

Bayou Terre Aux Boeufs Ridge Restoration and Reforestation Project

Monitoring Work Plan:

Marsh/Wetland Restoration (Shoreline Protection) & Floodplain Restoration (Cypress/Tupelo Reforestation)

C.O.E. Permit No. MVN-2017-00283-1ES,

C.U.P. Permit No. P20180067

St. Bernard Parish, Louisiana

Prepared for:



St. Bernard Parish Government
8201 W. Judge Perez Drive
Chalmette, Louisiana 70043

Prepared by:



ELOS Environmental, LLC
607 W. Morris Avenue
Hammond, LA 70403
(985) 662-5501

October 2022

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Royal Engineers & Consultants, LLC

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Responsible Mitigation Project”

1 Introduction

The Bayou Terre Aux Boeufs Ridge Restoration and Reforestation project is a continuation of recently completed *Lake Lery Marsh Creation Project, Phase 1* and *Bayou Terre Aux Boeufs Ridge Restoration, Armoring Phase 1* projects, and includes Marsh/Wetland Restoration (shoreline protection) and Floodplain Restoration (cypress/tupelo reforestation) components.

Shoreline protection involves the installation of limestone along a vulnerable reach of Bayou Terre Aux Boeufs, while cypress/tupelo reforestation will target an approximately 68-acre marsh polygon located immediately upstream of the shoreline protection area. Shoreline protection is needed to sustain and protect approximately 20 acres of existing live oak/hackberry habitat and ridge landform for future restoration efforts. Cypress/tupelo reforestation will provide further protection to the Bayou Terre Aux Boeufs ridge and associated habitat, and will fortify restored marsh within the previously completed *Lake Lery Marsh Creation Project, Phase 1* project area. This project is designated a Tier 1 priority within St. Bernard Parish Government (SBPG) *Coastal Strategy Document* and has been explicitly included in the Coastal Protection and Restoration Authority's (CPRA) 2017 State Master Plan.

The purpose of the monitoring effort is to measure the effectiveness of the proposed shoreline protection and reforestation interventions near Bayou Terre Aux Boeufs. This monitoring plan includes provisions for standardized data collection and analysis techniques to determine whether the project is achieving the anticipated benefits. Reports will be generated and recommendations may be made to adaptively manage the project.

1.1 Project Description

The Bayou Terre Aux Boeufs Ridge Restoration and Reforestation project is located within the Breton Sound hydrologic basin in Plaquemines and St. Bernard Parishes, Louisiana, southeast of New Orleans and immediately adjacent to the community of Delacroix, as shown in Figure 1 (attached). The purpose of the project is to increase local resilience by restoring critical environmental features.

This monitoring plan is consistent with BS-16 (South Lake Lery Shoreline and Marsh Restoration), which restored the shorelines and created marsh along the western and southern boundaries of Lake Lery; BS-17 (Lake Lery Rim Establishment and Marsh Creation), which was designed to provide net benefits to the southeastern portion of the Lake Lery shoreline; Lake Lery Marsh Creation Phase II, which created protective marsh immediately to the west of Bayou Terre Aux Boeufs; and the Breton Marsh Creation polygon, which was included in the 2017 State Master Plan.

Further, this monitoring plan addresses equipment used, installation methodology, data management, monitoring report formatting, and water level logger installation associated with the Bayou Terre Aux Boeufs Ridge Restoration and Reforestation project. The plan also includes the proposed locations as recommended by ELOS Environmental, LLC (ELOS). ELOS has also included an anticipated schedule for the project and proposed reporting outline (see Section 2,

Table 1). Per the authorized permit MVN-2017-00283-1ES, project construction must be completed by July 20, 2023 unless an extension is granted.

1.2 Goals

The goals of the project are to 1) reduce erosion and sustain shoreline along the Bayou Terre aux Boeufs ridge; 2) protect and sustain existing Live Oak/Hackberry forest along the ridge; and 3) create 68 acres of Cypress-Tupelo forest along the ridge further upstream to sustain the previously completed Lake Lery Marsh Creation (Phase 1) project. The proposed interventions are consistent with the 2017 State Master Plan and the 2022 SBPG Coastal Strategy Document. Protecting remaining Live Oak/Hackberry forests is also a high priority for the Louisiana Department of Agriculture and Forestry.

1.3 Features

The project features covered by this plan are inclusive of and are identified as the Bayou Terre Aux Boeufs Ridge Restoration and Reforestation Project. For Marsh/Wetland Restoration (shoreline protection) activities, approximately 6,200 linear feet of limestone berm atop a geotextile fabric base will be installed along the shorelines of Bayou Terre Aux Boeufs and Bayou Gentilly (see Figure 2) to protect approximately 20 acres of adjacent habitat and ridge landforms. For Floodplain Restoration (cypress/tupelo reforestation) activities includes the reforestation of an approximately 68-acre marsh polygon located between an existing reach of Bayou Terre aux Boeufs ridge and Lake Lery Marsh Restoration Site 1 (see Figure 5). This component of the project is a continuation of the referenced marsh creation project.

The following described project features and accompanying figures are as originally presented for permit authorization MVN-2017-00283-1ES (see Appendix B).

1.3.1 Marsh/Wetland Restoration (shoreline protection)

Shoreline Protection will consist of bank armoring along portions of Bayou Terre Aux Boeufs and Bayou Gentilly, in areas adjacent to existing wetland and non-wetland habitats (see Figure 2). Materials to be used are aggregate limestone riprap atop a geotextile fabric base. In wetland-adjacent locations aggregate will be raised to a level of +1 feet above surface elevation (+3.5 feet NAVD 88) on the upslope side, to a maximum elevation of +4.5 feet NAVD 88 and crest width of 3.5 feet. In non-wetland adjacent locations, aggregate fill will be placed level with adjacent surface elevation on the upslope crest, to a width of 3.5 feet. Fill slopes of 1:3 (rise:run) will be used north of Bayou Gentilly and 1:2 to the south, and will extend approximately 40 feet laterally from bank to channel. Total volume of aggregate fill is approximately 21,047 cubic yards, spanning a shoreline area of approximately 6.47 acres. See attached Figure 4 for shoreline section diagram.

1.3.2 Floodplain Restoration (cypress/tupelo reforestation)

This activity includes the reforestation of an approximately 68-acre marsh polygon within the former Lake Lery Marsh Restoration Site 1 (see Figure 3), and adjacent to an existing reach of the Bayou Terre aux Boeufs ridge. SBPG anticipates that this intervention will create approximately 68 acres of Cypress/Tupelo forest along the west side of the

referenced span of existing ridge, and will take approximately one (1) year to complete. See attached Figure 5 for the Floodplain Restoration (cypress/tupelo reforestation) project area and Appendix A for vegetative planting schematics. Tree spacing, total number of trees, and final acreage to be planted will be determined by ground elevation and planting budget available at the onset of reforestation activity. In the event localized settling along the western flank of the 68-acre polygon has rendered areas inappropriate for cypress/tupelo species, stabilization measures in the form of herbaceous wetland vegetative planting may be deemed necessary.

2 Features Requiring Monitoring

The Coast-wide Reference Monitoring System (CRMS) - Wetlands is a network of 392 monitoring sites distributed throughout the coastal zone of Louisiana. Hydrographic, vertical accretion, elevation change, vegetation, and soils, and aerial photography data are collected at each CRMS site. No CRMS monitoring stations are located in the project area, however, the following project-specific monitoring consistent with CRMS methodologies will be conducted, to help analyze project success.

The following monitoring strategies will provide the information necessary to evaluate the specific goals of protecting approximately 20 acres of live oak/hackberry ridge and marsh habitat, and enhancing approximately 68 acres of marsh through cypress-tupelo reforestation. See Table 1 for monitoring components and tracking metrics.

Marsh Restoration/Living Shoreline Component					
Goal: Protect twenty acres of existing ridge					
	Differences in Protocol	Spatial Extent	Baseline Year	Frequency	Limitations
Percentage Cover of Biomass by Species Type	No	Each Quad	2021	Annual and Pre/Post Construction	No
Elevation (cm)	No	Each Quad	2021	Annual and Pre/Post Construction	No
Shoreline Position	No	Shore. Quad	2021	Annual and Pre/Post Construction	No
Water Level	No	Loggers	2021	15 Minute Intervals (30 days), Pre-Construction	No
Oyster Reef Restored (acres, where applicable)	NA	NA	NA	NA	NA
Floodplain Restoration Component					
Goal: Create 68 acres of Cypress/Tupelo Forest					
	Differences in Protocol	Spatial Extent	Baseline Year	Frequency	Limitations
Percentage Cover of Biomass by Species Type	No	Each Quad	2021	Annual and Pre/Post Construction	No
Elevation (cm)	No	Each Quad	2021	Annual and Pre/Post Construction	No
Water Level	No	Each Quad	2021	15 Minute Intervals (30 days), Pre-Construction	No

Table 1. Monitoring components and tracking metrics.

2.1 Elevation and Shoreline Position

In order to evaluate land to water ratios and shoreline position in the project area, near-vertical aerial drone photography (1:12,000 scale) will be conducted pre- and post-construction, and in years 1 and 2 following post-construction, or as near these dates as possible using the CRMS schedule for photography acquisition. Land to water ratios will be determined using drone aerial photography (Z/I Imaging digital mapping camera) with 1-meter resolution. The photography will be georectified using standard operating procedures, and will be used in conjunction with topographic surveys and water level observations of the project area to evaluate surface elevation and shoreline position change. Aerial photography is tentatively scheduled at pre- and post-construction, and at years 2 and 3, based on the scheduling of monitoring site visits.

2.2 Water Level

Automated water level data loggers will be deployed at two locations to remotely monitor pre-construction water levels for the component project areas. The proposed geographic coordinates of Water Level Monitoring Site 1 are 29° 46' 30.84" N, 89° 47' 06.28" W, and 29° 46' 2.06" N, 89° 47' 34.66" W for Water Level Monitoring Site 2 (see attached Figure 5). Water level data will be collected at 15-minute intervals over a period of 30 days, after which it will be recovered and analyzed relative to topographic survey reference to establish mean high- and low-water elevations.

2.3 Percentage Cover of Biomass by Species Type

Vegetation surveys will be conducted to assess whether project areas have either a) maintained existing vegetative coverage or b) been successfully colonized by cypress/tupelo vegetation, and whether and to what extent non-target invasive species (tallow, willow) are present. Changes in existing vegetative community will be analyzed for the shoreline protection area covering approximately 20 acres. The colonization, transition, and maturation of the vegetative community will be analyzed for the cypress/tupelo reforestation area covering approximately 68 acres.

Vegetation sampling is scheduled at pre- and post-construction periods, and for years 1 and 2 (anticipated as 2024 and 2025), and will be further supplemented using drone photography. A staff gauge will be installed in an area of open water near the vegetative monitoring sites to provide a reference of measurement of water level height. The site monitoring field crew will record the geographic reference coordinates of the gauge at the time of installation onsite. A land surveyor will determine and confirm the water level height for staff gauge installation.

2.3.1 Existing Vegetation - Marsh/Wetland Restoration (shoreline protection)

Determining project success of the Marsh/Wetland Restoration (shoreline protection) area will be contingent upon the area maintaining existing coverage of live oak and hackberry habitat. Vegetation monitoring for the Marsh/Wetland Restoration (shoreline protection) area will consist of a minimum of three stations (Sites A, B, and C) serving as fixed points of reference for survey plots and monitoring activities. The proposed geographic reference coordinates of Vegetation Monitoring Site A are 29° 45' 30.79" North and 89° 47' 13.09" West; 29° 45' 52.14" North and 89° 47' 34.56" West for Site B; and 29° 46' 13.09" North and 89° 47' 25.16" West for Site C (see Figure 5). Data collection will follow methodology for woody vegetation within measured survey plots, including photographs, total percent cover, species present, and percent cover of each species, where applicable.

2.3.2 Planted Vegetation - Floodplain Restoration (cypress/tupelo reforestation)

A major criterion of determining project success of the Floodplain Restoration (cypress/tupelo reforestation) area will be the achievement of greater than 80 percent survivability of cypress/tupelo saplings by Year 2. Vegetation monitoring for the Floodplain Restoration (cypress/tupelo reforestation) area will consist of a minimum of two stations (Sites D and E), serving as fixed points of reference for survey plots and

monitoring activities. The proposed geographic reference coordinates of Vegetation Monitoring Site D are 29° 46' 37.15" North and 89° 46' 58.70" West, and 29° 46' 56.54" North and 89° 46' 44.80" West for Site E (see Figure 5). Data collection at vegetation stations will follow methodology for both woody and herbaceous (wetland) vegetation within measured survey plots, including photographs, total percent cover, species present, percent cover of each species, percent cover and height of each vegetation layer, and the depth of water on the surface, where applicable. Data collected specifically for cypress tupelo plantings will include sapling diameter, height, number in transect area, and canopy closure, where applicable.

3 Monitoring and Reporting Schedule

Field monitoring and reporting activities for a) Shoreline Protection and b) Cypress/tupelo Reforestation project components will take place according to the schedule below (see Table 2). Tracking metrics and corresponding project components are outlined in Section 2, Table 1. Monitoring surveys at Pre- and Post-construction intervals will be performed at each of the two project sites, to establish pre- and post-alteration baseline metrics for vegetation, water level, elevation, and shoreline position. Surveys at dates approximately one (1) and two (2) years after the Post-construction inspection interval will also be performed at each of the two project sites, to monitor change in baseline metrics over time.

ELOS will coordinate survey deployment schedule and the establishment of pre- and post-construction milestone dates with the construction contractor. Survey reports will be provided within thirty (30) days of the field monitoring interval. In terms of project completion metrics, establishment of a Monitoring Work Plan will be weighted at 10%, while field monitoring and reporting will be weighted at 30% for Pre-construction, and at 20% per activity thereafter for Post-construction, Year 1, and Year 2 surveys.

Marsh Restoration/Living Shoreline Component Goal: Protect twenty acres of existing ridge		Features Requiring Monitoring			
Monitoring Activity	Timing of Activity	Percentage Cover of Biomass by Species	Elevation	Shoreline Position	Water Level
Pre-Construction	no less than 30 days before construction	Field Sampling	Drone & Survey	Drone & Survey	Data Logger
Post-Construction	no more than 60 days after construction	Field Sampling	Drone & Survey	Drone & Survey	n/a
Year 1 Inspection	approx. one year after Post-Construction	Field Sampling	Drone & Survey	Drone & Survey	n/a
Year 2 Inspection	approx. two years after Post-Construction	Field Sampling	Drone & Survey	Drone & Survey	n/a
Floodplain Restoration Component Goal: Create 68 acres of Cypress/Tupelo Forest		Percentage Cover of			
Monitoring Activity	Timing of Activity	Biomass by Species	Elevation	Shoreline Position	Water Level
Pre-Construction	no less than 30 days before construction	Field Sampling	Drone & Survey	Drone & Survey	Data Logger
Post-Construction	no more than 60 days after construction	Field Sampling	Drone & Survey	Drone & Survey	n/a
Year 1 Inspection	approx. one year after Post-Construction	Field Sampling	Drone & Survey	Drone & Survey	n/a
Year 2 Inspection	approx. two years after Post-Construction	Field Sampling	Drone & Survey	Drone & Survey	n/a

Table 2. Monitoring and reporting schedule

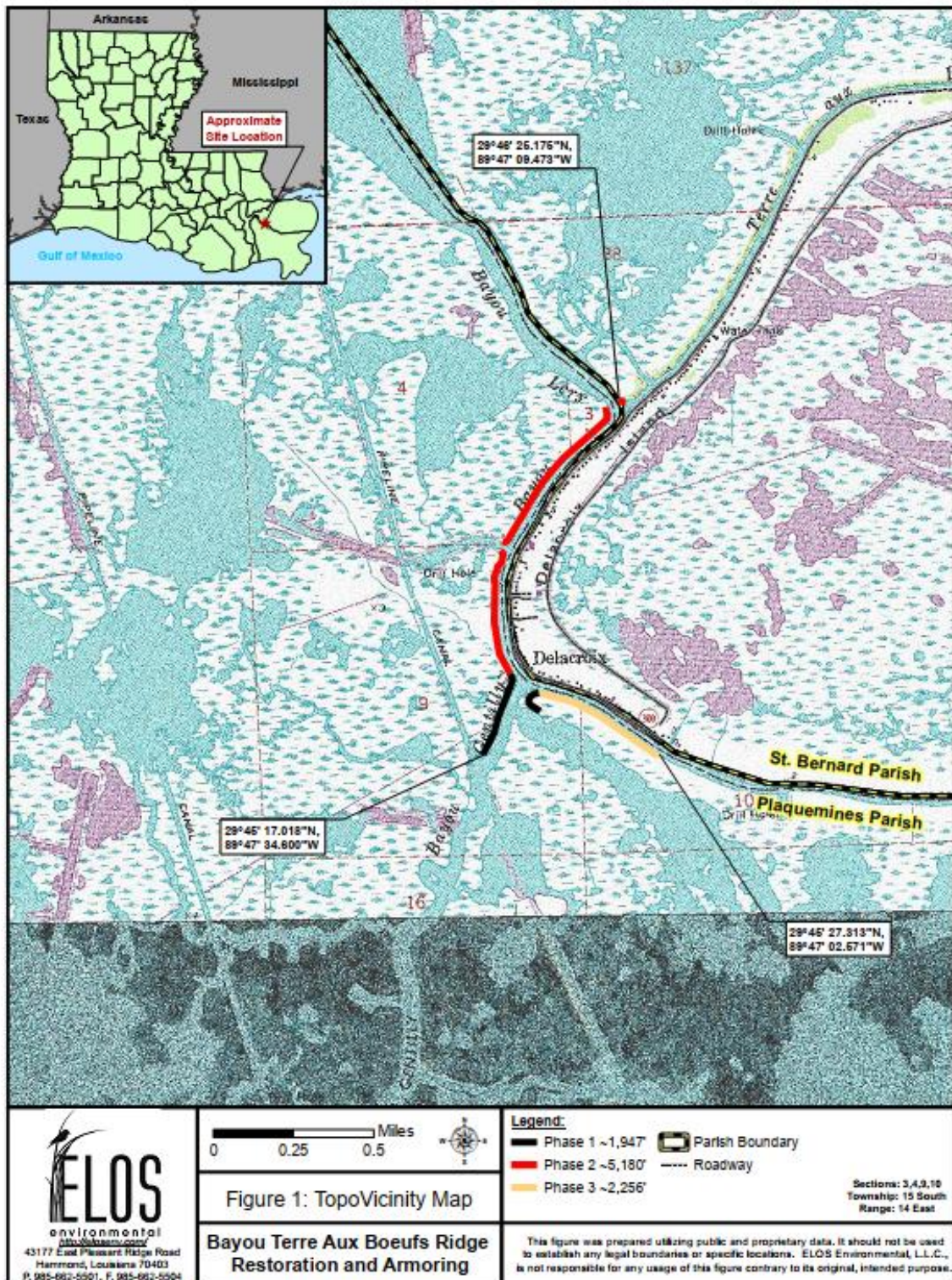
4 Responsibilities

ELOS will carry out the following monitoring and report development efforts:

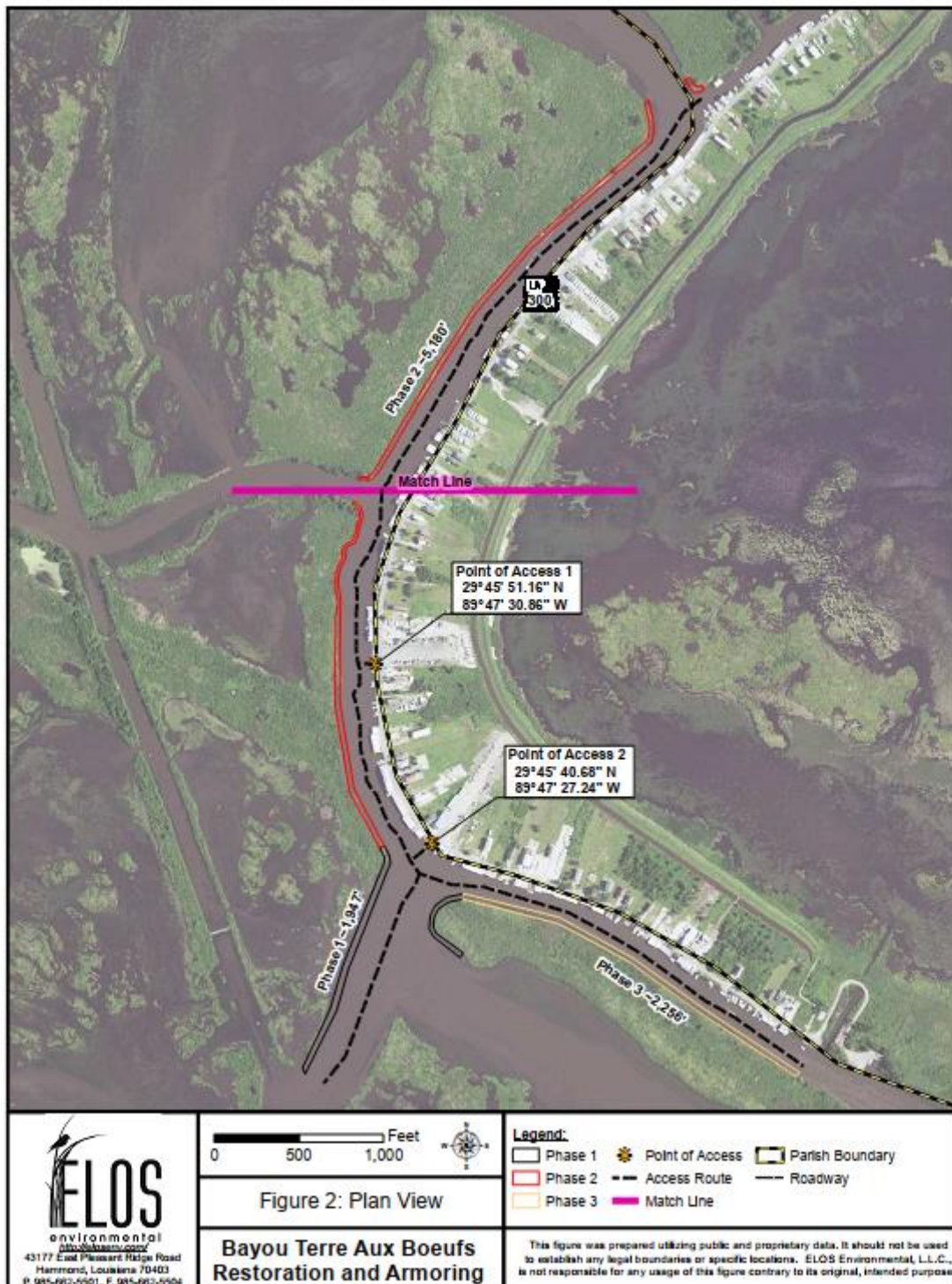
1. Coordinate and oversee all scientific data collection.
2. Ensure that all data go through quality control procedures and are entered into the public database.
3. Analyze the data and report on the status of the project annually. Should the data indicate that the project is not meeting the goals and objectives, adaptive management recommendations will be made. This may include implementation of invasive species control, dependent on percent coverage of target species (live oak/hackberry, cypress/tupelo) versus non-target invasive species at the two project areas.
4. Review the monitoring plan and budget annually with St. Bernard Parish to determine that the data being collected adequately evaluate the project and that funding is suitable to fulfill monitoring requirements.

FIGURES

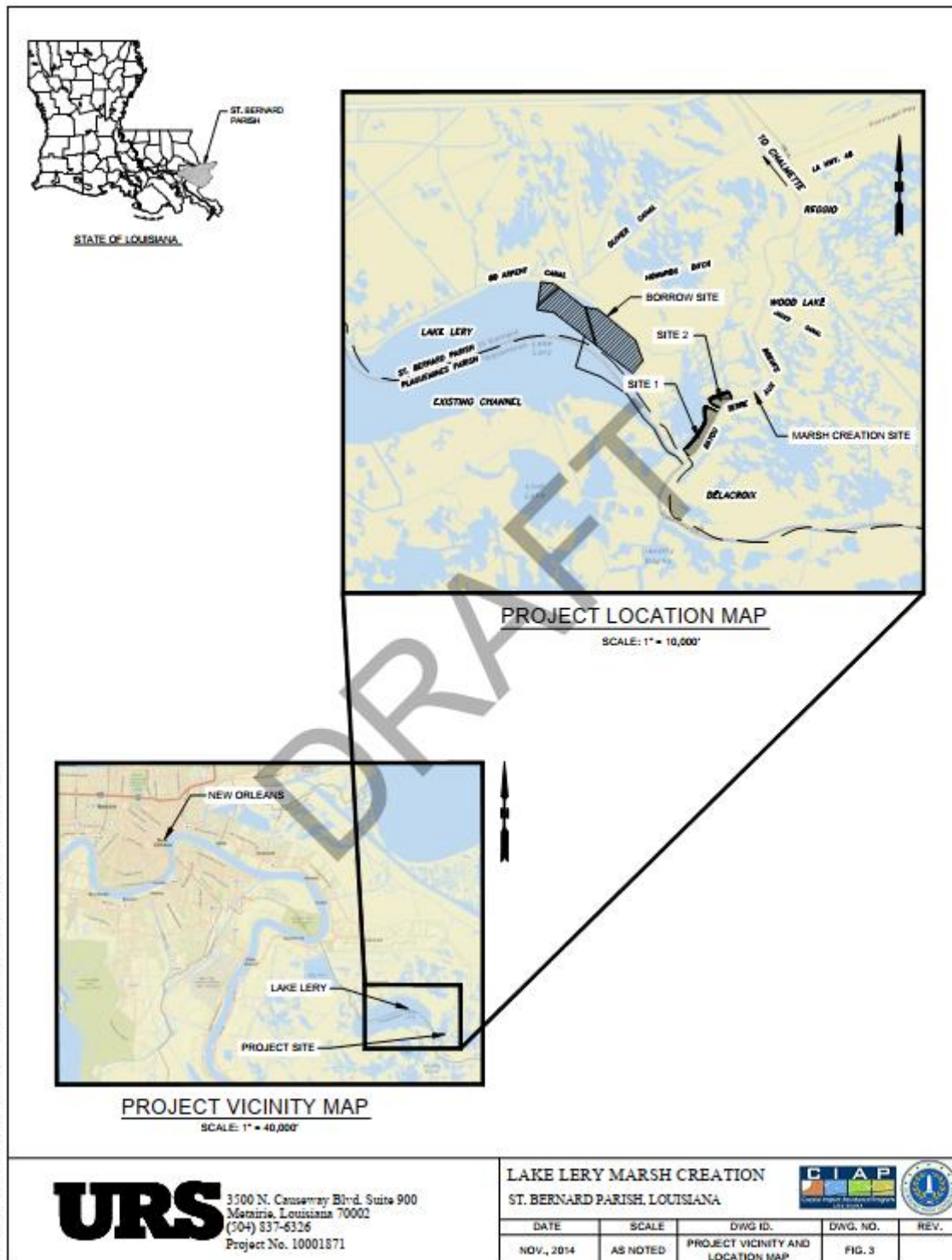
- ELOS Figure 1.** Vicinity Map – Bayou Terre Aux Boeufs Ridge Restoration & Reforestation area
- ELOS Figure 2.** Project Area – Marsh/Wetland Restoration (shoreline protection)
- URS Figure 3.** Vicinity Map – Lake Lery Marsh Restoration, Site 1
- ELOS Figure 4.** Diagram – Marsh/Wetland Restoration (shoreline protection)
- ELOS Figure 5.** Project Areas and Monitoring Sites – Marsh/Wetland Restoration Phase (shoreline protection), Floodplain Restoration (Cypress/Tupelo Reforestation)

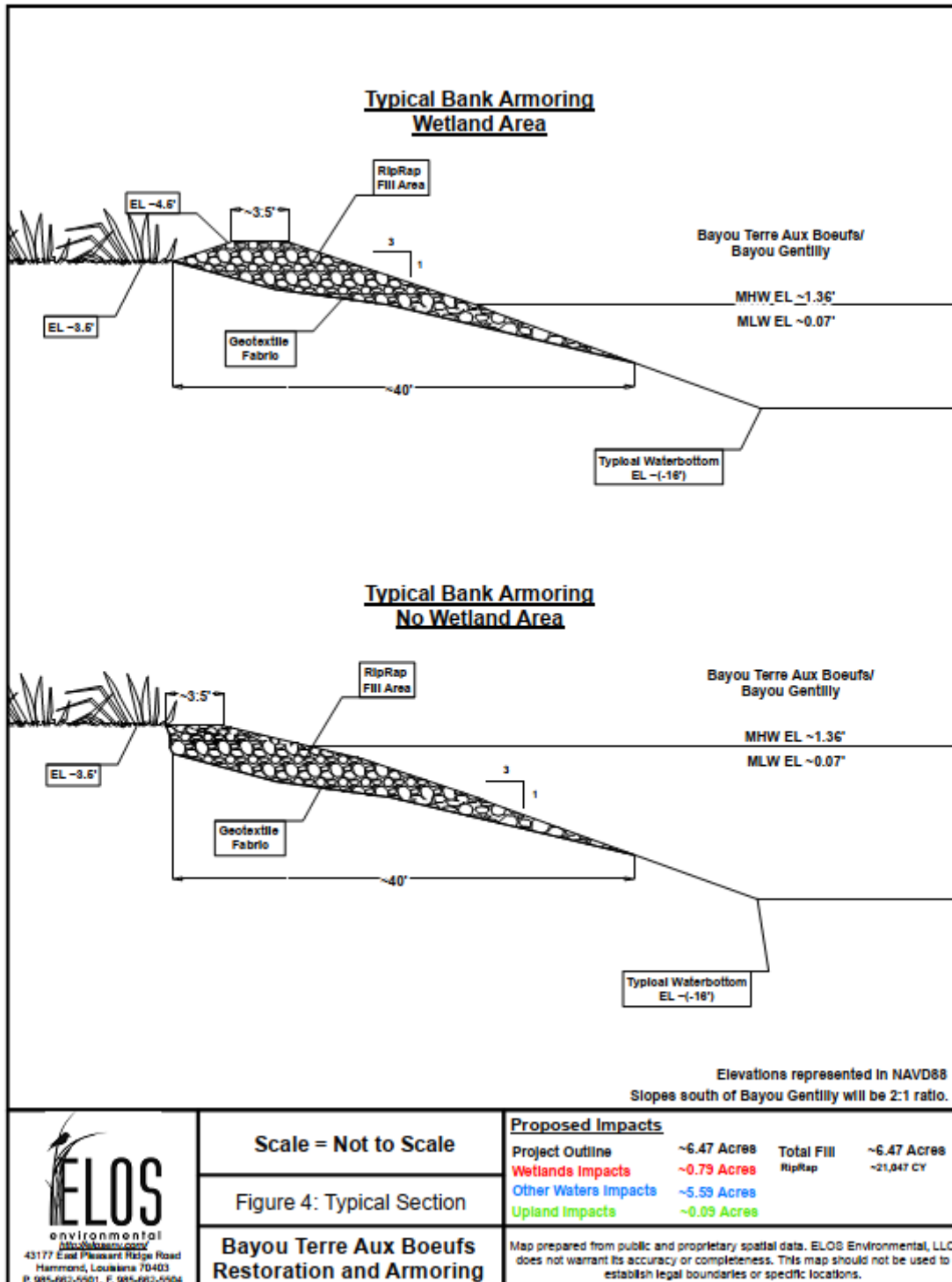


FAKLE\Bayou Terre Aux Boeufs\GIS Maps\Permit\Project JPA\Figure 1_topoVicinity Map.mxd

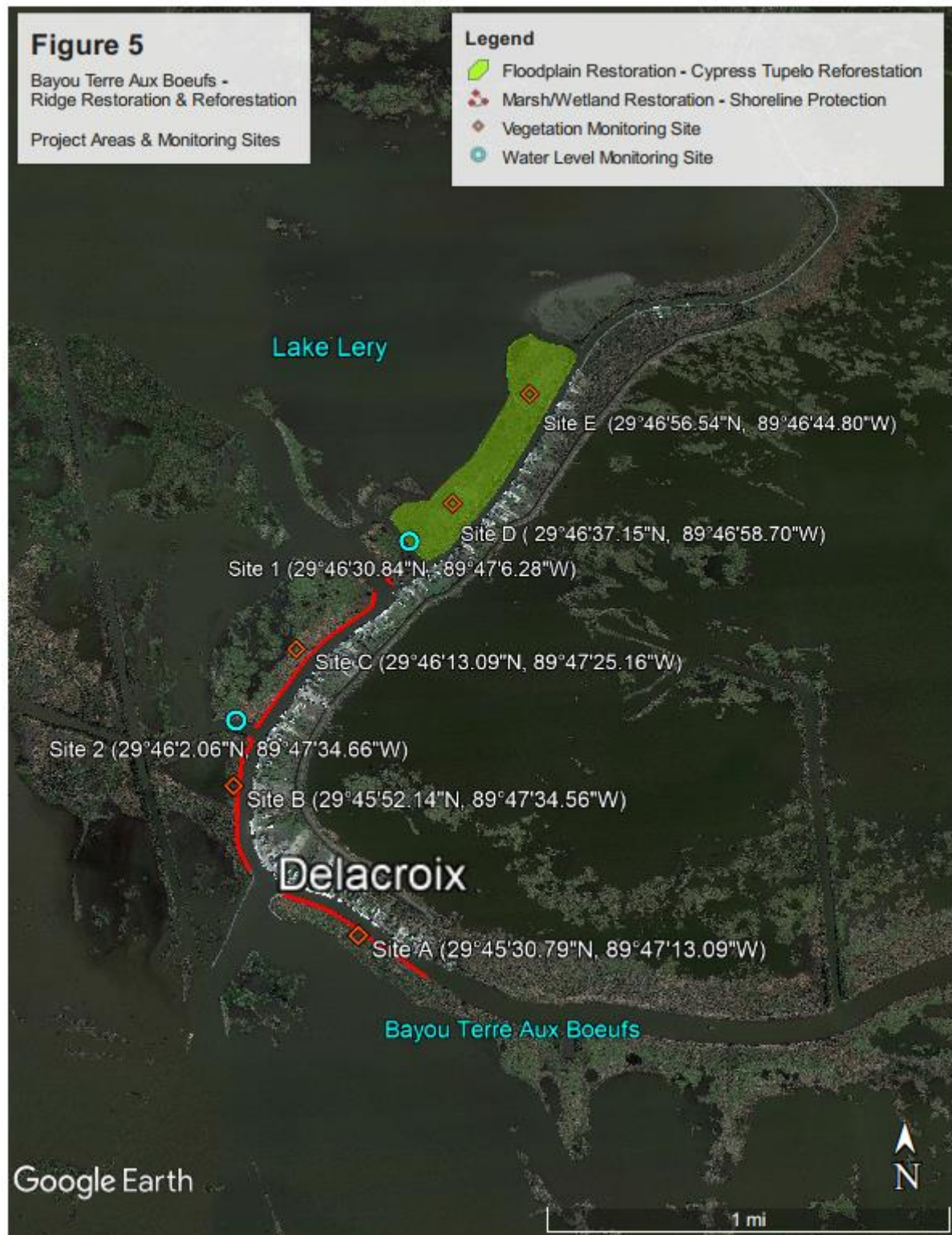


F:\ELOS\Bayou Terre Aux Boeufs\GIS Maps\Permit\Project JPA\Figure 2_Plan View





F:\NLE\Bayou Terre Aux Boeufs\GIS Maps\Permit\Project_JPA\Figure 4_Typical Section



APPENDIX A

Bayou Terre Aux Boeufs Ridge Restoration & Armoring, Vegetative
Planting Schematics (Preliminary)

Royal Engineers & Consultants, LLC
September, 2022

ST. BERNARD PARISH, LOUISIANA

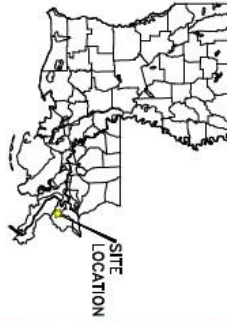
MONTH 2022

BAYOU TERRE AUX BOEUF RIDGE RESTORATION AND ARMORING

GUY MCINNIS
PARISH PRESIDENT

COUNCIL MEMBERS

KERRI CALAIS – AT LARGE EAST
RICHARD J. LEWIS – AT LARGE WEST
GILLIS MCLOSKEY – DISTRICT A
JOSHUA MORAN – DISTRICT B
HOWARD LUNA – DISTRICT C
WANDA ALCON – DISTRICT D
FRED EVERHART JR. – DISTRICT E



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- 1 TITLE SHEET
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- 3 PROJECT LAYOUT – ARMORING TASK
- 4 PROJECT LAYOUT – VEGETATIVE PLANTINGS
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- 8 TYP. SECTION & DETAILS – ARMORING TASK
- 9 TYP. SECTION & DETAILS – VEGETATIVE PLANTINGS
- 10 FEATURE COORDINATE TABLES
- 11 MAGNETIC ANOMALY COORDINATE TABLES
- 12-17 CROSS SECTIONS

ROYAL REVIEWERS

(1) UNLESS ASKED BY CPGA OR SPRG (OR IF WE INTERNALLY FEEL LIKE WE NEED TO) DEPEND UPON THE PROJECT TO BE INCLUDED IN THE TITLE SHEET AND THE PROJECT-RELATED DOCUMENTS. WE DO NOT HAVE AN EAC FOR PHASE I AND BAYOU TERRE AUX BOEUF SHOULD REASONABLY ACCOMMODATE ANY PIECE OF ANTICIPATED EQUIPMENT. THE GEN NOTES ON SHEET 02 STATE THAT NO ACCESS DREDGING IS TO BE ALLOWED.

(2) FOLLOWING A PRE-CONSTRUCTION SURVEY, WE MAY ADD A SHEET TO THE END OF THE SET THAT IS A QUANTITY TAKEOFF TABLE, WHICH LISTS APPROX. CY, GEOTECHNICAL, ALIGNMENT POINTS, ETC. IT IS NOT INCLUDED CURRENTLY.

ROYAL REVIEWERS

(1) WE ARE ATTEMPTING TO INCORPORATE BOTH PHASES II AND III INTO THE PROJECTED FUNDING. THE NAME OF THE PROJECT TO BE INCLUDED IN THE TITLE SHEET AND THE PROJECT-RELATED DOCUMENTS. WE DO NOT HAVE AN EAC FOR PHASE I AND BAYOU TERRE AUX BOEUF SHOULD REASONABLY ACCOMMODATE ANY PIECE OF ANTICIPATED EQUIPMENT. THE GEN NOTES ON SHEET 02 STATE THAT NO ACCESS DREDGING IS TO BE ALLOWED.

(2) PHASE II (BAYOU LERY TO BAYOU GENTILLY) IS THE BASE BID. PHASE III IS FROM BAYOU GENTILLY SOUTHWARDS.



5,000' 0 5,000' 10,000'
FULL SIZE SCALE: 1" = 5,000'
HALF SIZE SCALE: 1" = 10,000'

FILE NO. 2017-01

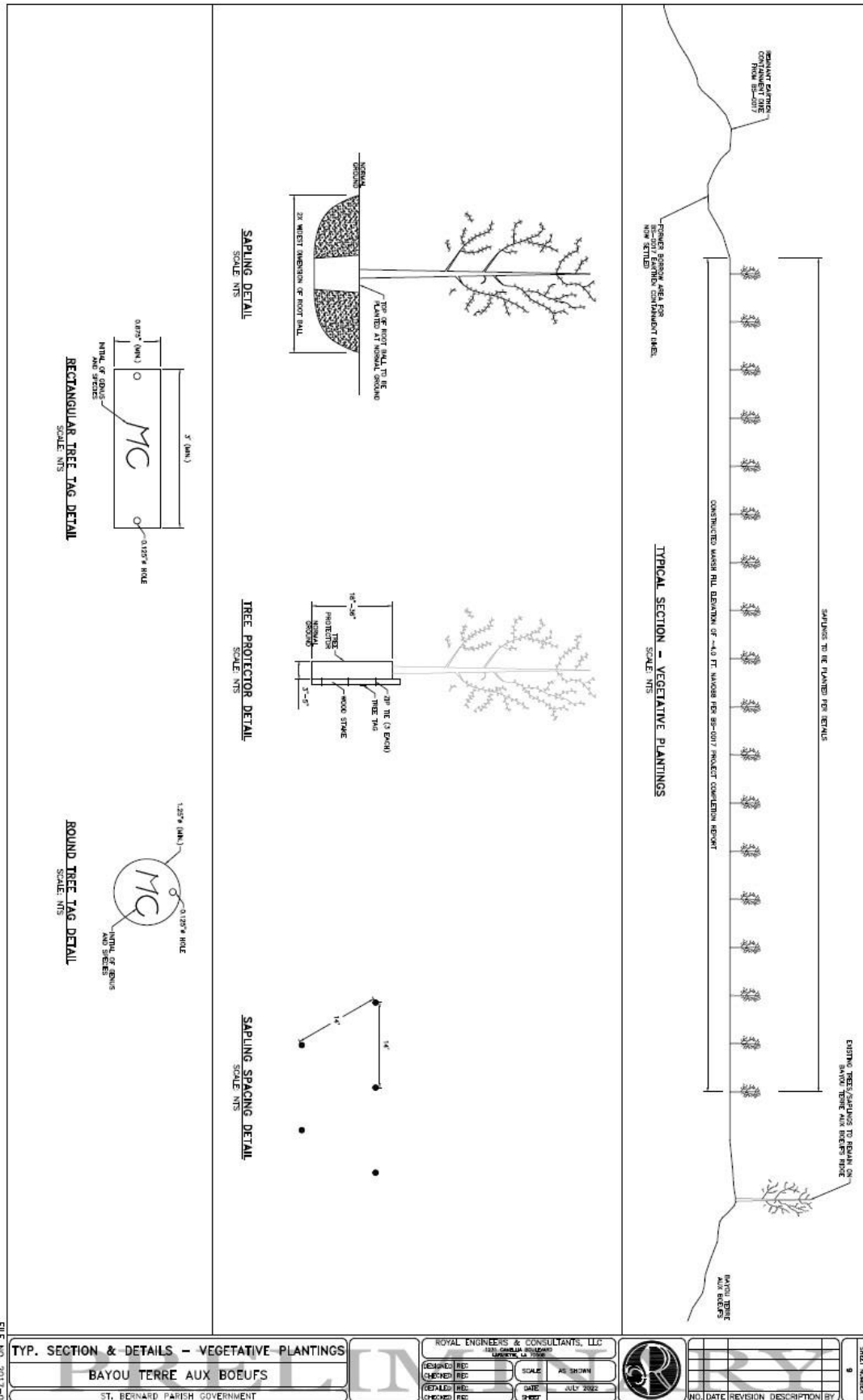
TITLE SHEET	
BAYOU TERRE AUX BOEUF	
ST. BERNARD PARISH GOVERNMENT	

ROYAL ENGINEERS & CONSULTANTS, LLC	
DESIGNED BY	SCALE AS SHOWN
CHECKED BY	DATE JULY 2022
REVIEWED BY	SHEET
APPROVED BY	



NO.	DATE	REVISION	DESCRIPTION
1			





APPENDIX B

Louisiana Department of Natural Resources,
Office of Coastal Management,
Coastal Use Permit P20180067 (Amended, Amended, Extended,
Amended)

U.S. Department of the Army,
Permit MVN-2017-00283-1ES



**DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT**

P.O. BOX 44487
BATON ROUGE, LOUISIANA 70804-4487
(225)342-7591
1-800-267-4019

COASTAL USE PERMIT/CONSISTENCY DETERMINATION

C.U.P. No.: P20180067

C.O.E. No.: MVN 2017-00283-1 ES

NAME: ST. BERNARD PARISH GOVERNMENT
c/o ROYAL ENGINEERING POSSIBILITIES
1231 CAMELLIA BLVD.
LAFAYETTE, LA 70508
Attn: Beau Tate

LOCATION: Plaquemines, Saint Bernard Parishes, LA
Northern most point - Lat 29-46-25.17N / Long -89-47-09.47W, Southern most point - Lat 29-45-17.01N / Long -89-47-34.30W; Bayou Terre Aux Boeufs; Bayou Gentilly; Delacroix, 70085.

DESCRIPTION: Proposed construction of Phases I, II, and III of the Bayou Terre Aux Boeufs Ridge Restoration and Armoring project via barge-mounted crane to place rock riprap along the western descending shoreline of Bayou Terre Aux Boeufs and a small portion of Bayou Gentilly. Approximately 21,047 cubic yards of riprap will be placed along the shoreline.

In accordance with the rules and regulations of the Louisiana Coastal Resources Program and Louisiana R.S. 49, Sections 214.21 to 214.41, the State and Local Coastal Resources Management Act of 1978, as amended, the permittee agrees to:

1. Carry out, perform, and/or operate the use in accordance with the permit conditions, plans and specifications approved by the Department of Natural Resources.
2. Comply with any permit conditions imposed by the Department of Natural Resources.
3. Adjust, alter or remove any structure or other physical evidence of the permitted use if, in the opinion of the Department of Natural Resources, it proves to be beyond the scope of the use as approved or is abandoned.
4. Provide, if required by the Department of Natural Resources, an acceptable surety bond in an appropriate amount to ensure adjustment, alteration, or removal should the Department of Natural Resources determine it necessary.
5. Hold and save the State of Louisiana, the local government, the department, and their officers and employees harmless from any damage to persons or property which might result from the use, including the work, activity, or structure permitted.
6. Certify that the use has been completed in an acceptable and satisfactory manner and in accordance with the plans and specifications approved by the Department of Natural Resources. The Department of Natural Resources may, when appropriate, require such certification to be given by a registered professional engineer.
7. All terms of the permit shall be subject to all applicable federal and state laws and regulations.
8. This permit, or a copy thereof, shall be available for inspection at the site of work at all times during operations.
9. The applicant will notify the Office of Coastal Management of the date on which initiation of the permitted activity described under the "Coastal Use Description" began. The applicant shall notify the Office of Coastal Management by entering a commencement date through the online system, or by mailing said information to OCM.
10. Unless specified elsewhere in this permit, this permit authorizes the initiation of the coastal use described under "Coastal Use Description" for two (2) years from the date of the signature of the Secretary or his designee on the original permit which was May 10, 2019. If the coastal use is not initiated within this two (2) year period, then this permit will expire and the applicant will be required to submit a new application. Initiation of the coastal use, for the purposes of this permit, means the actual physical beginning of the use of activity for which the permit is required. Initiation does not include preparatory activities, such as movement of equipment onto the coastal use site, expenditure of funds, contracting out of work, or performing activities which by themselves do not require a permit. In addition, the permittee must, in good faith, and with due diligence, reasonably progress toward completion of the project once the coastal use has been initiated.
11. The following special conditions must also be met in order for the use to meet the guidelines of the Coastal Resources Program:

- a. That permittee shall insure that all sanitary sewage and/or related domestic wastes generated during the subject project activity and at the site, thereafter, as may become necessary shall receive the equivalent of secondary treatment (30 mg/l BOD5) with disinfection prior to discharge into any of the streams or adjacent waters of the area or, in the case of total containment, shall be disposed of in approved sewerage and sewage treatment facilities, as is required by the State Sanitary Code. Such opinion as may be served by those comments offered herein shall not be construed to suffice as any more formal approval(s) which may be required of possible sanitary details (i.e. provisions) scheduled to be associated with the subject activity. Such shall generally require that appropriate plans and specifications be submitted to the Department of Health and Hospitals for purpose of review and approval prior to any

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utilization of such provisions.

- b. That a Class B permit is received from the Division of Administration, State Land Office prior to the initiation of construction.
- c. The area where the project is located is all part of the aboriginal homelands of the Chitimacha Tribe of Louisiana. As such, large villages, burial sites, and sacred sites were in place in that entire area. If at any time during the course of the work, any traditional cultural properties are discovered, Permittee shall immediately contact Kimberly S. Walden (Cultural Director) or Melanie Aymond (Research Coordinator) at (337) 923-9923 or (337) 923-4395. Office hours are Monday through Thursday from 7:30 A.M. - 5:00 P.M. and on Friday between 7:30 A.M. - 11:30 A.M. If traditional cultural properties are discovered on the weekend or after business hours, the notification shall be made the next business morning.
- d. Structures must be marked/lighted in accordance with U. S. Coast Guard regulations.
- e. Permittee shall, prior to commencement of the herein permitted activities, contact the Coastal Protection and Restoration Authority to determine if coordination is required.
- f. This permit does not convey any property rights, mineral rights, or exclusive privileges; nor does it authorize injury to property.
- g. All fill material shall be clean and free of contaminants and shall not contain hazardous materials such as asbestos or asbestos residue, shingles, tires, oil/grease residue, exposed rebar, protruding objects, etc.
- h. Permittee is subject to all applicable state laws related to damages which are demonstrated to have been caused by this action.
- i. Permittee shall allow representatives of the Office of Coastal Management or authorized agents to make periodic, unannounced inspections to assure the activity being performed is in accordance with the conditions of this permit.
- j. Permittee shall comply with all applicable state laws regarding the need to contact the Louisiana One Call (LOC) system (1-800-272-3020) to locate any buried cables and pipelines.
- k. This permit authorizes the initiation of the Coastal Use described under "Coastal Use Description" for two (2) years from the date of the signature of the Secretary or his designee on the original permit which was May 10, 2019. Initiation of the Coastal Use, for purposes of this permit, means the actual physical beginning of the use or activity for which the permit is required. Initiation does not include preparatory activities, such as movement of equipment onto the Coastal Use site, expenditure of funds, contracting out of work, or performing activities which by themselves do not require a permit. In addition, Permittee must, in good faith and with due diligence, reasonably progress toward completion of the project once the Coastal Use has been initiated. If the Coastal Use is not initiated within this two (2) year period, an extension may be granted pursuant to the requirements contained in the Rules and Procedures for Coastal Use Permits (Title 43:I.723.D.). Please note that a request for permit extension MUST be made no sooner than one hundred eighty (180) days and no later than sixty (60) days prior to the expiration of the permit.

The expiration date of this permit is five (5) years from the date of the signature of the Secretary or his designee on the original permit which was May 10, 2019. If the Coastal Use is not completed within this five (5) year period, an extension may be granted pursuant to the requirements contained in the Rules and Procedures for Coastal Use Permits (LAC 43:I.723(D)).

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C.U.P. No.: P20180067
C.O.E. No.: MVN 2017 -00283 -1 E8



Upon expiration of this permit, a new Coastal Use Permit will be required for completion of any unfinished or uncommenced work items and for any maintenance activities involving dredging or fill that may become necessary. Other types of maintenance activities may also require a new Coastal Use Permit.

- I. This determination does not eliminate the need to obtain a permit from the United States Army, Corps of Engineers or any other Federal, state or local approval that may be required by law. The drawings submitted with your referenced application are attached hereto and made a part of the record.

***** End of Conditions *****

By accepting this permit the applicant agrees to its terms and conditions.

I affix my signature and issue this permit this 10th day of May, 2019.

THE DEPARTMENT OF NATURAL RESOURCES

Karl L. Morgan, Administrator
Office of Coastal Management

This agreement becomes binding when signed by Administrator of the Office of Coastal Management Permits/Mitigation Division, Department of Natural Resources.

Attachments

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C.O.E. No.: MVN 2017-00283-1 ES



Final Plats:

1) P20180067 Final Plats 09/04/2018

cc: Martin Mayer, COE w/attachments
Dave Butler, LDWF w/attachments
Les Rosso, State Land w/attachments
Coastal Protection and Restoration Authority, CPRA w/attachments
Jordan Cobbs, OCM w/attachments
Craig Leblanc, Frank Cole, OCM/FI w/attachments
Plaquemines Parish w/attachments
Saint Bernard Parish w/attachments

ST. BERNARD PARISH GOVERNMENT w/attachments



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS, LOUISIANA 70118

REPLY TO
ATTENTION OF

July 20, 2018

Operations Division
Eastern Evaluation Section

Subject: MVN 2017-00283-1 ES

St. Bernard Parish Government
Attn: John Lane
8201 W. Judge Perez Drive
Chalmette, LA 70043

Dear Mr. Lane:

The proposed work to place rip rap along the western descending shoreline of Bayou Terre Aux Boeufs and Bayou Gentilly in Delacroix, St. Bernard and Plaquemines Parishes, Louisiana as shown on the enclosed drawings, is authorized under **Category II** of the **Programmatic General Permit** provided that all conditions of the permit are met.

In addition, you must comply with the enclosed: "Standard Manatee Conditions for In-Water Activities".

This authorization has a blanket water quality certification from the Louisiana Department of Environmental Quality; therefore, no additional authorization from DEQ is required.

However, prior to commencing work on your project, you must obtain approvals from state and local agencies as required by law and by terms of this permit. These approvals include, but are not limited to, a permit, consistency determination or determination of "no direct or significant impact (NDSI) on coastal waters" from the Louisiana Department of Natural Resources, Office of Coastal Management.

This approval to perform work is valid for 5 years from the date of this letter.

Permittee is aware that this office may reevaluate its decision on this permit at any time the circumstances warrant.

-2-

Should you have any further questions concerning this matter, please contact Ben Sherman at (504) 862-2041.

Sincerely,

FARABEE MICH
AELVERNE.105
3559979

for
Martin S. Mayer
Chief, Regulatory Branch

Enclosures

APPENDIX C

EXAMPLE - Monitoring Inspection & Report,
“East Bank Levee Permittee Responsible Mitigation Project”

Associated Permits (not attached):

U.S. Department of the Army,
Permit MVN-2011-1995-EOO
Permit MVN-2011-1974-EOO

Monitoring Report

For

East Bank Levee Permittee Responsible Mitigation Project

**LDNR CUP:
P20110924
MVN-2011-
1995-EOO
MVN-2011-
1974-EOO**

In

Plaquemines Parish, Louisiana

Prepared For

Plaquemines Parish Government

By



43177 East Pleasant
Ridge Road Hammond,
LA 70403
985-662-5501 (Office) • 985-662-5504 (Fax)

August 2018

The purpose of this report is to provide a monitoring update of the East Bank Permittee Responsible Mitigation Project (PRMP) located on approximately 30.66 acres at latitude 29°50'53.98"N and longitude -89°55'9.23"W (approximate center point) in Plaquemines Parish, Louisiana. This location includes all or portions of Sections 6,28,5,4 T14S – R13E.

The intent of the Project is to create wetland habitat value (credits) to offset unavoidable impacts to wetlands and "Waters of the United States" associated with the improvement of the Plaquemines Parish Government's (PPG) Braithwaite to White Ditch hurricane protection levee, which is permitted under the Office of Coastal Management's (OCM) permit P20111021 and the US Army Corps of Engineers' (USACE) permit MVN2011-1995-EOO.

The project area is a former fresh marsh that degraded to open water. Plaquemines Parish Government hydraulically pumped material from existing ponds near the Braithwaite golf course into ± 21 acres of shallow open water on the flood side of the East Bank Levee to create a platform for marsh creation. Upon final settling, vegetation naturally colonized the site and planting vegetation was deemed unnecessary.

ELOS personnel visited the site on July 25, 2018 to conduct monitoring surveys. Prior to this site visit, ELOS conducted an aerial vegetation survey using drone technology (**Figure 1**). ELOS personnel verified the aerial vegetation survey during the July 25th monitoring survey.

In accordance with the long-term monitoring plan, two permanent circular monitoring stations were randomly established, one on each side of the mitigation site as shown on **Figure 1**. Each station encompassed a 26-foot radius (1/20th acre) and was marked at the center point with a steel rod. At each plot, vegetation cover values were recorded along with hydrology notes, mortality, and any herbivory, vandalism, or noxious species present.

The data collected revealed that the site demonstrates robust vegetation characteristic of a healthy wetland ecosystem. On average, vegetation cover values were greater than 90% across the site. **Table 1** summarizes the percent cover values derived from the drone survey for the dominant species across the entire site area. Dominant species at the site were *Typha domengensis*, *Amaranthus australis*, *Salix nigra*, *Sagittaria platyphylla*, *Phragmites australis*, *Alternanthera philoxeroides*, and *Echinochloa walteri*.

Table 1: Percent cover values of dominant species across entire mitigation site

Species	Percent cover of entire site
<i>Typha domengensis</i>	40
<i>Amaranthus australis</i>	40
<i>Salix nigra</i>	30
<i>Sagittaria platyphylla</i>	25
<i>Phragmites australis</i>	10
<i>Alternanthera philoxeroides</i>	5
<i>Echinochloa walteri</i>	5

Within the site, the borders of the fill area were ridges dominated by *Salix nigra*. *Phragmites australis* bordered the interior of the *Salix nigra* ridges. The interior of the site was dominated by *Amaranthus australis* in the east and *Typha domengensis* in the west. The eastern tract of land showed a higher elevation than the western tract. As a result, the western tracts of land exhibited higher populations of hydrophytic vegetation such as *Sagittaria platyphylla*, *Alternanthera philoxeroides*, *Zizaniopsis miliacea* and *Bidens laevis*. Both plots exhibited 10-15% dead vegetation, most likely caused by the natural cycle of senescence and regeneration of *Echinochloa walteri*.

The hydrology within the fill area is dominated by precipitation since the area is bordered on all sides by ridges to contain the dredge material. The eastern tract near Plot 1 exhibited surface soil cracking, but no standing surface water was present.

In both the eastern and western tracts, no vandalism, trash, debris, or herbivory issues were observed. Possible hog sign was observed in the eastern tract in an area devoid of most vegetation. However, hog sign and trails were not prevalent throughout the site.

Overall, the mitigation site exhibited the soils, hydrology, and vegetation necessary to support a robust wetland ecosystem capable of mitigating the ecosystem services provided by the area impacted by the permitted project.



43177 East Pleasant Ridge Road
Hammond, Louisiana 70403
P. 985-662-5501, F. 985-662-5504

Vegetation Type

PRMP

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.

Legend:

- Site Outline ~30.66 Acres
- Alternanthera philoxeroides ~3.26 Acres
- Amaranthus australis ~2.99 Acres
- Echinochloa ~1.44 Acres
- Open Water ~0.64 Acres

- Phragmites australis ~0.69 Acres
- Salix nigra ~6.69 Acres
- Typha spp. ~5.08 Acres
- Sagitaria platyphylla ~9.87 Acres

* Sample Plots

May 2018 Aerial

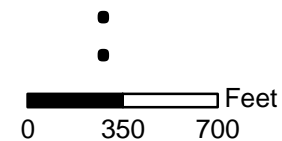




Photo 1: Plot 1, Vegetation View 1.



BAYOU TERRE AUX BOEUFs - MONITORING WORK PLAN
Marsh/Wetland & Floodplain Restoration

OCTOBER 2022

Plot 1	GPS location:	29°50'55.328"N 89°55'4.32"W	
Investigators: S. Giles, C.	Date:	7/25/2018	
Species	% cover	Wetland status	Invasive?
Sagittaria platyphylla	15	OBL	No
Zizaniopsis miliacea	25	OBL	No
Bidens laevis	5	OBL	No
Alternanthera	12	OBL	No
Amaranthus australis	15	OBL	No
Baccharis halimifolia	3	FAC	No
Ludwigia grandiflora	2	OBL	No
Cyperus odoratus	2	FACW	No
Salix nigra	10	OBL	No
Echinochloa walteri	3	OBL	No
Photos?	Yes		
Herbivory present?	No		
Vandalism/ trash?	No		
Hydrology notes:	Plot lies in an area of lower elevation. Small ponds of standing water in plot, about 3 inches deep.		
Likely causes of mortality:	10% dead vegetation in plot. Mostly Echinochloa walteri caused by normal pattern of senescence and regeneration.		