

**“Simpson Tract”
Non-Riverine Wetland Restoration Project**

**Beaufort County, NC
Tar-Pamlico River Basin
(Cataloging Unit #03020104)**

**Mitigation Plan
(Task 6)**

NC EEP Contract #D05027-1



Prepared For:

**North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
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LMG

LAND MANAGEMENT GROUP INC.

Environmental Consultants

Wilmington, N.C.

EXECUTIVE SUMMARY

Prior to project implementation, the Simpson Tract Property was managed for silvicultural production. The site consisted entirely of mono-culture pine stands with sparse hardwood colonization. Under contract with the EEP, Wetland Resource Center (WRC) restored 30.0 acres of non-riverine wetland which drain into the Pungo Creek (a tributary of the Pungo River) in Beaufort County, NC.

The entire 30.0 acre area has been planted with an appropriate mixture of tree and shrub species at an average density of 720 stems/acre. Planting was completed in February 2007. A total of fifteen (15) 0.10-acre permanent plots corresponding to a total of 1.5 acres (equivalent to 5% of the restoration area) were established throughout the project area. Annual monitoring will be conducted near the end of the growing season (September-October) for a period of five years. Vegetative planting will be deemed successful if survivorship of plantings and volunteers of desirable species meets or exceeds a target stem density of 320 stems/acre.

Monitoring reports will be submitted annually to the EEP (by January 1 of each year). These reports will include results of vegetative monitoring and photographic documentation of site conditions. Monitoring reports will also identify any contingency measures that may need to be employed to remedy any site deficiencies.

The following mitigation report summarizes the restoration project and includes more specific information related to project implementation and 'as-built' conditions.

1.0 NARRATIVE

Introduction

As approved by the EEP, WRC implemented the restoration of 30.0 acres of non-riverine wetland habitat located at the headwaters of Pungo Creek, a fourth-order tributary of the Pungo River within the Tar-Pamlico River Basin (USGS 8-digit Hydrologic Unit 03020104; DWQ Subbasin 03-03-07). The project area is part of the "Simpson Tract", located approximately 10 miles south of Plymouth in Beaufort County, NC (refer to Figure 1). This tract was intensively managed for silvicultural production prior to implementation of restoration activities. The project will provide for the re-establishment of characteristic tree and shrub species adjacent to open field ditches on the north side of Rodman Road (refer to Figure 2).

Mitigation Goals and Objectives

The proposed restoration project is intended to provide suitable, high-quality non-riverine wetland restoration as compensatory mitigation for wetland impacts authorized through the EEP. The objective of the project is to restore appropriate vegetation and diffuse flow conditions to help reduce non-point source discharge of contaminants into adjacent water bodies and increase flood water retention. The primary functions of the restoration project detailed in this document are to provide surface water storage, nutrient uptake, and sediment retention. In addition, the project will provide ancillary benefits to wildlife by providing refuge for resident and migratory species via enhanced niche habitat and increased food-web support.

Pre-Construction Conditions

The 30-acre restoration area is part of a larger tract of land (1,391 acres). Approximately 950 acres have been determined to be non-jurisdictional ("non-wetlands") by the NRCS (USACE concurrence of this determination has also been provided in previous submittals to the EEP). The remaining acreage has been confirmed to be jurisdictional wetlands. The predominant land use of the tract (both jurisdictional and non-jurisdictional areas) is silvicultural production. Prior land use practices (including herbicide, pesticide, and fertilizer application) serve as potential contributors to decreased water quality of adjacent surface waters (i.e. ditches and 'blue-line' streams). The natural vegetative assemblage of the tract has been modified over the years via prescribed drainage improvements (i.e. ditching), bedding, and planting of loblolly pine (*Pinus taeda*). These silvicultural practices have resulted in a community dominated by pine in more mature stands outside of the proposed restoration area. Hardwood species characteristic of headwater swamp communities of the Coastal Plain are either absent entirely or occur only in sparse locations. Typical canopy species of an undisturbed area would include swamp tupelo (*Nyssa biflora*), bald cypress (*Taxodium distichum*), pond pine (*Pinus serotina*), and Atlantic white cedar (*Chamaecyparis thyoides*). Understory species typical of non-

riverine swamp forest communities include American titi (*Cyrilla racemiflora*), sweet bay (*Magnolia virginiana*), red bay (*Persea borbonia*), fetterbush (*Lyonia lucida*), red maple (*Acer rubrum*), and catbrier (*Smilax* species).

Project Implementation

Site preparation commenced in the fall of 2006. During this period, areas of invasive or non-target species were drum-chopped and bush-hogged. Following these activities, an herbicide was applied to reduce competition within the project area. A water soluble herbicide was used and applied by a licensed applicator to reduce impacts to the surrounding open water areas.

In order to re-establish the appropriate hydrologic conditions throughout the restoration area, a total of four (4) 50' long ditch plugs were installed in ditches draining from the project area. Prior to project construction, appropriate 401/404 authorization was received for placement of clay plugs within those ditches.

After review of the application, the permit was issued on February 17, 2007. Earth work was conducted from February 20-21, 2007. Approximately 100 cubic yards of material was used to form the ditch plugs. Ditch plugs were installed at specified locations. Final grading was conducted in the plugged areas to allow for subsidence and compaction of the fill material. All areas that were disturbed during the installation process were covered with a seed mixture to minimize erosion. Refer to Appendix A for photographs of post-construction conditions.

Site planting was completed on February 23, 2007. The installation of approximately 18,000 seedlings was supervised by LMG to ensure proper spacing and planting depths. LMG obtained a mix of hardwood and shrub seedlings which accurately represent the targeted headwater swamp community discussed in the approved restoration plan (Table 1). Seedlings were planted on 8' centers at a depth sufficient to cover the root collar throughout the project area. Following the planting activities, LMG inspected the project area to ensure that seedlings had been installed correctly.

2.0 AS-BUILTS

As defined by the approved restoration plan, a total of fifteen (15) permanent monitoring plots were established, which corresponds to a total of 1.5 acres (equivalent to 5% of the restoration area). A total of six (6) automated wells (RDS, Inc. WM-40s) were also installed to monitor shallow groundwater hydrology and surface inundation within the restoration area. All six wells were paired with vegetation plots.

TABLE 1. Simpson Non-riverine Plant List

Species	# planted	(% of total)
Bald cypress (<i>Taxodium distichum</i>)	4,000	22.86%
White Cedar (<i>Chamaemycyparis thyoides</i>)	2,500	14.29%
Black Gum (<i>Nyssa sylvatica</i>)	5,000	28.57%
Red Bay (<i>Persea borbonia</i>)	3,000	17.14%
Fetterbush (<i>Lyonia lucida</i>)	1,000	5.71%
Sweet Bay (<i>Magnolia virginiana</i>)	2,000	11.43%
Wax Myrtle (<i>Myrica cerifera</i>)	1,000	5.71%
Total Plants	18,500	

Three (3) additional wells were installed in reference areas located near the Van Swamp Gameland to the north of the project site. These reference sites were selected based on similarities in landscape position, hardwood species assemblages and soil types. Wells were installed in accordance with installation methods outlined in the Wetlands Regulatory Assistance Program (WRAP) Technical Note 00-02. Water levels will be recorded once daily. Data will be downloaded from the wells every three months (i.e. once quarterly). Data from well downloads will be compiled and graphically displayed to demonstrate hydroperiods of monitored areas.

Refer to Appendix A for photo documentation of the February 2007 planting. Refer to the attached survey (Appendix B) of the wetland restoration area for the location and corresponding number of the permanent vegetative monitoring plots and paired hydrologic monitoring equipment on the site. Locations and a typical cross section of the installed ditch plugs are also included in Appendix B.

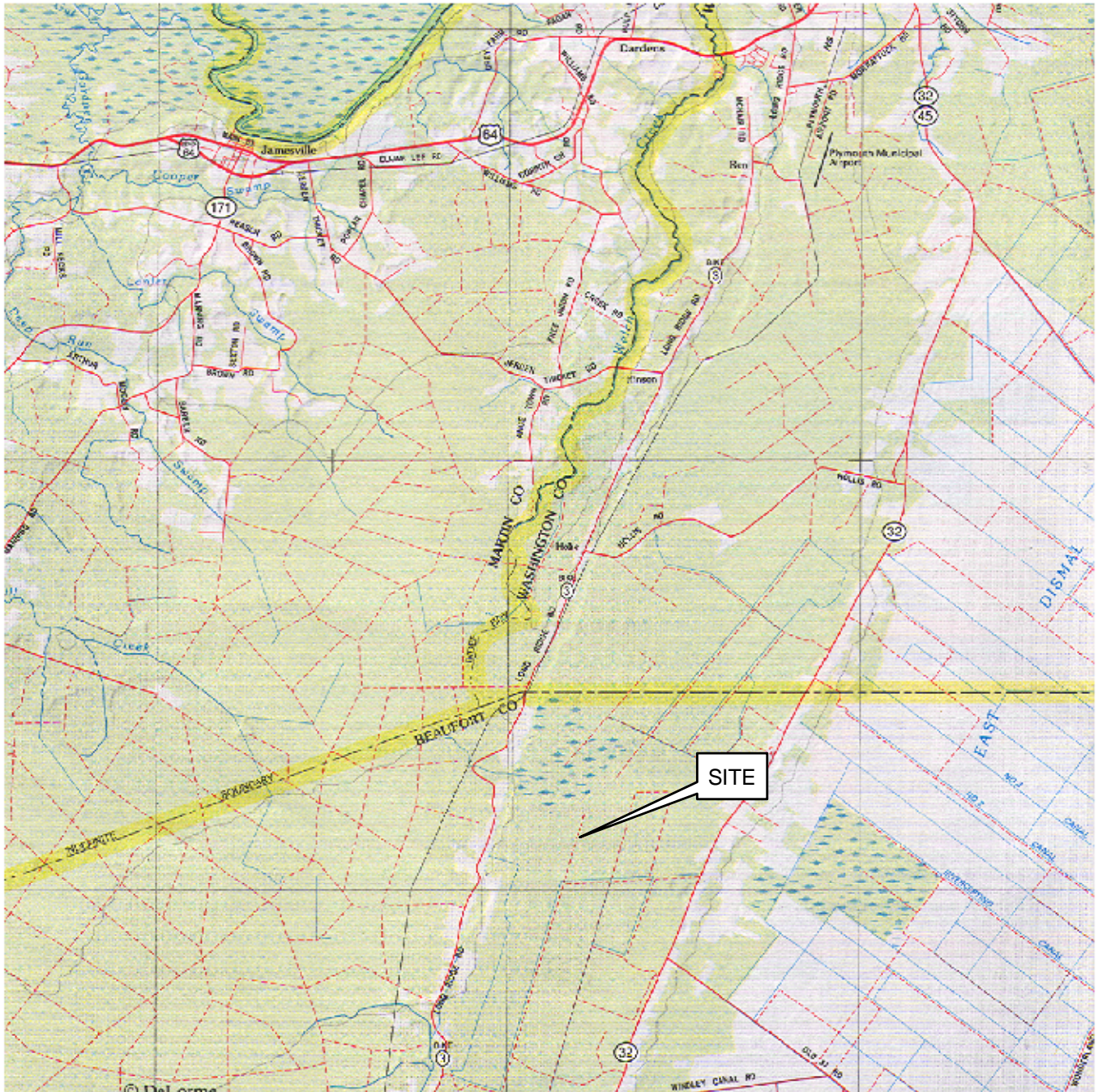
3.0 MONITORING PLAN

Annual monitoring will be conducted near the end of each growing season for a period of five years. Vegetative monitoring will be conducted at each of the fifteen (15) 0.10-acre permanent plots. Vegetative planting will be deemed successful if survivorship of plantings and volunteers of desirable species¹ meets or exceeds a target stem density of 320 stems/acre. Hydrologic monitoring will be deemed successful if static water table at, or within, 12" of the soil surface for 12.5% of the growing season (equivalent to 32 days based upon SCS-established growing season dates) during periods of normal rainfall. Data from the three reference wells will also be included. Monitoring reports will be submitted annually to the EEP (by January 1 of each year). These reports will include results of vegetative monitoring and photographic documentation of site conditions. Monitoring reports will also identify any contingency measures that may need to be employed to remedy any site deficiencies. For instance, deer browse tubes and fencing may need to be used if evidence of significant herbivory or deer browse is observed. In addition, supplemental planting may be necessary in areas of reduced survivorship.

4.0 CONCLUSION

LMG has completed the implementation of 30.0 acres of non-riverine restoration located in TAR-7 of the lower Tar-Pamlico Basin. Reversion of silvicultural land to wetland will decrease source nutrient loading and concurrently increase nutrient removal capacity. In addition, the project will provide ancillary benefits to aquatic and wildlife habitat via enhanced niche habitat and increased food-web support. By doing so, the proposed project will help to effectively mitigate for authorized loss of wetlands within the Tar-Pamlico Basin.

¹ Desirable species are considered as noninvasive species characteristic of riparian habitats.
Simpson Tract Non-riverine Wetland Restoration Plan
Contract No. D05027-1



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 SCALE: 1" = 2 miles

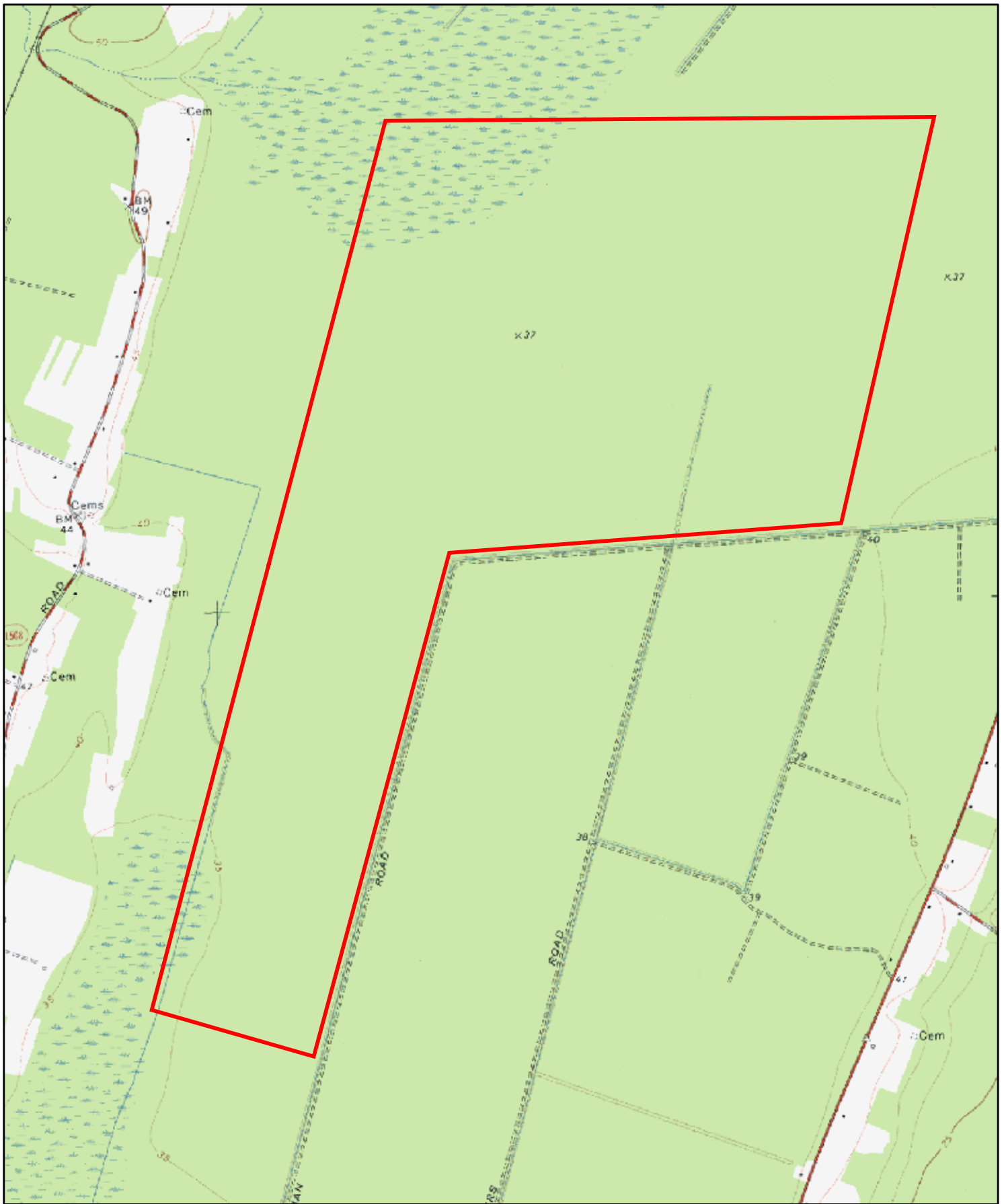
Simpson Tract
Tar-Pamlico River Basin
HUC: 03020104
Subbasin:03-03-07

Figure 1.
 Vicinity Map
 Delorme Gazetteer
 Land Management Group, Inc.



Simpson Tract
Tar-Pamlico River Basin
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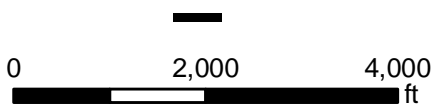
Figure 2.
 USDA Soil Survey
 Beaufort County
 Land Management Group, Inc.



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Figure 3.
 USGS Topographic Map
 Hoke, NC

Land Management Group, Inc.



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Figure 4.
1998 Aerial Photography

Land Management Group, Inc.



Legend

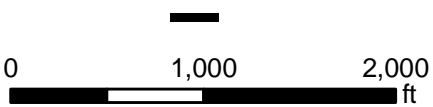
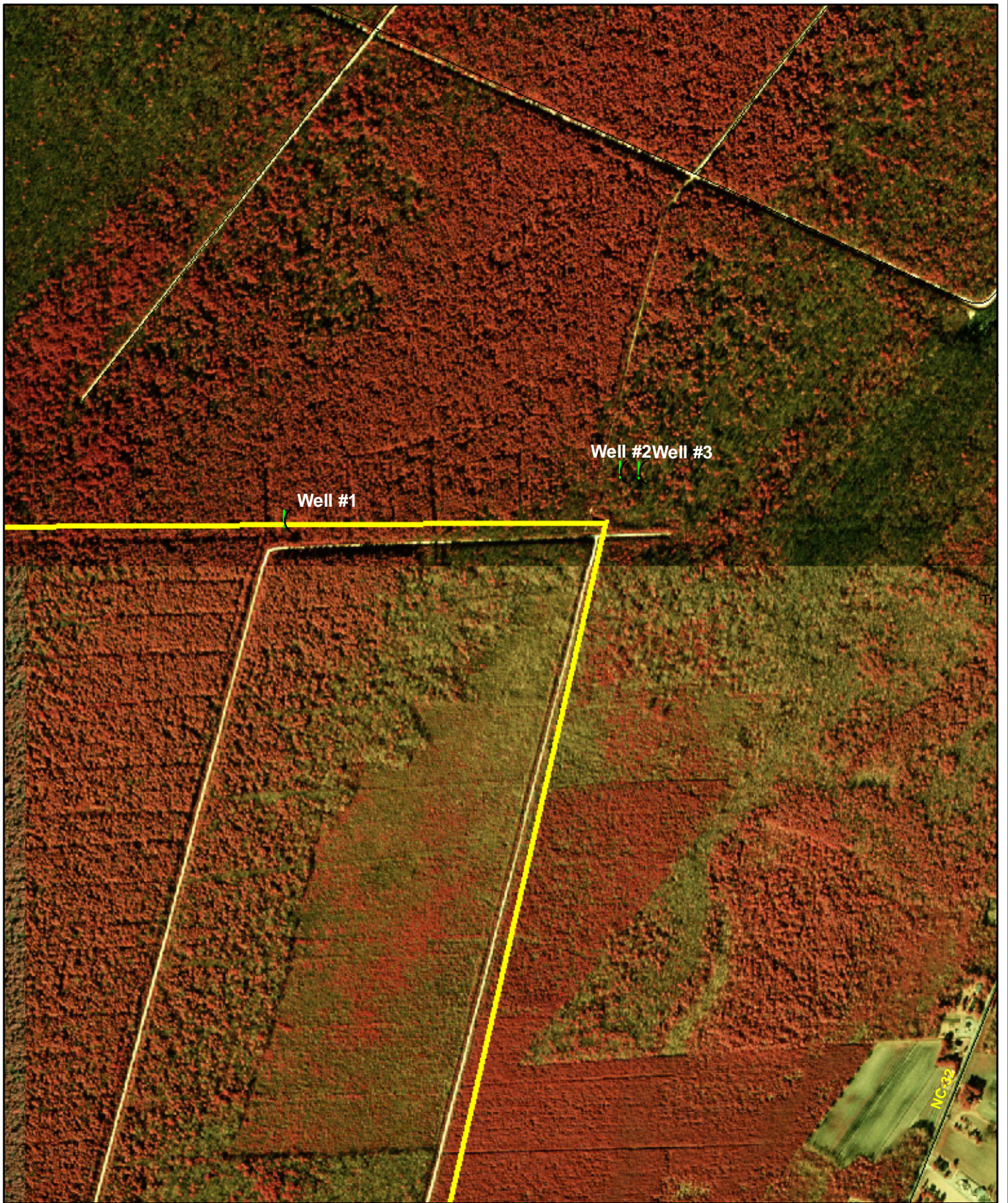
- Wetland Restoration Site ~30ac.
- Buffer Restoration Site ~45ac.



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Figure 5.
 Wetland and Buffer
 Restoration Plan

Land Management Group, Inc.



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Subbasin:03-03-07

Figure 6.
Reference Well Locations

Land Management Group, Inc.

Appendix A. Site Photographs



Site conditions prior to planting (February 2007).



Typical well installation in reference area.



Clean fill material used for ditch plugs.



Heavy equipment used to install ditch plugs throughout wetland restoration area.

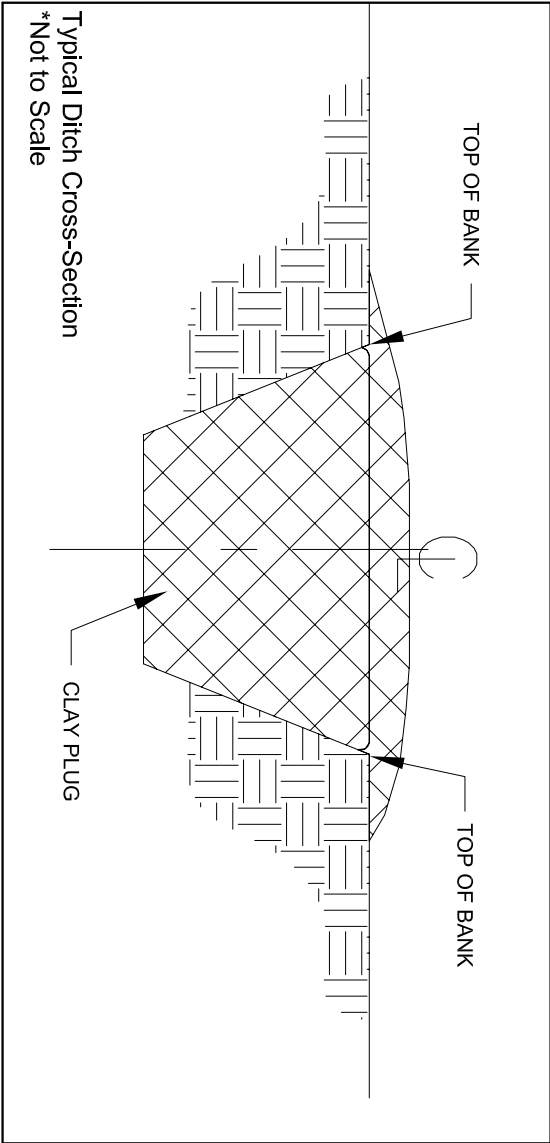
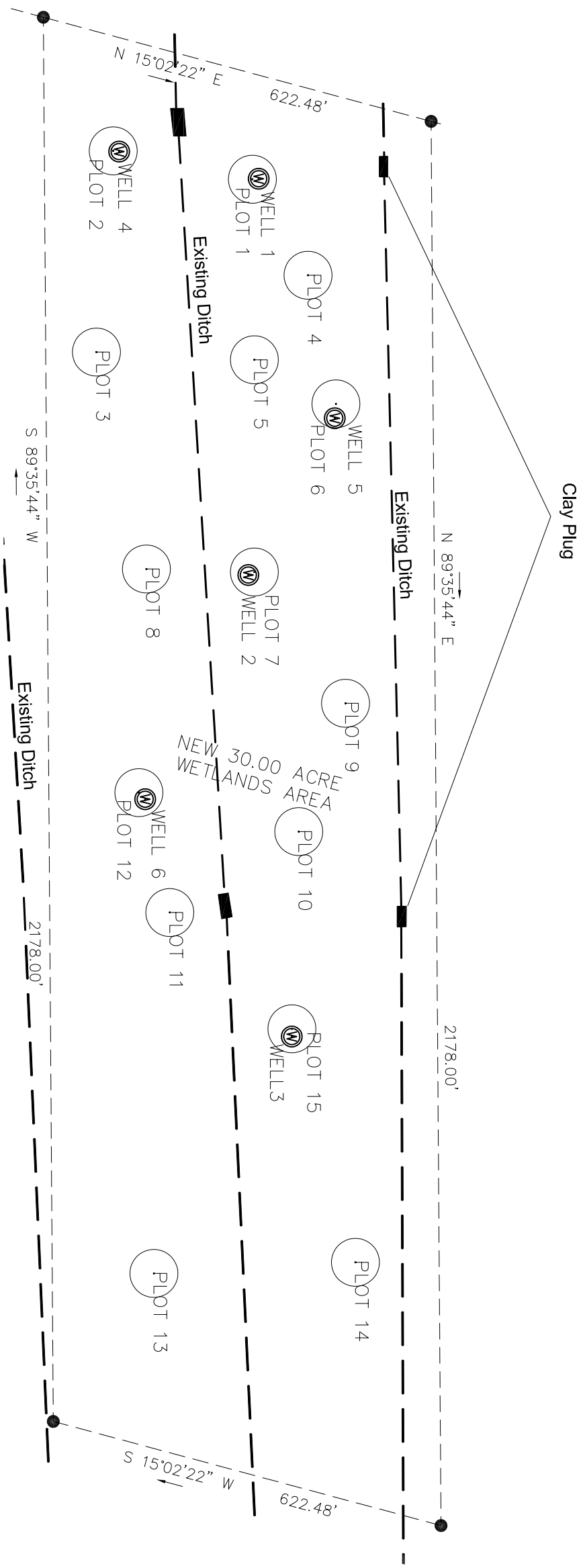
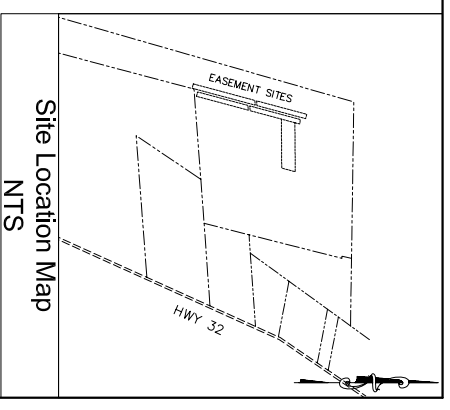


Bald cypress planted within wetland restoration area.



Typical monitoring plot within wetland restoration area.

Appendix B. Conservation Easement with Monitoring Plots and Well Locations



LAND MANAGEMENT IS NOT RESPONSIBLE FOR LOCATING, OR THE LOCATION OF, UTILITIES. ANY UTILITIES SHOWN ON THIS PLAN HAVE BEEN PROVIDED BY THIRD PARTIES AND ARE FOR GENERAL REFERENCE PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE OWNER/APPLICANT AND/OR CONTRACTOR TO CONTACT A PROFESSIONAL UTILITY LOCATING COMPANY.

THIS MAP IS BASED ON ORIGINAL DRAWINGS AND/OR SURVEY INFORMATION FROM:

THE EAST GROUP
 Engineering • Architecture • Surveying • Technology

LAND MANAGEMENT IS NOT RESPONSIBLE FOR THE ACCURACY OF SMD INFORMATION

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Project:	Simpson Wetland Restoration	Date:	4/17/07	Revision Date:	
Applicant:		Scale:	1"=200'	Job Number:	40-05-624
Title:		Drawn By:	GSF	Sheet Number:	Appendix B