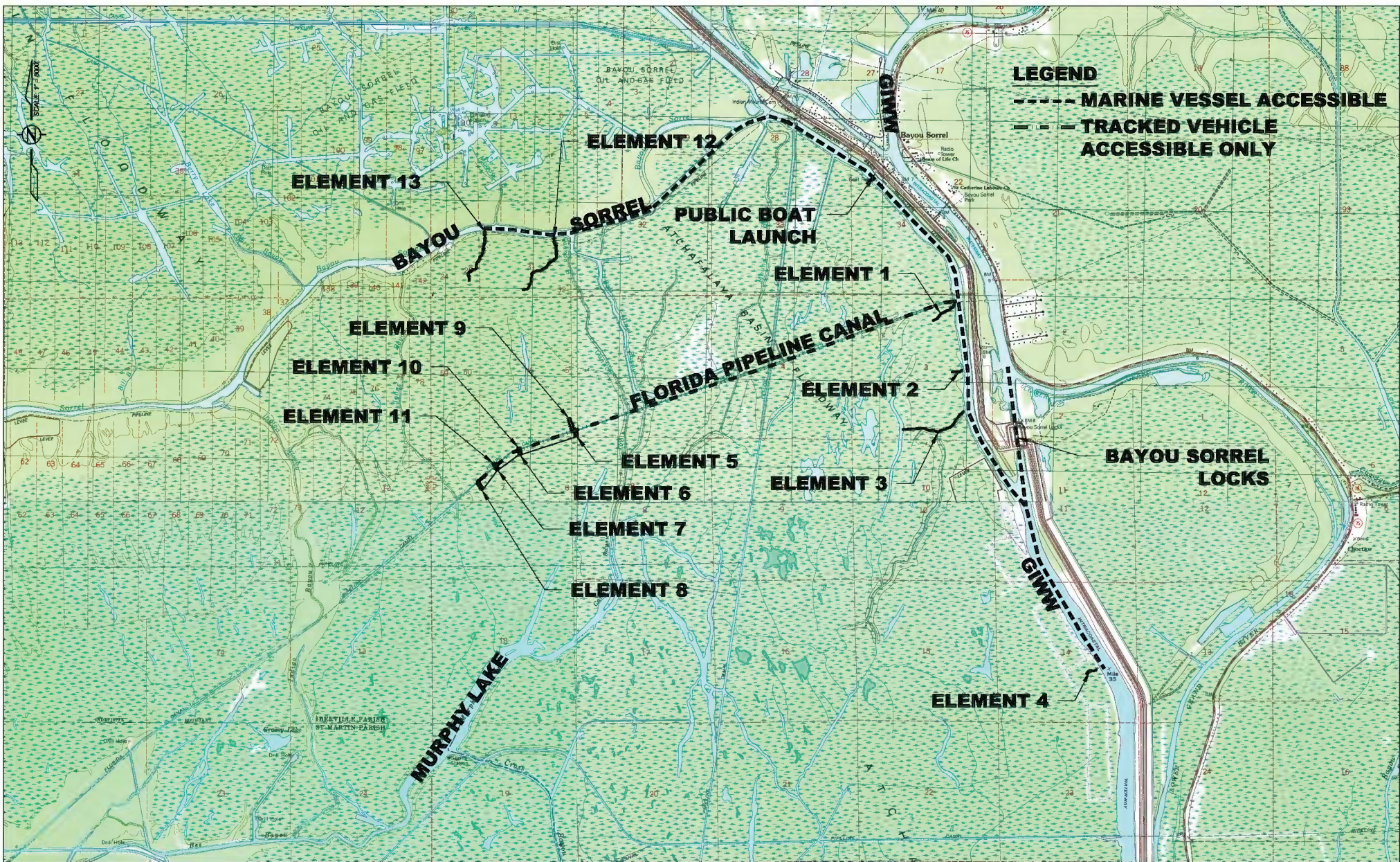
DATE: FEBRUARY 2018

SHEET: 2 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES



DESIGNED BY: R. LEAR




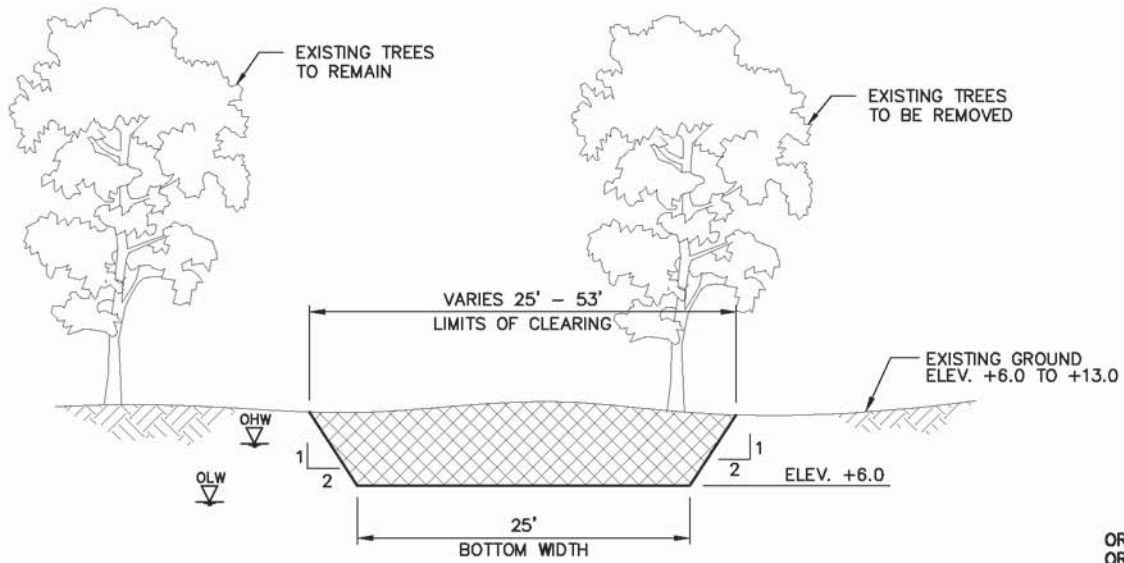
REV.	DATE	DESCRIPTION	BY

EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA
PROJECT ACCESS MAP

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

	
	WBS NUMBER: F.11000077
	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
COE PERMIT NUMBER: MVN 2016-01163-CY	DATE: FEBRUARY 2018

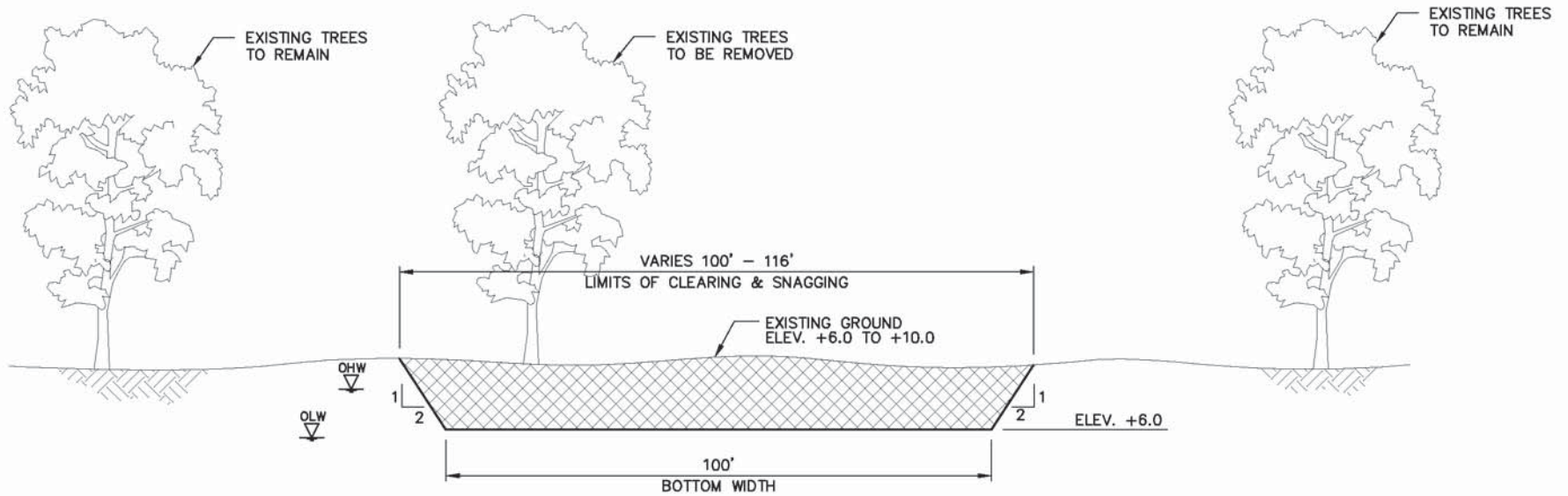

DATE: FEBRUARY 2018
SHEET: 3 OF 29



ORDINARY HIGH WATER: +9.3
 ORDINARY LOW WATER: +1.7

TYPICAL DREDGE SECTION
ELEMENTS 1, 2, 3, 4, 12 & 13

N.T.S.



TYPICAL DREDGE SECTION
ELEMENTS 5, 6, 7, 8, 9, 10 & 11

N.T.S.

EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA



DREDGE SECTIONS

WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

DATE: FEBRUARY 2018

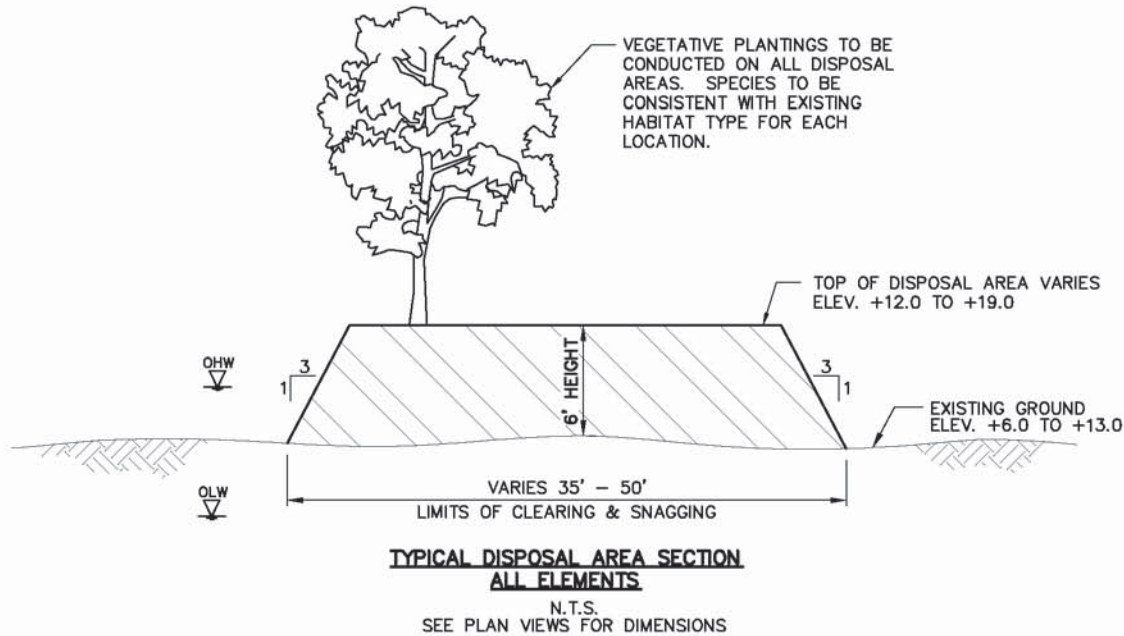
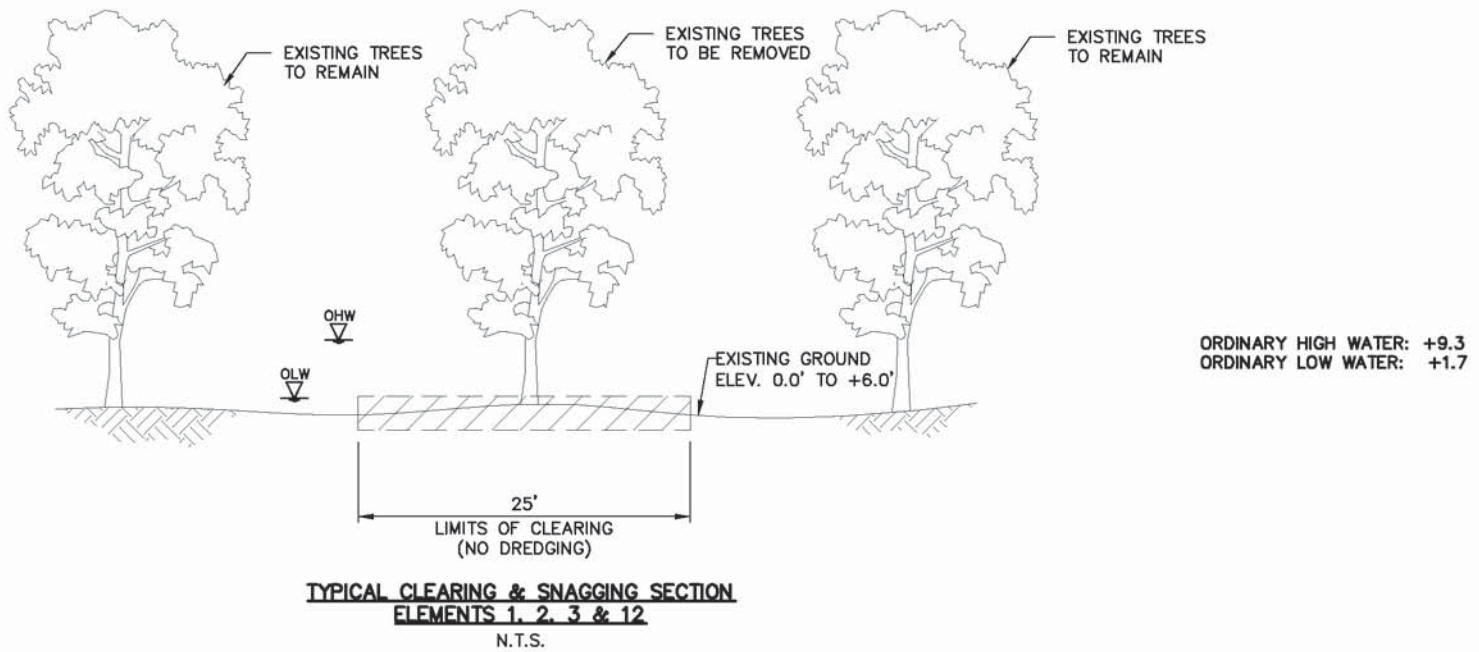
COE PERMIT NUMBER: MVN 2016-01163-CY

SHEET: 4 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR



EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA



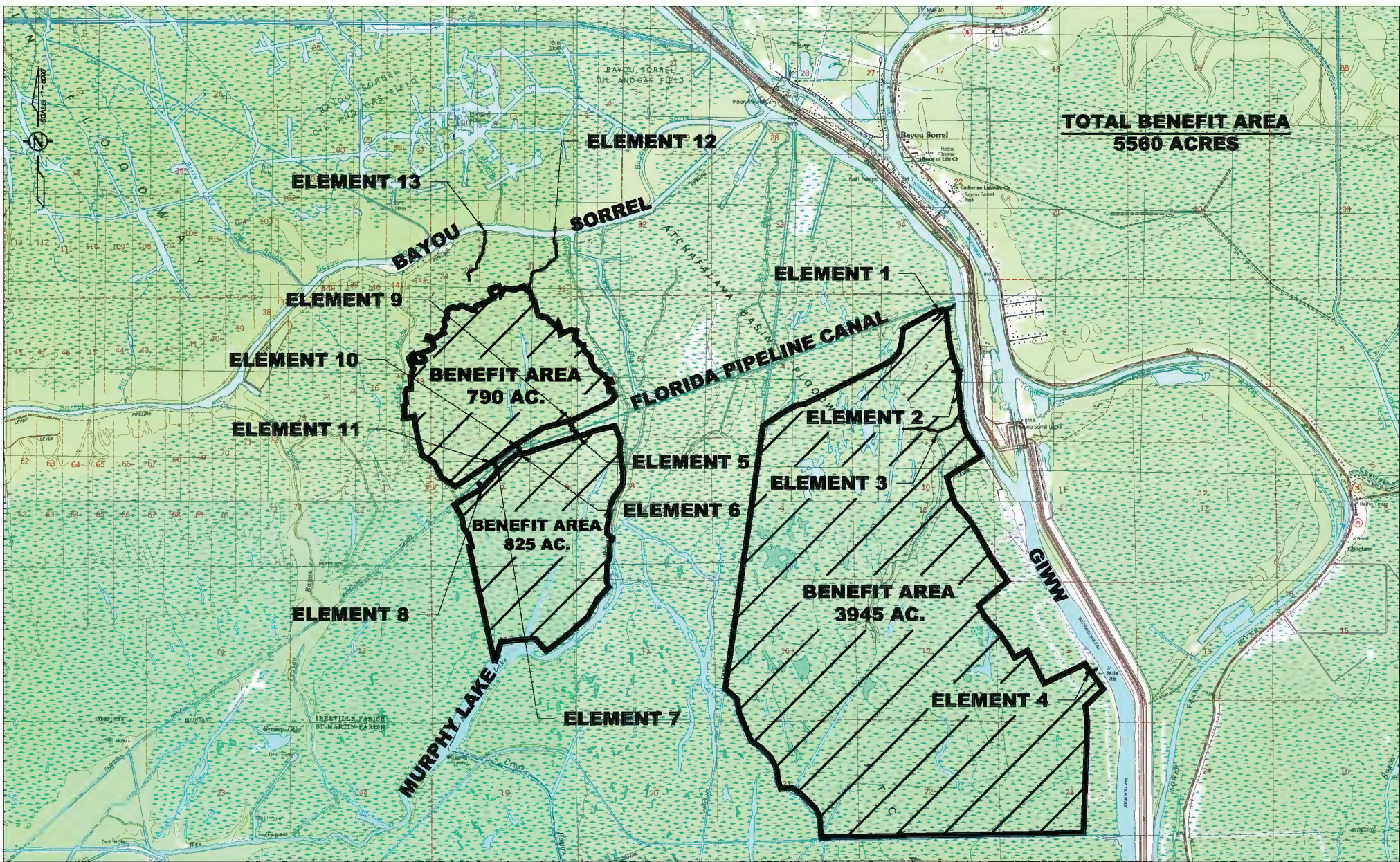
CLEARING & DISPOSAL AREA SECTION

WBS NUMBER: F.11000077
FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
COE PERMIT NUMBER: MVN 2016-01163-CY

DATE: FEBRUARY 2018
SHEET: 5 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR



**TOTAL BENEFIT AREA
5560 ACRES**

**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**



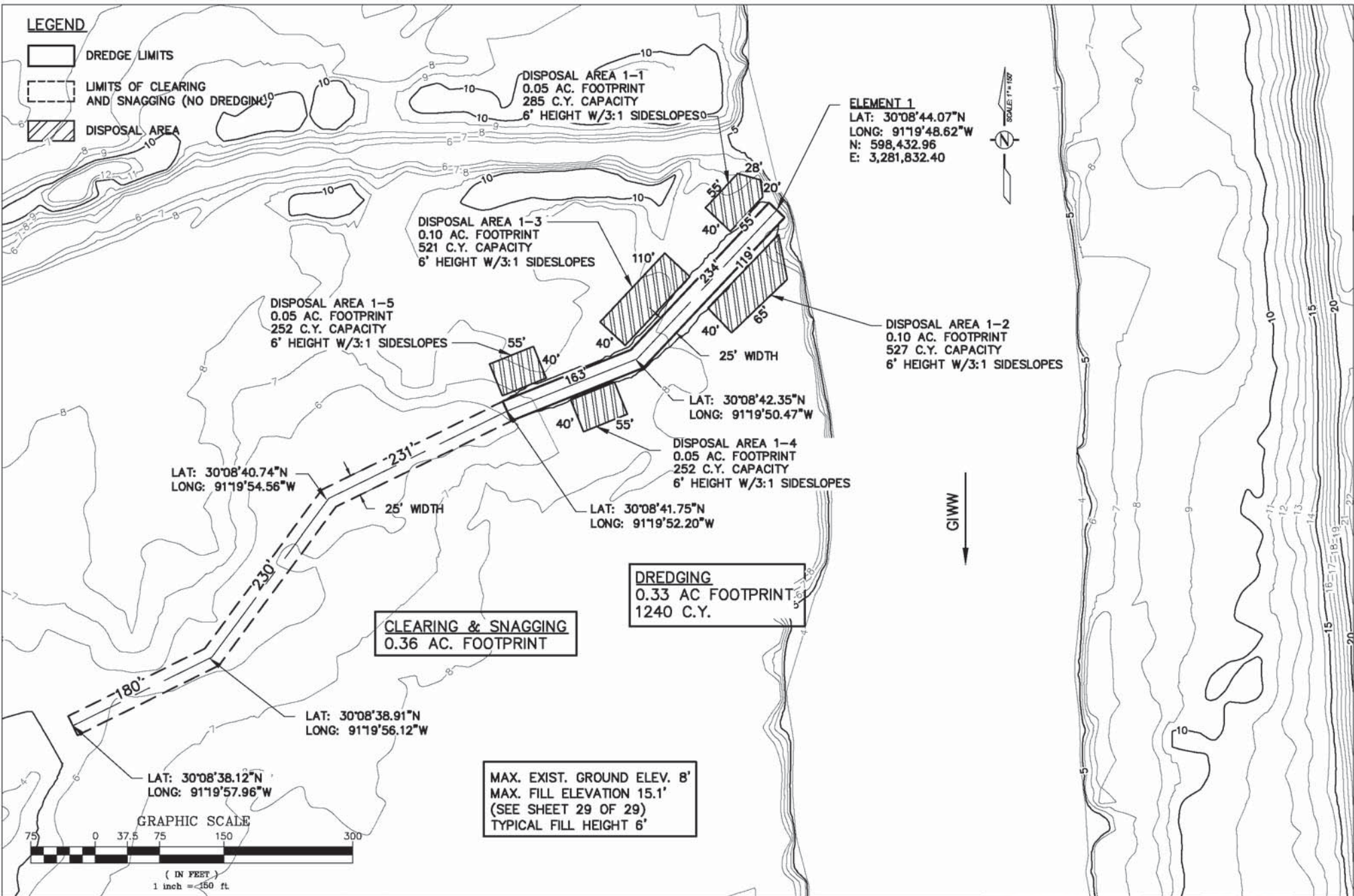
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WBS NUMBER: F.11000077
 FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
 COE PERMIT NUMBER: MVN 2016-01163-CY

DATE: FEBRUARY 2018
 SHEET: 6 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR



REV.	DATE	DESCRIPTION	BY

**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

ELEMENT 1 PLAN VIEW

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

SIGMA CONSULTING GROUP, INC.

WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY

ATCHAFALAYA RIVER BASIN

DEPARTMENT OF WATERS

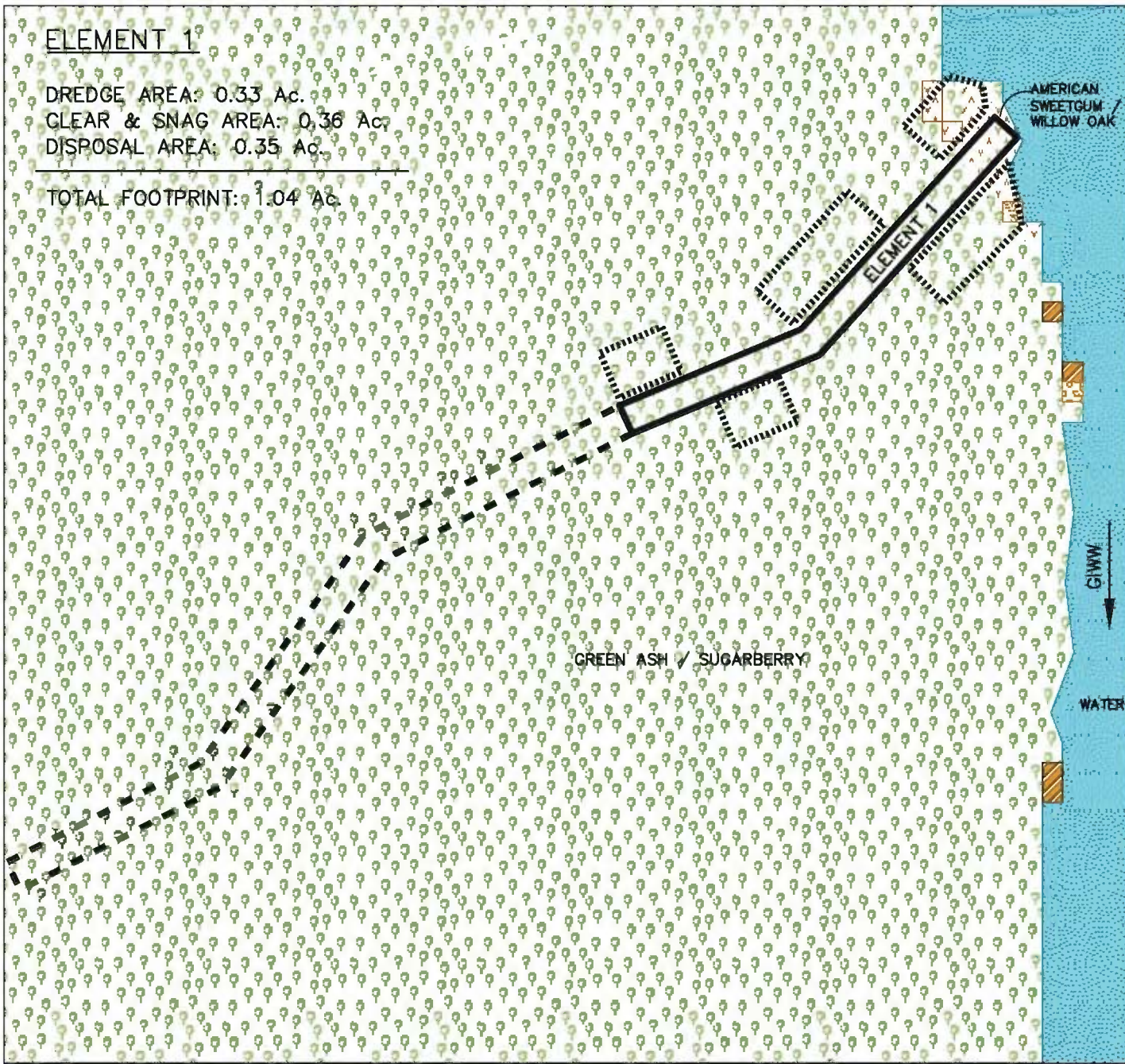
DATE: FEBRUARY 2018

SHEET: 7 OF 29

ELEMENT 1

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 CLEAR & SNAG AREA: 0.36 Ac.
 DISPOSAL AREA: 0.35 Ac.

TOTAL FOOTPRINT: 1.04 Ac.

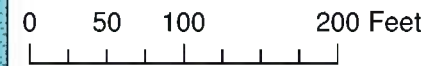


Legend

- Clear and Snag
- Disposal Area
- Dredge Area

Forestry

- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo



REV.	DATE	DESCRIPTION	BY




**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
 ATCHAFALAYA RIVER BASIN
 BAYOU SORREL, LOUISIANA**

ELEMENT 1 FORESTRY CLASS

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	DATE: FEBRUARY 2018	
COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 8 OF 29	

LEGEND

-  DREDGE LIMITS
-  LIMITS OF CLEARING AND SNAGGING (NO DREDGING)
-  DISPOSAL AREA

CLEARING & SNAGGING
0.15 AC. FOOTPRINT

DREDGING
0.11 AC. FOOTPRINT
270 C.Y.

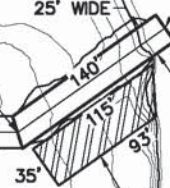
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LONG: 91°19'45.41"W
N: 595,983.79
E: 3,282,114.31

LAT: 30°08'19.05"N
LONG: 91°19'49.75"W

LAT: 30°08'19.02"N
LONG: 91°19'46.72"W

25' WIDE

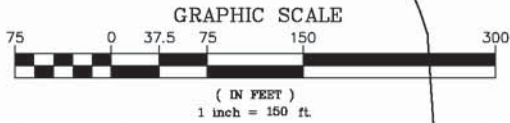
25' WIDE



DISPOSAL AREA 2-1
0.08 AC. FOOTPRINT
368 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

GIWW

MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

ELEMENT 2 PLAN VIEW



WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY

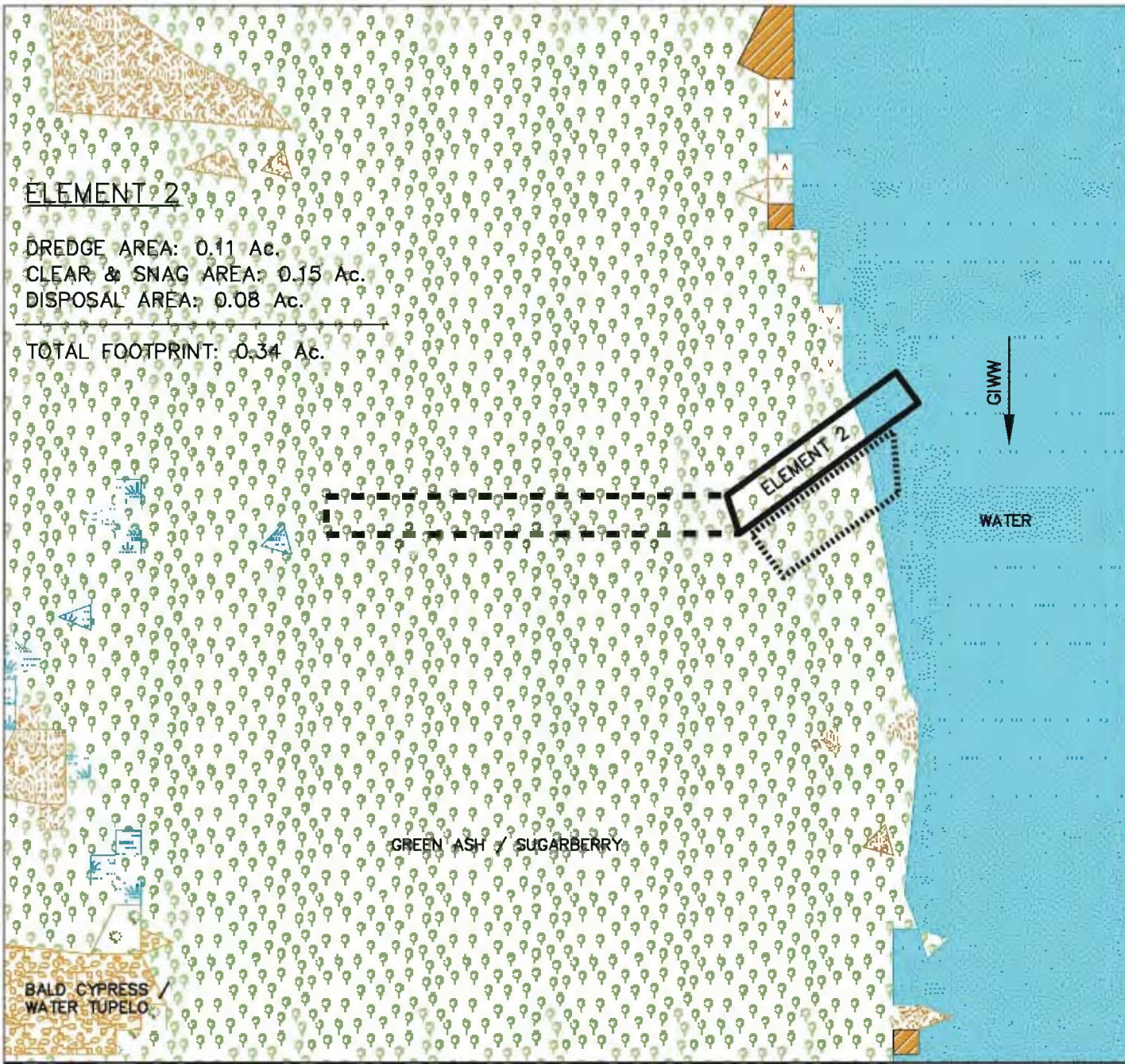
DATE: FEBRUARY 2018

SHEET: 9 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR



Legend

- Clear and Snag
- Disposal Area
- Dredge Area

Forestry




- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

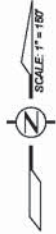
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EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA							
							WBS NUMBER: F.11000077
ELEMENT 2 FORESTRY CLASS				FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	DATE: FEBRUARY 2018		
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 10 OF 29

F:\0202017\1001\071600\Permit Drawings\171001 Element 2 Forestry.dwg [ELEMENT 2] Jan 23, 2018 - 1:59pm

LEGEND

-  DREDGE LIMITS
-  LIMITS OF CLEARING AND SNAGGING (NO DREDGING)
-  DISPOSAL AREA



LAT: 30°07'57.71"N
LONG: 91°20'10.83"W

LAT: 30°07'58.11"N
LONG: 91°20'01.62"W

LAT: 30°07'57.37"N
LONG: 91°19'59.79"W

LAT: 30°07'57.26"N
LONG: 91°19'57.46"W

MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'

DREDGING
0.19 AC. FOOTPRINT
575 C.Y.

CLEARING & SNAGGING
1.38 AC. FOOTPRINT

DISPOSAL AREA 3-2
0.08 AC. FOOTPRINT
448 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

ELEMENT 3
LAT: 30°08'04.42"N
LONG: 91°19'44.82"W
N: 594,427.67
E: 3,282,165.82

DISPOSAL AREA 3-1
0.07 AC. FOOTPRINT
400 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

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LAT: 30°08'01.22"N
LONG: 91°19'48.14"W

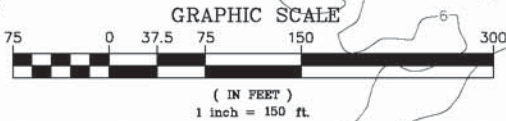
LAT: 30°07'58.47"N
LONG: 91°19'50.51"W

LAT: 30°08'02.64"N
LONG: 91°19'46.68"W

LAT: 30°07'56.65"N
LONG: 91°19'55.78"W

LAT: 30°07'57.81"N
LONG: 91°19'52.36"W

LAT: 30°07'59.76"N
LONG: 91°19'48.97"W



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**



ELEMENT 3 PLAN VIEW

WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY

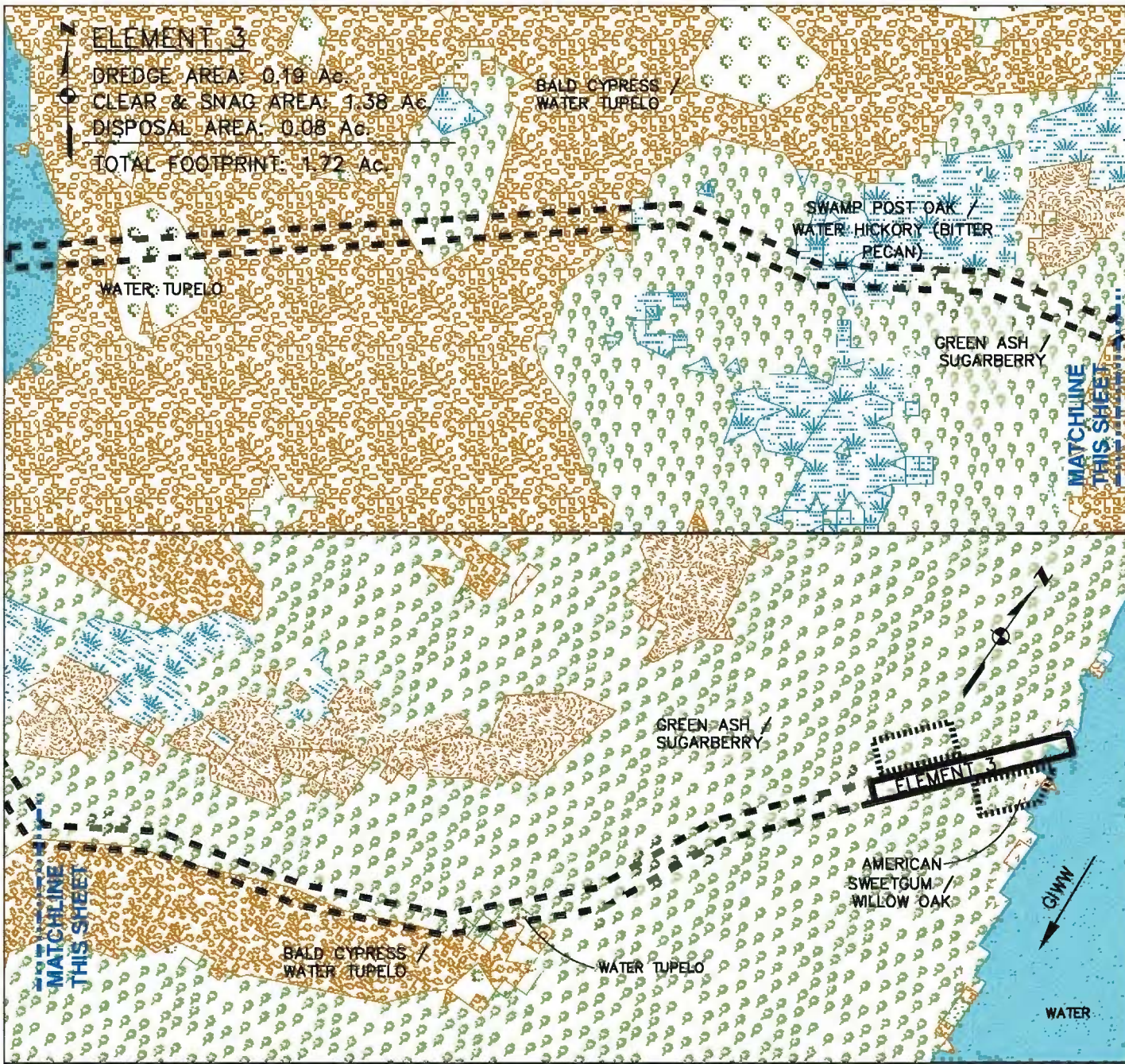
DATE: FEBRUARY 2018

SHEET: 11 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR



Legend

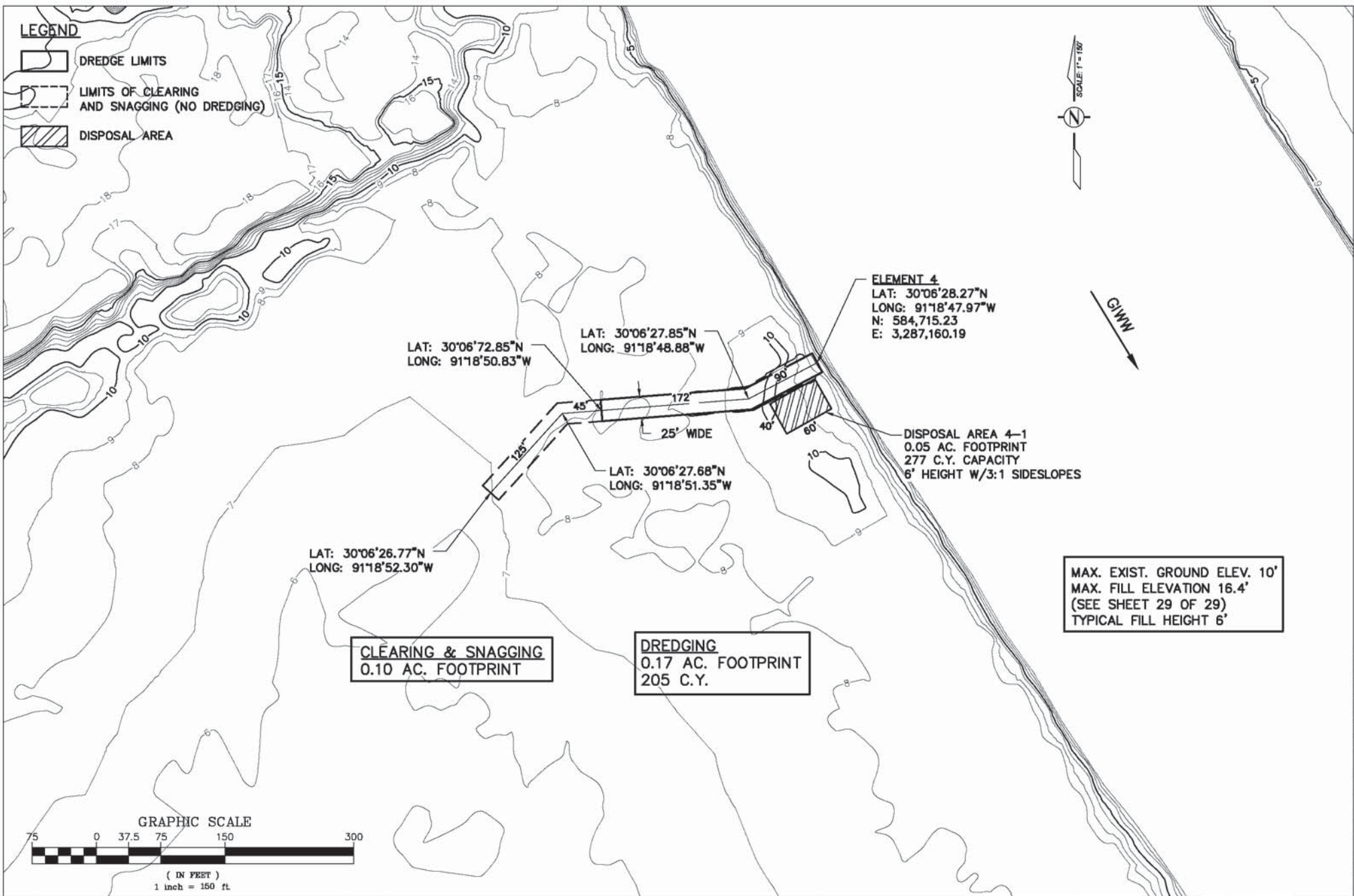
- Clear and Snag
- Disposal Area
- Dredge Area

Forestry

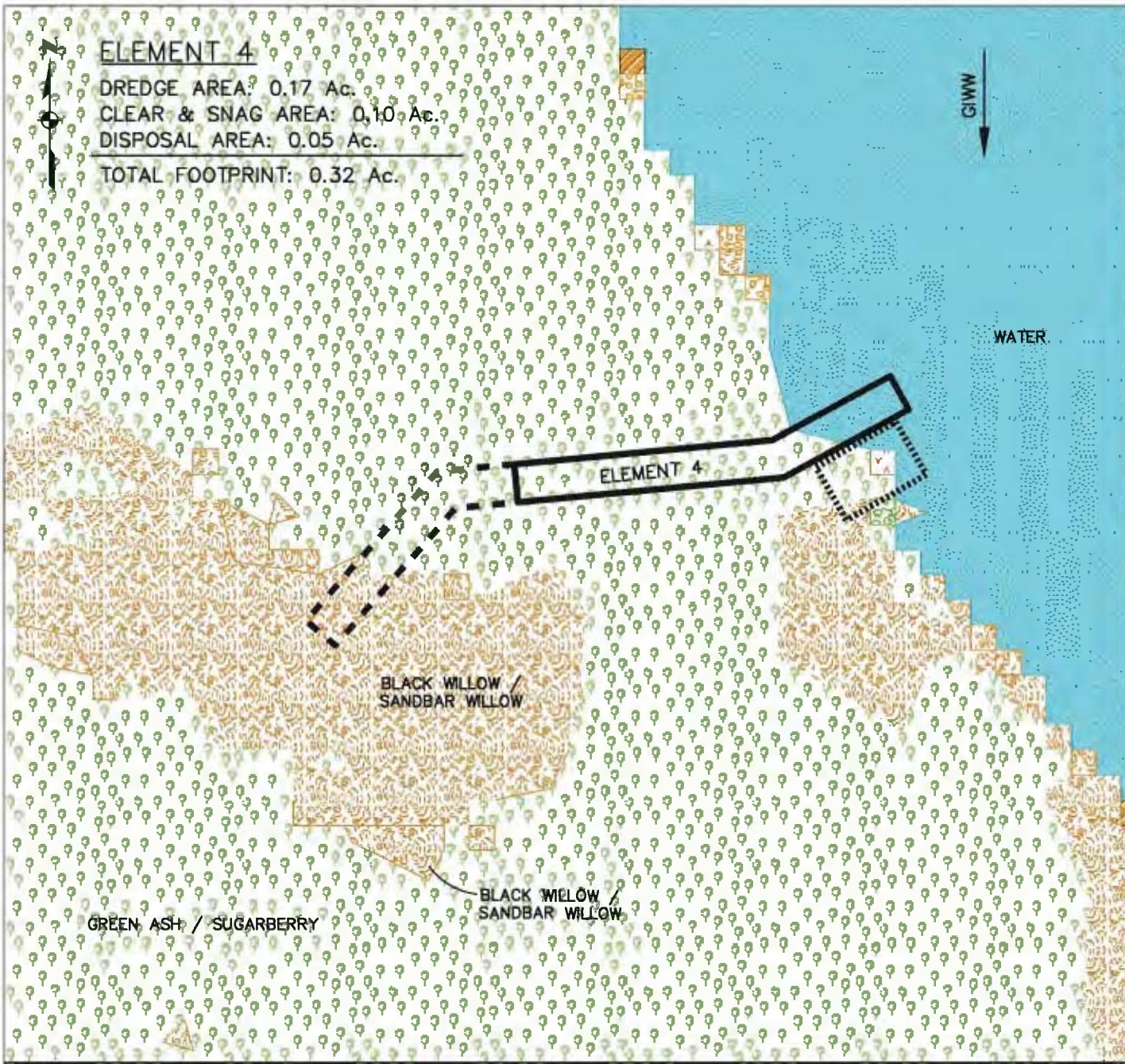
- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

0 50 100 200 Feet

<p style="text-align: center;">EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA</p> <p style="text-align: center;">ELEMENT 3 FORESTRY CLASS</p>						
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	



EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA						
ELEMENT 4 PLAN VIEW				FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	DATE: FEBRUARY 2018	
REV. DATE DESCRIPTION BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 13 OF 29		

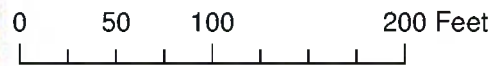


ELEMENT 4

DREDGE AREA: 0.17 Ac.
 CLEAR & SNAG AREA: 0.10 Ac.
 DISPOSAL AREA: 0.05 Ac.
 TOTAL FOOTPRINT: 0.32 Ac.




Legend

- Clear and Snag
- Disposal Area
- Dredge Area
- Forestry**
- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo



				EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA				
				ELEMENT 4 FORESTRY CLASS				
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 14 OF 29	

LEGEND

-  DREDGE LIMITS
-  LIMITS OF CLEARING AND SNAGGING (NO DREDGING)
-  DISPOSAL AREA

MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'

DREDGING
1.24 AC. FOOTPRINT
2410 C.Y.

DREDGING
0.48 AC. FOOTPRINT
1030 C.Y.

DISPOSAL AREA 9-1
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

DISPOSAL AREA 9-3
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

DISPOSAL AREA 5-1
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'

LAT: 30°08'01.76"N
LONG: 91°22'33.75"W

LAT: 30°07'55.00"N
LONG: 91°22'30.39"W

DISPOSAL AREA 9-5
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

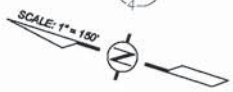
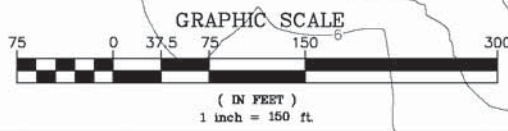
ELEMENT 5
LAT: 30°07'56.90"N
LONG: 91°22'31.02"W
N: 593,670.30
E: 3,267,572.60

DISPOSAL AREA 5-2
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

DISPOSAL AREA 9-4
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

DISPOSAL AREA 9-2
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

ELEMENT 9
LAT: 30°07'56.95"N
LONG: 91°22'31.98"W
N: 593,675.93
E: 3,267,487.79



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**



ELEMENT 5 & 9 PLAN VIEW

WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY

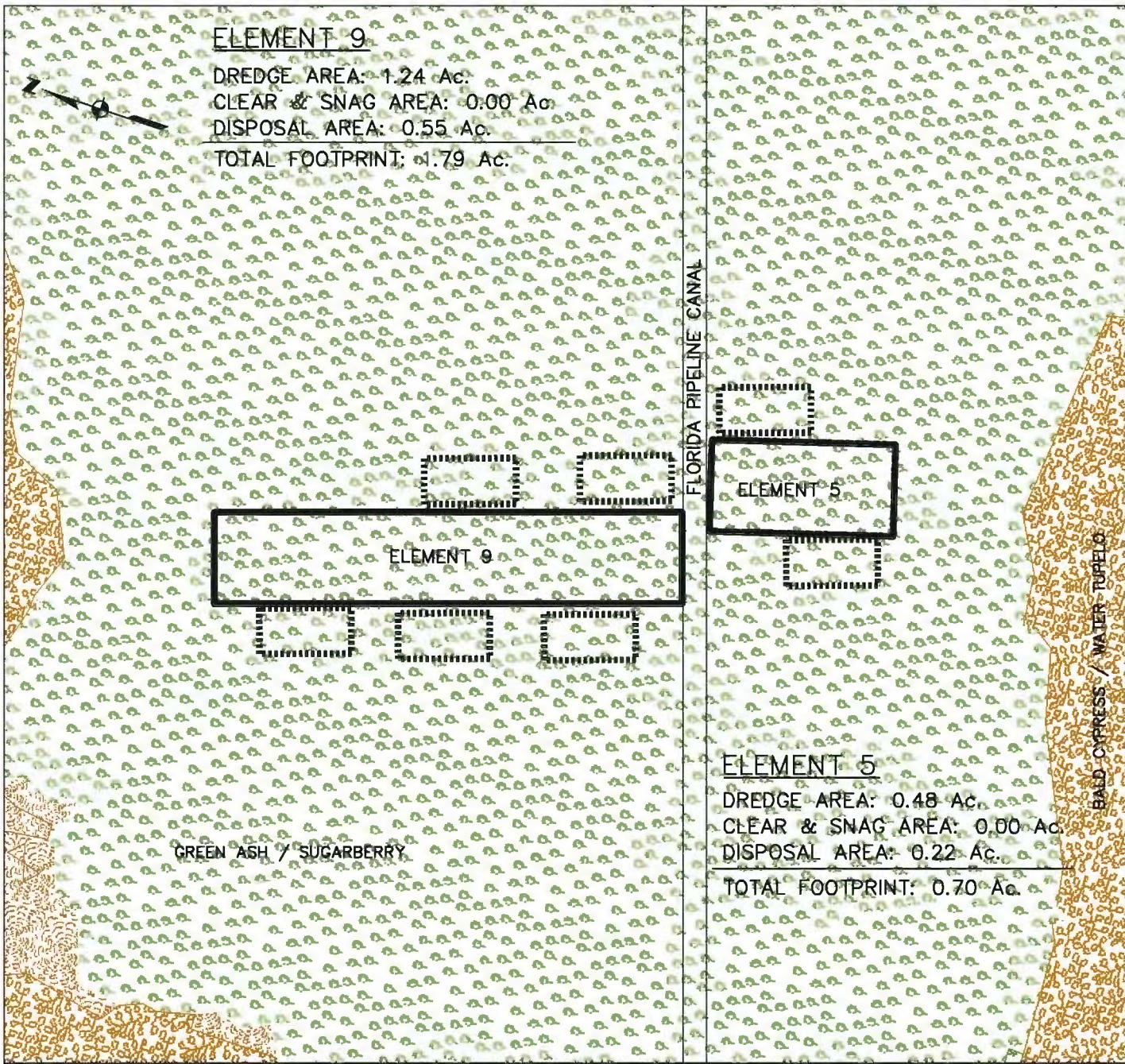
DATE: FEBRUARY 2018

SHEET: 15 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR



Legend

- Clear and Snag
- Disposal Area
- Dredge Area

Forestry




- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

0 50 100 200 Feet

				EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA				
				ELEMENT 5 & 9 FORESTRY CLASS				
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 16 OF 29

F:\0202017\100171800\Permit Drawings\171001 Element 5 and 9 Forestry.dwg [ELEMENT 5 and 9] Feb 13, 2018 - 6:35am

LEGEND

-  DREDGE LIMITS
-  LIMITS OF CLEARING AND SNAGGING (NO DREDGING)
-  DISPOSAL AREA



DREDGING
0.24 AC. FOOTPRINT
505 C.Y.

DREDGING
0.31 AC. FOOTPRINT
530 C.Y.

DISPOSAL AREA 10-1
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/5:1 SIDESLOPES

DISPOSAL AREA 6-1
0.11 AC. FOOTPRINT
655 C.Y. CAPACITY
6' HEIGHT W/3:1 SIDESLOPES

LAT: 30°07'50.78"N
LONG: 91°22'55.32"W

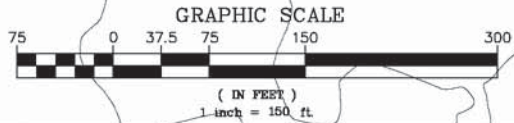
MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'

MAX. EXIST. GROUND ELEV. 8'
MAX. FILL ELEVATION 15.1'
(SEE SHEET 29 OF 29)
TYPICAL FILL HEIGHT 6'

LAT: 30°07'48.20"N
LONG: 91°22'54.77"W

ELEMENT 10
LAT: 30°07'49.80"N
LONG: 91°22'55.15"W
N: 592,953.86
E: 3,265,453.38

ELEMENT 6
LAT: 30°07'49.48"N
LONG: 91°22'55.00"W
N: 592,921.29
E: 3,265,466.83



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**



ELEMENT 6 & 10 PLAN VIEW

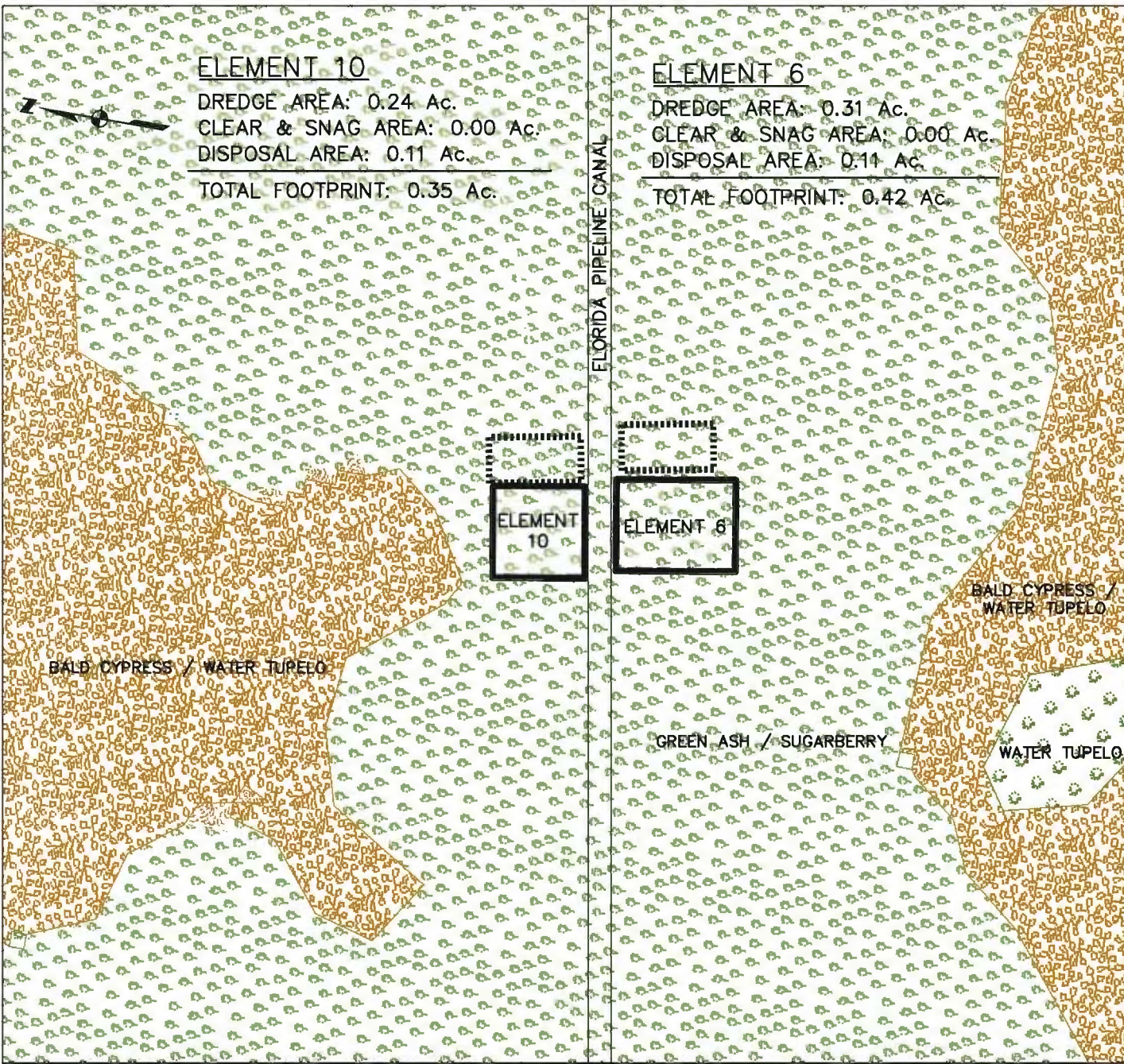
WBS NUMBER: F.11000077
FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
COE PERMIT NUMBER: MVN 2016-01163-CY

DATE: FEBRUARY 2018
SHEET: 17 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR



ELEMENT 10

DREDGE AREA: 0.24 Ac.
 CLEAR & SNAG AREA: 0.00 Ac.
 DISPOSAL AREA: 0.11 Ac.
 TOTAL FOOTPRINT: 0.35 Ac.

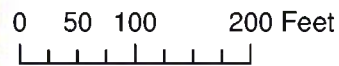
ELEMENT 6

DREDGE AREA: 0.31 Ac.
 CLEAR & SNAG AREA: 0.00 Ac.
 DISPOSAL AREA: 0.11 Ac.
 TOTAL FOOTPRINT: 0.42 Ac.

FLORIDA PIPELINE CANAL

Legend

- Clear and Snag
- Disposal Area
- Dredge Area
- Forestry**
- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo



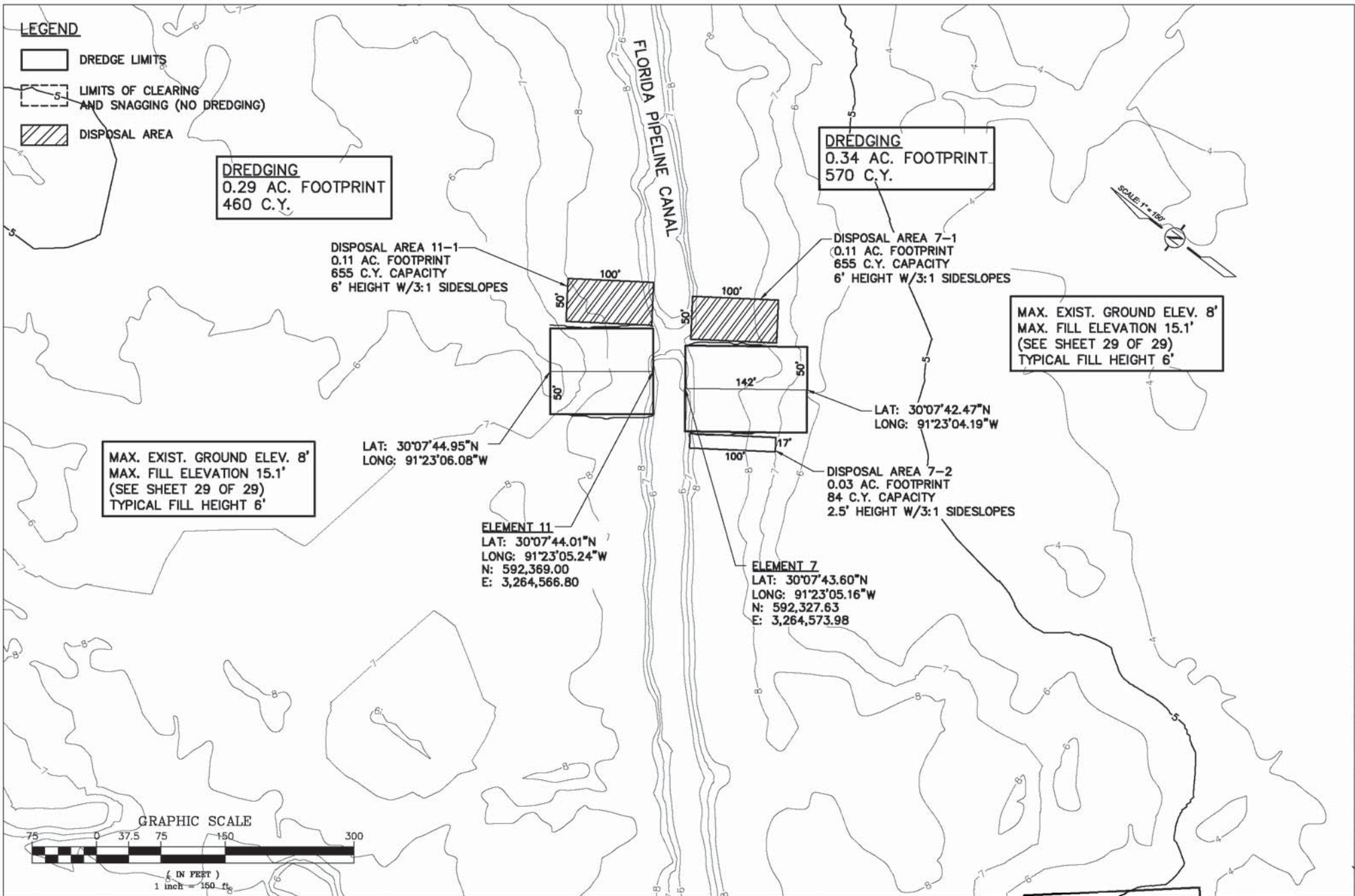
REV.	DATE	DESCRIPTION	BY

**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
 ATCHAFALAYA RIVER BASIN
 BAYOU SORREL, LOUISIANA**

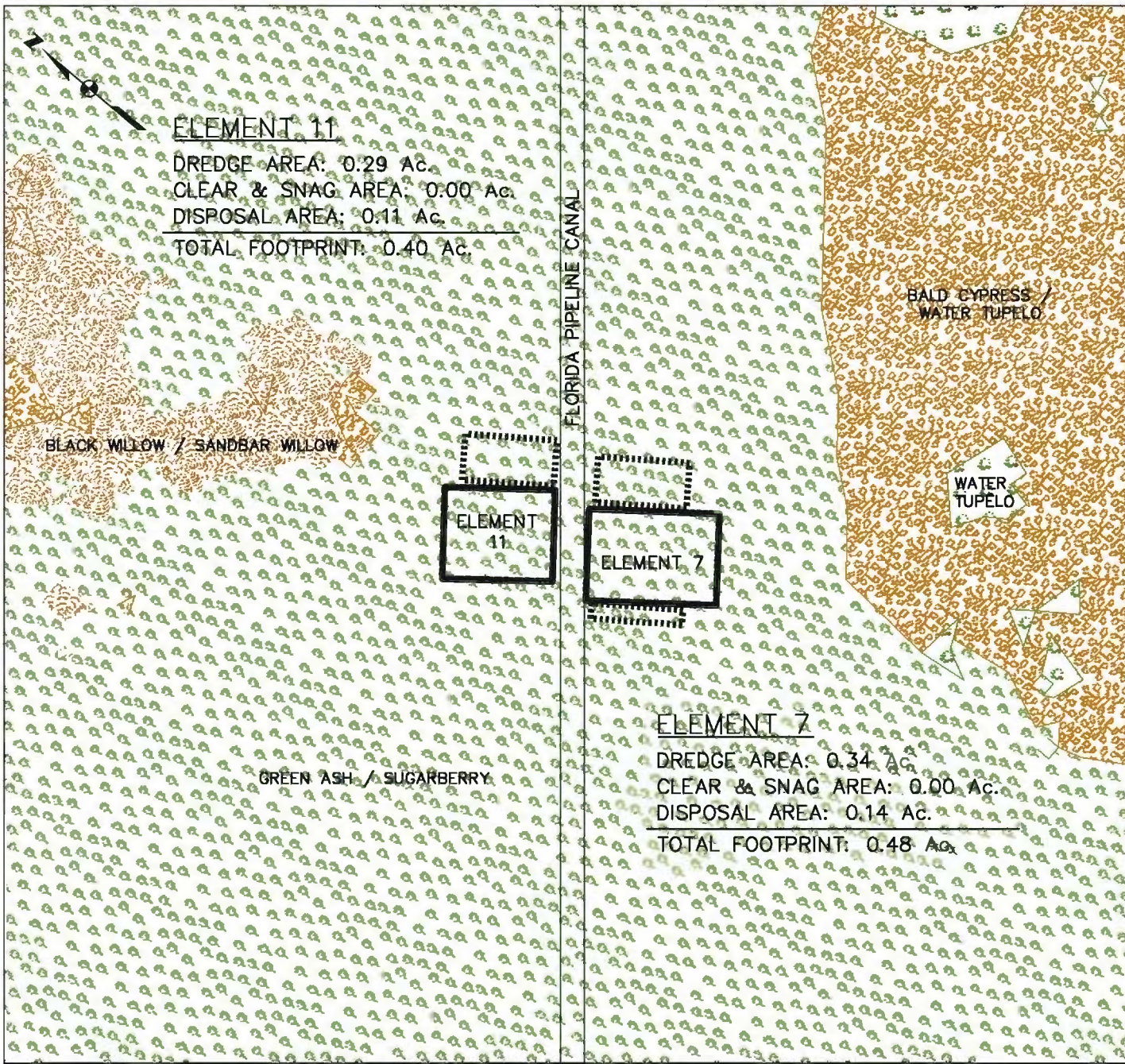
ELEMENT 6 & 10 FORESTRY CLASS

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

			WBS NUMBER: F.11000077
			FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83 DATE: FEBRUARY 2018
			COE PERMIT NUMBER: MVN 2016-01163-CY SHEET: 18 OF 29



<p>EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA</p>									
				<p>WBS NUMBER: F.11000077</p>		<p>FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83</p>		<p>DATE: FEBRUARY 2018</p>	
<p>ELEMENT 7 & 11 PLAN VIEW</p>				<p>COE PERMIT NUMBER: MVN 2016-01163-CY</p>		<p>SHEET: 19 OF 29</p>			
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES		DESIGNED BY: R. LEAR			



Legend

- Clear and Snag
- Disposal Area
- Dredge Area

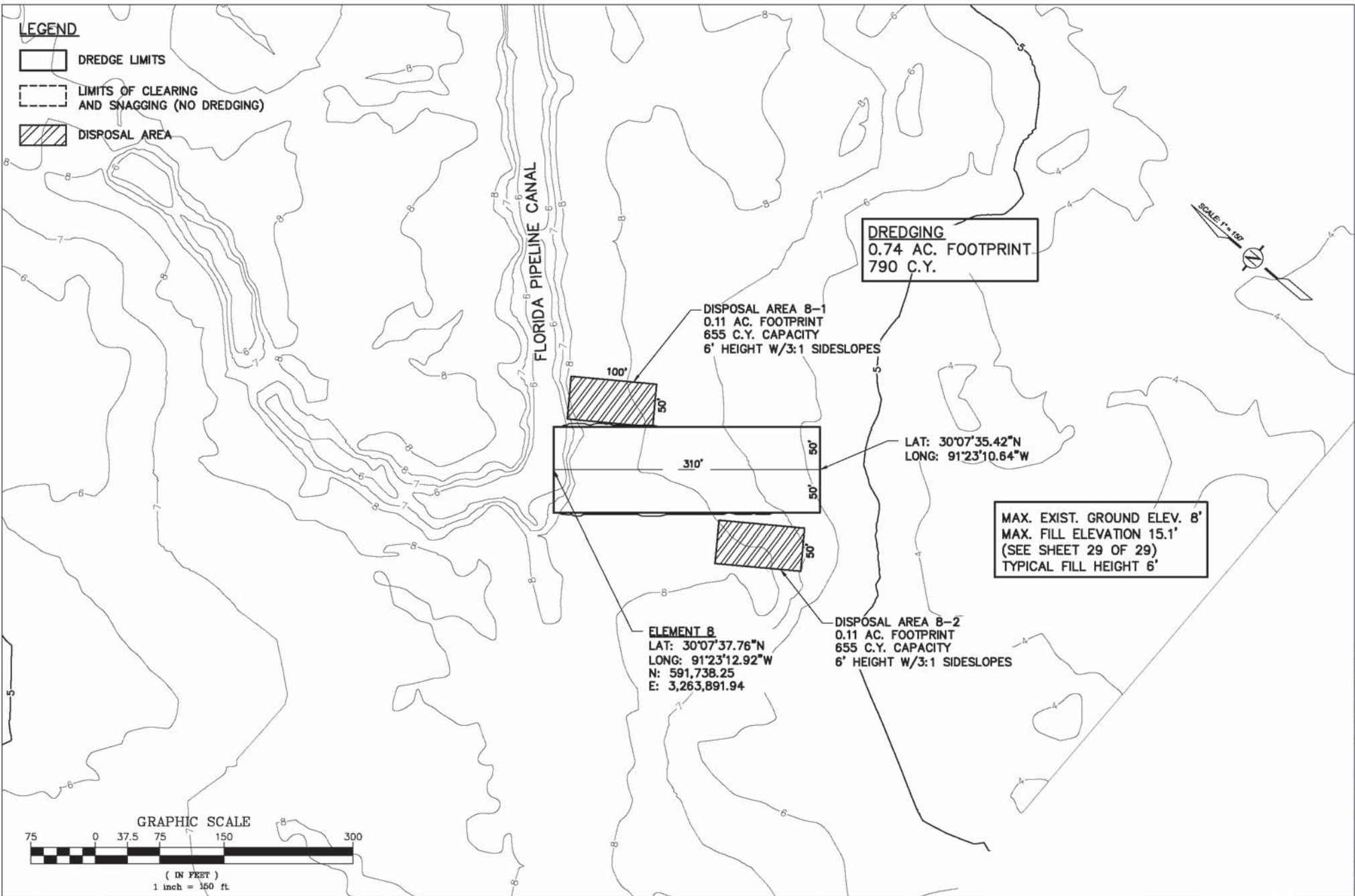
Forestry

- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

0 50 100 200 Feet

EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA							
							WBS NUMBER: F.11000077
ELEMENT 7 & 11 FORESTRY CLASS				FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83	DATE: FEBRUARY 2018		
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR	COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 20 OF 29

F:\0202017\0017001\Permit Drawings\171001 Element 7 and 11 Forestry.dwg ELEMENT 7 and 11 Feb 13, 2018 - 11:27am



REV.	DATE	DESCRIPTION	BY

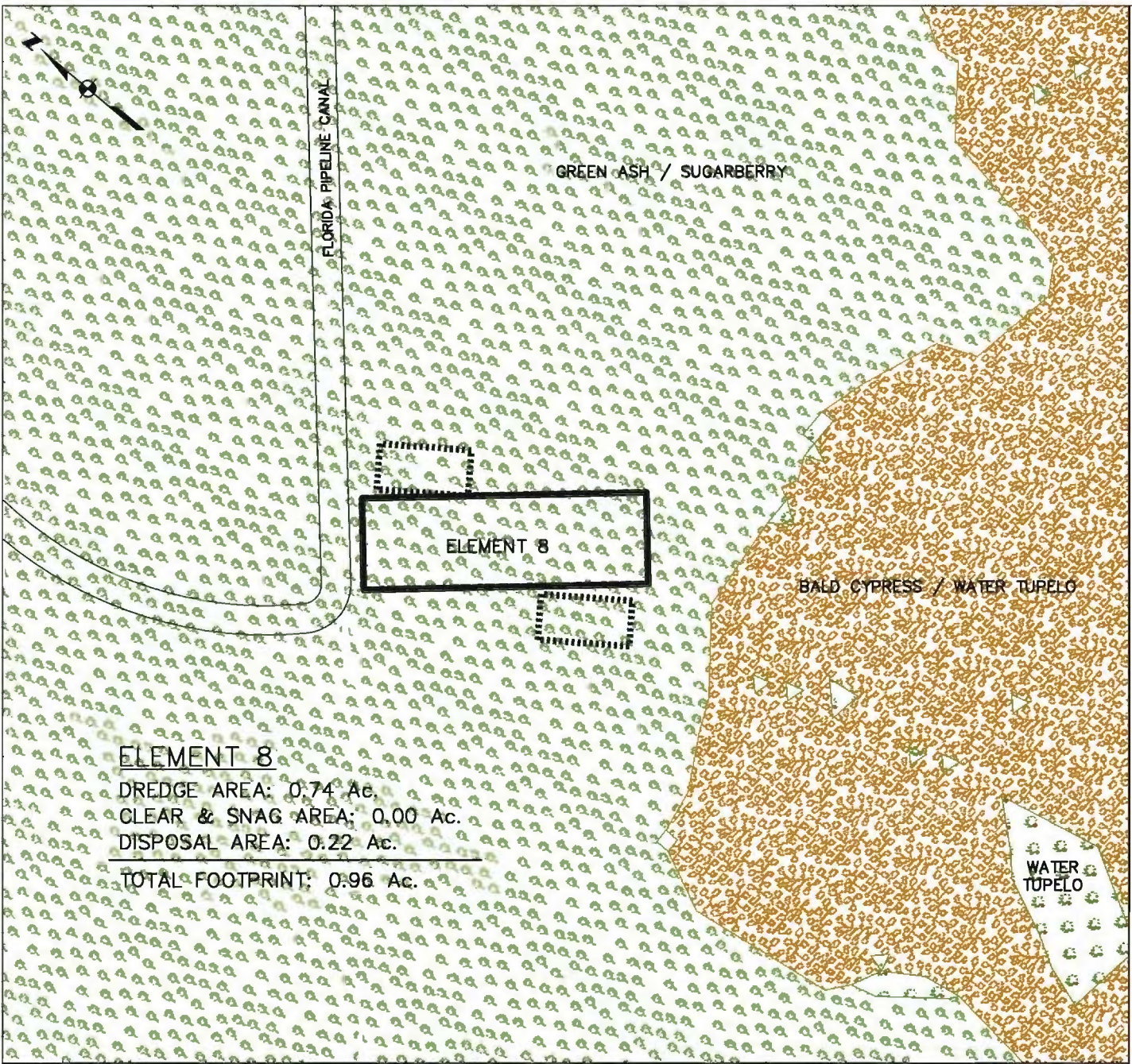
**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

ELEMENT 8 PLAN VIEW

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

	WBS NUMBER: F.11000077
	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
	COE PERMIT NUMBER: MVN 2016-01163-CY

DATE: FEBRUARY 2018
SHEET: 21 OF 29



Legend

- Clear and Snag
- Disposal Area
- Dredge Area

Forestry

- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

0 50 100 200 Feet

ELEMENT 8

DREDGE AREA: 0.74 Ac.
 CLEAR & SNAG AREA: 0.00 Ac.
 DISPOSAL AREA: 0.22 Ac.
 TOTAL FOOTPRINT: 0.96 Ac.

REV.	DATE	DESCRIPTION	BY

**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
 ATCHAFALAYA RIVER BASIN
 BAYOU SORREL, LOUISIANA**

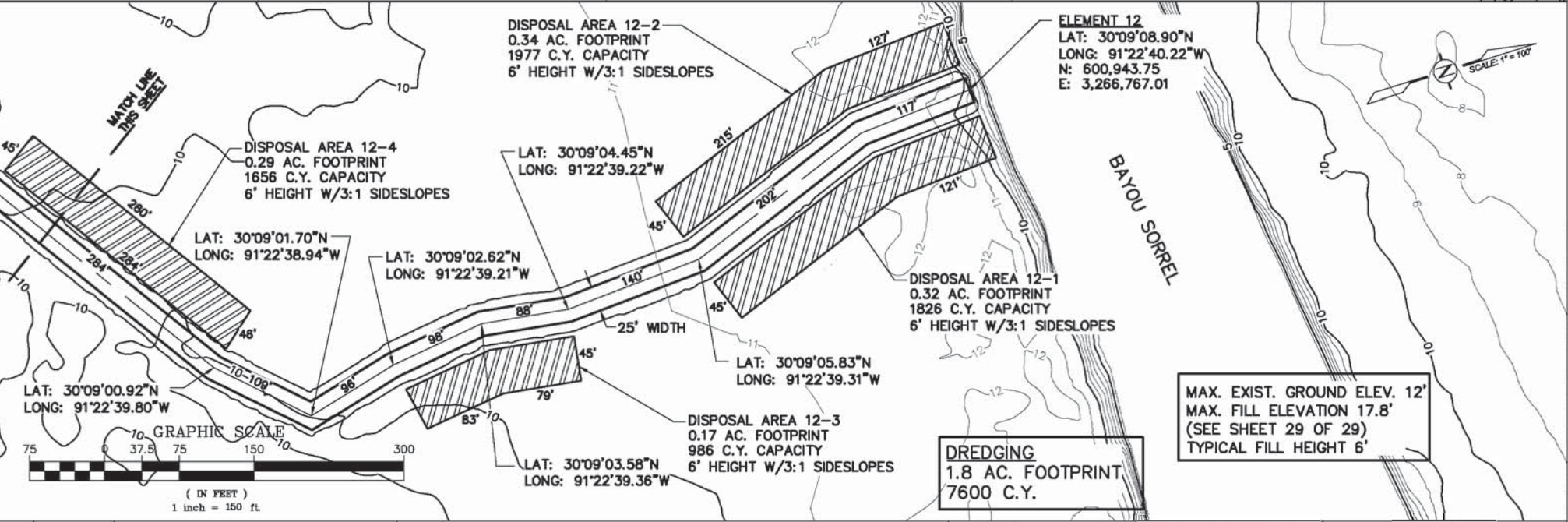
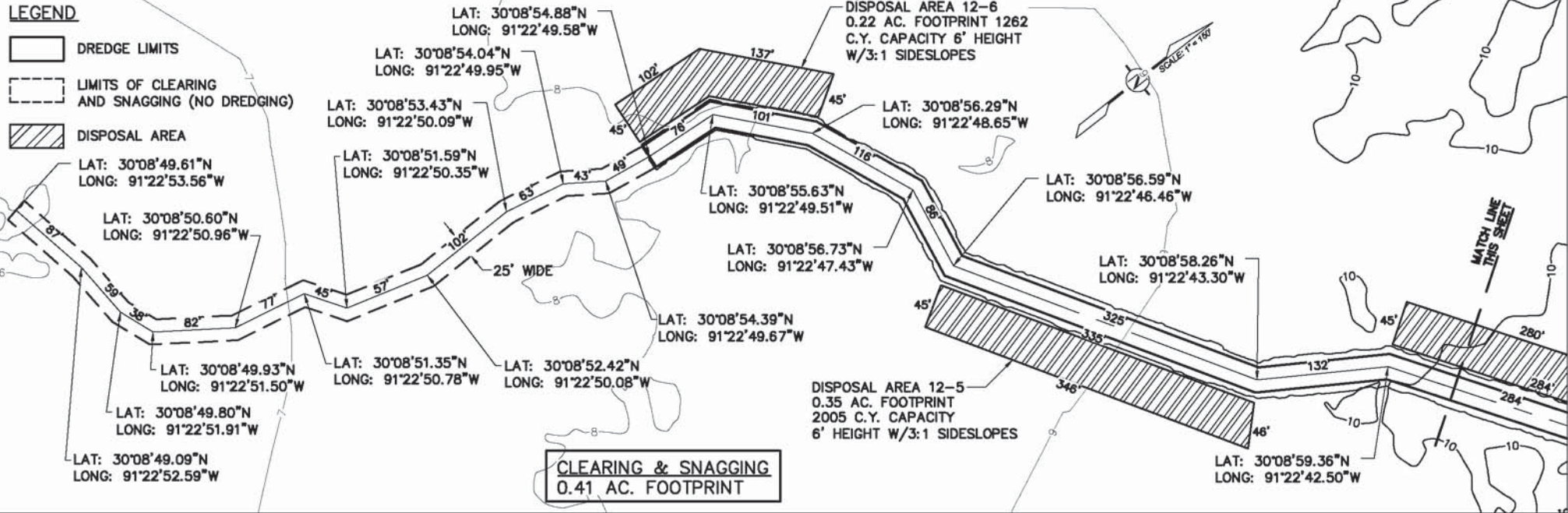
ELEMENT 8 FORESTRY CLASS

DRAWN BY: D. THYMES DESIGNED BY: R. LEAR

	WBS NUMBER: F.11000077		
	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83		
COE PERMIT NUMBER: MVN 2016-01163-CY	SHEET: 22 OF 29		

LEGEND

- DREDGE LIMITS
- LIMITS OF CLEARING AND SNAGGING (NO DREDGING)
- DISPOSAL AREA



**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

ELEMENT 12 PLAN VIEW

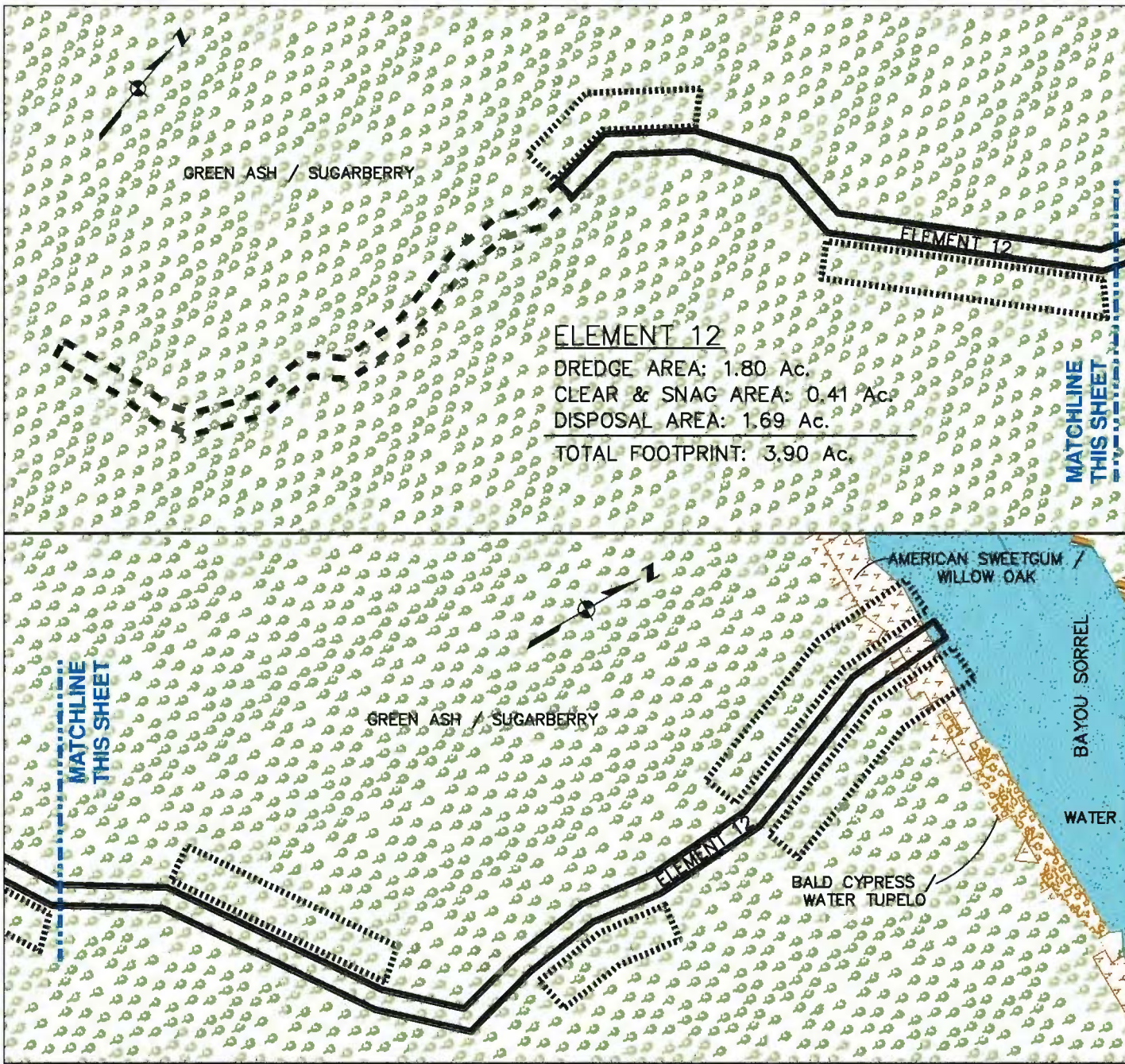


REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR
---------------------	----------------------

WBS NUMBER: F.11000077	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83
COE PERMIT NUMBER: MVN 2016-01163-CY	DATE: FEBRUARY 2018

SHEET: 23 OF 29



ELEMENT 12
 DREDGE AREA: 1.80 Ac.
 CLEAR & SNAG AREA: 0.41 Ac.
 DISPOSAL AREA: 1.69 Ac.
 TOTAL FOOTPRINT: 3.90 Ac.

Legend

- Clear and Snag
- Disposal Area
- Dredge Area

Forestry

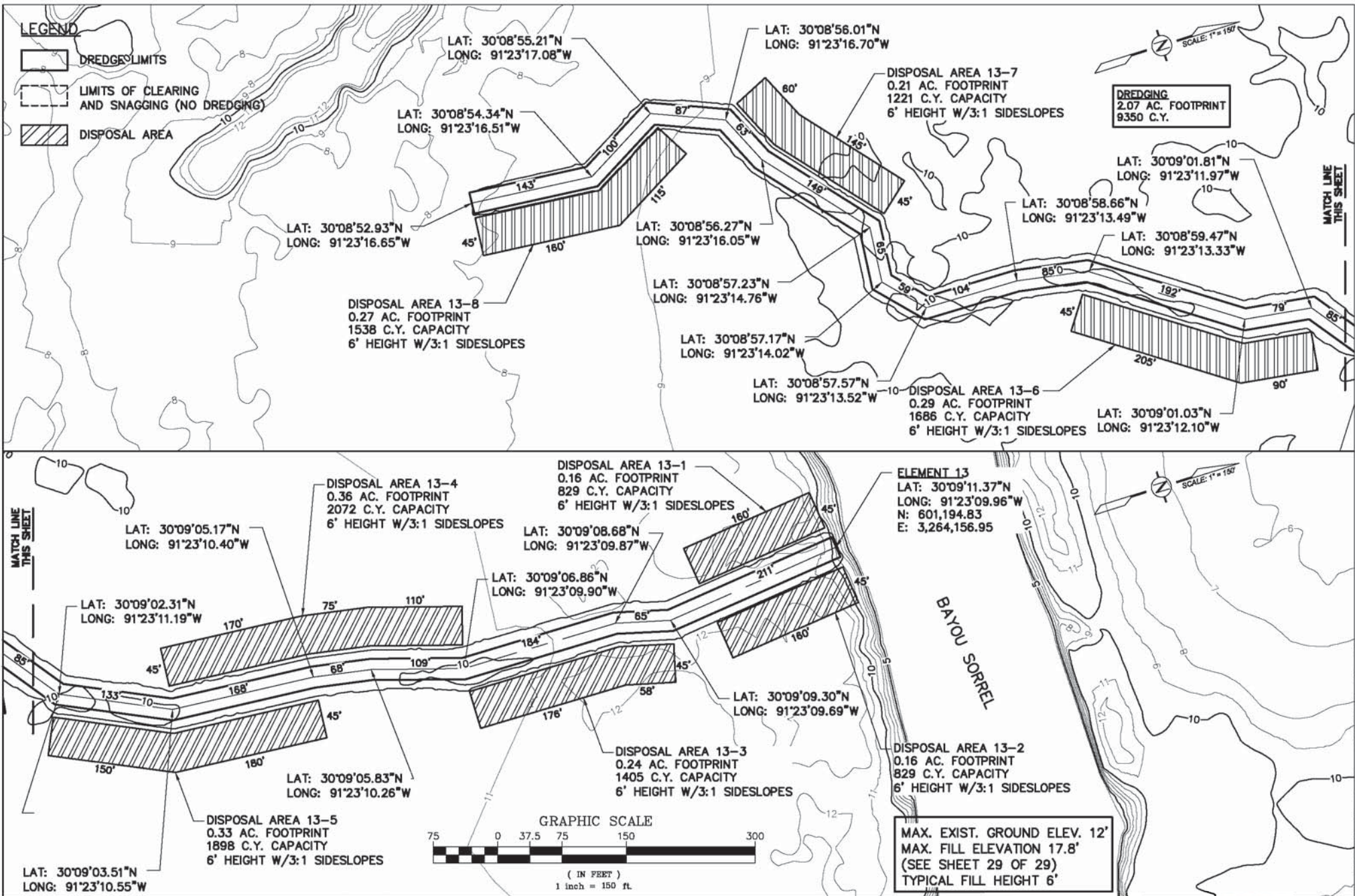
- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo

0 50 100 200 Feet

EAST GRAND LAKE ECOLOGICAL ENHANCEMENT			
ATCHAFALAYA RIVER BASIN			
BAYOU SORREL, LOUISIANA			
ELEMENT 12 FORESTRY CLASS			
REV.	DATE	DESCRIPTION	BY
		DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR

SIGMA CONSULTING GROUP, INC.	WBS NUMBER: F.11000077			
	FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83			DATE: FEBRUARY 2018
	COE PERMIT NUMBER: MVN 2016-01163-CY			SHEET: 24 OF 29

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**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
ATCHAFALAYA RIVER BASIN
BAYOU SORREL, LOUISIANA**

ELEMENT 13 PLAN VIEW



WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY

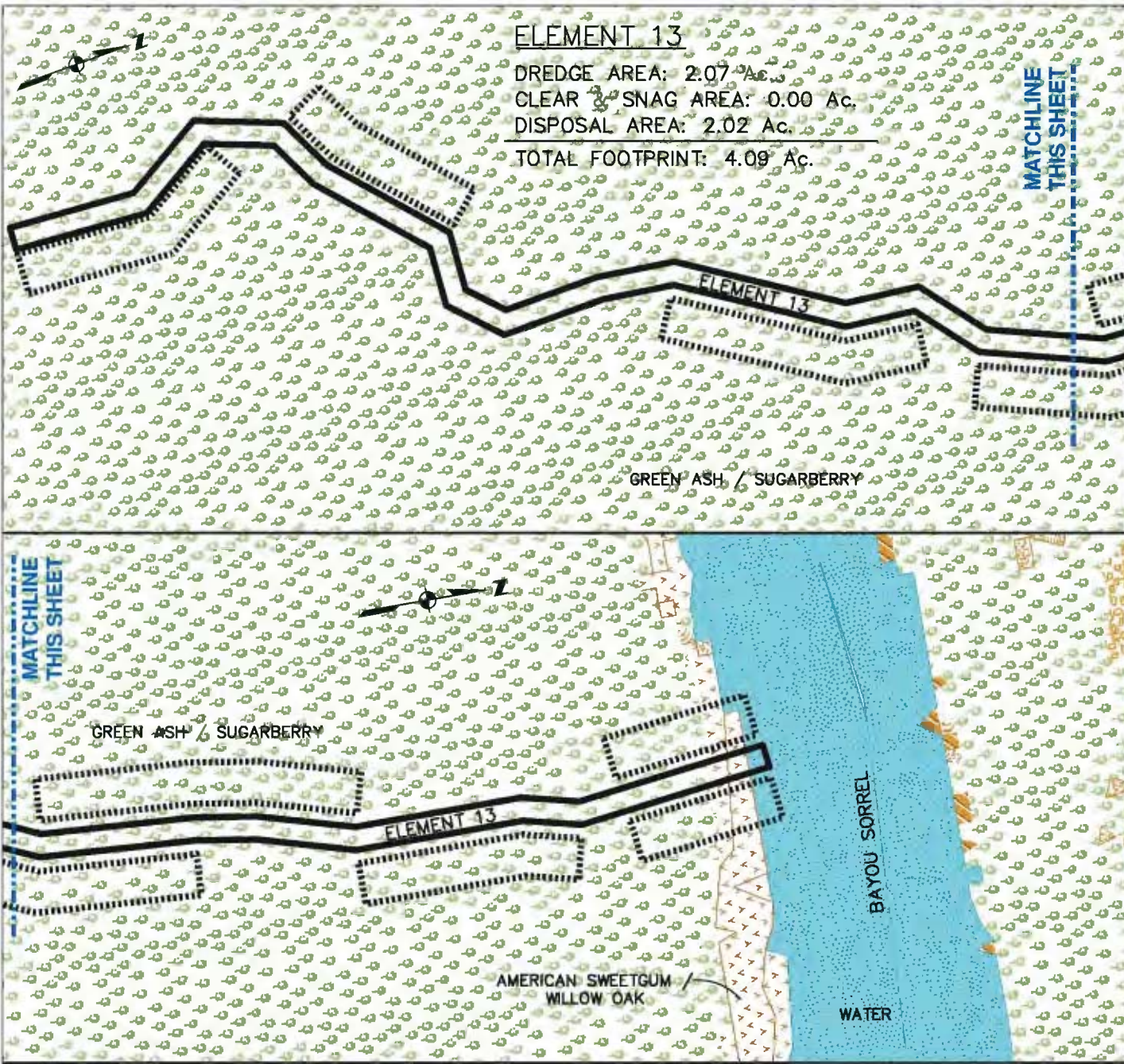
DATE: FEBRUARY 2018

SHEET: 25 OF 29

REV.	DATE	DESCRIPTION	BY

DRAWN BY: D. THYMES

DESIGNED BY: R. LEAR

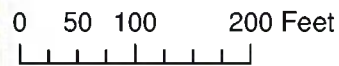


ELEMENT 13

DREDGE AREA: 2.07 Ac.
 CLEAR & SNAG AREA: 0.00 Ac.
 DISPOSAL AREA: 2.02 Ac.
 TOTAL FOOTPRINT: 4.09 Ac.

Legend

- Clear and Snag
- Disposal Area
- Dredge Area
- Forestry**
- American Sweetgum/Willow Oak
- American Sycamore / American Elm
- Baldcypress
- Baldcypress / Water Tupelo
- Black Willow / Sandbar Willow / Baldcypress
- Black Willow / Sandbar Willow
- Cultivated
- Grassland
- Green Ash / Sugarberry
- High Intensity Developed
- Low Intensity Developed
- Mixed Bottomland Hardwoods
- Mixed Upland Hardwoods
- Out
- Pasture / Hay
- River Birch / American Sycamore
- Swamp Post Oak / Water Hickory (Bitter Pecan)
- Swamp Red Maple / Tupelo Sp.
- Unknown Floating Aquatic Vegetation
- Water
- Water Tupelo




REV.	DATE	DESCRIPTION	BY

**EAST GRAND LAKE ECOLOGICAL ENHANCEMENT
 ATCHAFALAYA RIVER BASIN
 BAYOU SORREL, LOUISIANA**

ELEMENT 13 FORESTRY CLASS


DRAWN BY: D. THYMES DESIGNED BY: R. LEAR



WBS NUMBER: F.11000077

FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83

COE PERMIT NUMBER: MVN 2016-01163-CY




DATE: FEBRUARY 2018

SHEET: 26 OF 29

EAST GRAND LAKE ECOLOGICAL RESTORATION
 ATCHAFALAYA RIVER BASIN
 BAYOU SORREL, LOUISIANA

IMPACT SUMMARY

Element Number	Impacted Footprint			Cut/Fill	
	Dredge Area (Acres)	Clearing Area (Acres)	Disposal Area (Acres)	Excavation (C.Y.)	Disposal Capacity (C.Y.)
1	0.33	0.36	0.35	1,240	1,837
2	0.11	0.15	0.08	270	368
3	0.19	1.38	0.15	575	848
4	0.17	0.10	0.05	205	277
5	0.48	0.00	0.22	1,030	1,310
6	0.31	0.00	0.11	530	655
7	0.34	0.00	0.14	570	739
8	0.74	0.00	0.22	790	1,310
9	1.24	0.00	0.55	2,410	3,275
10	0.24	0.00	0.11	505	655
11	0.29	0.00	0.11	460	655
12	1.80	0.41	1.69	7,600	9,712
13	2.07	0.00	2.02	9,350	11,478
Subtotal	8.31	2.40	5.80	25,535	33,119
Total		16.51		25,535	

				EAST GRAND LAKE ECOLOGICAL ENHANCEMENT ATCHAFALAYA RIVER BASIN BAYOU SORREL, LOUISIANA		 WBS NUMBER: F.11000077 FEDERAL PROJECT NUMBER: 11-431-99-01, PART 83 COE PERMIT NUMBER: MVN 2016-01163-CY	 DATE: FEBRUARY 2018 SHEET: 27 OF 29	
				IMPACT SUMMARY				
REV.	DATE	DESCRIPTION	BY	DRAWN BY: D. THYMES	DESIGNED BY: R. LEAR			