CLb ! [MITIGATION PLAN

Norman's Pasture Restoration Site
EEP Contract 005010
EEP Project Number 95717

Norman's Pasture II Restoration Site
EEP Contract 5787
EEP Project Number 96310

Sampson County, North Carolina

Cape Fear River Basin
Cataloging Unit 03030006

Prepared for:

Ecosystem Enhancement PROGRAM

NC Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699

Final - November 2014

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Prepared by:

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Final - November 2014

EXECUTIVE SUMMARY

This mitigation plan has been written in conformance with the requirements of the following:

- *Federal rule for compensatory mitigation project sites as described in the Federal Register Title 33 Navigation and Navigable Waters Volume 3 Chapter 2 Section § 332.8 paragraphs (c)(2) through (c)(14).*
- *NCDENR Ecosystem Enhancement Program In-Lieu Fee Instrument signed and dated July 28, 2010*

These documents govern NCEEP operations and procedures for the delivery of compensatory mitigation.

The Norman's Pasture Restoration Site (NPRS) is a full-delivery mitigation project being developed for the North Carolina Ecosystem Enhancement Program (EEP). The NPRS is former riparian wetland system in the Cape Fear River Basin (03030006 8-digit cataloging unit) in eastern Sampson County, North Carolina that has been substantially modified to maximize agricultural production. The site offers the chance to restore impacted agricultural lands to riparian wetland habitat.

The Norman's Pasture II Restoration Site (NPII) is located directly upgradient to NPRS and consists of a first-order stream and wetland system. NPII will expand on the restoration efforts of the NPRS by extending restoration and protection initiatives to the headwater extents of much of the local watershed. The site offers the potential to restore and protect a range of unique aquatic resources in one setting – existing riparian wetlands, a forested tributary that has lost connection with its historic floodplain, lower gradient seep-fed headwaters, and adjacent upland buffers.

The 2009 Cape Fear River Basin RBRP identified HUC 03030006110040 (Stewarts Creek) as a Targeted Local Watershed (NCEEP 2009). The goals and priorities for NPRS's and NPII's are based on the information presented in The Cape Fear River Basin Restoration Priorities, to protect and improve water quality throughout the Basin by reducing sediment and nutrient inputs into streams and rivers and to support efforts to restore local watersheds (NCEEP 2009). The project goals are in line with the basin priorities and include the following:

- Reconnect a continuous stream and wetland headwater wetland system to Stewarts Creek
- Expand and protect riparian habitat along Stewarts Creek
- Buffer nutrient inputs from adjacent agricultural and grazing practices

Additional goals for the project include:

- Increase the local hydroperiod by encouraging both surface and subsurface storage and retention
- Restore and establish a functional and diverse stream/wetland complex

The project goals will be addressed through the following objectives:

- Redevelop a stream/wetland complex that has previously been impacted by ditching and cattle grazing
- Fill field ditches to restore surface flow retention and historic flow paths
- Protect and integrate existing riparian wetlands into the project design
- Re-forest riparian areas with native plant communities
- Re-connect headwater seeps to the broader swamp forest community of Stewarts Creek being restored by NPRS and NPII.

The NPRS will aim to restore and establish a functional stream/wetland complex with 16.2 acres of riparian wetland restoration (15.5 acres of re-establishment and 0.7 acre of wetland rehabilitation). Select ditches across the site will be modified or filled and seeps will be redirected and redeveloped to retain and distribute surface flow across the site. The two project tributaries (Tributaries 1 and 2 to Stewarts Creek) will be restored to integrated headwater/stream systems, but no stream mitigation credit is included in NPRS. Approximately 9.0 acres of wetland preservation is included throughout the NPRS, but for no additional credit.

The NPII will aim to restore and establish a stream/wetland complex with 10.2 acres of riparian wetland restoration (8.8 acres of re-establishment and 1.4 acres of rehabilitation). Approximately 843 linear feet of Tributary 1 to Stewarts Creek will be improved with Enhancement II and reconnected to the historic floodplain. Also, approximately 0.8 acre of existing wetlands will be included as preservation at NPII (no mitigation credit).

The two sites are located approximately five miles west of Magnolia, North Carolina in Sampson County. The projects begin southwest of the intersection of Cornwallis Road and MJ Johnson Road, and Stewarts Creek, a fourth-order stream, forms the southern boundary.

Once site grading is complete, the riparian communities will be planted as Riverine Swamp Forest and Headwater Forest communities (NCWAM, v. 4.1 2010). The sites will be monitored for seven years or until the success criteria are met.

Norman's Pasture Restoration Site, Sampson County EEP Contract 005010; EEP Project Number 95717									
Mitigation Credits									
	Stream		**Riparian Wetland**		**Non-riparian Wetland**		**Buffer**	**Nitrogen Nutrient Offset**	**Phosphorous Nutrient Offset**
Type	R	RE	R	RE	R	RE			
Linear Feet/Acres			16.2						
Credits			16.0						
TOTAL CREDITS			16.0		-				

R= Restoration RE= Restoration Equivalent of Creation or Enhancement

Norman's Pasture II, Sampson County EEP Contract 5787; EEP Project Number 96310									
Mitigation Credits									
	Stream		**Riparian Wetland**		**Non-riparian Wetland**		**Buffer**	**Nitrogen Nutrient Offset**	**Phosphorous Nutrient Offset**
Type	R	RE	R	RE	R	RE			
Linear Feet/Acres		843	10.2						
Credits		337	9.7						
TOTAL CREDITS	337		9.7						

R= Restoration RE= Restoration Equivalent of Creation or Enhancement

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1.0 RESTORATION PROJECT GOALS AND OBJECTIVES

EEP develops River Basin Restoration Priorities (RBRP) to guide its restoration activities within each of the state's 54 cataloging units. RBRPs delineate specific watersheds that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration. These watersheds are called Targeted Local Watersheds (TLWs) and receive priority for EEP planning and restoration project funds.

The 2009 Cape Fear River Basin RBRP identified HUC 03030006110040 (Stewarts Creek) as a Targeted Local Watershed (NCEEP 2009). The watershed is characterized by 54% forest and 40% agricultural areas with past impacts to streams including channelization and nonpoint source pollution. This watershed is a TLW due to the number of animal operations within its boundary and the many opportunities for mitigation.

The Norman's Pasture Restoration Site (NPRS) and Norman's Pasture II Restoration Site (NPII) were both identified as opportunities to improve and protect stream and wetland habitat and functions within the TLW. The goals and priorities for NPRS's and NPII's are based on the information presented in The Cape Fear River Basin Restoration Priorities, to protect and improve water quality throughout the Basin by reducing sediment and nutrient inputs into streams and rivers and to support efforts to restore local watersheds (NCEEP 2009). The project goals are in line with the basin priorities and include the following:

- Reconnect a continuous stream and wetland headwater wetland system to Stewarts Creek
- Expand and protect riparian habitat along Stewarts Creek
- Buffer nutrient inputs from adjacent agricultural and grazing practices

Additional goals for the project include:

- Increase the local hydroperiod by encouraging both surface and subsurface storage and retention
- Restore and establish a functional and diverse stream/wetland complex

The project goals will be addressed through the following objectives:

- Redevelop a stream/wetland complex that has previously been impacted by ditching and cattle grazing
- Fill field ditches to restore surface flow retention and historic flow paths
- Protect and integrate existing riparian wetlands into the project design
- Re-forest riparian areas with native plant communities
- Re-connect headwater seeps to the broader swamp forest community of Stewarts Creek being restored by NPRS and NPII.

2.0 SITE SELECTION

2.1 Directions

NPRS and NPII are located on two parcels located off of Cornwallis Road approximately five miles west of Magnolia, North Carolina. To reach the sites from Raleigh: proceed east on I-40 for approximately 65 miles until Exit 364 for US-24. Then travel on US-24 west towards Clinton for approximately one mile. Turn left onto Carrolls Road and then take the first right onto Blanchard Road. Blanchard Road will turn into Cornwallis Road and the sites will be approximately six miles ahead on the right.

2.2 Site Selection

NPRS and NPII are part of the 03030006 Watershed Cataloging Unit (South River and Great Coharie Creek) located within the Cape Fear River Basin. The Cape Fear River Basin is the largest in the state and contains a number of North Carolina's larger cities, including Greensboro, High Point, Burlington, Durham, Fayetteville and Wilmington. The population within the watershed in 2000 was 3.6 million people, and it is expected to grow to 5.2 million by 2020. As a result, the focus in this watershed is on mitigating impacts from stormwater and protecting and/or restoring existing habitat (NCEEP, 2009).

The project sites are bounded by Cornwallis Road to the east, Stewarts Creek to the south, agricultural land to the north, and woodlands to the west. The sites have a long history of hydrologic modification in order to allow for farming and grazing to take place on the property. The existing site conditions are shown in Section 2.6 and seen in site photographs (Section 2.8). Within the 8-digit cataloging unit, the Stewarts Creek drainage (03030006110040) remains only moderately affected by urban development, having its start in Warsaw, NC before crossing under I-40 and ending in Clinton, NC.

The soils at the sites were examined for their wetland potential. The Soil Survey of Sampson County describes several predominant soil series at the NPRS and NPII, including Lumbee sandy loam, Bibb and Johnston, Johnston loam, Norfolk loamy sand, and Chipley sand. Lumbee sandy loam is a nearly level, poorly drained soil on smooth flats and in shallow depressions on stream terraces. The Bibb and Johnston soil series is described as frequently flooded and having soils that are poorly or very poorly drained along major streams. Johnston loam is a very poorly drained series found on narrow to moderately broad floodplains. Norfolk loamy sand is a well-drained soil located on low ridges and side slopes in uplands. The Chipley Sand series has 0 to 2 percent slopes, and is described as being a nearly level, moderately well-drained soil on smooth ridges (Soil Survey of Sampson County, USDA SCS 1985).

A soils investigation by KCI's licensed soil scientist at both of the sites found the soils described above in addition to Johns fine sandy loam, Lynn Haven sand, and Torhunta fine sandy loam. Johns fine sandy loam is a somewhat poorly drained to moderately well drained series found on stream terraces. Lynn Haven sand is a poorly drained soil typical of flat areas or found in large, shallow depressions. Torhunta fine sandy loam is a very poorly drained soil found on upland bays and stream terraces. The soil data sheets and a map of the soil delineation and borings are included in (Appendix C, Soil Delineation and Characterization).

2.2.1 Historic Site Geology/Geomorphic Setting

NPRS and NPII occupy a unique position in the geologic landscape. Effective development of the mitigation plan relies on both an understanding of the process that lead to the formation of the resources and the actions that created the site impairments.

The sites lie within the Rolling Coastal Plains (Level IV 65m) ecoregion of the Coastal Plain physiographic province. This region is described as a rolling, hilly, dissected portion of the Inner Coastal Plain that is made up of sedimentary material. The geology at the sites are classified as part of the Black Creek formation, which is comprised of gray to black, lignic clay and contains thin beds and laminae of fine-grained micaceous sand and thick lenses of cross-bedded sand (Winner and Coble 1996). Glauconitic, fossiliferous clayey sand lenses exist in the upper part. Also, it is landward of the Surry Scarp and sits on the unconformity that separates the Cretaceous Black Creek formation from the Peedee formation (NC Archaeological Council 2011). Intertonguing of the formations is common and form ravinements, which are disconformities resulting from surf zone beveling. Ravinements in the Cretaceous are associated with the termination of delta construction and deposition of the destructive strata (Benson 1968).

Deltas formed landward of the Surry Scarp in Sampson County. This process created several small overlapping coalescing deltas with sediments brought in by fluvial systems and deposited in deep water subsiding basins. The sediments were interdistributed, covered and reworked until Taylor time and gradually declined as the sediment supply decreased (Benson 1968). As each delta lobe ceased its seaward movement, the lens of sediments would subside and become inundated by marine water. These processes created a transitional fluvial-deltaic shoreline facies between the Middendorf and Peedee formations (Benson 1968).

Subsequent weathering of the Black Creek formation sediments resulted in an incised paleovalley complex with terraced floodplains and ramps. This process exposed the varying lenses of sediment created by the deltaic environment. For the majority of the formation, the Cape Fear River and its tributaries incised into the landscape parallel to the channels and subaqueous/subaerial levees of the buried deltas SE. This linear development exposes layered sediments in the same orientation as they were deposited, resulting in consistent material composition along each ramp/terrace.

NPRS and NPII are bordered on the south by Stewarts Creek. Stewarts Creek's incision into the landscape occurs perpendicular to the depositional features of the buried deltas (SW). This process is likely the result of the position of the Surry Scarp and the seam of unconformity between the Black Creek and Peedee formations at this location (NC Archaeological Council 2011). The paleovalley complex created by Stewarts Creek cross cuts the deltaic deposits resulting in a highly varied landscape with lenses of material with varying densities and compositions being exposed along the ramps and terraces it creates. The resulting exposed landscape is a mosaic of exposed delta deposits mimicking the braided channels that once were part of this feature.

The cross-cut orientation of the paleovalley complex created by Stewarts Creek also creates a unique interface with the groundwater hydrology. Groundwater discharge in the valley occurs at the toes of floodplain terraces within the incised valley. These seeps discharge water loaded much higher and distant in the landscape along the buried distributary channels in the formation. As a result, the seeps are continuous and on the lower terraces are under sufficient pressure to be classified as artesian. Water discharging from the seeps flows toward Stewarts Creek, and perches on clay lenses between less erodible formations on the terraces.

2.2.2 Chronology of Impacts

Historic aerials from Sampson County were examined for any information about how the sites' hydrology and vegetation have changed over the last century. They were obtained from the USGS EarthExplorer, USGS DOQQs, and NC OneMap for 1938, 1951, 1966, 1981, 1989, 1993, 1998, and 2008. The reviewed aerials are found in Figure 2.7. The NPRS and NPII were systematically impacted over the past 100 years. The primary impacts to the system were associated with ditching and draining in an attempt to remove hydrologic sources, seeps, springs, and groundwater from the sites.

1938 – This is the earliest photo available for the sites. It shows the matrix of exposed high points as agricultural fields and surrounding wetland drainages. The aerial shows that the two main ditches near Tributary 2 running from east to west were already in place by that time, although some of the southern portion of the land was still forested at this time.

1938 to 1951 – By 1951, the majority of the forested portions of the sites had been cleared and additional ditches are visible in the middle portion of NPRS and in the floodplain of Stewarts Creek. Evidence of wetness in the fields is still prominent.

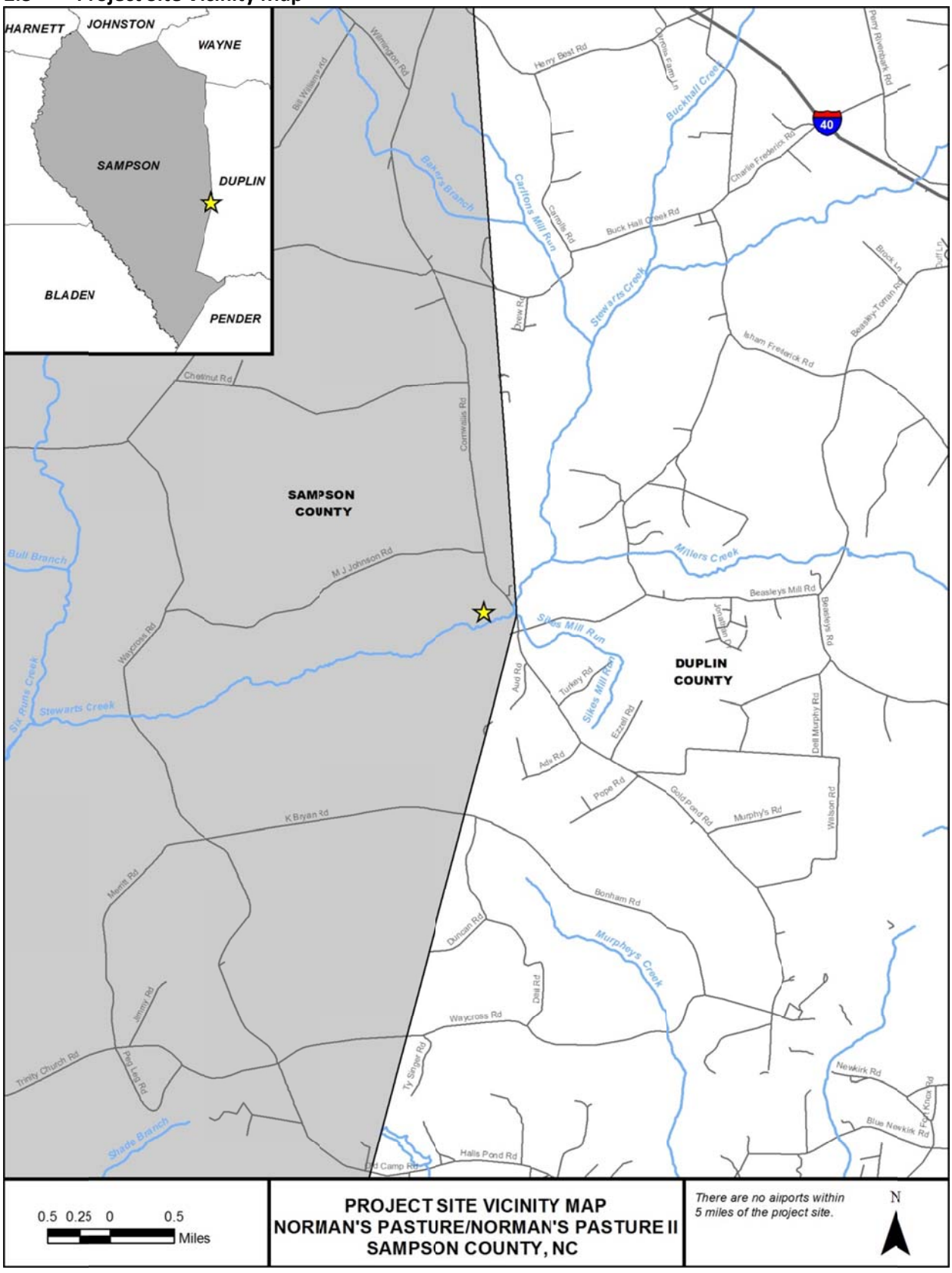
1951 to 1966 - By 1966, the sites show evidence of agricultural production in the cleared areas; additional ditching along the eastern boundary is evident below the seep south of the farm residence.

1966 to 1981 – By 1981, the seep south of the residence was cleared and excavated and turned into a shallow pond. The ditches conveying flow from the seep were further refined and straightened. In addition, the two seeps in the east central portion of NPRS were also cleared and converted to ponds.

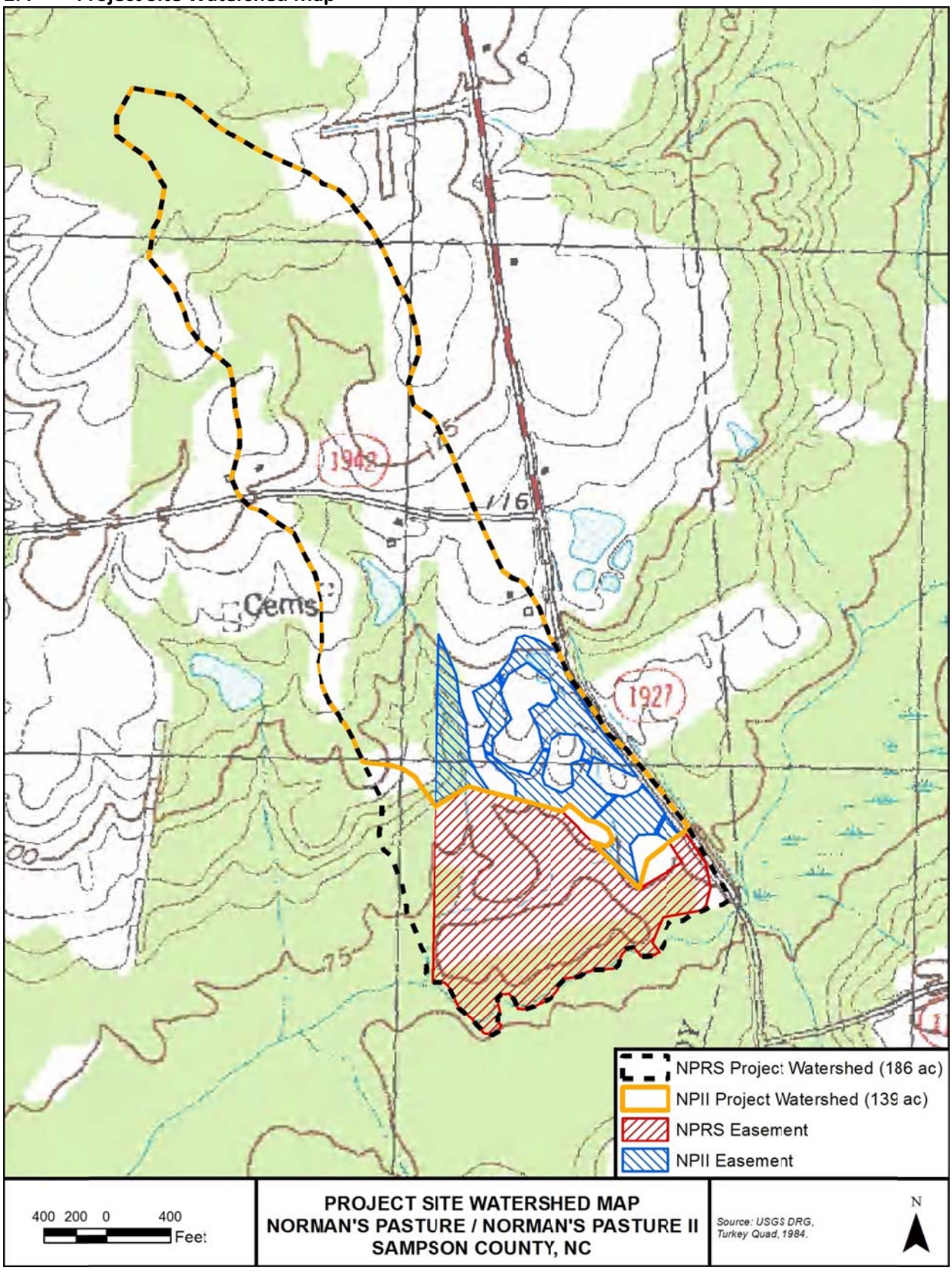
1981 to current – The ditching in the system has been maintained and the sites are primarily used for row crop agriculture and pasture. The surrounding area is rural with low development pressure at this time. These land use trends indicated that restoring this property back to a forested wetland will provide an important habitat enhancement in the watershed.

The historic aerial photographs available for the site confirm that the sites are characterized by a series of seeps feeding into broad wetland channels that then discharge into the broad flat floodplain of Stewarts Creek, supporting an extensive stream/wetland complex.

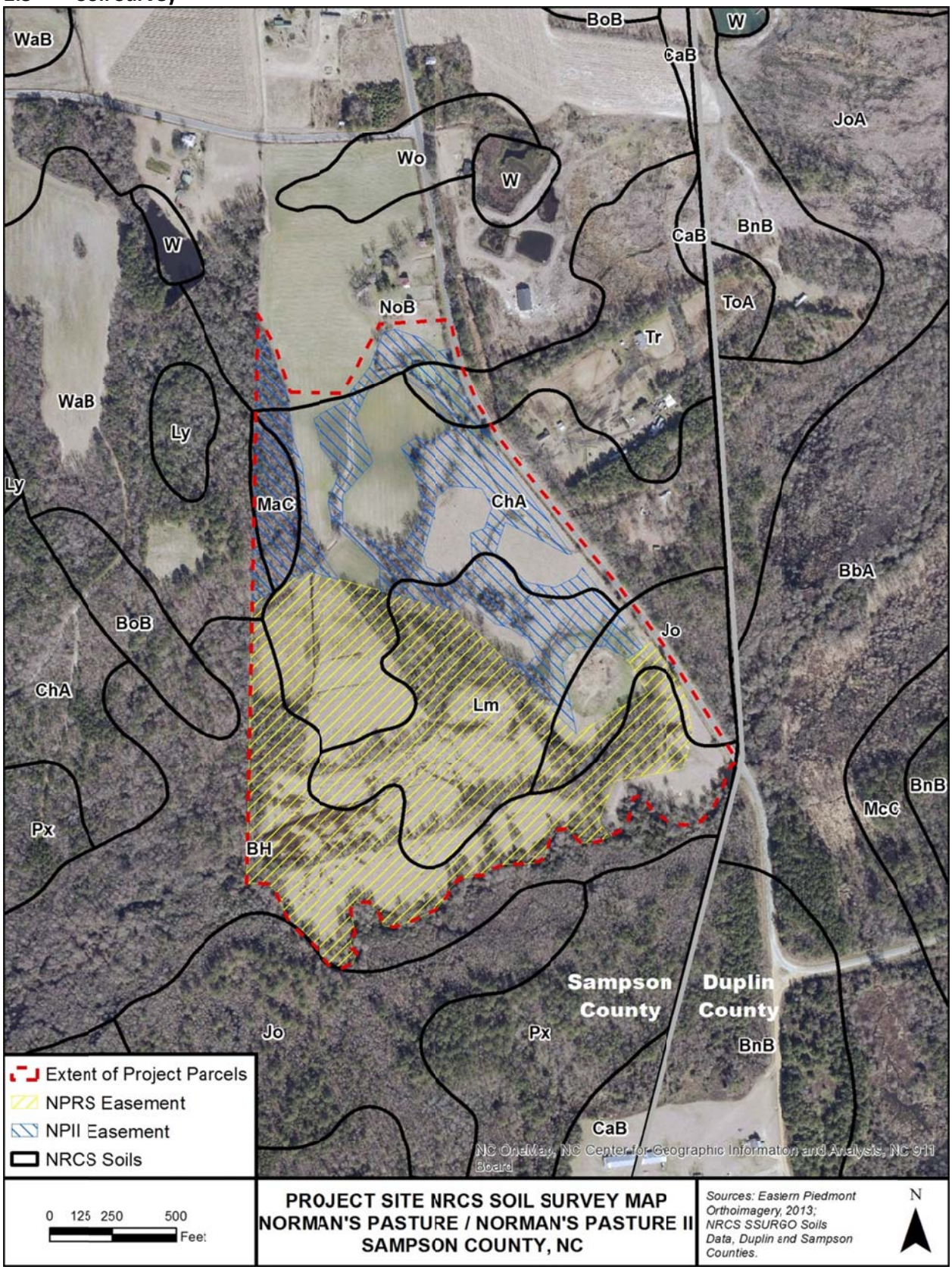
2.3 Project Site Vicinity Map



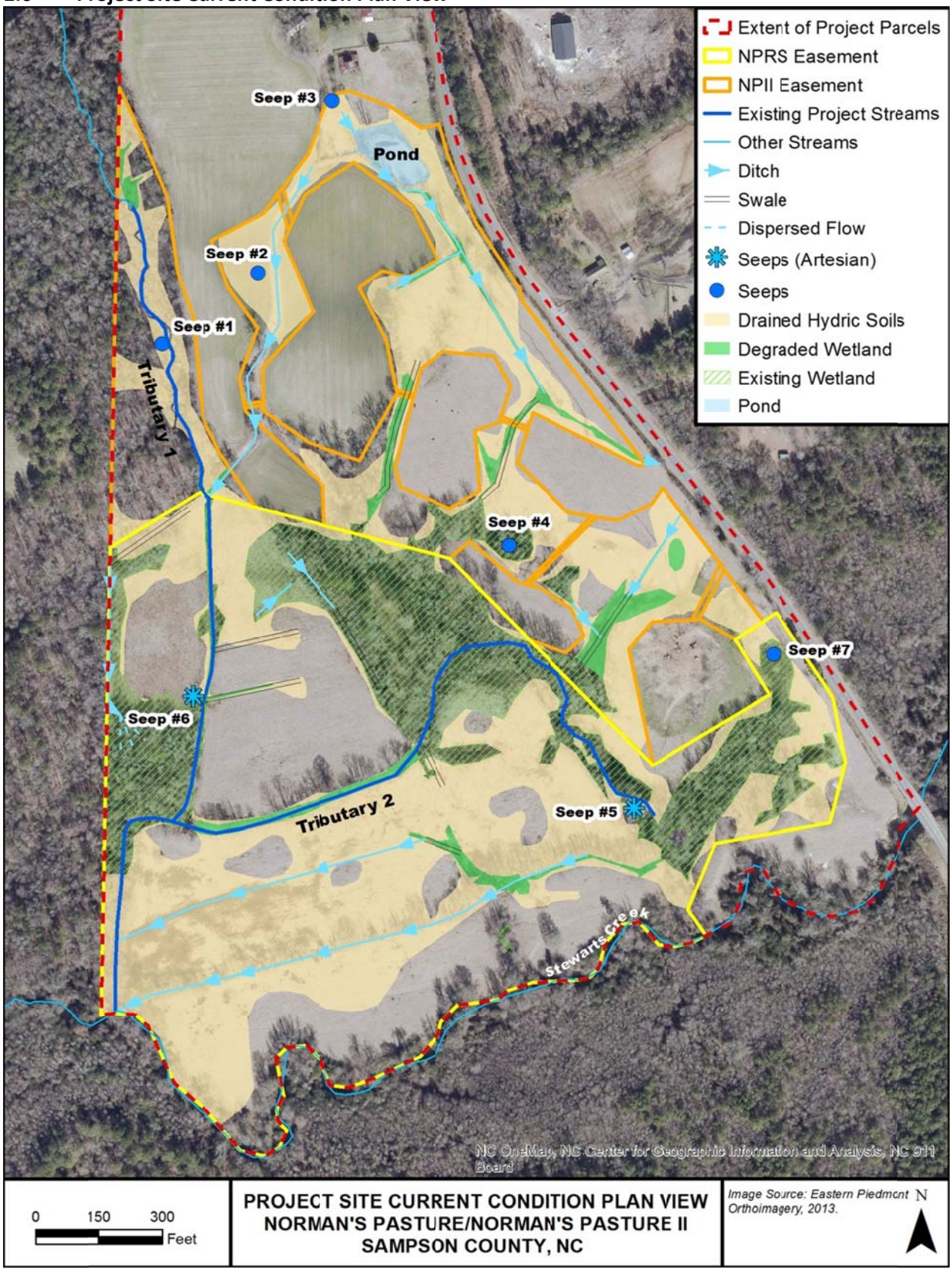
2.4 Project Site Watershed Map



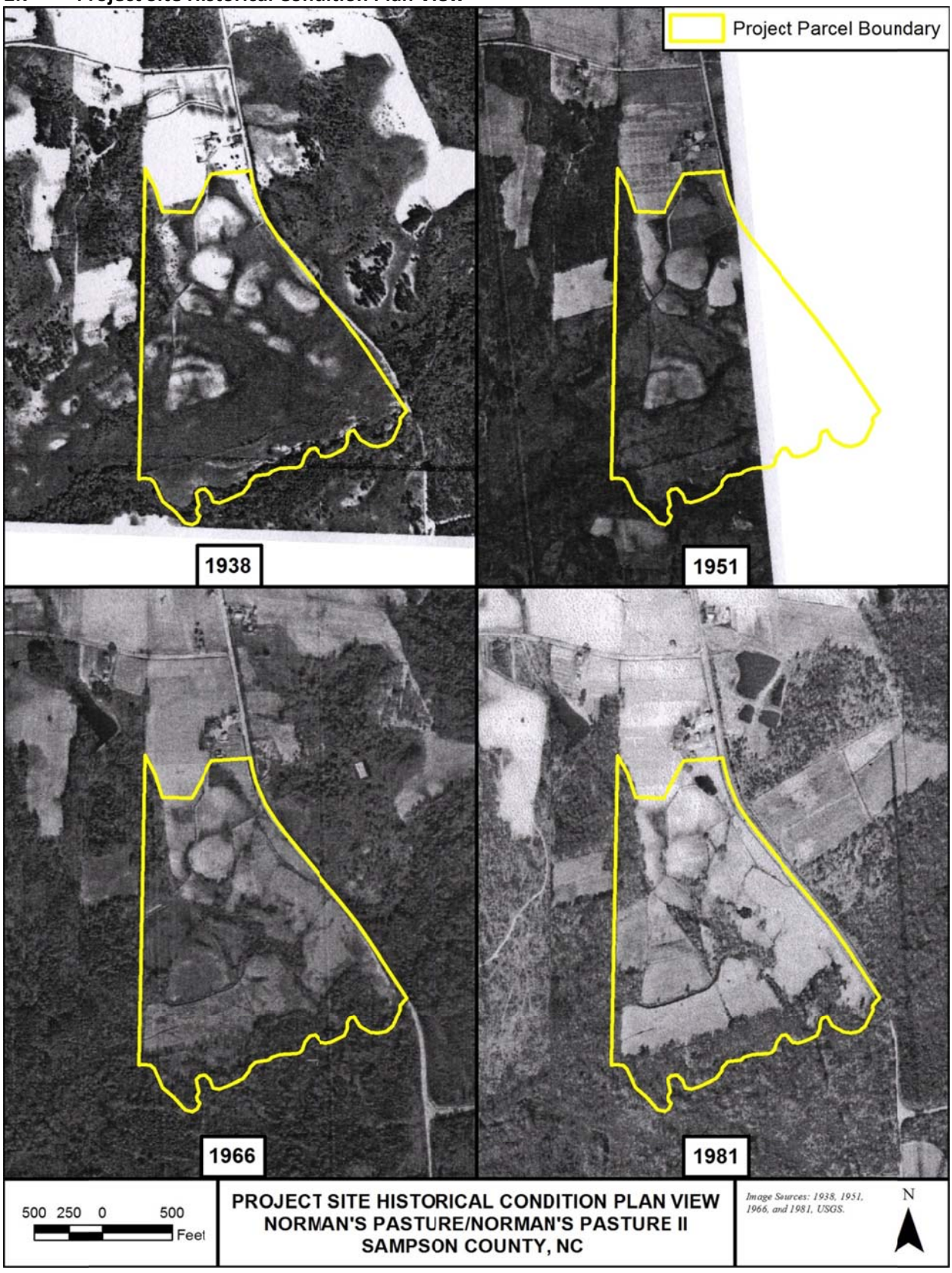
2.5 Soil Survey

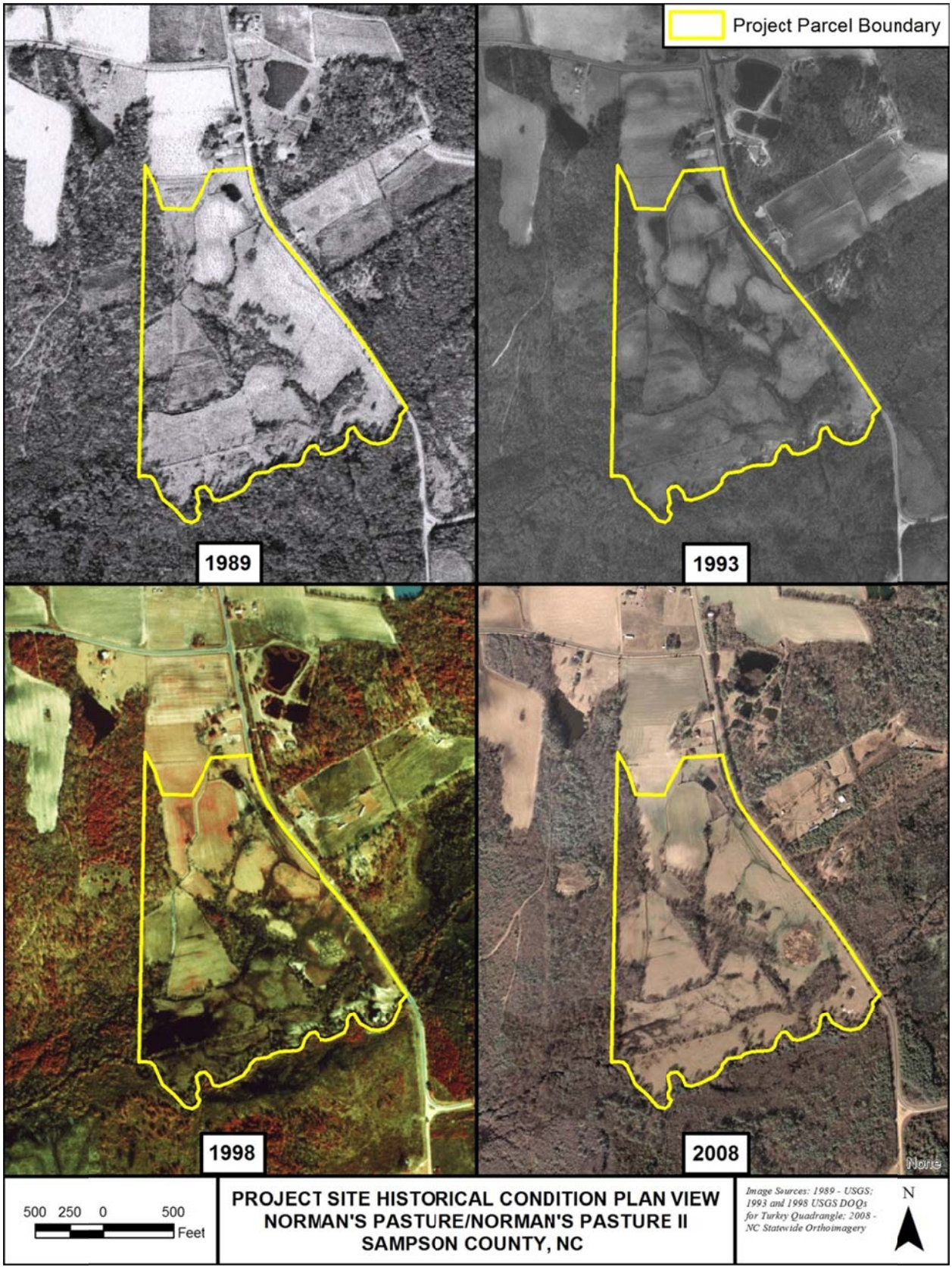


2.6 Project Site Current Condition Plan View



2.7 Project Site Historical Condition Plan View




Project Parcel Boundary
1989
1993
1998
2008
None
500 250 0 500
Feet
PROJECT SITE HISTORICAL CONDITION PLAN VIEW
NORMAN'S PASTURE/NORMAN'S PASTURE II
SAMPSON COUNTY, NC
Image Sources: 1989 - USGS; 1993 and 1998 USGS DOQs for Turkey Quadrangle; 2008 - NC Statewide Orthoimagery
N

2.8 Site Photographs

View from Cornwallis Road looking west at field and Tributary 2 tree line of NPRS. 6/13/2013

View from Cornwallis Road looking south at field and Wetland 1 located on the eastern portion of NPRS. 6/13/2013

View looking east at Wetland 1 on NPRS. 6/13/2013

View looking north at the beginning of Tributary 2 on NPRS. Notice the high water mark on the tree. 6/13/2013

View looking west at the most southern border ditch of NPRS. Notice the high water mark on the trees. 6/13/2013

View looking north at Tributary 2 and Wetland 4 located on the eastern portion of NPRS. 6/13/2013

View looking east from the confluence of Tributary 2 and Stewarts Creek on NPRS. 6/13/2013

View looking east at ditch to be filled on NPRS. 6/13/2013

View looking north at Wetland 9 located at the western project boundary of NPRS. 6/13/2013

View looking south and downstream at Tributary 1 on NPRS. 6/13/2013

View looking north and upstream at Tributary 1 on NPRS. 6/13/2013

View looking upstream at Tributary 1 on NPII. 4/14/2014

View of head cut located on Tributary 1 on NPII. 4/14/2014

View looking downstream on Tributary 1 on NPII. 4/14/2014

View looking upstream on Tributary 1 at the start of NPII. 4/14/2014

View looking south at the pond to be filled on NPII. 4/14/2014

View looking south at ditch to be filled located near Cornwallis Road on NPII. 4/14/2014

View looking southwest at ditch to be filled on NPII. 4/14/2014

View looking south at ditch to be filled located at the southern portion of NPII. 4/14/2014

View looking south at ditch to be filled located at the northern portion of NPII. 4/14/2014

View looking southwest at ditch to be filled entering Tributary 1 on NPII. 4/14/2014

3.0 SITE PROTECTION INSTRUMENT

3.1 Site Protection Instrument Summary Information

The land required for the construction, management, and stewardship of this mitigation project includes portions of the following parcels. The conservation easement documents for NPRS was finalized in June 2013. A copy of the land protection instrument is included in Appendix A.

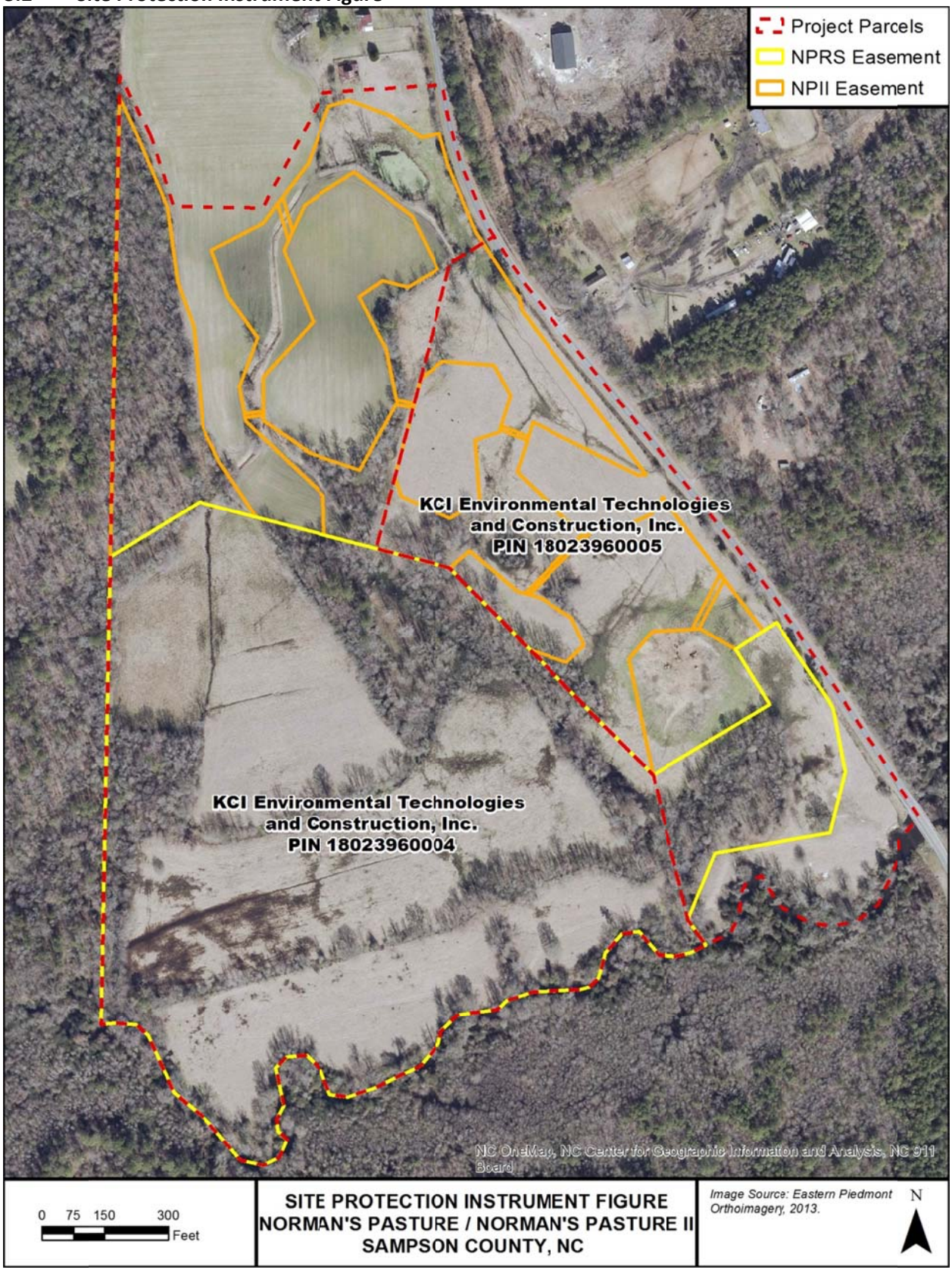
Norman's Pasture Restoration Site

Landowners	Instrument Number	PIN	County	Site Protection Instrument	Deed Book and Page Number	Acreage protected
KCI Technologies & Construction Inc.	03608	18023960004; 18023960005	Sampson	Conservation Easement	DB 1862 PG 104	36.92

Norman's Pasture II

Landowners	Instrument Number	PIN	County	Site Protection Instrument	Acreage protected
KCI Technologies & Construction Inc.		18023960004; 18023960005	Sampson	Conservation Easement	16.3

3.2 Site Protection Instrument Figure



4.0 BASELINE INFORMATION

Project Information			
Project Name	Norman's Pasture Restoration Site		
County	Sampson County		
Project Area (acres)	36.92 acres		
Project Coordinates (lat. and long.)	34.904893 N , -78.151460 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Cape Fear		
USGS Hydrologic Unit 8-digit	03030006	**USGS Hydrologic Unit 14-digit**	03030006110040
DWQ Sub-basin	03-06-19		
Project Drainage Area (acres)	186.0 acres		
Project Drainage Area Percentage of Impervious Area	1%		
CGIA Land Use Classification	Managed Herbaceous Cover 42% (77.3 ac), Cultivated 24% (44.3 ac), Bottomland Forest/Hardwood Swamps 17% (31.0 ac), Southern Yellow Pine 10% (19.5 ac), Mixed Hardwoods/Conifers 5% (9.2 ac), and Evergreen Shrubland 2% (4.2 ac)		

Existing Reach Summary Information		
Parameters	**T1**	**T2**
Length of reach (linear feet)	1,585	1,612
Valley classification	Valley Type X	Valley Type X
Drainage area (acres)	112 acres	36 acres
NCDWQ Water Quality Classification	Project Reach Not Classified; Receiving water = Stewarts Creek (C; SW)	Project Reach Not Classified; Receiving water = Stewarts Creek (C; SW)
Morphological Description (stream type)	Portions ditched channel; other C5	Portions headwater stream; other ditched channel
Evolutionary trend	Channelized	Channelized
Mapped Soil Series	Chipley Johnston; Torhunta	Bibb and Johnston; Johnston; Lumbee
Drainage class	Somewhat poorly drained; very poorly drained; very poorly drained	Poorly drained; very poorly drained; poorly drained
Soil Hydric status	Drained hydric	Drained hydric
Slope	0-2%	0-2%
FEMA classification	Zone AE	Zone AE
Existing vegetation community	Pasture, Headwater Forest	Pasture, Riverine Swamp Forest
Percent composition of exotic invasive vegetation	<5%	<5%

Existing Wetland Summary Information				
Parameters	**Area 1***	**Area 4***	**Area 9***	**Area 10***
Size of Wetland (acres)	1.99 acres	5.20 acres	2.19 acres	0.02 acre
Wetland Type	Riparian	Riparian	Riparian	Riparian
Mapped Soil Series	Bibb and Johnston	Lumbee	Bibb and Johnston	Bibb and Johnston
Drainage class	Poorly or very poorly drained	Poorly Drained	Poorly or very poorly drained	Poorly or very poorly drained
Soil Hydric Status	Drained Hydric	Drained Hydric	Drained Hydric	Drained Hydric
Source of Hydrology	Seepage/ Precipitation	Seepage / Precipitation	Seepage / Precipitation	Seepage / Precipitation
Hydrologic Impairment	Ditching and Crops	Ditching and Crops	Ditching and Crops	Ditching and Crops
Existing vegetation community	Crops, Pasture, Wetland	Crops, Pasture, Forested Wetland	Crops, Pasture, Forested Wetland	Crops, Pasture
Percent composition of exotic invasive vegetation	<5%	<5%	<5%	0%

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	Applying for NWP 27	Jurisdictional Determination
Waters of the United States – Section 401	Yes	Applying for NWP 27	Jurisdictional Determination
Endangered Species Act**	No	N/A	N/A
Historic Preservation Act**	No	N/A	N/A
Coastal Zone Management Act ** (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	Yes	Yes	No-Rise Certification Letter/ FEMA Floodplain Checklist
Essential Fisheries Habitat**	No	N/A	N/A

* Refer to Jurisdictional Determination wetland delineation map in Appendix B for numbering.

**Items addressed in the Categorical Exclusion in Appendix B.

Project Information			
Project Name	Norman's Pasture II		
County	Sampson County		
Project Area (acres)	16.3 acres		
Project Coordinates (lat. and long.)	34.906839 N , 78.151797 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Cape Fear		
USGS Hydrologic Unit 8-digit	03030006	**USGS Hydrologic Unit 14-digit**	03030006110040
DWQ Sub-basin	03-06-19		
Project Drainage Area (acres)	139.0 acres		
Project Drainage Area Percentage of Impervious Area	1%		
CGIA Land Use Classification	Cultivated 32% (44.3 ac), Managed Herbaceous Cover 31% (42.9 ac), Bottomland Forest/Hardwood Swamps 14% (19.5 ac), Southern Yellow Pine 14% (19.5 ac), Mixed Hardwoods/Conifers 6% (9.0 ac), and Evergreen Shrubland 3% (4.2 ac)		

Existing Reach Summary Information	
Parameters	**T1**
Length of reach (linear feet)	843
Valley classification	Valley Type X
Drainage area (acres)	112 acres
NCDWQ Water Quality Classification	Project Reach Not Classified; Receiving water = Stewarts Creek (C; SW)
Morphological Description (stream type)	Modified E5
Evolutionary trend	Stage III
Mapped Soil Series	Johnston
Drainage class	Very Poorly drained
Soil Hydric status	Drained hydric
Slope	0-1%
FEMA classification	Zone AE & Zone X
Existing vegetation community	Headwater Forest Community
Percent composition of exotic invasive vegetation	<5%

Existing Wetland Summary Information					
Parameters	**Area 6***	**Area 7***	**Area 8***	**Area 9* continued from NPRS**	**Area 11***
Size of Wetland (acres)	0.09 acre	0.17 acre	0.37 acre	0.02 acre	0.08 acre
Wetland Type	Riparian	Riparian	Pond and Riparian	Riparian	Riparian
Mapped Soil Series	Bibb and Johnston; Lumbee	Johnston loam	Lynn Haven	Bibb and Johnston	Torhunta Variant
Drainage class	Poorly or very poorly drained	Very poorly drained	Poorly or very poorly drained	Poorly or very poorly drained	Very poorly drained
Soil Hydric Status	Drained Hydric	Drained Hydric	Drained Hydric	Drained Hydric	Drained Hydric
Source of Hydrology	Seepage / Precipitation	Seepage / Precipitation	Seepage/ Precipitation	Seepage / Precipitation	Seepage / Precipitation
Hydrologic Impairment	Ditching and Crops	Ditching and Crops	Ditching and Crops	Ditching and Crops	Ditching
Existing vegetation community	Crops, Pasture, Wetland	Crops, Pasture, Wetland	Crops, Pasture	Crops, Pasture, Forested Wetland	Forested Wetland

Percent composition of exotic invasive vegetation	0%	0%	0%	0%	0%

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	Applying for NWP 27	Jurisdictional Determination
Waters of the United States – Section 401	Yes	Applying for NWP 27	Jurisdictional Determination
Endangered Species Act**	No	N/A	N/A
Historic Preservation Act**	No	N/A	N/A
Coastal Zone Management Act ** (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	Yes	Yes	No-Rise Certification Letter/ FEMA Floodplain Checklist
Essential Fisheries Habitat**	No	N/A	N/A

* Refer to Jurisdictional Determination wetland delineation map in Appendix B for numbering.
**Items addressed in the Categorical Exclusion in Appendix B.

4.1 Watershed Summary Information

The sites are within the 03030006 (Cape Fear 06) Watershed Cataloging Unit (8-digit HUC) and the Local Watershed Unit 03030006110040 (14-digit HUC). The project's 14-digit HUC has been identified by the North Carolina Ecosystem Enhancement Program (EEP) as a targeted local watershed (TLW). Section 2.4 Watershed Map shows the site in relation to the project watershed, which is comprised of 186 acres as it reaches Stewarts Creek. Below the project site, Stewarts Creek continues for approximately four river miles before it flows into Six Runs Creek. Neither Stewarts Creek nor Six Runs Creek are listed on the draft 2014 303(d) list (add reference). The project site is also not within a water supply watershed. Stewarts Creek (DWQ Index 18-68-2-10) is classified as Class C water with the supplemental classification of swamp waters (Sw).

The project watershed for the NPRS is comprised of 186 total acres. Current land use in the project watershed consists of Managed Herbaceous Cover 42% (77.3 ac), Cultivated 24% (44.3 ac), Bottomland Forest/Hardwood Swamps 17% (31.0 ac), Southern Yellow Pine 10% (19.5 ac), Mixed Hardwoods/Conifers 5% (9.2 ac), and Evergreen Shrubland 2% (4.2 ac). The project watershed drains to the west, north, and east into the project site. The project watershed for NPII is made up of 139 acres and is located within the watershed for NPRS. Current land use in the project watershed is approximately Cultivated 32% (44.3 ac), Managed Herbaceous Cover 31% (42.9 ac), Bottomland Forest/Hardwood Swamps 14% (19.5 ac), Southern Yellow Pine 14% (19.5 ac), Mixed Hardwoods/Conifers 6% (9.0 ac), and Evergreen Shrubland 3% (4.2 ac). The impervious surface within the project watershed is limited to the surfaces of MJ Johnson Road and Cornwallis Road and impervious areas within rural residential properties, amounting to approximately 1% of the total area project drainage area. The nearest named downstream water body is Stewarts Creek. The project area is located in the United States Geological Survey (USGS) Turkey Quadrangle.

4.2 Reach Summary Information

Norman's Pasture Restoration Site

Existing Conditions

Two separate unnamed tributaries to Stewarts Creek flow through the site. Neither stream will be used for mitigation credit, but both are described here since they will be integrated into the project design. Tributary 1 (T1) begins northwest of the project site from a farm pond and flows south approximately 350 linear feet onto the project. Tributary 2 (T2) flows west, approximately 1,440 linear feet to join T1 and forms on the site from the southeast. T1 and T2 are both headwater channels due to their small drainage areas. The broad flat topography of the site means that the streams have minimal slope and are slow-moving systems. The *Current Conditions Plan View* in Section 2.6 shows the existing conditions at the NPRS and site photographs are included in Section 2.8.

T1 enters NPRS in the northwestern corner of the project. The channel has been ditched through an open agricultural field, and continues in this form until the edge of the field where an artesian spring is located. The channel has been further excavated in this location and the remaining spoil can be seen to the left of the stream. Further downstream, T1 transitions into a channel type with little evidence of ditching and with access to its floodplain. T2 joins T1 coming in from the west and then T1 travels along the property line as a straightened channel with spoil piles adjacent to the right bank until it enters into Stewarts Creek.

T2 begins in the middle of the NPRS site and flows to the north and then to the west before joining T1 along the western edge of the site. T2 receives its primary hydrologic input from an artesian spring. Based on landowner reports, this artesian spring provides a consistent source of hydrology. Currently, T2 is a functional headwater stream at its beginning and is surrounding by high-quality wetlands. Unlike a single-thread channel, the stream has multiple flow paths throughout the wetted section that moves in a linear direction. The braided system is largely shaped by the existing trees. T2 flows through a more heavily wooded area where it receives additional drainage from hillside seepage entering from the northeast. At this point, T2 flows toward the west, where it becomes a wide channelized ditch until it reaches the confluence with T1. There is little to no movement within the channel, leaving the water essentially ponded with large amounts of duckweed. Along the left bank of this lower section of T2, there is no riparian vegetation. The right bank has a narrow strip of trees.

The jurisdictional determination delineation identified both tributaries as jurisdictional tributaries (see Appendix B for jurisdictional determination plat).

Norman's Pasture II

Existing Conditions

An upper reach of T1 flows through the northwestern corner of NPII before reaching NPRS, and this portion of T1 will be included for mitigation credit. T1 begins upstream of NPII from a farm pond and flows south onto the site. As it initially comes onto the project site, it is a stable stream within a forested riparian wetland buffer. However, after a downstream headcut, it begins to incise and T1 flows in a narrow, steep valley. In this section, the right bank has a steep valley wall while the left bank has a higher bank that is bare and exposed. There is a farm field just to the east of the left bank. This tributary is surrounded by hydric soils that have evidently been drained as the channel has incised over the years.

Historic evidence of the incision includes exposed tree roots, active headcuts, and the exposed soil profile that is apparent throughout much of the project reach. The first major headcut is thought to have been initiated circa 1938 with the placement of a drainage ditch intended to improve drainage and allow access to a tar kiln that was located on the opposite side of the channel. Three major knick points are visible along the profile and the bank height ratios are in excess of 2 (See Appendix C, Existing Conditions Cross-Sections). Side channels have formed and downcut perpendicular to the channel and further drained adjacent wetland/seep areas.

The *Current Conditions Plan View* in Section 2.6 shows the existing conditions at the NPII and the site photographs are included in Section 2.8. The jurisdictional determination that identified T1 as a jurisdictional tributary is included in Appendix B.

Channel Morphology (Pattern, Dimension, and Profile)

A Rosgen Level II assessment was conducted to gather existing stream dimension data from the NPII reach of T1 to determine the degree of channel instability. Two channel cross-sections were surveyed at two representative locations and classified T1 as a G5 channel. The cross-sectional data developed from this survey is presented in Appendix C.

Channel Stability Assessment

As reflected in the project goals and objects, sediment is not a large concern at this site. For this reason, a Bank Erosion Hazard Index (BEHI) evaluation was not conducted for the project.

Bankfull Verification

The standard methodology used in natural channel design is based on the ability to select the appropriate bankfull discharge and generate the corresponding bankfull hydraulic geometry from a stable reference system(s). The determination of bankfull stage is the most critical component of the natural channel design process.

Bankfull can be defined as "the stage at which channel maintenance is most effective, that is, the discharge at which moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of the channels," (Dunne and Leopold, 1978). Several characteristics that commonly indicate the bankfull stage include: incipient point of flooding, breaks in slope, changes in vegetation, highest depositional features (i.e. point bars), and highest scour line. The identification of bankfull stage, especially in a degraded system, can be difficult. Therefore, verification measures were undertaken to validate the correct identification of the bankfull stage on all project reaches.

Regional curves are typically utilized in ungauged areas to approximate bankfull discharge, area, width, and depth as a function of drainage area based on interrelated variables from other similar streams in the same hydrophysiographic province. Regional curves and corresponding equations from "Bankfull Hydraulic Geometry Relationships for North Carolina Streams" (Harman *et al*., 1999) were used to approximate bankfull in the project reaches. Based on the regional curves, a bankfull discharge and cross-sectional area were estimated for all reaches. For T1, the regional curve estimates a bankfull discharge of 26.6 ft_3/s and a cross-sectional area of 6.8 ft_2. A reference reach, located approximately 300 linear feet upstream of T1 was surveyed for a reference stream by KCI in April 2014. The reference cross-sections resulted in a cross-sectional area of 3.7 ft_2 and 2.7 ft_2, respectively. KCI analyzed the relationship between drainage area and discharge to the NC coastal regional curve data and the reference reach. The results indicated the cross-sectional area and discharge for the reference stream

were slightly lower to the regional curve data. This is due to the reference reach being further upstream in a smaller watershed resulting in a smaller cross-sectional area. Since the reference stream is located in close proximity of T1 and flows through a headwater forest community that has a stable planform and contains lower banks and a high width/depth ratio, KCI feels that it is a suitable reference for the project reaches. The dimensionless hydraulic geometry relationships were developed from stable channel dimensions to assist in the design of the proposed channel cross-sectional data for the T1 enhancement reach.

T1 will be enhanced by reconnecting the channel grade to its historic elevations. The bankfull bench will be similar to the reference cross-sections.

4.3 Wetland Summary Information

Wetlands historically formed at both the NPRS and NPII sites due to on-site seeps and streams making their way down to the floodplain of Stewarts Creek. The topography of the site begins with the highest elevations at the northern edge of the NPII Site. The elevation decreases sharply as one moves from north to south until about the center of the sites when the slope becomes much gentler. Water on the sites exits via the southern boundary into Stewarts Creek. The drained hydric soils at the site experience approximately a 2-foot change in elevation as the slope grades down slightly from the center towards the northeastern corner of the site and along the main ditch out of the southern edge of the site.

Norman's Pasture Restoration Site

Existing Wetlands

NPRS has been impacted by a history of channelization, farming production, and cattle grazing. Despite efforts to effectively drain wetlands on the property, several areas of existing wetland exist within the NPRS. These areas were delineated by KCI wetland scientists and the boundaries were confirmed through a jurisdictional determination with the US Army Corps of Engineers (Section 4.4) and are identified as Wetlands 1, 4, 9, and 10 in the Baseline Information Table. The project includes existing forested wetlands along the southeastern and middle portion of NPRS and a small portion to the northwest. The goal of this project will be to join these areas to a larger whole braided stream/wetland complex. The wetland data forms are included in (Appendix B, USACE Wetland Determination Forms).

Vegetation

The NPRS includes forested wetland areas generally located along T1, T2, and the man-made drainage features. The existing wetlands support a variety of tree species, including: green ash (*Fraxinus pennsylvanica*), ironwood (*Carpinus caroliniana*), willow oak (*Quercus phellos*), tulip poplar (*Liriodendron tulipifera*), laurel oak (*Quercus laurifolia*), river birch (*Betula nigra*), bald cypress (*Taxodium distichum*), red maple (*Acer rubrum*), Sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), American elm (*Ulmus americana),* persimmon (*Diospyros virginiana*), and American hawthorn (*Crataegus sp*.).

Existing herbaceous vegetation throughout the wetlands and the ditches includes soft rush (*Juncus effusus*), strawcolored flatsedge (*Cyperus strigosis*), creeping charlie ground ivy (*Glechoma hederacea*), knotweed (*Polygonum sp*.), bahia grass (*Paspalum notatum*), dogfennel (*Eupatorium capillifolium*), broomsedge (*Andropogon sp.)*, lizards tail (*Saururus cernuus*), and sensitive fern (*Onoclea sensibilis*).

Norman's Pasture II

Existing Wetlands

There are many incoming seeps and riparian wetlands that have been modified to accommodate agriculture and grazing at the NPII as the slope transitions down to the NPRS floodplain area. Despite efforts to effectively drain wetlands on the property, several areas of existing wetland exist within the NPII. These areas were delineated by KCI wetland scientists and the boundaries were confirmed through a jurisdictional determination with the US Army Corps of Engineers (Section 4.4) and are identified as Wetlands 6, 7, 8, 9, and 11 in the Baseline Information Table. The project includes existing forested wetlands throughout the portion of NPII. The goal of this project will be to join these areas to a larger whole braided stream/wetland complex. The wetland data forms are included in Appendix B.

Vegetation

The NPII includes forested wetland areas generally located along T1 and the man-made drainage features. The existing wetlands and ditches support the same variety of tree species and herbaceous vegetation as located at NPRS as described above.

4.3.1 Existing Seeps

The fluvial geomorphic processes that developed this landscape evolved into numerous seeps and confining layers along the toe of the various terraces and ramps on the site, which in turn created the unique wetland complex seen in the historic photographs. The hydrologic sources that supported this complex were manipulated over a period of 70 years, resulting in significant degradation of the existing wetland/stream complex. There are seven major seeps (five seeps and 2 artesian wells) with continuous flow located on NPRS and NPII (see Section 2.6). They have been impacted as described below:

1. The first seep is located on NPII along the western border. This seep flows into T1 and has incised into the landscape, draining the adjacent hydric soils. At the point of dispersion onto broader wetland flats around the periphery of a residual mound, a ditch was excavated to carry the flow through the mound to a lower elevation, thus depleting several adjacent wetland areas of their hydrologic sources. In addition, the creation of the drainage ditch led to the head cut and degradation of T1.

2. The second seep is located approximately 200 yards to the east of Seep 1 along the center portion of NPII. This seep is in the center of the field and is drained by a ditch excavated into the landscape along its historic connection to the wetland channel. Hydric soils exist in this corridor and in the seep area. A ditch was cut across an interfluve to join the other ditch draining Seep 1. Instead of flowing to the southwest to T1, this drainage pattern historically went toward the southeast and into the large wetland in the center of the site, as evidenced by relic hydric soils below the point of diversion.

3. The third seep is located 150 yards to the east of Seep 2 along the NPII boundary near Cornwallis Road. This seep was excavated between 1966 and 1981 to create a pond. A ditch leads from the pond and several adjacent seepage areas to carry the discharges through a large area of relic hydric soils and into the large existing wetland in the center of the site. The ditches effectively removed the hydrologic source from the surrounding hydric soil areas. This seep historically supported a broad complex of wetlands on the terrace that parallels Cornwallis Road before draining to the small stream-swamp complex on the floodplain of Stewarts Creek.

4. The fourth seep is located 300 yards south of Seep 3 along the southern portion of NPII. This seep was excavated and manipulated between 1966 and 1981 to create two shallow ponds. This seep maintains its historic drainage path to the wetland in the center of the site, but exhibits areas of fill around the periphery to hold back water.

5. The fifth seep is located 250 yards south of Seep 4 along the NPRS project boundary. This seep is lower in elevation than Seeps 1 through 4 and is artesian in nature. This seep historically created a continuous source of water for the cypress swamp adjacent to Cornwallis Road. The seep was redirected to flow north and then west along the toe of the floodplain through the excavated channel of T2, and bypasses the relic hydric soils on the floodplain.

6. The sixth seep is located 50 yards east of the western easement boundary of NPRS and 200 yards north of Stewarts Creek. This seep lies immediately adjacent to T1 carrying the flow from Seep 1 through the residual mound at the point where it ties in to the wooded cypress swamp. This seep is artesian in nature and forces water out of a pipe three feet above the ground.

7. The seventh seep is located 20 yards west of the eastern easement boundary of NPRS along Cornwallis Road. This seep is located at the top of Wetland 1.

4.4 Regulatory Considerations

A jurisdictional determination was submitted to the US Army Corps of Engineers on December 19, 2012 and approved on February 1, 2013 for the NPRS. An addendum to the jurisdictional determination was approved on May 10, 2013 for NPII. The approved jurisdictional determinations are included in Appendix B. Following the completion of the mitigation plan, a pre-construction notification (PCN) will be completed to apply for a Nationwide 27 Permit (NWP) to comply with Sections 401 and 404 of the Clean Water Act with the Wilmington District of the US Army Corps of Engineers and the NCDENR Division of Water Quality.

NPRS is located within the FEMA 100-year floodplain (Zone AE) for Stewarts Creek as well as a small portion of NPII. A No-Rise Certification was completed and approved for the site based on the proposed design. The approval letter and FEMA Checklist are included in Appendix B.

5.0 DETERMINATION OF CREDITS

Norman's Pasture Restoration Site, Sampson County									
Mitigation Credits									
	Stream		**Riparian Wetland**		**Non-riparian Wetland**		**Buffer**	**Nitrogen Nutrient Offset**	**Phosphorous Nutrient Offset**
Type	R	RE	R	RE	R	RE			
Linear Feet/Acres			16.2						
Credits			16.0						
TOTAL CREDITS			16.0						

Project Components						
Project Component -or- Reach ID	**Stationing/ Location**	**Existing Footage/ Acreage**	**Approach (PI, PII etc.)**	**Restoration -or- Restoration Equivalent**	**Restoration Footage or Acreage**	**Mitigation Ratio**
Wetland Reestablishment				Restoration	15.5	1:1
Wetland Rehabilitation				Restoration	0.7	1.5:1
Wetland Preservation				Preservation	9.0	N/A

Component Summation						
Restoration Level	**Stream (linear feet)**	**Riparian Wetland (acres)**		**Non-riparian Wetland (acres)**	**Buffer (square feet)**	**Upland (acres)**
		Riverine	Non-Riverine			
Restoration		16.2				
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation		9.0				
High Quality Preservation						
TOTAL CREDITS		16.0				

R= Restoration RE= Restoration Equivalent of Creation or Enhancement

Norman's Pasture II, Sampson County									
Mitigation Credits									
	Stream		**Riparian Wetland**		**Non-riparian Wetland**		**Buffer**	**Nitrogen Nutrient Offset**	**Phosphorous Nutrient Offset**
Type	R	RE	R	RE	R	RE			
Linear Feet/Acres		843	10.2						
Credits		337	9.7						
TOTAL CREDITS		337	9.7						

Project Components						
Project Component -or- Reach ID	**Stationing/ Location**	**Existing Footage/ Acreage**	**Approach (PI, PII etc.)**	**Restoration -or- Restoration Equivalent**	**Restoration Footage or Acreage**	**Mitigation Ratio**
Tributary 1	10+00 – 19+43	843		Enhancement II	843	2:5
Wetland Reestablishment				Restoration	8.8	1:1
Wetland Rehabilitation				Restoration	1.4	1.5:1
Wetland Preservation				Preservation	0.8	N/A

Component Summation						
Restoration Level	**Stream (linear feet)**	**Riparian Wetland (acres)**		**Non-riparian Wetland (acres)**	**Buffer (square feet)**	**Upland (acres)**
		Riverine	Non-Riverine			
Restoration			9.7			
Enhancement						
Enhancement I						
Enhancement II	337					
Creation						
Preservation			0.8			
High Quality Preservation						
TOTAL CREDITS	337		9.7			

R= Restoration RE= Restoration Equivalent of Creation or Enhancement

6.0 CREDIT RELEASE SCHEDULE

All credit releases will be based on the total credit generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary DA authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard. The release of project credits will be subject to the criteria described as follows:

Stream and Forested Wetland Credits			
Monitoring Year	**Credit Release Activity**	**Interim Release**	**Total Released**
0	Initial Allocation – see requirements below	30%	30%
1	First year monitoring report demonstrates performance standards are being met	10%	40%
2	Second year monitoring report demonstrates performance standards are being met	10%	50%
3	Third year monitoring report demonstrates performance standards are being met	10%	60%
4	Fourth year monitoring report demonstrates performance standards are being met	10%	70%
5	Fifth year monitoring report demonstrates performance standards are being met; Provided that all performance standards are met, the IRT may allow the NCEEP to discontinue hydrologic monitoring after the fifth year, but vegetation monitoring must continue for an additional two years after the fifth year for a total of seven years.	10%	80%
6	Sixth year monitoring report demonstrates performance standards are being met	10%	90%
7	Seventh year monitoring report demonstrates performance standards are being met, and project has received close-out approval	10%	100%

Initial Allocation of Released Credits

The initial allocation of released credits, as specified in the mitigation plan can be released by the NCEEP without prior written approval of the DE upon satisfactory completion of the following activities:

- Approval of the final Mitigation Plan
- Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
- Completion of project construction (the initial physical and biological improvements to the mitigation site) pursuant to the mitigation plan; Per the NCEEP Instrument, construction means that a mitigation site has been constructed in its entirety, to include planting, and an as-built report has been produced. As-built reports must be sealed by an engineer prior to project closeout, if appropriate but not prior to the initial allocation of released credits.
- Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required

Subsequent Credit Releases

All subsequent credit releases must be approved by the DE, in consultation with the IRT, based on a determination that required performance standards have been achieved. For stream projects a reserve of 15% of a site's total stream credits shall be released after two bank-full events have occurred, in separate years, provided the channel is stable and all other performance standards are met. In the event that less than two bank-full events occur during the monitoring period, release of these reserve credits shall be at the discretion of the IRT. As projects approach milestones associated with credit release, the NCEEP will submit a request for credit release to the DE along with documentation substantiating achievement of criteria required for release to occur. This documentation will be included with the annual monitoring report.

7.0 MITIGATION WORK PLAN

7.1 Target Wetland Types and Plant Communities

The NPRS and NPII will be planted as a Riverine Swamp Forest and Headwater Forest communities (NCWAM, v. 4.1 2010) based on the location within the Stewarts Creek floodplain. Disturbed areas of NPII will also be planted as a Headwater Forest Community. The planting plan is shown in the attached project plan sheets (Appendix D). Any areas that have a low density of existing vegetation will be supplementally planted with the species listed below. Trees and shrubs will be planted at a density of 968 stems per acre (9 feet x 5 feet spacing) to achieve a mature survivability of two hundred ten (210) planted stems per acre after seven years. Woody vegetation planting will be conducted during dormancy. Species to be planted may consist of the following and any substitutions from the planting plan will be taken from this list:

Riverine Swamp Forest– 22.44 acres

Common Name	Scientific Name	Wetland Indicator
River birch	*Betula nigra*	FACW
Sweet bay	*Magnolia virginiana*	FACW
Water tupelo	*Nyssa aquatica*	OBL
Swamp bay	*Persea palustris*	FACW
Overcup oak	*Quercus lyrata*	OBL
Swamp chestnut oak	*Quercus michauxii*	FACW
Laurel oak	*Quercus laurifolia*	FACW
Bald cypress	*Taxodium distichum*	OBL

Headwater Forest– 16.00 acres

Common Name	Scientific Name	Wetland Indicator
Green ash	*Fraxinus pennsylvanica*	FACW
River birch	*Betula nigra*	FACW
Sweet bay	*Magnolia virginiana*	FACW
Swamp chestnut oak	*Quercus michauxii*	FACW
Laurel oak	*Quercus laurifolia*	FACW
Water oak	*Quercus nigra*	FAC
Tulip poplar	*Liriodendron tulipifera*	FACU
Bald cypress	*Taxodium distichum*	OBL
American elm	*Ulmus americana*	FAC

A herbaceous seed mix composed of appropriate native species will also be developed and used to further stabilize and restore the wetland.

The project easements will be marked and surveyed as per EEP's requirements contained within http://portal.ncdenr.org/web/eep/fd-forms-templates. The boundary marking plan is described in the attached project plan sheets (Appendix D).

7.2 Design Parameters

Norman's Pasture Restoration Site

The mitigation approach for NPRS will aim to restore and establish a functional stream/wetland complex with 16.2 acres of wetland restoration. All of the existing drained hydric soils will be restored to a riparian wetland system. Mitigation actions will focus on re-establishing an appropriate wetland hydroperiod by filling ditches, installing ditch plugs, restoring integrated headwater streams, developing and redirecting productive seeps, and planting the site with appropriate vegetation. Existing spoil will be used as available to fill the remainder of the ditches. After filling in ditches and bringing up the elevations of the channelized streams, the restored wetlands will have a diffuse flow, creating a shallow braided stream/wetland system. The existing channelized reaches, T1 and T2, will be graded to a natural condition for the integrated stream/wetland complex, but no stream mitigation credit is included in the NPRS project. Approximately 9.0 acres of wetland preservation (no wetland mitigation credit) are dispersed throughout the NPRS. The proposed project conditions are shown in Section 7.4.

While the credit type and ratio for this project generally follow the framework of the restoration mitigation type, these mitigation types have been further refined to be considered either re-establishment or rehabilitation, which are both forms of restoration. Re-establishment occurs where the functions are returned to the site in a location where an aquatic resource previously existed. Rehabilitation results in an improvement in most, if not all, aquatic resource functions at a degraded, existing wetland site (40 CFR Part 230). The USACE has approved restoration credits for both "re-establishment" and "re-habilitation" through the 2008 mitigation rules and subsequently on other EEP projects. The outcome from these discussions has been different ratios for rehabilitation and re-establishment, although they are both considered forms of restoration credit.

Riparian Wetland Restoration – 16.2 acres (15.5 ac Re-establishment and 0.7 ac Rehabilitation)

The mitigation actions at NPRS will focus on bringing up the elevation of the channelized streams of T1 and T2 and creating a shallow braided stream/wetland system. A ditch plug will be installed at the beginning of T1, which will allow water to spread out and develop a braided channel system to the west. A detailed topographic survey was used to design slight grading modifications to redirect and lengthen overland flow paths in order to retain and treat surface hydrology longer. The minor grading will also create multiple flow paths. Surface roughness variations will also be enhanced in areas where the years of agricultural production have overly compacted the soil. The ditched channel of T1 will be filled for approximately 480 lf until it reaches an artesian well. The artesian well will have seep protection installed to protect the water source and distribute the flow downstream into the multi-thread headwater/stream wetland. After the artesian well, this section of T1 will remain unfilled through the confluence of T2. After the confluence with T2, the existing channel of T1 transitions into an existing sinuous channel for approximately 200 lf. This section of channel has the appropriate pattern and dimensions with access to its floodplain and will remain unfilled. This section of channel will be connected to the restored upstream headwater stream. Further downstream, the ditched channel of T1 will continue to be brought up in grade for approximately 320 lf until the confluence with Stewarts Creek. The adjacent spoil pile along the right top of bank will be used to fill the old channel and allow floodplain access.

The head of T2 will not be disturbed as it is currently functioning as a stream/wetland complex. This area had previously been impacted by cattle compacting the ground, which has caused water to pond and prevented additional herbaceous vegetation from forming. The surrounding buffer will be planted with Riverine Swamp Forest species in those areas without established vegetation. A ditch plug will be installed approximately 160 lf south of the start of T2, along the southern portion of the site near Stewarts Creek. At the start of T2, the adjacent ditch to the northeast will be filled by using the existing spoil pile along the top of bank. As T2 begins to flow west, it becomes a wide channelized ditch and flows for approximately 560 lf until it reaches the confluence of T1. The channelized reach will be filled in its entirety and three ditch plugs will be installed along the reach. The new flow path of T2 will be realigned through the center of the field where Lidar topography shows a defined headwater stream/wetland valley. The restored stream will not be a single-thread channel, but instead will have multiple threads that will meander through the valley bottom toward Stewarts Creek.

A seep located in the southeastern portion of NPRS, adjacent Cornwallis Road, will be redirected and redeveloped to retain and distribute surface flow across the site. A 50' by 50' water quality BMP will be installed in this area to maximize seep production.

There are two man-made ditches located at the southern portion of the easement that run east to west. The southern ditch will be filled for approximately 864 lf, while the northern ditch will be filled for approximately 870 lf until the confluence with T1. Filling these two ditches will allow the hydrology that fed these ditches to instead flow southwest into the downslope wetlands.

Where there are currently drained hydric soils adjacent to the ditches, the wetlands will be reestablished, by the grading and filling of drainage features. By eliminating the ditched channels and returning the flow to a braided system, all of the wetland/stream functions will be improved and the functions of the system will be significantly increased compared to the existing conditions. Rehabilitation of the existing wetlands will be accomplished by restoring the historic flow paths through the system and re-forestation.

Once the grading is completed, the southern and middle portion will be planted as Riverine Swamp Forest while a portion in the north and southeastern sides will be planted as the Headwater Forest Community as described in Section 7.1 and as shown on the planting plan in Appendix D.

An overview map of the proposed mitigation is shown in Section 7.4 and the project plan sheets are included in Appendix D. The following elements of functional uplift, increase, and improvement are expected from this project:

1. Increase in flood storage
2. Increase in groundwater recharge
3. Increase in sediment trapping and filtration
4. Increase in carbon storage
5. Increase in biochemical cycling of nutrients and other pollutants
6. Increase in habitat utilization by wildlife (migrants and residents)
7. Increase in landscape patch structure

Riparian Wetland Preservation – 9.0 acres

These areas are currently forested wetlands and require no specific actions to improve their condition. No actions will be taken in wetlands identified for preservation, and no units will be generated by their preservation.

Reference Wetland
A suitable reference wetland was found approximately 1,584 feet northeast of the eastern edge of the NPII, adjacent to Cornwallis Road. The reference wetland is comprised of deciduous hardwoods over a shrub layer and is consistent with the Headwater Forest Community that will be a target wetland type at the project site (see Appendix B, Reference Sites). A groundwater monitoring well was installed in September 2013 to document the reference wetland hydrology during the course of monitoring (see Appendix B, Reference Sites).

Norman's Pasture II
The mitigation approach for NPII will aim to restore and establish a functional stream/wetland system with 10.2 acres of wetland restoration. All of the existing drained hydric soils will be restored to a riparian wetland system. Mitigation actions will focus on filling ditches, developing and redirecting productive seeps, and integrating the wetland area into the adjacent stream/wetland complex. Tributary 1 will be improved using Enhancement II to a first-order stream/wetland system. Approximately 0.8 acre of wetland preservation is located at the southern portion of NPII, which connects to the existing wetlands on NPRS.

The credit types and ratios for the NPII wetlands follow the same framework discussed above for NPRS, where wetland re-establishment and rehabilitation are both considered forms of restoration, but with different credit ratios.

Riparian Wetland Restoration – 10.2 acres (8.8 ac Re-establishment and 0.7 ac Rehabilitation)
A seep located in the northern portion of NPII, adjacent to the pond, will be redirected and redeveloped to retain and distribute surface flow across the site. A 50' by 50' water quality BMP will be installed in this area to maximize seep production. The pond is approximately 0.4 acre and will be filled.

There are two primary man-made ditches located in the central portion of NPII and along the eastern portion of the easement bordering Cornwallis Road. The central ditch flows south and will be filled for approximately 840 lf until the confluence of T1. The eastern ditch flows south and will be filled for approximately 870 lf until it encounters Cornwallis Road with an existing 24" corrugated metal pipe. The swale adjacent to the CMP will be graded to redirect drainage away from the 24" CMP and into the field. The eastern ditch contains two smaller joined ditches that flow southwest and they will be filled for approximately 160 lf and 250 lf, respectively. The last ditch to be filled is located at the southeastern portion of the NPII and flows southwest for approximately 376 lf. Filling the pond and ditches will allow the historic flow paths to reform and to slow the rate of water movement through the system to the downslope wetlands.

The current functionality of the seeps is limited. Rehabilitation of the seeps will improve the water quality, aquatic and terrestrial habitat, and provide connectivity of habitat types and flow between the down and up gradient resources. Rehabilitation of the existing wetlands will be accomplished by restoring the historic flow paths through the system and re-forestation. The current drained hydric soils within the project site will be reestablished to riparian wetland and the marginal existing wetlands will be improved. By eliminating the ditched channels and returning the flow to a braided system, all of the wetland/stream functions will be improved and the functions of the system will be significantly increased compared to the existing conditions.

The wetland located at the head of Tributary 1 will be restored. The incision of T1 has led to the loss of hydrology in the adjacent hydric soils. In order to restore hydrology to the wetland community, the channel grade of T1 will be re-established at historic elevations and rehabilitating the wetland area.

Once the grading is completed, the disturbed areas will be planted as Headwater Forest Community as described in Section 7.1 and as shown on the planting plan in Appendix D.

Riparian Wetland Preservation - 0.8 acre
There are areas of existing forested wetlands that require no specific actions to improve their condition. No actions will be taken in wetlands identified for preservation, and no units will be generated by their preservation.

Reference Wetlands
The NPRS reference wetland will also be used for NPII.

Stream Enhancement II of Tributary 1 – 843 lf
The existing wetland located at the head of Tributary 1 will be rehabilitated. The incision of T1 has led to the partial loss of hydrology in the adjacent hydric soils. In order to restore hydrology to the wetland community, the channel grade of T1 will be re-established at historic elevations to lengthen the wetland hydroperiod and restore lost hydrologic function to the system. This will be accomplished by placement of grade control structures at critical points along the channel, and raising the invert with a stone mixture that is consistent with the existing gradation of material in the channel. The planform will not be altered as a result of this work. Channel work will be limited to only the specific location of the grade control placement. Invasive species removal and supplemental planting (as needed) will also occur in this area.

In the project plan sheets (Appendix D, Sheet 6), there is a typical cross-section for T1. Given this typical cross-section and the designed grade of the floodplain, the designer will work with the equipment operator to grade this low-flow channel through the valley. T1 will be graded to reconnect the channel to its historic floodplain. It is the intention of the design for the low-flow channel to be sized so that during most precipitation events and dependent on the seasonal elevation of the water table, the low-flow channel capacity is exceeded and overbank flow is spread throughout the valley, accessing multiple flow paths. A reference example of the proposed channel cross-section is best illustrated by the two reference cross-sections (Appendix B). These cross-sections have a primary channel, but there are also low areas adjacent to the channels that have flow in them during storm events.

In-stream structures, including riffle enhancement and log drops, will be used to stabilize the channel (refer to Appendix D, Plan Sheets 3 and 6). These structures are designed to reduce bank erosion, influence secondary circulation in the near-bank region of stream bends, and provide grade control. Riffle areas will also be enhanced with graded gravel material to mimic existing stable riffle features. During construction, the number of mature trees removed from the existing riparian areas will be minimized as much as possible. Any valuable trees that may provide immediate shade to the restored channel will be left in place if feasible.

Reference Stream
A short reach of T1, located approximately 300 lf upstream of the existing project reach, was surveyed by KCI in April 2014 (see Appendix B, Reference Sites). The sediment distribution and transport are the same as at the project reach. Two stable riffle cross-sections were surveyed and classified as a C5 channel to be used as a dimensional reference. The stream flows through a headwater forest community and has stable planform and banks with lower banks and a high width/depth ratio. Small sand riffles are present and there is no evidence of bed degradation. The reach contains stable and functional riffles and pools. The dimensionless hydraulic geometry relationships were developed from stable channel dimensions to assist in the design of the proposed channel cross-sectional data for the T1 enhancement reach.

7.3 Data Analysis

Wetlands
In order to model the effect of filling the onsite ditches and the grading of the wetland restoration areas of Norman's Pasture, DRAINMOD was used to simulate the before and after conditions. DRAINMOD is a computer simulation water balance model that follows the groundwater elevation in the surface profile using soil inputs, climatic data, and drainage conditions (NCSU 2013). It was originally developed for agricultural drainage design, but has been adapted for evaluating wetland hydrology due to its modeling of poorly drained soils over a time step.

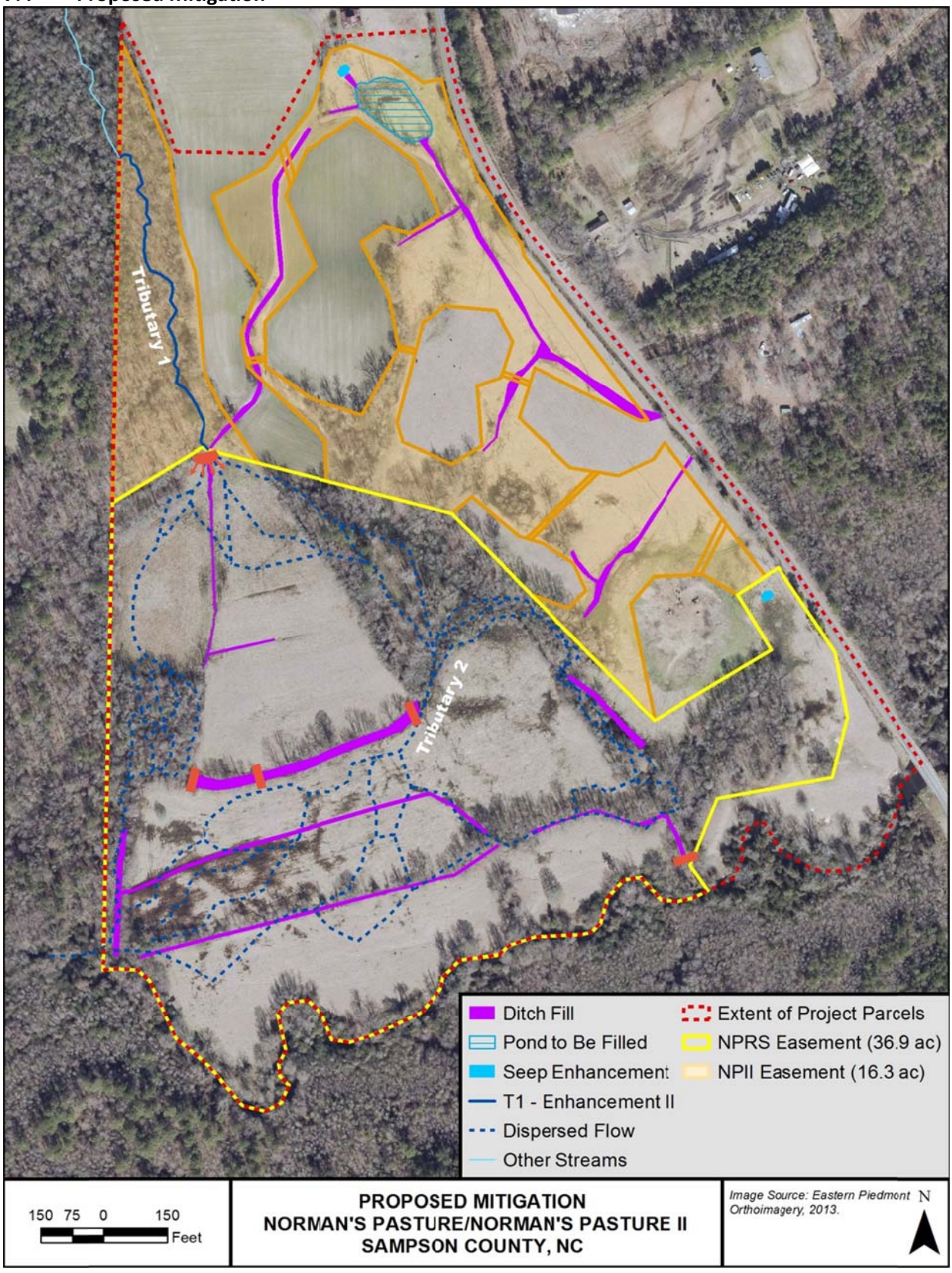
Two different models were used for the site based on the two sets of recorded groundwater gauge data available for model calibration from the growing season in 2012. Climatic data (daily rainfall and maximum and minimum daily temperatures) were obtained from the Elizabethtown 3 SW COOP Station (312732), approximately 35 miles southwest from the site and the closest station with at least 50 years of daily rainfall data. For the model simulation, 54 years of available data were used (1959-2012). The daily rainfall was distributed to an hourly increment within the computer program. The temperatures were used in the Thornthwaite potential evapotranspiration calculations. The soils data were obtained from the NRCS parameters for the Bibb Johnston soil series and from onsite observations. Once the baseline model was created in DRAINMOD, the parameters were calibrated to match the gauge data as much as feasible. Variations between the recorded groundwater data and modeled levels exist due to the difference in rainfall intensity between the site and the weather station. The gauge data also showed more seasonal variation than could be accounted for in the model, likely from upslope seepage. The wetland criteria were set to evaluate the groundwater saturation over the growing period of Feb 28 – Nov 21 (267 days) at 12% continuous saturation (32 days). Wetland hydrology was considered achieved if the model reached 12% continuous saturation for 50% or more of the simulated years.

The Gauge 1 model was developed for the southern portion of the restoration area of NPRS in the open field. For the existing conditions model, the average drain spacing for this area is approximately 145 feet and the average drain depth is 1.0 foot between the field drains. The proposed conditions model has the same drain spacing with a minimal depth to assume a small influence from the regraded wetland and dispersed surface flow. The surface storage was also increased to 2.0 inches to account for increased surface roughness in the restored wetland. Based on these conditions, the existing conditions model showed that wetland hydrology was achieved 19 out of 54 years, or 35% of modeled years. For the proposed conditions, the site achieved wetland hydrology for 45 out of 54 years, or 83%.

The Gauge 2 model was used for the central field of the proposed restoration wetland of NPRS. The ditch spacing in this area was an average of 165 feet. The average drain depth is also 1.0 feet deep. For the proposed condition, the drain spacing was again kept the same and the surface storage was also increased to 2.0 inches. The existing conditions model indicated 2 out of 54 years (4%) with wetland hydrology whereas the proposed conditions model predicted 42 out of 54 years, or 78%.

Based on the model results, the site should show an increase in groundwater hydrology following restoration that will lead to jurisdictional wetland conditions. The model results are included in Appendix C.

7.4 Proposed Mitigation



7.5 Proposed Mitigation Type

8.0 MAINTENANCE PLAN

The site will be monitored on a regular basis, with a physical inspection of the site conducted a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following:

Component/Feature	Maintenance Through Project Close-Out
Wetland	Routine wetland maintenance and repair activities may include securing of loose coir matting and supplemental installations of live stakes and other target vegetation within the wetland. Areas where stormwater and floodplain flows intercept the wetland may also require maintenance to prevent scour.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.

9.0 PERFORMANCE STANDARDS

The NPRS and NPII will be monitored to determine if the development of the wetland indicators on site meet the standards for mitigation credit production as presented in Section 5.0. The credits will be validated upon confirmation that the success criteria described below are met. The site will be monitored for performance standards for seven years after completion of construction.

Stream Visual Assessment

During site walks, KCI will document any areas of erosion, invasive species problems, tree and shrub mortality issues, bed aggradation or degradation, or other problem area and evaluate whether or not corrective actions are needed.

Wetland hydrology monitoring will be conducted to determine if the restored wetland areas meet the proposed performance criteria for wetland hydrology. The site must present continuous saturated or inundated hydrologic conditions for at least 9% of the growing season for the Headwater Forest Community and 12% for the Riverine Swamp Forest Community during normal weather conditions based on a conservative estimate. A "normal" year is based on NRCS climatological data for Sampson County, and using the 30th to 70th percentile thresholds as the range of normal, as documented in the USACE Technical Report "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology, April 2000." The soil survey for Sampson County estimates that the growing season begins February 28 and ends November 21 (267 days).

Section 10 describes the monitoring requirements for the sites. Monitoring will comply with guidance included in "Monitoring Requirements and Performance Standards for Stream and/or Wetland Mitigation" (NCDENR EEP, 2011). Hydrologic performance will be determined through evaluation of automatic recording gauge data supplemented by documentation of wetland hydrology indicators as defined in the 1987 USACE Wetland Delineation Manual. Daily data will be collected from automatic wells over the 7-year monitoring period following implementation. These data will determine if the wetland meets the hydrology success criterion of the water table being within 12 inches of the ground surface continuously for greater than 9% and 12% of the growing season.

Vegetation Success

The vegetation success criteria will comply with guidance included in "Monitoring Requirements and Performance Standards for Stream and/or Wetland Mitigation" (NCEEP, 2011), which states that the plots must achieve a stem density of 320 planted stems/acre after three years, 260 planted stems/acre after five years, and 210 planted stems/acre after seven years to be considered successful.

10.0 MONITORING REQUIREMENTS

Annual monitoring data will be reported using the EEP monitoring template. The monitoring report shall provide a project data chronology that will facilitate an understanding of project status and trends, population of EEP databases for analysis, research purposes, and assist in decision making regarding project close-out.

Norman's Pasture Restoration Site				
Required	**Parameter**	**Quantity**	**Frequency**	**Notes**
Yes	Groundwater Hydrology	9 gauges	Annual	Groundwater monitoring gauges with data recording devices will be installed on-site; the data will be downloaded on a monthly basis during the growing season
Yes	Vegetation	18 permanent vegetation monitoring plots	During monitoring years 1, 2, 3, 5, and 7.	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols
Yes	Exotic and nuisance vegetation		Annual	Locations of exotic and nuisance vegetation will be mapped
Yes	Project boundary		Semi-annual	Locations of vegetation damage, boundary encroachments, etc. will be mapped

Norman's Pasture II				
Required	**Parameter**	**Quantity**	**Frequency**	**Notes**
Yes	Groundwater Hydrology	13 gauges	Annual	Groundwater monitoring gauges with data recording devices will be installed on-site; the data will be downloaded on a monthly basis during the growing season
Yes	Surface Water Hydrology	1 gauge	Annual	One pressure transducer gauge will be installed on site; the device will be inspected every two months to document the occurrence of bankfull events on the project
Yes	Vegetation	13 permanent vegetation monitoring plots	During monitoring years 1, 2, 3, 5, and 7.	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols
Yes	Exotic and nuisance vegetation		Annual	Locations of exotic and nuisance vegetation will be mapped
Yes	Project boundary		Semi-annual	Locations of vegetation damage, boundary encroachments, etc. will be mapped

The first scheduled monitoring will be conducted during the first full growing season following project completion. Monitoring shall subsequently be conducted annually for a total period of seven years or until the project meets its success criteria.

Groundwater elevations will be monitored to evaluate the attainment of jurisdictional wetland hydrology. Verification of wetland hydrology will be determined by automatic recording well data collected within the project area and reference wetland. Automatic recording gauges will be established within the mitigation areas to document the presence of surface water (Refer to Appendix C, Proposed Monitoring Plan). Daily data will be collected from the automatic gauges for a minimum of a 7- year monitoring period following wetland construction. A nearby reference wetland will also be monitored using the same procedures for comparative analysis (Refer to Appendix B for Reference Sites).

Beginning at the end of the first growing season, KCI will monitor the planted vegetation in monitoring years 1, 2, 3, 5, and 7 or until the success criterion is met. The survivability of the vegetation plantings will be evaluated using a sufficient number of 100-m^2 vegetative sampling plots randomly placed throughout the restored wetland. Permanent monuments will be established at the corners of each monitoring plot and documented by either conventional survey or GPS. The vegetation monitoring will follow the Level 2 method of the current CVS-EEP protocol (http://cvs.bio.unc.edu/methods.htm).

Photograph reference points (PRPs) will be established to assist in characterizing the site and to allow qualitative evaluation of the site conditions. The location of each photo point will be marked in the monitoring plan and the bearing/orientation of the photograph will be documented.

Annual monitoring reports will be prepared and submitted after all monitoring tasks for each year are completed. The report will document the monitored components and include all collected data, analyses, and photographs. Each report will provide the new monitoring data and compare the most recent results against previous findings. The monitoring report format will be similar to that set out in the most recent EEP monitoring protocol.

11.0 LONG-TERM MANAGEMENT PLAN

Upon approval for close-out by the Interagency Review Team (IRT), the sites will be transferred to the NCDENR Division of Natural Resource Planning and Conservation's Stewardship Program. This party shall be responsible for periodic inspection of the sites to ensure that restrictions required in the conservation easement are upheld. Endowment funds required to uphold easement and deed restrictions shall be negotiated prior to site transfer to the responsible party.

The NCDENR Division of Natural Resource Planning and Conservation's Stewardship Program currently houses EEP stewardship endowments within the non-reverting, interest-bearing Conservation Lands Stewardship Endowment Account. The use of funds from the Endowment Account is governed by North Carolina General Statute GS 113A-232(d)(3). Interest gained by the endowment fund may be used only for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The NCDENR Stewardship Program intends to manage the account as a non-wasting endowment. Only interest generated from the endowment funds will be used to steward the compensatory mitigation sites. Interest funds not used for those purposes will be re-invested in the Endowment Account to offset losses due to inflation.

12.0 ADAPTIVE MANAGEMENT PLAN

Upon completion of site construction KCI will implement the post-construction monitoring protocols previously defined in this document. Project maintenance will be performed as described previously in this document. If, during the course of annual monitoring it is determined the site's ability to achieve site performance standards are jeopardized, KCI will notify the EEP and the USACE of the need to develop a Plan of Corrective Action. The Plan of Corrective Action may be prepared using in-house technical staff or may require engineering and consulting services. Once the Corrective Action Plan is prepared and finalized KCI will:

1. Notify the EEP and USACE as required by the Nationwide 27 permit general conditions.
2. Revise performance standards, maintenance requirements, and monitoring requirements as necessary and/or required by the USACE.
3. Obtain other permits as necessary.
4. Implement the Corrective Action Plan.
5. Provide the USACE a Record Drawing of Corrective Actions. This document shall depict the extent and nature of the work performed.

13.0 FINANCIAL ASSURANCES

Pursuant to Section IV H and Appendix III of the Ecosystem Enhancement Program's In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environment and Natural Resources has provided the U.S. Army Corps of Engineers Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by EEP. This commitment provides financial assurance for all mitigation projects implemented by the program.

14.0 OTHER INFORMATION

14.1 Definitions

8-digit Catalog Unit (CU) – The USGS developed a hydrologic coding system to delineate the country into uniquely identified watersheds that can be commonly referenced and mapped. North Carolina has 54 of these watersheds uniquely defined by an 8-digit number. EEP typically addresses watershed – based planning and restoration in the context of the 17 river basins (each has a unique 6-digit number), 54 catalog units and 1,601 14-digit hydrologic units.

14–digit Hydrologic Unit (HU) – In order to address watershed management issues at a smaller scale, the U.S. Natural Resources Conservation Service (NRCS) developed methodology to delineate and uniquely identify watersheds at a scale smaller than the 8-digit catalog unit. A hydrologic unit is a drainage area delineated to nest in a multilevel, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface waters. North Carolina has 1,601 14-digit hydrologic units.

DWQ – North Carolina Division of Water Quality

EEP – The North Carolina Ecosystem Enhancement combines existing wetlands restoration initiatives (formerly the Wetlands Restoration Program or NCWRP) of the N.C. Department of Environment and Natural Resources with ongoing efforts by the N.C. Department of Transportation (NCDOT) to offset unavoidable environmental impacts from transportation-infrastructure improvements.

Native vegetation community – a distinct and reoccurring assemblage of populations of plants, animals, bacteria and fungi naturally associated with each other and their population; as described in Schafale, M.P. and Weakley, A. S. (1990), Classification of the Natural Communities of North Carolina, Third Approximation.

Project Area - includes all protected lands associated with the mitigation project.

RBRP - The River Basin Restoration Priorities are documents that delineate specific watersheds (Targeted Local Watersheds) within a River Basin that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration.

Taylor time – A geological time period during the black creek formation.
Refer to The Depositional Environment of the Upper Cretaceous Black Creek Formation in North and South Carolina. Benson, PH III. 1968. (Page iii and 110).
Carolina Geological Society. Guidebook of Excursion in The Coastal Plain of North Carolina. October 8-9, 1955. H.E. LeGrand and P.M. Brown (Page 3, Table 1).
http://www.carolinageologicalsociety.org/CGS/1950s_files/gb%201955.pdf

TLW - Targeted Local Watershed, are 14-digit hydrologic units which receive priority for EEP planning and restoration project funds.

USGS – United States Geological Survey

14.2 References

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Appendix A. Site Protection Instrument

BK:01862 PG:0104

FILED
SAMPSON COUNTY
ELEANOR N. BRADSHAW
REGISTER OF DEEDS

FILED	Jun 17, 2013
AT	04:17:17 pm
BOOK	01862
START PAGE	0104
END PAGE	0113
INSTRUMENT #	03608

STATE OF NORTH CAROLINA

CONSERVATION EASEMENT PROVIDED PURSUANT TO FULL DELIVERY MITIGATION CONTRACT

SAMPSON COUNTY
SPO File Number 82-J
Prepared by: Office of the Attorney General
Property Control Section
Return to: NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS CONSERVATION EASEMENT DEED, made this 13TH day of JUNE, 2013, by **KCI Environmental Technologies and Construction Inc.**, a Delaware corporation ("**Grantor**"), whose mailing address is **Landmark Center II, Suite 220, 4601 Six Forks Road, Raleigh NC 27609**, to the State of North Carolina, ("**Grantee**"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Ecosystem Enhancement Program (formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between **KCI Technologies, Inc., Landmark Center II, Suite 220, 4601 Six Points Road, Raleigh NC 27609** and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number **005010**.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Ecosystem Enhancement Program in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in **Turkey Township**, **Sampson County**, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately **69.70 acres** and being conveyed to the Grantor by deed as recorded in **Deed Book** ~~00083~~ 1801 **at Page** ~~032-00032~~ 983-987 of the **Sampson County** Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement over the herein described areas of the Property, thereby restricting and limiting the use of the included areas of the Property to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept such Conservation Easement. This Conservation Easement shall be for the protection and benefit of Stewart Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Easement Area consists of the following:

Conservation Easement "1" containing a total of **3.51 acres** and Conservation Easement "2" containing a total of **33.41 acres** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: **Norman's Pasture Wetland Restoration Site, EEP Site No. 95717, SPO File No. 82-J:** Property of **KCI Environmental Technologies and Construction, Inc.**," dated **April 15, 2013** by **Matthew M. Crawford**, PLS Number **L-4257** and recorded in the **Sampson County**, North Carolina Register of Deeds at **Plat Book** 83 **Page** 39.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Easement Area".

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITES

The Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Easement Area is prohibited.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Easement Area not inconsistent with this Conservation Easement, and the right of access to the Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Vegetative Cutting. Except as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Easement Area is prohibited.

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Easement Area.

H. Roads and Trails. There shall be no construction of roads, trails, walkways, or paving in the Easement Area.

I. Signs. No signs shall be permitted in the Easement Area except interpretive signs describing restoration activities and the conservation values of the Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Easement Area may temporarily be used for good cause shown as needed for the survival of livestock and agricultural production on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no subdivision, partitioning, or dividing of the underlying Property owned by the Grantor in fee simple ("fee") that is subject to this Easement is allowed. Unless agreed to by the Grantee in writing, any future conveyance of the underlying fee and the rights conveyed herein shall be as a single block of property. Any future transfer of the fee simple shall be subject to this Conservation Easement. Any transfer of the fee is subject to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Ecosystem Enhancement Program, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, and monitor the stream, wetland and any other riparian resources in the Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterraneous water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. The Grantee, its employees and agents, successors or assigns, shall be permitted to place fencing on the Property to restrict livestock access. Although the Grantee is not responsible for fence maintenance, the Grantee reserves the right to repair the fence, at its sole discretion.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Easement Area that is inconsistent with the purposes of this Easement and to require the restoration of such areas or features in the Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor-in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and

other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the

obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property. Such notification shall be addressed to: Justin McCorkle, General Counsel, US Army Corps of Engineers, 69 Darlington Avenue, Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Easement Area, and the right of quiet enjoyment of the Easement Area

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes.

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from

encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

KCI Environmental Technologies and Construction Inc.,
a Delaware corporation

[CORPORATE SEAL]

By: _____
Joseph P. Pfeiffer, Jr., Vice President

Laurie Arensdorf
Asst. Secretary
Laurie Arensdorf

STATE OF NORTH CAROLINA
COUNTY OF WAKE

I, D Michelle Jones a Notary Public for said County and State, certify that **Joseph P. Pfeiffer, Jr.** personally came before me this day and acknowledged that he is Vice President of **KCI Environmental Technologies and Construction Inc.,** a corporation, and that by authority duly given and as the act of the corporation the foregoing instrument was signed in its name by him as its Vice President.

Witness my hand and official seal, this the 12 day of June, 2013.

(Notary Seal)

D Michelle Jones
Notary Public

My Commission Expires:
11.22.2016

Exhibit A

KCI ENVIRONMENTAL TECHNOLOGIES AND CONSTRUCTION, INC CONSERVATION EASEMENT 1

A parcel of land to be used for Conservation Easement purposes located on lands now or formerly owned by KCI Environmental Technologies and Construction, Inc. located in Turkey Township, Sampson County, North Carolina and being more particularly described as follows:

Commencing at a found pk nail in the centerline of a bridge on Cornwallis Road (60 foot right-of-way) at the Southeast corner of said lands owned by KCI Environmental Technologies and Construction, Inc. point having North Carolina State Plane Coordinates of N: 420546.49, E: 2255707.65; Thence South 41°23'38" West on the centerline of Stewart Creek a distance of 31.15 feet to the East line of Cornwallis Road; Thence North 32°58'20" West on the Westerly line of Cornwallis Road a distance of 338.94 feet to the Point of Beginning;

Thence S 10°43'26" E a distance of 155.93 feet to a 5/8 inch rebar set with aluminum cap;
Thence S 14°04'47" W a distance of 147.75 feet to a 5/8 inch rebar set with aluminum cap;
Thence S 79°42'41" W a distance of 277.40 feet to a 5/8 inch rebar set with aluminum cap;
Thence S 22°15'14" W a distance of 171.74 feet to a found capped iron pin;
Thence N 13°48'35" W a distance of 355.51 feet to a found capped iron pin;
Thence N 58°55'19" E a distance of 324.39 feet to a 5/8 inch rebar set with aluminum cap;
Thence N 31°34'08" W a distance of 153.99 feet to a 5/8 inch rebar set with aluminum cap;
Thence N 57°04'31" E a distance of 116.22 feet to a 5/8 inch rebar set with aluminum cap on the Westerly line of Cornwallis Road;
Thence S 35°05'23" E on the Westerly line of Cornwallis Road, a distance of 36.36 feet to a 5/8 inch rebar set with aluminum cap;
Thence S 33°38'37" E, continuing on the Westerly line of Cornwallis Road, a distance of 167.01 feet to a 5/8 inch rebar set with aluminum cap;
Thence S 32°58'20" E, continuing on the Westerly line of Cornwallis Road, a distance of 39.64 feet to the Point of Beginning.;

Containing 152,808 square feet or 3.51 acres, more or less.

KCI ENVIRONMENTAL TECHNOLOGIES AND CONSTRUCTION, INC CONSERVATION EASEMENT 2

A parcel of land to be used for Conservation Easement purposes located on lands now or formerly owned by KCI Environmental Technologies and Construction, Inc. located in Turkey Township, Sampson County, North Carolina and being more particularly described as follows:

Beginning at the Southeast corner of said lands now or formerly owned by KCI Environmental Technologies and Construction, Inc; said point being in the center of Stewart Creek and having North Carolina State Plane coordinates of N:1019404.12, E:2485678.80;
Thence on the centerline of Stewart Creek the following 36 calls:

(1) S 63°10'39" W a distance of 39.44 feet to a point;

(2) S 77°10'36" W a distance of 39.50 feet to a point;
(3) N 83°55'22" W a distance of 39.67 feet to a point;
(4) N 40°56'16" W a distance of 71.95 feet to a point;
(5) S 81°51'57" W a distance of 41.05 feet to a point;
(6) S 40°35'46" W a distance of 58.75 feet to a point;
(7) S 15°19'45" W a distance of 60.41 feet to a point;
(8) S 42°52'50" W a distance of 29.34 feet to a point;
(9) S 75°21'05" W a distance of 24.34 feet to a point;
(10) S 86°59'32" W a distance of 114.21 feet to a point;
(11) S 71°40'00" W a distance of 64.17 feet to a point;
(12) S 46°55'35" W a distance of 31.70 feet to a point;
(13) S 82°13'50" W a distance of 94.99 feet to a point;
(14) S 44°17'03" W a distance of 56.69 feet to a point;
(15) S 12°32'33" W a distance of 28.61 feet to a point;
(16) S 39°09'29" W a distance of 69.91 feet to a point;
(17) S 64°29'35" W a distance of 120.63 feet to a point;
(18) S 71°24'01" W a distance of 65.52 feet to a point;
(19) N 82°08'34" W a distance of 42.83 feet to a point;
(20) N 21°32'48" W a distance of 59.95 feet to a point;
(21) N 44°11'25" W a distance of 52.77 feet to a point;
(22) S 84°16'02" W a distance of 47.71 feet to a point;
(23) S 42°24'17" W a distance of 36.51 feet to a point;
(24) S 11°58'33" E a distance of 90.17 feet to a point;
(25) S 28°05'41" W a distance of 35.46 feet to a point;
(26) S 05°31'43" E a distance of 30.19 feet to a point;
(27) S 46°59'18" E a distance of 29.46 feet to a point;
(28) S 23°52'03" W a distance of 46.07 feet to a point;
(29) S 62°15'15" W a distance of 41.74 feet to a point;
(30) N 77°11'46" W a distance of 55.60 feet to a point;
(31) N 40°07'39" W a distance of 121.17 feet to a point;
(32) N 49°42'46" W a distance of 105.86 feet to a point;
(33) N 24°05'26" W a distance of 149.79 feet to a point;
(34) N 47°29'42" W a distance of 38.20 feet to a point;
(35) N 86°00'22" W a distance of 50.94 feet to a point;
(36) S 83°00'17" W a distance of 30.88 feet to a point at the Southeast corner of lands now or formerly owned by Melvin Koregay (DB 1383 PG 363);

Thence N 01°06'33" E, on the East line of said lands owned by Melvin Koregay, a distance of 1111.24 feet to a 5/8 inch rebar set with aluminum cap;
Thence N 57°58'50" E a distance of 247.50 feet to a a 5/8 inch rebar set with aluminum cap;
Thence S 75°15'00" E a distance of 618.24 feet to a found capped iron pin;
Thence S 44°27'58" E a distance of 687.41 feet to a found capped iron pin;
Thence S 13°48'35" E a distance of 355.51 feet to a found capped iron pin;
Thence S 34°56'04" E a distance of 74.12 feet to the Point of Beginning.

Containing 1,455,436 square feet or 33.41 acres, more or less.

NOTES:

1. DISTANCES SHOWN / ORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE D.
2. AREA COMPUTED BY ORDI E METHOD.
3. THE BASIS OF THE RIDIANS AND COORDINATES FOR THIS PLAT IS THE NORTH CAROLINA ATE PLA COORDINATE SYSTEM, NORTH AMERICAN DATUM NOVEMBER 2012. AL DISTANC S ARE GROUND UNLESS OTHERWISE NOTED.
4. DEED REFERENCES S SHOWN HEREON.
5. SUBJECT PROPERTIES KN S TAX NUMBER: AS SHOWN HEREON.
6. SUBJECT PROPERTIES PA Y LIE WITHIN THE AREA DESIGNATED AS ZONE "AE, BASED ON FEDERAL FL SURANCE RATE MAP 3720244200K EFFECTIVE JAN. 5, 2007.
7. THE STATE PLANE COORDINATES FOR THIS PROJECT WERE PRODUCED WITH RTK GPS OBSERVATIONS. THE NETWORK POSITIONAL ACCURACY OF THE RTK DERIVED POSITIONAL INFORMATION IS 0.02 METER. HORIZONTAL POSITIONS ARE REFERENCED TO NAD 83 (NSRS2007). COMBINED SCALE FACTOR = 0.999891360
8. PARCELS MAY BE SUBJ TO EASEMENTS AND RESTRICTIONS THAT ARE NOT SHOWN HEREON.
9. NO ORIGINAL ADDRESS ILL BE CHANGED WITH THIS RECORDING.
11. ZONED; RA (RESIDENT L AGRICULTURAL)
FRONT SETBACK: 50'
SIDE SETBACK
REAR SETBACK

SUBDIVISION ADMIN TOR CERTIFICATION

THIS FINAL PLAT IS EXEMP FR HE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED. F RC ARE 10 ACRES OR MORE.

6-17-13
ADMINISTRATOR DATE

REVIEW OFFICER CE CATION

I, Cynthia Cobb, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREME RECORDING.

Cynthia Cobb 6-17-13
REVIEW OFFICER DATE

by: Myra Lowe

CERTIFICATE OF RE RATION BY REGISTER OF DEEDS

NORTH CAROLINA

FILED FOR REGISTRATION 17 DAY OF June, 2013
AT 4:16 O'CLOCK P REGISTERED IN THE OFFICE OF THE REGISTER OF DEEDS OF N COUNTY ON THE 17 DATE OF June, 2013
IN BOOK NO. 83 PAGE NO. 39

Eleanor N. Bradshaw
REGISTER OF DEEDS
BY: Juanita H. Lane - Assistant

I, MATTHEW M. CRAWFORD, HEREBY DECLARE THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM A SURVEY MADE UNDER MY SUPERVISION, THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED, AS DRAWN FROM INFORMATION AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS GREATER THAN 1:10,000; THAT THIS MAP DOES REPRESENT AN OFFICIAL BOUNDARY SURVEY AND HAS BEEN PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 14TH DAY OF JUNE, 2013.

6/14/2013
NORTH CAROLINA REGISTRATION NUMBER L-4257
MATTHEW M. CRAWFORD

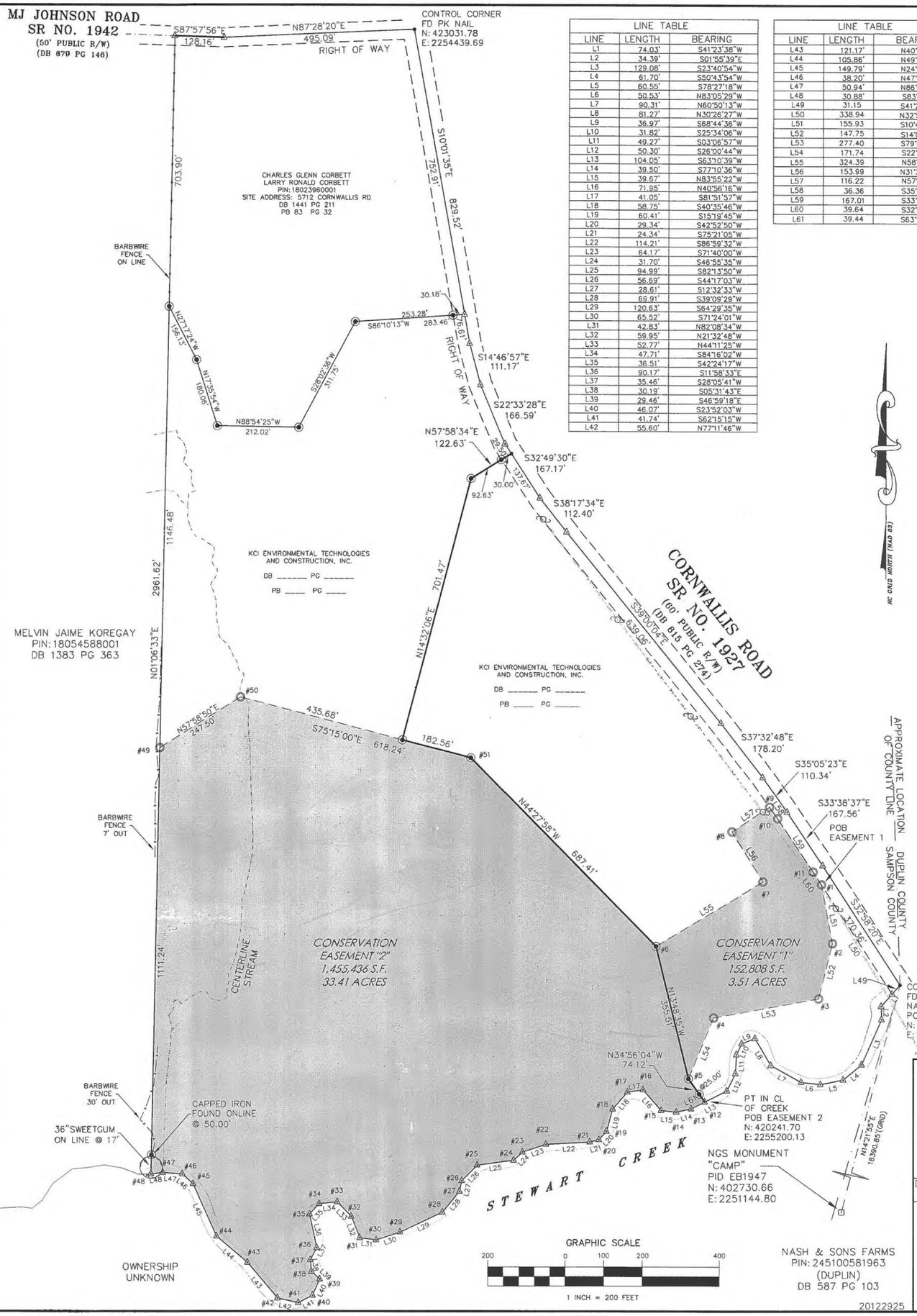
NORTH CAROLINA PROFESSIONAL SEAL L-4257 LAND SURVEYOR MATTHEW M CRAWFORD

I, MATTHEW M. CRAWFORD, PROFESSIONAL LAND SURVEYOR, NO. L-4257 CERTIFY TO THE FOLLOWING:

THAT THE SURVEY CREATES A SUBDIVISION OF LAND WITHIN THE AREA OF A COUNTY OR MUNICIPALITY THAT HAS AN ORDINANCE THAT REGULATES PARCELS OF LAND.

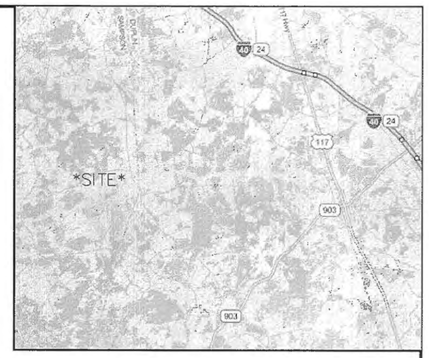
6/14/2013
NORTH CAROLINA REGISTRATION NUMBER L-4257
MATTHEW M. CRAWFORD

NORTH CAROLINA PROFESSIONAL SEAL L-4257 LAND SURVEYOR MATTHEW M CRAWFORD



LINE TABLE		
LINE	LENGTH	BEARING
L1	74.03'	S41°23'38"W
L2	34.39'	S01°55'39"E
L3	129.08'	S23°40'54"W
L4	61.70'	S50°43'54"W
L5	60.55'	S78°27'18"W
L6	50.53'	N83°05'29"W
L7	90.31'	N60°50'13"W
L8	81.27'	N30°26'27"W
L9	36.97'	S68°44'36"W
L10	31.82'	S25°34'06"W
L11	49.27'	S03°08'57"W
L12	50.30'	S26°00'44"W
L13	104.05'	S63°10'39"W
L14	39.50'	S77°10'36"W
L15	39.67'	N83°55'22"W
L16	71.95'	N40°56'16"W
L17	41.05'	S81°51'57"W
L18	58.75'	S40°35'46"W
L19	60.41'	S15°19'45"W
L20	29.34'	S42°52'50"W
L21	24.34'	S75°21'05"W
L22	114.21'	S86°59'32"W
L23	64.17'	S71°40'00"W
L24	31.70'	S46°55'35"W
L25	94.99'	S82°13'50"W
L26	56.69'	S44°17'03"W
L27	28.61'	S12°32'33"W
L28	69.91'	S39°09'29"W
L29	120.63'	S64°29'35"W
L30	65.52'	S71°24'01"W
L31	42.83'	N82°08'34"W
L32	59.95'	N21°32'48"W
L33	52.77'	N44°11'25"W
L34	47.71'	S84°16'02"W
L35	36.51'	S42°24'17"W
L36	90.17'	S11°58'33"E
L37	35.46'	S28°05'41"W
L38	30.19'	S05°31'43"E
L39	29.46'	S46°59'18"E
L40	46.07'	S23°52'03"W
L41	41.74'	S62°15'15"W
L42	55.60'	N77°11'46"W

LINE TABLE		
LINE	LENGTH	BEARING
L43	121.17'	N40°07'39"W
L44	105.86'	N49°42'46"W
L45	149.79'	N24°05'26"W
L46	38.20'	N47°29'42"W
L47	50.94'	N86°00'22"W
L48	30.88'	S83°00'17"W
L49	31.15	S41°23'38"W
L50	338.94	N32°58'20"W
L51	155.93	S10°43'26"E
L52	147.75	S14°04'47"W
L53	277.40	S79°42'41"W
L54	171.74	S22°15'14"W
L55	324.39	N58°55'19"E
L56	153.99	N31°34'08"W
L57	116.22	N57°04'31"E
L58	36.36	S35°05'23"E
L59	167.01	S33°38'37"E
L60	39.64	S32°58'20"E
L61	39.44	S63°10'39"W



VICINITY MAP
(NOT TO SCALE)

POINT TABLE			
POINT	NORTHING	EASTING	DESCRIPTION
1	420807.47	2255502.59	ESMT COR
2	420654.27	2255531.60	ESMT COR
3	420510.96	2255495.66	ESMT COR
4	420461.41	2255222.72	ESMT COR
5	420302.46	2255157.68	ESMT COR
6	420647.70	2255072.82	ESMT COR
7	420815.15	2255350.65	ESMT COR
8	420946.35	2255270.03	ESMT COR
9	421009.52	2255367.58	ESMT COR
10	420979.76	2255388.49	ESMT COR
11	420840.73	2255481.01	ESMT COR
12	420241.70	2255200.13	ESMT COR
13	420223.90	2255164.93	ESMT COR
14	420215.14	2255126.42	ESMT COR
15	420219.34	2255086.97	ESMT COR
16	420273.69	2255039.83	ESMT COR
17	420267.88	2254999.20	ESMT COR
18	420223.27	2254960.97	ESMT COR
19	420165.01	2254945.00	ESMT COR
20	420143.52	2254925.03	ESMT COR
21	420137.36	2254901.49	ESMT COR
22	420131.37	2254787.44	ESMT COR
23	420111.19	2254726.53	ESMT COR
24	420089.54	2254703.38	ESMT COR
25	420076.70	2254609.26	ESMT COR
26	420036.11	2254569.67	ESMT COR
27	420008.19	2254563.46	ESMT COR
28	419953.98	2254519.31	ESMT COR
29	419902.04	2254410.45	ESMT COR
30	419881.14	2254348.35	ESMT COR
31	419886.99	2254305.92	ESMT COR
32	419942.75	2254283.91	ESMT COR
33	419980.59	2254247.12	ESMT COR
34	419975.83	2254199.65	ESMT COR
35	419948.87	2254175.03	ESMT COR
36	419860.66	2254193.74	ESMT COR
37	419829.37	2254177.04	ESMT COR
38	419799.33	2254179.94	ESMT COR
39	419779.23	2254201.49	ESMT COR
40	419737.10	2254182.84	ESMT COR
41	419717.66	2254145.90	ESMT COR
42	419729.98	2254091.68	ESMT COR
43	419822.64	2254013.59	ESMT COR
44	419891.09	2253932.84	ESMT COR
45	420027.83	2253871.70	ESMT COR
46	420053.64	2253843.53	ESMT COR
47	420057.19	2253792.72	ESMT COR
48	420053.43	2253762.07	ESMT COR
49	421164.46	2253783.58	ESMT COR
50	421295.69	2253993.43	ESMT COR
51	421138.28	2254591.30	ESMT COR

LEGEND

- EXISTING PK NAIL
- EXISTING IRON
- 5/8" REBAR SET W/ 3.25" ALUMINUM CAP WITH STATE SEAL
- CALCULATED POINT
- EXISTING MONUMENT
- POWER POLE
- OVERHEAD WIRE
- NEW CONSERVATION EASEMENT FOR "THE STATE OF NC, ECOSYSTEM ENHANCEMENT PROGRAM."
- POB POINT OF BEGINNING
- POC POINT OF COMMENCEMENT

FINAL PLAT
CONSERVATION EASEMENT
FOR
NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM
PROJECT NAME: NORMAN'S PASTURE WETLAND RESTORATION SITE
EEP PROJECT #: 95717
SPO FILE NO. 82-J: PROPERTY OF KCI ENVIRONMENTAL TECHNOLOGIES AND CONSTRUCTION, INC
TURKEY TOWNSHIP, SAMPSON COUNTY, NC

DATE:	SCALE:	SHEET:
APRIL 15, 2013	1" = 200'	1 OF 1

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS
4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266
KCI ASSOCIATES OF NORTH CAROLINA C-0764

SURVEY NOTES

1. DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREA COMPUTED BY COORDINATE METHOD.
3. THE BASIS OF THE MERIDIANS AND COORDINATES FOR THIS PLAT IS THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM NOVEMBER 2012. ALL DISTANCES ARE GROUND UNLESS OTHERWISE NOTED.
4. DEED REFERENCES: AS SHOWN HEREON.
5. SUBJECT PROPERTIES KNOWN AS TAX NUMBER: AS SHOWN HEREON.
6. SUBJECT PROPERTIES PARTIALLY LIE WITHIN THE AREA DESIGNATED AS ZONE "AE, BASED ON FEDERAL FLOOD INSURANCE RATE MAP 3720244200K EFFECTIVE JAN. 5, 2007.
7. THE STATE PLANE COORDINATES FOR THIS PROJECT WERE PRODUCED WITH RTK GPS OBSERVATIONS. THE NETWORK POSITIONAL ACCURACY OF THE RTK DERIVED POSITIONAL INFORMATION IS 0.02 METER. HORIZONTAL POSITIONS ARE REFERENCED TO NAD 83 (NSRS2007). COMBINED SCALE FACTOR = 0.999891360
8. NO N.C. GEODETIC MONUMENTS WERE FOUND WITHIN 2,000 FEET OF THIS SURVEY.
9. SUBJECT PARCELS MAY BE SUBJECT TO EASEMENTS AND RESTRICTIONS THAT ARE NOT SHOWN HEREON.
10. NO ORIGINAL ADDRESS WILL BE CHANGED WITH THIS RECORDING.
11. ZONED: RA (RESIDENTIAL AGRICULTURAL)
    FRONT SETBACK: 50'
    SIDE SETBACK: 15'
    REAR SETBACK: 25'

OWNER CERTIFICATION

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF SAMPSON AND THAT I HEREBY ADOPT THIS CONSERVATION EASEMENT PLAN WITH MY FREE CONSENT AND ESTABLISH THE ACCESS EASEMENTS AS NOTED.

KCI ENVIRONMENTAL TECHNOLOGIES AND CONSTRUCTION, INC.
OWNER

8/4/14
DATE

SUBDIVISION ADMINISTRATOR CERTIFICATION

THIS FINAL PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED. PARCELS ARE 10 ACRES OR MORE.

by Cindy Cottle
ADMINISTRATOR

8-8-14
DATE

REVIEW OFFICER CERTIFICATION

I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by Cindy Cottle
REVIEW OFFICER

8-8-14
DATE

CERTIFICATE OF REGISTRATION BY REGISTER OF DEEDS

NORTH CAROLINA

FILED FOR REGISTRATION ON THE 8th DAY OF August, 2014
AT 2:53 O'CLOCK P M AND REGISTERED IN THE OFFICE OF THE REGISTER OF DEEDS OF SAMPSON COUNTY ON THE 8th DATE OF August 2014
IN BOOK NO. 87 PAGE NO. 25.

Eleanor N. Bradshaw
REGISTER OF DEEDS

BY: Amy B. Jordan / Deputy

I, MATTHEW M. CRAWFORD, HEREBY DECLARE THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM A SURVEY MADE UNDER MY SUPERVISION, THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED, AS DRAWN FROM INFORMATION AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS GREATER THAN 1:10,000; THAT THIS MAP DOES REPRESENT AN OFFICIAL BOUNDARY SURVEY AND HAS BEEN PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 1ST DAY OF AUGUST, 2014

NORTH CAROLINA REGISTRATION NUMBER L-4257
MATTHEW M. CRAWFORD

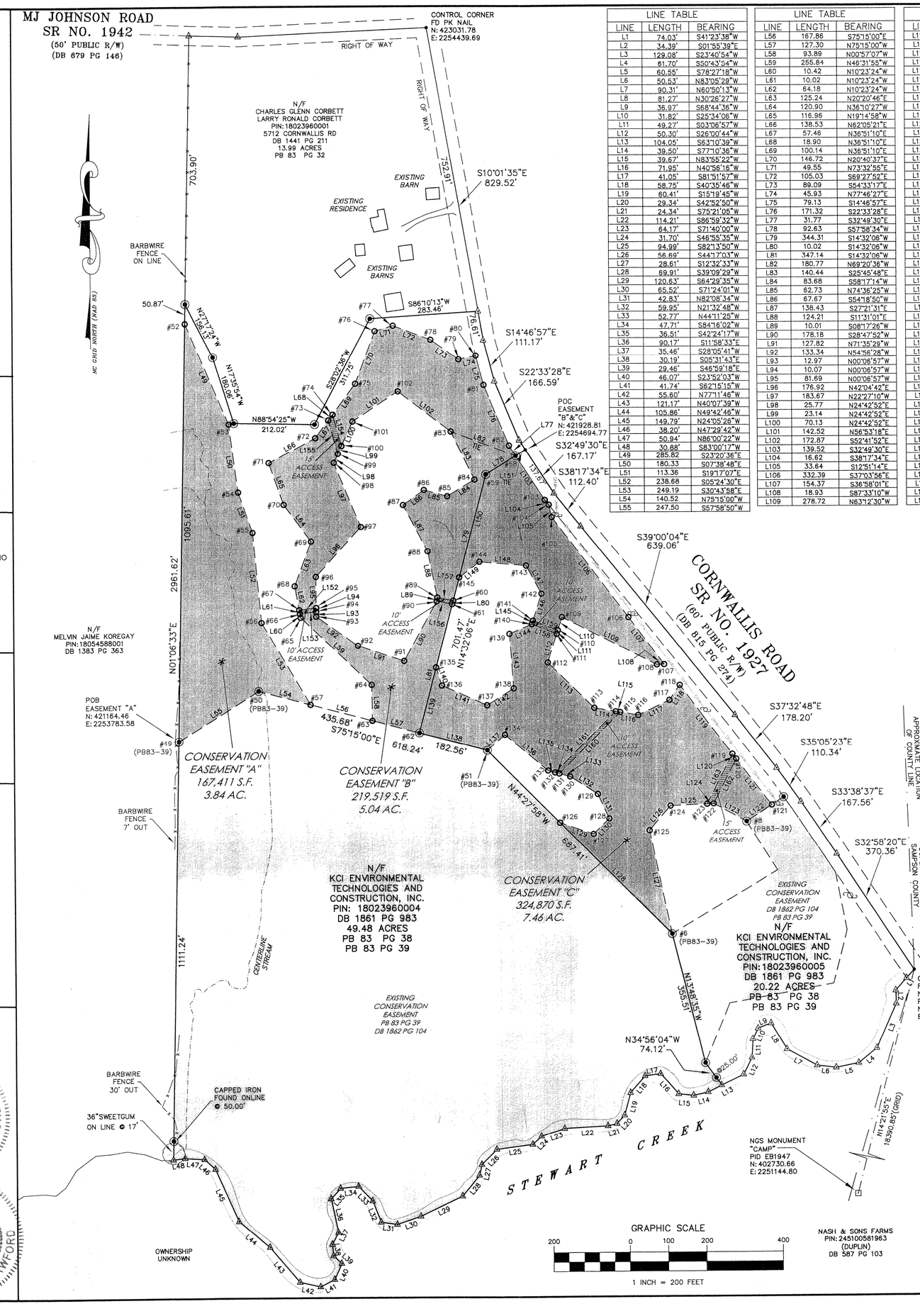
NORTH CAROLINA PROFESSIONAL SEAL L-4257 LAND SURVEYOR MATTHEW M CRAWFORD

I, MATTHEW M. CRAWFORD, PROFESSIONAL LAND SURVEYOR, NO. L-4257 CERTIFY TO THE FOLLOWING:

THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

NORTH CAROLINA REGISTRATION NUMBER L-4257
MATTHEW M. CRAWFORD

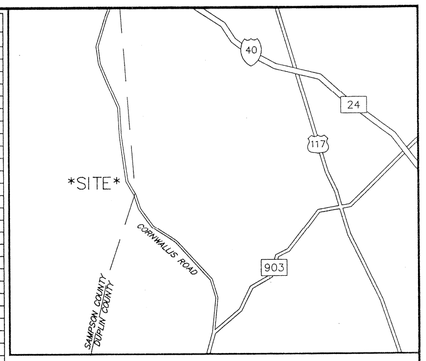
NORTH CAROLINA PROFESSIONAL SEAL L-4257 LAND SURVEYOR MATTHEW M CRAWFORD



LINE TABLE		
LINE	LENGTH	BEARING
L1	74.03'	S41°23'38"W
L2	34.39'	S01°55'39"E
L3	129.08'	S23°40'54"W
L4	81.70'	S50°43'54"W
L5	60.55'	S78°27'18"W
L6	50.53'	N83°05'29"W
L7	90.31'	N60°50'13"W
L8	81.27'	N30°26'27"W
L9	36.97'	S68°44'36"W
L10	31.82'	S25°34'06"W
L11	49.27'	S03°06'57"W
L12	50.30'	S26°00'44"W
L13	104.05'	S63°10'39"W
L14	39.50'	S77°10'36"W
L15	39.67'	N83°55'22"W
L16	71.95'	N40°56'16"W
L17	41.05'	S81°51'57"W
L18	58.75'	S40°35'46"W
L19	60.41'	S15°19'45"W
L20	29.34'	S42°52'50"W
L21	24.34'	S75°21'05"W
L22	114.21'	S86°59'32"W
L23	64.17'	S71°40'00"W
L24	31.70'	S46°55'35"W
L25	94.99'	S82°13'50"W
L26	56.69'	S44°17'03"W
L27	28.61'	S12°32'33"W
L28	69.91'	S39°09'29"W
L29	120.63'	S64°29'35"W
L30	65.52'	S71°24'01"W
L31	42.83'	N82°08'34"W
L32	59.95'	N21°32'48"W
L33	52.77'	N44°11'25"W
L34	47.71'	S84°16'02"W
L35	36.51'	S42°24'17"W
L36	90.17'	S11°58'33"E
L37	35.46'	S28°05'41"W
L38	30.19'	S05°31'43"E
L39	29.46'	S46°59'18"E
L40	46.07'	S23°52'03"W
L41	41.74'	S62°15'15"W
L42	55.60'	N77°11'46"W
L43	121.17'	N40°07'39"W
L44	105.86'	N49°42'46"W
L45	149.79'	N24°05'28"W
L46	38.20'	N47°29'42"W
L47	50.94'	N86°00'22"W
L48	30.88'	S83°00'17"W
L49	285.82	S23°20'36"E
L50	180.33	S07°38'48"E
L51	113.36	S19°17'07"E
L52	238.68	S05°24'30"E
L53	249.19	S30°43'58"E
L54	140.52	N75°15'00"W
L55	247.50	S57°58'50"W

LINE TABLE		
LINE	LENGTH	BEARING
L56	167.86	S75°15'00"E
L57	127.30	N75°15'00"W
L58	93.89	N00°57'07"W
L59	255.84	N46°31'55"W
L60	10.42	N10°23'24"W
L61	10.02	N10°23'24"W
L62	64.18	N10°23'24"W
L63	125.24	N20°20'46"E
L64	120.90	N36°10'27"W
L65	116.96	N19°14'58"W
L66	138.53	N62°05'21"E
L67	57.48	N36°51'10"E
L68	18.90	N36°51'10"E
L69	100.14	N36°51'10"E
L70	146.72	N20°40'37"E
L71	49.55	N73°32'55"E
L72	105.03	S69°27'52"E
L73	89.09	S54°33'17"E
L74	45.93	N77°46'27"E
L75	79.13	S14°46'57"E
L76	171.32	S22°33'28"E
L77	31.77	S32°49'30"E
L78	92.63	S57°58'34"W
L79	344.31	S14°32'06"W
L80	10.02	S14°32'06"W
L81	347.14	S14°32'06"W
L82	180.77	N69°20'36"W
L83	140.44	S25°45'48"E
L84	83.68	S58°17'14"W
L85	62.73	N74°36'25"W
L86	67.67	S54°18'50"W
L87	138.43	S27°21'31"E
L88	124.21	S11°31'01"E
L89	10.01	S08°17'26"W
L90	178.18	S28°47'52"W
L91	127.82	N71°35'29"W
L92	133.34	N54°56'28"W
L93	12.97	N00°06'57"W
L94	10.07	N00°06'57"W
L95	81.69	N00°06'57"W
L96	176.92	N42°04'42"E
L97	183.67	N22°27'10"W
L98	25.77	N24°42'52"E
L99	23.14	N24°42'52"E
L100	70.13	N24°42'52"E
L101	142.52	N58°53'18"E
L102	172.87	S52°41'52"E
L103	139.52	S32°49'30"E
L104	16.62	S38°17'34"E
L105	33.64	S12°51'14"E
L106	332.39	S37°03'56"E
L107	154.37	S36°58'01"E
L108	18.93	S87°33'10"W
L109	278.72	N63°12'30"W

LINE TABLE		
LINE	LENGTH	BEARING
L110	35.89	S17°34'42"W
L111	10.02	S17°34'42"W
L112	78.56	S17°34'42"W
L113	170.07	S45°41'51"E
L114	56.80	S80°25'09"E
L115	12.25	S80°25'09"E
L116	47.83	S80°25'09"E
L117	90.59	N64°21'56"E
L118	47.50	N35°10'35"E
L119	227.57	S37°00'31"E
L120	16.73	S37°02'15"E
L121	153.88	S37°02'15"E
L122	78.99	S57°04'31"W
L123	98.14	N61°04'53"W
L124	17.20	S87°23'36"W
L125	96.33	S87°23'36"W
L126	85.02	S40°29'10"W
L127	282.16	S11°43'09"E
L128	417.19	N44°27'58"W
L129	93.15	S71°02'32"E
L130	57.94	N45°31'39"E
L131	71.33	N24°33'23"W
L132	86.13	N57°11'28"W
L133	29.57	N73°57'38"W
L134	11.41	N73°57'38"W
L135	19.08	N73°57'38"W
L136	147.55	N49°47'55"W
L137	61.73	S48°33'03"W
L138	182.56	N75°15'00"W
L139	176.26	N14°32'06"E
L140	49.54	S17°33'13"E
L141	128.07	S66°25'52"E
L142	82.35	N58°09'48"E
L143	143.17	N04°10'41"W
L144	63.30	N66°57'12"E
L145	10.02	N17°55'54"E
L146	74.33	N17°55'54"E
L147	83.96	N28°36'43"W
L148	122.54	N85°15'26"W
L149	66.58	S52°11'50"W
L150	281.56	N14°32'06"E
L151	30.00	S57°58'34"W
L152	44.88	N82°55'25"E
L153	43.08	S82°55'25"W
L154	84.97	S15°41'15"E
L155	91.10	N15°41'15"W
L156	41.10	N78°44'39"W
L157	42.19	S78°44'44"E
L158	70.10	N68°32'36"W
L159	70.03	S68°32'36"E
L160	228.03	S44°51'03"W
L161	226.46	N44°51'03"E
L162	132.44	S26°42'23"W
L163	148.26	N26°42'23"E



VICINITY MAP
(NOT TO SCALE)

LEGEND

- EXISTING PK NAIL
- EXISTING IRON
- 5/8" REBAR SET W/ 3.25" Al LIMINUM CAP WITH STATE SEAL
- CALCULATED POINT
- EXISTING MONUMENT
- POWER POLE
- OHW — OHW — OVERHEAD WIRE
- NEW CONSERVATION EASEMENT FOR "THE STATE OF NC, ECOSYSTEM ENHANCEMENT PROGRAM."
- EXISTING CONSERVATION EASEMENT
- ACCESS EASEMENT FOR INGRESS AND EGRESS
- POB — POINT OF BEGINNING
- POC — POINT OF COMMENCEMENT

POINT TABLE			
PT #	NORTHING	EASTING	DECRIPTION
6	420647.70	2255072.82	ESMT COR
8	420946.35	2255270.03	ESMT COR
49	421164.46	2253783.58	ESMT COR
50	421295.69	2253993.43	ESMT COR
51	421138.28	2254591.30	ESMT COR
52	422259.86	2253804.79	ESMT COR
53	421997.44	2253918.04	ESMT COR
54	421818.72	2253942.04	ESMT COR
55	421711.72	2253979.48	ESMT COR
56	421474.11	2254001.97	ESMT COR
57	421259.91	2254129.32	ESMT COR
58	421912.90	2254669.33	ESMT COR
59	421863.78	2254590.80	ESMT COR
60	421530.49	2254504.38	ESMT COR
61	421520.79	2254501.87	ESMT COR
62	421184.76	2254414.75	ESMT COR
63	421217.17	2254291.65	ESMT COR
64	421311.05	2254290.09	ESMT COR
65	421487.05	2254104.41	ESMT COR
66	421497.29	2254102.53	ESMT COR
67	421507.15	2254100.73	ESMT COR
68	421570.28	2254089.15	ESMT COR
69	421687.71	2254132.70	ESMT COR
70	421785.30	2254061.34	ESMT COR
71	421895.72	2254022.78	ESMT COR
72	421960.57	2254145.20	ESMT COR
73	422006.55	2254179.65	ESMT COR
74	422021.67	2254190.99	ESMT COR
75	422101.80	2254251.05	ESMT COR
76	422239.07	2254302.86	ESMT COR
77	422253.10	2254350.37	ESMT COR
78	422216.26	2254448.73	ESMT COR
79	422164.59	2254521.31	ESMT COR
80	422174.32	2254566.19	ESMT COR
81	422097.81	2254586.38	ESMT COR
82	421939.60	2254652.10	ESMT COR
83	421976.67	2254500.18	ESMT COR
84	421850.19	2254561.22	ESMT COR
85	421806.20	2254490.03	ESMT COR
86	421822.85	2254429.56	ESMT COR
87	421783.38	2254374.59	ESMT COR
88	421660.43	2254438.21	ESMT COR
89	421538.72	2254463.01	ESMT COR
90	421528.82	2254461.56	ESMT COR
91	421372.68	2254375.73	ESMT COR
92	421413.04	2254254.46	ESMT COR
93	421489.63	2254145.31	ESMT COR
94	421502.60	2254145.29	ESMT COR
95	421512.68	2254145.26	ESMT COR

POINT TABLE			
PT #	NORTHING	EASTING	DECRIPTION
96	421594.37	2254145.10	ESMT COR
97	421725.68	2254263.67	ESMT COR
98	421895.43	2254193.52	ESMT COR
99	421918.85	2254204.29	ESMT COR
100	421939.87	2254213.97	ESMT COR
101	422003.57	2254243.29	ESMT COR
102	422081.43	2254362.67	ESMT COR
103	421795.65	2254744.96	ESMT COR
104	421782.61	2254755.26	ESMT COR
105	421749.82	2254762.74	ESMT COR
106	421484.58	2254963.08	ESMT COR
107	421361.25	2255055.91	ESMT COR
108	421360.44	2255037.00	ESMT COR
109	421486.07	2254788.19	ESMT COR
110	421451.86	2254777.36	ESMT COR
111	421442.31	2254774.33	ESMT COR
112	421367.42	2254750.60	ESMT COR
113	421248.63	2254872.32	ESMT COR
114	421239.18	2254928.32	ESMT COR
115	421237.14	2254940.40	ESMT COR
116	421229.18	2254987.56	ESMT COR
117	421268.37	2255069.23	ESMT COR
118	421307.19	2255096.60	ESMT COR
119	421125.47	2255233.58	ESMT COR
120	421112.12	2255243.65	ESMT COR
121	420989.29	2255336.34	ESMT COR
122	420993.81	2255184.13	ESMT COR
123	420993.02	2255166.95	ESMT COR
124	420988.64	2255070.71	ESMT COR
125	420923.98	2255015.51	ESMT COR
126	420945.43	2254780.59	ESMT COR
127	420915.17	2254868.69	ESMT COR
128	420955.76	2254910.03	ESMT COR
129	421020.64	2254880.39	ESMT COR
130	421067.31	2254808.00	ESMT COR
131	421075.48	2254779.58	ESMT COR
132	421078.63	2254768.61	ESMT COR
133	421083.90	2254750.27	ESMT COR
134	421179.15	2254637.57	ESMT COR
135	421355.38	2254458.99	ESMT COR
136	421308.15	2254473.93	ESMT COR
137	421256.94	2254591.31	ESMT COR
138	421300.38	2254661.27	ESMT COR
139	421443.17	2254650.84	ESMT COR
140	421467.95	2254709.09	ESMT COR
141	421477.48	2254712.18	ESMT COR
142	421548.20	2254735.06	ESMT COR
143	421621.90	2254694.85	ESMT COR
144	421632.04	2254572.74	ESMT COR
145	421591.23	2254520.13	ESMT COR

FINAL PLAT
CONSERVATION EASEMENT

NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM
PROJECT NAME: NORMAN'S PASTURE II STREAM AND WETLAND RESTORATION SITE
EEP PROJECT #: 96310
SPO FILE NO. 82-AK: PROPERTY OF KCI ENVIRONMENTAL TECHNOLOGIES AND CONSTRUCTION, INC
TURKEY TOWNSHIP, SAMPSON COUNTY, NC

DATE:	SCALE:	SHEET:
APRIL 28, 2014	1" = 200'	1 OF 1

KCI ASSOCIATES OF NORTH CAROLINA C-0764

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS

4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266

20122925

Appendix B. Baseline Information Data

USACE Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey/Sampson Sampling Date: 12-6-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#1

Investigator(s): S. Stokes Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace/FLAT Local relief (concave, convex, none): FLAT Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 34°54'14" Long: -78°08'57" Datum:

Soil Map Unit Name: Lumbee Variant NWI classification: PEMIB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

Heavily impacted area pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (**LRR U**)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): > 22
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP#1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1. Juncus effusus	40	✓	OBL
2. Straw colored Flat sedge - Cyperus strigosus	30	✓	FACW
3. Creeping Charlie - Glechoma hederacea	20	✓	FACU
4. Polygonum spp.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		

50% of total cover: 45 20% of total cover: 18

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (If observed, list morphological adaptations below).

Creeping Charlie - Ground Ivy

SOIL

Sampling Point: DP#1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2						FSL	
4-6.5	10YR 4/2		7.5YR 4/4	2			FSL	
6.5-13	10YR 4/2						LS	
13-22+	10YR 4/2						SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Sampson Sampling Date: 12-6-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP # 2 NW@ W4-89

Investigator(s): S. Stokes Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace/FLAT Local relief (concave, convex, none): CONCAVE/FLAT Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 34°54'14" Long: -78°08'57" Datum: _____

Soil Map Unit Name: Chipley NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Heavily impacted cow pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): > 20
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP# 2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1.			
2. Juncus effusus -	40	✓	OBL
3. Bahia Grass - Paspalum notatum	40	✓	FACU
4. Dog Fennel - Eupatorium capillifolium	20	✓	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP#2 New

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10yr 3/1	100					SL	
8-11	10yr 4/3	98	5yr 4/4 rip	2%	C	M	SL	
11-15	10yr 4/2	100					SL	
15-20	10yr 4/3	60	7.5yr 4/4	5%	C	M	SL	
			10yr 4/2	35	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Somewhat Poorly drained soil.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey / Sampson Sampling Date: 12-7-12

Applicant/Owner: KEJ Associates of NC State: NC Sampling Point: DP#3 @ WH-154

Investigator(s): S. Stokes Section, Township, Range: _____

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 34°54'14" Long: -78°09'08" Datum: _____

Soil Map Unit Name: Torhunya NWI classification: PEMIB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Heavily impacted cow pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ✓ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes ✓	No _____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 10

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP# 3

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Herb Stratum (Plot size: _____)			
1. Soft Rush - Juncus effusus	55	✓	OBL
2. Straw Flat Sedge - Cyperus strigosus	10		FACW
3. Blackberry - Rubus	5		
4. Unknown Asters			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP # 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10yr 2/1	100					Loam	
4-6	10yr 2/1	100					ls	
6-18	10yr 2/1	100					ls	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Surface soil tending toward mucky modified.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Sampson Sampling Date: 12-7-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP# 4 NW@W4-154

Investigator(s): S. Staken Section, Township, Range:

Landform (hillslope, terrace, etc.): Uplands Local relief (concave, convex, none): Convex Slope (%): 1-2

Subregion (LRR or MLRA): LRRT Lat: 34°54'14" Long: -78°09'08" Datum:

Soil Map Unit Name: Chipley NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

Heavily impacted corn pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP# 4

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover: ____ 20% of total cover: ____			
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover: ____ 20% of total cover: ____			
Herb Stratum (Plot size: 10')			
1. Broom Sedge - Andropogon virginicus	30	✓	FAC
2. Dog Fennel - Eupatorium capillifolium	20	✓	FACW
3. Bahia Grass - Paspalum notatum	20	✓	FACW
4. Blackberry - Rubus argutus	20		FAC
5. Unknown Asters	10		
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		
50% of total cover: 50 20% of total cover: 20			
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover: ____ 20% of total cover: ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP# 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10yr 3/1						sl	AS boundary
6-9	10yr 5/4		7.5yr 5/6	2	C	m	sl	
9-15	10YR 4/3		7.5YR 5/6	20	C	m	LS	
15-18	10YR 4/2	90	10YR 5/3	10	C	m	ls	
18-20	10yr 4/2	100					ls	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey / Sampson Sampling Date: 12-7-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#5 WP WL-23

Investigator(s): S. Sykes Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRRT Lat: 34°54'10" Long: -78°09'03" Datum:

Soil Map Unit Name: Bibb Johnson NWI classification: PEMIB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:
Heavily impacted cow pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 10"
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP# 5

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Herb Stratum (Plot size: _____)			
1.			
2. Stream Flat Sedge - Cyperus strigosus	50	✓	FACW
3. Soft Rush - Juncus effusus	30	✓	OBL
4. Polygonum spp.	20		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP#5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 9	10YR 3/1	100					L	
9 - 18	10YR 4/2	97	10YR 3/4	3	C	PL	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey / Sampson Sampling Date: 12-7-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP# 6 NW

Investigator(s): S. Sykes Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 34°54'11" Long: -78°09'03" Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

Heavily impacted Cow Pasture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): 17
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP#6

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1. Bahia Grass - Paspalum notatum	40	✓	FACU
2. Broomsedge - Andropogon virginicus	30	✓	FAC
3. Blackberry - Rubus argutus	10		FAC
4. Unknown Asters -			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

50% of total cover: 40 20% of total cover: 16

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP# 6 NW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10yr 3/1	100					SL	
7-10	10yr 3/2	100					SL-LS	
10-20	10yr 6/1	100					S	
20-24	10yr 6/1	97	10yr 3/2	3			S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Not F-13 since not in a concrete canoram.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey, Sampson Sampling Date: 12-7-12

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#7 @ WL-139

Investigator(s): S. Stokes Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 34°54'06" Long: -78 09' 07" Datum:

Soil Map Unit Name: Lumbee NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

Heavily impacted cow pasture.
Field is drained.
No contrasting data point. DP# 7 is 63' from drainage ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): > 24"
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP#7

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1. Bahia Grass - Paspalum notatum	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP-4 single pit containing

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10yr 3/1	100					SL	
4-7.5	10yr 3/1	98	10yr 3/4	1-2%	C	M	SL	
7.5-24	10yr 3/1	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ✓ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

F-13 - But soil not in a Carolina Bay or closed depression

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture - Addendum 1 City/County: Turkey / Sampson Sampling Date: 3-28-13

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#8 WQ WIO-5

Investigator(s): S. Stokes Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0 %

Subregion (LRR or MLRA): LRR T Lat: 34°54'24.6" N Long: -78 09'12.3" W Datum: NAD 83

Soil Map Unit Name: Torhunta Variant NWI classification: PFO1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?**	Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____		
Wetland Hydrology Present?	Yes ✓ No ____		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✓	No ____	Depth (inches): 0 - 2
Water Table Present?	Yes ✓	No ____	Depth (inches): Surface
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

B- Saturated

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP# 8

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	50	✓	FAC
2. Liquidambar Styraciflua	30	✓	FAC
3. Magnolia Virginiana	20		FACW
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Sapling/Shrub Stratum (Plot size: 10')			
1. Ilex opaca	30	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		

50% of total cover: 15 20% of total cover: 6

Herb Stratum (Plot size: 1m')			
1. Saururus cernuus	20	✓	OBL
2. Onoclea sensibilis	10	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		

50% of total cover: 15 20% of total cover: 6

Woody Vine Stratum (Plot size: 30')			
1. Smilax Laurifolia	30	✓	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		

50% of total cover: 50 20% of total cover: 6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP#8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10yr 2/1	100					L	slightly organic
14-18	10yr 3/1	100					S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture City/County: Turkey / Sampson Sampling Date: 3-28-13

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#9 NW

Investigator(s): S. Stokes Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 5%

Subregion (LRR or MLRA): LRR T Lat: 34°54'246" Long: -78°09'12.1" Datum: NAD 83

Soil Map Unit Name: Norfolk Variant NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____	
Water Table Present?	Yes ____	No ✓	Depth (inches): 18"	
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches): ____	**Wetland Hydrology Present?** Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP#9 NW

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	60	✓	FACU
2. Acer rubrum	30	✓	FAC
3. Pinus taeda	20		FAC
4.			
5.			
6.			
7.			
8.			
	110	= Total Cover	

50% of total cover: 55 20% of total cover: 22

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: 20% of total cover:

Herb Stratum (Plot size:)			
1. Arundinaria gigantea	10	✓	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

50% of total cover: 5 20% of total cover: 2

Woody Vine Stratum (Plot size:)			
1. Vitis rotundifolia	20	✓	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	

50% of total cover: 10 20% of total cover: 4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DP#9 NW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					sl	
8-10	10YR 4/2	100					ls	
10-13	10YR 4/3	100					ls	
13-15	10YR 4/3	95	5YR 4/6 c2p	5	C	PL	sl	
15-20	10YR 5/3	90	5YR 4/6 c2p	5	C	PL	sl	
			10YR 4/2 c2p	5		M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Reference Sites

Reference Wetland

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: KCI Associates of North Carolina, P.A. **Date:** September 27, 2013
Project: Norman's Pasture **Project #:** 20111232P-CF_06
County: Sampson **State:** NC
Location: Corwallis Road at Stewart's Creek **Site/Lot:** Reference Wetland
Soil Series: Torhunta
Soil Classification: Coarse-loamy, siliceous, active, acid, thermic Typic Humaquepts
AWT: 24" 0-12" **Slope:** 0-3% **Aspect:**
Elevation: **Drainage:** Poorly to Very Poorly Drained **Permeability:** Moderately rapid or Moderate
Vegetation: Forested Wetland
Borings terminated at 50 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A1	0-8	10YR 2/1		lfs	1fgr	mfr	cs	
A2	8-11	10YR 3/1		lfs	1mgr	mfr	cw	
Bg1	11-17	10YR 3/2	2.5YR 3/4c2p	sl	1fsbk	mfr	cw	
Bg2	17-23	10YR 4/1	10YR 4/3c2d	sl	1fsbk	mfr	cw	
Bg3	23-27	10YR 3/1		fsl	1fsbk	ml	gw	
Bg4	27-31	10YR 4/1		ls	1fsbk	ml	gw	
Bg5	31-40	10YR 5/2		s	sg	ml	gw	
Bg5	40-50	10YR 5/2	10YR 4/3c2f	s	sg	ml		

COMMENTS:

The Torhunta series is a very poorly drained soil in upland bays and on stream terraces in Coastal Plain.
The Torhunta series is formed in coarse to medium textured, marine or fluvial deposits.
This Torhunta series is a hydric soil.
This Torhunta soil has slow runoff; moderately rapid permeability.

DESCRIBED BY: SFS DATE: 9/27/2013

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Norman's Pasture Reference City/County: Turkey / Sampson Sampling Date: 9-27-13

Applicant/Owner: KCI Associates of NC State: NC Sampling Point: DP#1

Investigator(s): S.Styons, Tommy Seelinger Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace toeslope Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR P Lat: N34°54'31.8" Long: W078°08'47.3 Datum:

Soil Map Unit Name: Tarhunta NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____	
Water Table Present?	Yes ____	No ✓	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 9-11"	**Wetland Hydrology Present?** Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP#1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Magnolia virginiana (Sweetbay)	30	✓	FACW
2. Gordonia lasianthus (Loblolly Bay)	30	✓	FACW
3. Quercus nigra (Water Oak)	20	✓	FAC
4. Liquidambar styraciflua (Sweetgum)	20	✓	FAC
5. Acer rubrum (Red maple)	10		FAC
6. Liriodendron tulipifera (Tuliptree)	10		FACU
7.			
8.			
	120 = Total Cover		
50% of total cover: 60	20% of total cover: 24		
Sapling/Shrub Stratum (Plot size: 10')			
1. Clethra alnifolia (Coastal Pepper-Bush)	20	✓	FACW
2. Persea Borbonia (Red Bay)	10	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: 1m)			
1. Leucothoe axillaris (Dog hobble Coastal)	10		FACW
2. Osmunda cinnamomea	80	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (Common greenbrier)	5		FAC
2. Smilax laurifolia (Laurel-leaf greenbrier)	10	✓	FACW
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

Additional species in area:
Viburnum nudum

SOIL

Sampling Point: DP#1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10yr 2/1	100					lfs	
8-11	10yr 3/1	100					lfs	
11-19	10yr 3/2	94	2.5yr 3/4 c2p	6	C	m	sl	
19-23	10yr 4/1	94	10yr 4/3 c2d	6	C	m,pl	sl	
23-27	10yr 3/1	100					s	
27-31	10yr 4/1	100					s	
31-40	10yr 5/2	100					s	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

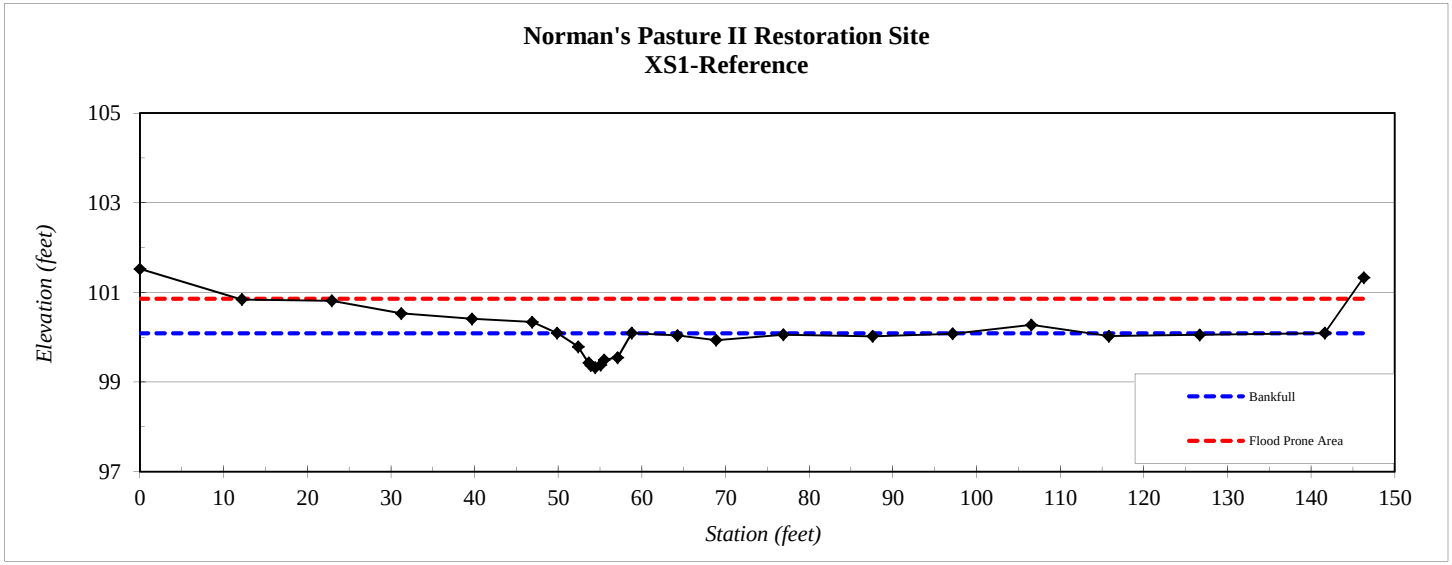
Wetland Reference Photos

Reference Stream

River Basin:	Cape Fear
Watershed:	Normans Pasture II, T1 Reference
XS ID	XS1 Reference
Drainage Area (sq mi):	
Date:	4/14/2014
Field Crew:	A. French, T. Seelinger

Station	Elevation
0.0	101.52
12.2	100.84
23.0	100.81
31.2	100.53
39.7	100.41
46.9	100.34
49.9	100.09
52.4	99.79
53.6	99.43
53.9	99.37
54.4	99.32
55.1	99.38
55.5	99.50
57.1	99.54
58.8	100.09
64.2	100.04
68.9	99.93
76.9	100.06
87.6	100.02
97.2	100.08
106.6	100.27
115.8	100.02
126.7	100.05
141.6	100.09
146.3	101.33

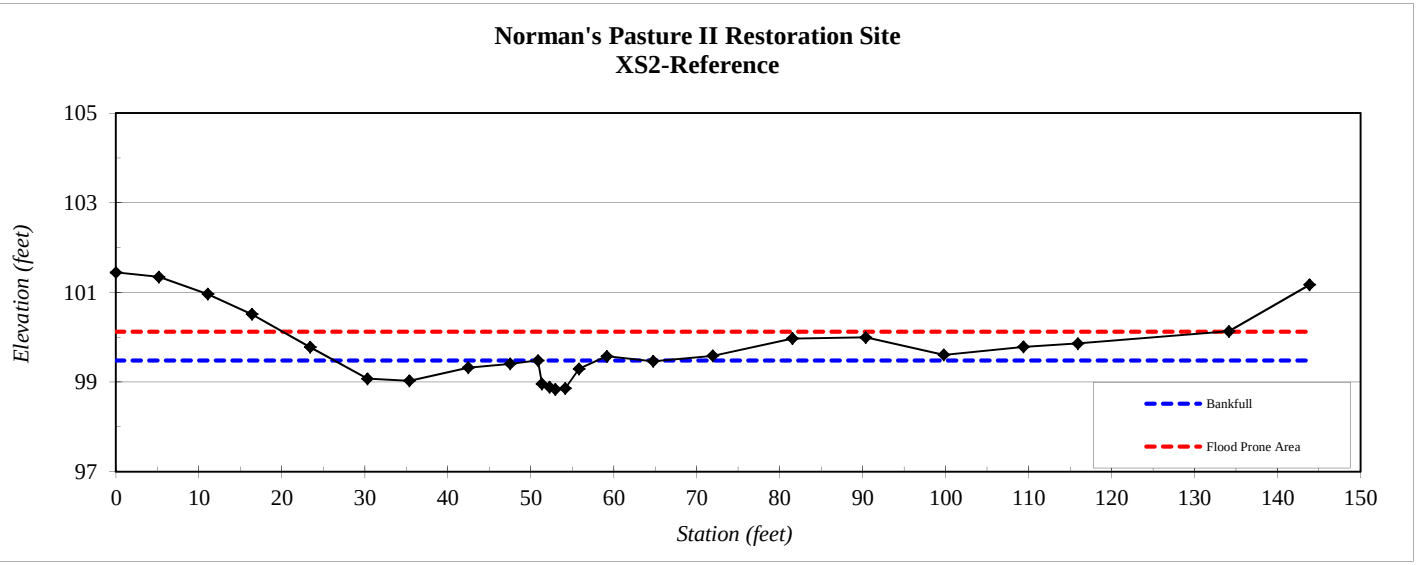
SUMMARY DATA	
Bankfull Elevation:	100.1
Bankfull Cross-Sectional Area:	3.7
Bankfull Width:	8.9
Flood Prone Area Elevation:	100.9
Flood Prone Width:	120
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.4
W / D Ratio:	21.4
Entrenchment Ratio:	13.5
Bank Height Ratio:	1.0



River Basin:	Cape Fear
Watershed:	Normans Pasture II, T1 Reference
XS ID	XS2 Reference
Drainage Area (sq mi):	
Date:	4/14/2014
Field Crew:	A. French, T. Seelinger

Station	Elevation
0.0	101.44
5.2	101.34
11.1	100.96
16.4	100.51
23.4	99.78
30.3	99.08
35.4	99.03
42.5	99.32
47.5	99.41
50.9	99.48
51.3	98.96
52.3	98.88
53.0	98.84
54.2	98.86
55.8	99.30
59.2	99.57
64.8	99.46
71.9	99.59
81.5	99.97
90.4	99.99
99.8	99.61
109.4	99.79
115.9	99.86
134.2	100.13
143.9	101.17

SUMMARY DATA	
Bankfull Elevation:	99.5
Bankfull Cross-Sectional Area:	2.7
Bankfull Width:	7.2
Flood Prone Area Elevation:	100.1
Flood Prone Width:	110
Max Depth at Bankfull:	0.6
Mean Depth at Bankfull:	0.4
W / D Ratio:	19.2
Entrenchment Ratio:	15.3
Bank Height Ratio:	1.0



Reference Locations


Tributary 1
Tributary 2
Stewarts Creek
Wetland Reference Gauge
Stream Reference Reach
Existing Streams
NPRS Easement
NPII Easement
Extent of Project Parcels
200 100 0 200
Feet
REFERENCE LOCATIONS
NORMAN'S PASTURE / NORMAN'S PASTURE II
SAMPSON COUNTY, NC
Image Source: Eastern Piedmont Orthoimagery, 2013.
N

Jurisdictional Determination

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2013-00109** County: **Sampson** U.S.G.S. Quad: **Turkey**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner: **Mr. Larry Ronald Corbett**

Address: **1904 Eleanor Drive**
Kinston, North Carolina 28504

Agent: **KCI Associates of NC**
Attn: Steve Stokes

Address: **4601 Six Forks Road**
Raleigh, North Carolina 27609

Property description:
Size (acres) **~60** Nearest Town **Turkey**
Nearest Waterway **Stewarts Creek** River Basin **Black River**
USGS HUC **03030006** Coordinates **34.903889N, -78.149167 W**
Location description: **Property is known as Normans Pasture, located at 5712 Cornwallis Road, Turkey, North Carolina. PIN 18023960001.**

Indicate Which of the Following Apply:

A. Preliminary Determination

_ Based on preliminary information, there may be waters of the U.S. including wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

B. Approved Determination

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X **There are waters of the U.S. including wetlands on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.**

_ We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters of the U.S. including wetlands on your property have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on ___. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our

published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Morehead City, NC, at (252) 808-2808 to determine their requirements.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact _____ at_____.

C. Basis For Determination

This site exhibits wetland criteria as described in the 1987 Corps Wetland Delineation Manual and Coastal Plain Supplement and is adjacent to Stewarts Creek, a tributary to the Black River, a Navigable Water of the U.S. The site also contains a stream feature (UT to Stewarts Creek) and three jurisdictional tributaries which display Ordinary High Water Marks and drain to Stewarts Creek. This determination is based on information provided by KCI Associates of NC and a site visit by Emily Hughes on 1/16/2013.

D. Remarks

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **4/1/2013**.

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: _____

Date: **2/1/2013** Expiration Date: **2/1/2018**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the attached customer Satisfaction Survey or visit http://per2.nwp.usace.army.mil/survey.html to complete the survey online.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Larry Corbett** et al.	File Number: **SAW-2013-00109**	Date: **2/1/2013**
Attached is:		See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)		B
☐ PERMIT DENIAL		C
☒ **APPROVED JURISDICTIONAL DETERMINATION**		**D**
☐ PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
District Engineer, Wilmington Regulatory Division, **Attn: Emily Hughes, Regulatory Specialist** **Wilmington Regulatory Field Office** **69 Darlington Ave.** **Wilmington, NC 28403-1343**	Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Emily Hughes, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN: 18023960001
DB 1441 PG 211

MELVIN JAME KOREGAY
PIN: 18054588001
DB 1383 PG 363

CORNWALLIS ROAD

LIMITS OF STUDY AREA

WETLAND 8
15,970 S.F.
0.37 ACRES

WETLAND 7
7,574 S.F.
0.17 ACRES

WB JURISDICTIONAL TRIBUTARY
893 S.F.
0.02 ACRES

WETLAND 4
283,609 S.F.
6.51 ACRES

WETLAND 6
3941 S.F.
0.09 ACRES

DP#1
DP#2
DP#3
DP#4
DP#5
DP#6
DP#7

CHANNEL

RPW

WETLAND 9
95,568 S.F.
2.19 ACRES

STREAM
7,308 S.F.
0.17 ACRES

WA JURISDICTIONAL TRIBUTARY
14,167 SF
0.33 ACRES

NON WETLAND

WETLAND 1
55,893 S.F.
1.99 ACRES

NON WETLAND

ISOLATED WETLAND 10
843 S.F.
0.02 ACRES

STEWART CREEK

TOP BANK

CENTERLINE

SHEET 2

SHEET 3

*SITE

VICINITY MAP
NOT TO SCALE

N
W
E
S

GRAPHIC SCALE
0 125 250 500
1 INCH = 250 FEET

WETLAND DELINEATION MAP FOR NORMAN'S PASTURE WETLAND RESTORATION TURKEY TWP, SAMPSON COUNTY NORTH CAROLINA

DATE:	SCALE:	SHEET:
DEC 10, 2012	1" = 250'	1 OF 3

KCI ASSOCIATES OF NORTH CAROLINA C-0764

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS

4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266

20122925

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN: 18023960001
DB 1441 PG 211

WETLAND 8
15,970 S.F.
0.37 ACRES

LIMITS OF
STUDY AREA

WETLAND 7
7,574 S.F.
0.17 ACRES

W9 JURISDICTIONAL
TRIBUTARY
893 S.F.
0.02 ACRES

WETLAND 4
283,659 S.F.
6.51 ACRES

WETLAND 6
3941 S.F.
0.09 ACRES

DP#1

DP#2

DP#3

DP#4

MATCHLINE

N

W

E

S

GRAPHIC SCALE

0 75 150 300

1 INCH = 150 FEET

WETLAND DELINEATION MAP FOR NORMAN'S PASTURE WETLAND RESTORATION TURKEY TWP, SAMPSON COUNTY NORTH CAROLINA

DATE:	SCALE:	SHEET:
DEC 10, 2012	1" = 150'	1 OF 3

KCI ASSOCIATES OF N.C.
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MATCHLINE

WETLAND 4
283,659 S.F.
6.51 ACRES

CHANNEL

RPW

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN: 18023960001
DB 1441 PG 211

WETLAND 9
95,589 S.F.
2.19 ACRES

STREAM
7,306 S.F.
0.17 ACRES

W4
JURISDICTIONAL
TRIBUTARY
14,187 SF
0.33 ACRES

DP#6

DP#5

NON WETLAND

WETLAND 1
86,693 S.F.
1.99 ACRES

NON WETLAND

DP#7

ISOLATED
WETLAND 10
842 S.F.
0.02 ACRES

FENCE

TOP BANK

CENTERLINE

STEWART CREEK

N

W E

S

GRAPHIC SCALE

0 75 150 300

1 INCH = 150 FEET

WETLAND DELINEATION MAP FOR NORMAN'S PASTURE WETLAND RESTORATION TURKEY TWP, SAMPSON COUNTY NORTH CAROLINA

DATE:	SCALE:	SHEET:
DEC 10, 2012	1" = 150'	3 OF 3

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KCI ASSOCIATES OF NORTH CAROLINA C-0764

20122925

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2013-00109** County: **Sampson** U.S.G.S. Quad: **Turkey**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Applicant/Agent: **KCI Associates of NC**
Attn: Steve Stokes
Address: **4601 Six Forks Road**
Raleigh, North Carolina 27609

Property description:

Size (acres)	**69.38**	Nearest Town	**Turkey**
Nearest Waterway	**Stewarts Creek**	River Basin	**Black River**
USGS HUC	**03030006**	Coordinates	**34.903889N, -78.149167 W**

Location description: **Property is known as Normans Pasture, located at 5712 Cornwallis Road, Turkey, North Carolina. PIN 18023960001.**

Indicate Which of the Following Apply:

A. Preliminary Determination

_ Based on preliminary information, there may be waters of the U.S. including wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

B. Approved Determination

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X **There are waters of the U.S. including wetlands on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.**

_ We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters of the U.S. including wetlands on your property have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on ___. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our

published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Morehead City, NC, at (252) 808-2808 to determine their requirements.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact _____ at_____.

C. Basis For Determination

This site exhibits wetland criteria as described in the 1987 Corps Wetland Delineation Manual and Coastal Plain Supplement and is adjacent to Stewarts Creek, a tributary to the Black River, a Navigable Water of the U.S. The site also contains a stream feature (UT to Stewarts Creek) and three jurisdictional tributaries which display Ordinary High Water Marks and drain to Stewarts Creek. This determination is based on information provided by KCI Associates of NC and a site visit on 1/16/2013 and a desktop determination on 5/10/13 by Emily Hughes.

D. Remarks

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **7/10/2013**.

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: Emily Hughes

Date: **5/10/2013** Expiration Date: **5/10/2018**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the attached customer Satisfaction Survey or visit http://per2.nwp.usace.army.mil/survey.html to complete the survey online.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Steve Stokes, KCI Associates**	File Number: **SAW-2013-00109**	Date: **5/10/2013**

Attached is:	See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)	B
☐ PERMIT DENIAL	C
☒ **APPROVED JURISDICTIONAL DETERMINATION**	**D**
☐ PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: **District Engineer, Wilmington Regulatory Division,** **Attn: Emily Hughes, Regulatory Specialist** **Wilmington Regulatory Field Office** **69 Darlington Ave.** **Wilmington, NC 28403-1343**	If you only have questions regarding the appeal process you may also contact: Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Emily Hughes, 69 Darlington Avenue, Wilmington, North Carolina 28403

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Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

MJ JOHNSON ROAD
(60' PUBLIC R/W)

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN:18023960001
DB 1441 PG 211

LIMITS OF STUDY AREA APRIL 2013

WETLAND 10
3,556 S.F.
0.08 ACRES

WETLANDS LOCATED FOR PREVIOUS JD MAP

MELVIN JAME KOREGAY
PIN:18054588001
DB 1383 PG 383

STREAM

LIMITS OF STUDY AREA DEC 2012

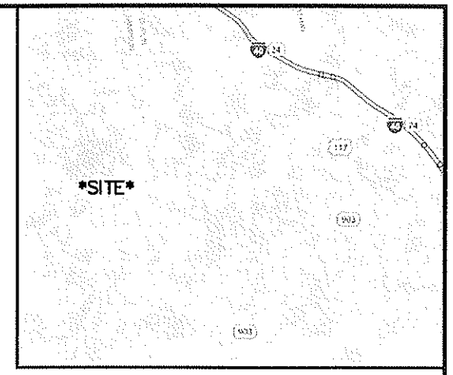
W9 JURISDICTIONAL TRIBUTARY
923 S.F.
0.02 ACRES

FORMER JD ACTION ID SAW-2013-00109

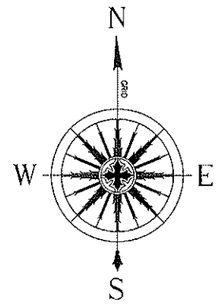
WETLANDS LOCATED FOR PREVIOUS JD MAP

CORNWALLIS ROAD
(80' PUBLIC R/W)

20122925



VICINITY MAP
NOT TO SCALE



GRAPHIC SCALE
0 100 200 400
1 INCH = 200 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 200	1 OF 2

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS

4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266

KCI
ASSOCIATES OF
NORTH CAROLINA
C-0764

EXISTING BARN

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN:18023980001
DB 1441 PG 211

FENCE

LIMITS OF STUDY AREA APRIL 2013

WETLANDS LOCATED FOR PREVIOUS JD MAP

CORNWALLIS ROAD (60' PUBLIC R/W)

R/W LINE

W10-1 W10-2 W10-3 W10-4 W10-5 W10-6 W10-7 W10-8 W10-9 W10-10 W10-11 W10-12 W10-13 W10-14 W10-15 W10-16 W10-17 W10-18 W10-19 W10-20 W10-21 W10-22

DP#8 DP#9

WETLAND 10
3,556 S.F.
0.08 ACRES

CHARLES GLENN CORBETT
LARRY RONALD CORBETT
PIN:18023960001
DB 1441 PG 211

2'

2'

3'

STREAM
2,809 S.F.
0.06 ACRES

3'

4'

PROPERTY LINE

W9 JURISDICTIONAL TRIBUTARY
923 S.F.
0.02 ACRES

JT1-8A JT1-8 JT1-9A JT1-9

FORMER JD ACTION ID SAW-2013-00109

4'

WETLAND 9
95,589 S.F.
2.19 ACRES
(PREVIOUS JD MAP

W9-4B W9-3B

W9 JURISDICTIONAL TRIBUTARY
893 S.F.
0.02 ACRES
(PREVIOUS JD MAP)

LIMITS OF STUDY AREA DEC 2012

WETLANDS LOCATED FOR PREVIOUS JD MAP

20122925

N
GRID
W E
S

GRAPHIC SCALE
0 50 100 200
1 INCH = 100 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 100'	2 OF 2

KCI ASSOCIATES OF NORTH CAROLINA C-0784

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS

4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9288

N

W E

S

GRAPHIC SCALE

0 50 100 200

1 INCH = 100 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 100'	2 OF 2

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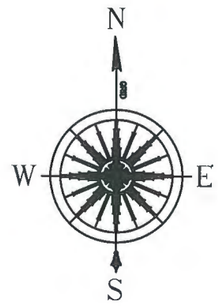
RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266

KCI ASSOCIATES OF NORTH CAROLINA
C-0764

VICINITY MAP
NOT TO SCALE



GRAPHIC SCALE

1 INCH = 200 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 200	1 OF 2

KCI
ASSOCIATES OF
NORTH CAROLINA
C-0764

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RALEIGH, NC 27609
PHONE (919) 783-9214 * FAX (919) 783-9266

N

W E

S

GRAPHIC SCALE

0 50 100 200

1 INCH = 100 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 100'	2 OF 2

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KCI ASSOCIATES OF NORTH CAROLINA
C-0764

VICINITY MAP
NOT TO SCALE

N
W
E
S

GRAPHIC SCALE

0 100 200 400

1 INCH = 200 FEET

WETLAND DELINEATION MAP
FOR
NORMAN'S PASTURE
WETLAND RESTORATION
ADDENDUM 1
TURKEY TWP, SAMPSON COUNTY
NORTH CAROLINA

DATE:	SCALE:	SHEET:
MARCH 28, 2013	1" = 200	1 OF 2

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KCI ASSOCIATES OF NORTH CAROLINA C-0764

FHWA Categorical Exclusion Form

Categorical Exclusion Form for Ecosystem Enhancement Program Projects
Version 1.4

Note: Only Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Norman's Pasture Wetland Restoration Site
County Name:	Sampson County, NC
EEP Number:	95717
Project Sponsor:	KCI Technologies, Inc.
Project Contact Name:	Tim Morris
Project Contact Address:	4601 Six Forks Rd, Suite 220, Raleigh, NC 27609
Project Contact E-mail:	tim.morris@kci.com
EEP Project Manager:	Kristin Miguez

Project Description

For Official Use Only

Reviewed By:

2/26/13
Date

EEP Project Manager

Conditional Approved By:

Date

For Division Administrator
FHWA

☐ **Check this box if there are outstanding issues**

Final Approval By:

2-25-13
Date

For Division Administrator
FHWA

RECEIVED
JAN 29 2013
NC ECOSYSTEM
ENHANCEMENT PROGRAM

Part 2: All Projects Regulation/Question	Response
Coastal Zone Management Act (CZMA)	
1. Is the project located in a CAMA county?	☐ Yes ☒ No
2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?	☐ Yes ☐ No ☒ N/A
3. Has a CAMA permit been secured?	☐ Yes ☐ No ☒ N/A
4. Has NCDCM agreed that the project is consistent with the NC Coastal Management Program?	☐ Yes ☐ No ☒ N/A
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial?	☐ Yes ☒ No ☐ N/A
3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☒ No ☐ N/A
4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☐ No ☒ N/A
5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?	☐ Yes ☐ No ☒ N/A
6. Is there an approved hazardous mitigation plan?	☐ Yes ☐ No ☒ N/A
National Historic Preservation Act (Section 106)	
1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?	☐ Yes ☒ No
2. Does the project affect such properties and does the SHPO/THPO concur?	☐ Yes ☐ No ☒ N/A
3. If the effects are adverse, have they been resolved?	☐ Yes ☐ No ☒ N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Does the project require the acquisition of real estate?	☒ Yes ☐ No ☐ N/A
3. Was the property acquisition completed prior to the intent to use federal funds?	☐ Yes ☒ No ☐ N/A
4. Has the owner of the property been informed: * prior to making an offer that the agency does not have condemnation authority; and * what the fair market value is believed to be?	☒ Yes ☐ No ☐ N/A

Part 3: Ground-Disturbing Activities Regulation/Question	Response
American Indian Religious Freedom Act (AIRFA)	
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	☐ Yes ☒ No
2. Is the site of religious importance to American Indians?	☐ Yes ☐ No ☒ N/A
3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?	☐ Yes ☐ No ☒ N/A
4. Have the effects of the project on this site been considered?	☐ Yes ☐ No ☒ N/A
Antiquities Act (AA)	
1. Is the project located on Federal lands?	☐ Yes ☒ No
2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?	☐ Yes ☐ No ☒ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☐ No ☒ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☒ N/A
Archaeological Resources Protection Act (ARPA)	
1. Is the project located on federal or Indian lands (reservation)?	☐ Yes ☒ No
2. Will there be a loss or destruction of archaeological resources?	☐ Yes ☐ No ☒ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☐ No ☒ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☒ N/A
Endangered Species Act (ESA)	
1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?	☒ Yes ☐ No
2. Is Designated Critical Habitat or suitable habitat present for listed species?	☐ Yes ☒ No ☐ N/A
3. Are T&E species present or is the project being conducted in Designated Critical Habitat?	☐ Yes ☐ No ☒ N/A
4. Is the project "likely to adversely affect" the specie and/or "likely to adversely modify" Designated Critical Habitat?	☐ Yes ☐ No ☒ N/A
5. Does the USFWS/NOAA-Fisheries concur in the effects determination? (By virtue of no-response)	☐ Yes ☐ No ☒ N/A
6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?	☐ Yes ☐ No ☒ N/A

Executive Order 13007 (Indian Sacred Sites)	
1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?	☐ Yes ☒ No
2. Has the EBCI indicated that Indian sacred sites may be impacted by the proposed project?	☐ Yes ☐ No ☒ N/A
3. Have accommodations been made for access to and ceremonial use of Indian sacred sites?	☐ Yes ☐ No ☒ N/A
Farmland Protection Policy Act (FPPA)	
1. Will real estate be acquired?	☒ Yes ☐ No
2. Has NRCS determined that the project contains prime, unique, statewide or local important farmland?	☒ Yes ☐ No ☐ N/A
3. Has the completed Form AD-1006 been submitted to NRCS?	☒ Yes ☐ No ☐ N/A
Fish and Wildlife Coordination Act (FWCA)	
1. Will the project impound, divert, channel deepen, or otherwise control/modify any water body?	☒ Yes ☐ No
2. Have the USFWS and the NCWRC been consulted?	☒ Yes ☐ No ☐ N/A
Land and Water Conservation Fund Act (Section 6(f))	
1. Will the project require the conversion of such property to a use other than public, outdoor recreation?	☐ Yes ☒ No
2. Has the NPS approved of the conversion?	☐ Yes ☐ No ☒ N/A
Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)	
1. Is the project located in an estuarine system?	☐ Yes ☒ No
2. Is suitable habitat present for EFH-protected species?	☐ Yes ☐ No ☒ N/A
3. Is sufficient design information available to make a determination of the effect of the project on EFH?	☐ Yes ☐ No ☒ N/A
4. Will the project adversely affect EFH?	☐ Yes ☐ No ☒ N/A
5. Has consultation with NOAA-Fisheries occurred?	☐ Yes ☐ No ☒ N/A
Migratory Bird Treaty Act (MBTA)	
1. Does the USFWS have any recommendations with the project relative to the MBTA?	☐ Yes ☒ No
2. Have the USFWS recommendations been incorporated?	☐ Yes ☐ No ☒ N/A
Wilderness Act	
1. Is the project in a Wilderness area?	☐ Yes ☒ No
2. Has a special use permit and/or easement been obtained from the maintaining federal agency?	☐ Yes ☐ No ☒ N/A

Categorical Exclusion Form for Ecosystem Enhancement Program Projects
Version 1.4

Note: Only Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Norman's Pasture II Wetland Restoration Site
County Name:	Sampson County, NC
EEP Number:	96310
Project Sponsor:	KCI Technologies, Inc.
Project Contact Name:	Tim Morris
Project Contact Address:	4601 Six Forks Rd, Suite 220, Raleigh, NC 27609
Project Contact E-mail:	tim.morris@kci.com
EEP Project Manager:	Kristin Miguez
Project Description	
For Official Use Only	

Reviewed By:

4/25/14
Date

EEP Project Manager

Conditional Approved By:

Date

For Division Administrator
FHWA

☐ **Check this box if there are outstanding issues**

Final Approval By:

4-24-14
Date

For Division Administrator
FHWA

Part 2: All Projects Regulation/Question	Response
Coastal Zone Management Act (CZMA)	
1. Is the project located in a CAMA county?	☐ Yes ☒ No
2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?	☐ Yes ☐ No ☒ N/A
3. Has a CAMA permit been secured?	☐ Yes ☐ No ☒ N/A
4. Has NCDCM agreed that the project is consistent with the NC Coastal Management Program?	☐ Yes ☐ No ☒ N/A
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial?	☐ Yes ☒ No ☐ N/A
3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☒ No ☐ N/A
4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☐ No ☒ N/A
5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?	☐ Yes ☐ No ☒ N/A
6. Is there an approved hazardous mitigation plan?	☐ Yes ☐ No ☒ N/A
National Historic Preservation Act (Section 106)	
1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?	☐ Yes ☒ No
2. Does the project affect such properties and does the SHPO/THPO concur?	☐ Yes ☐ No ☒ N/A
3. If the effects are adverse, have they been resolved?	☐ Yes ☐ No ☒ N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Does the project require the acquisition of real estate?	☒ Yes ☐ No ☐ N/A
3. Was the property acquisition completed prior to the intent to use federal funds?	☐ Yes ☒ No ☐ N/A
4. Has the owner of the property been informed: * prior to making an offer that the agency does not have condemnation authority; and * what the fair market value is believed to be?	☒ Yes ☐ No ☐ N/A

Part 3: Ground-Disturbing Activities Regulation/Question	Response
American Indian Religious Freedom Act (AIRFA)	
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	☐ Yes ☒ No
2. Is the site of religious importance to American Indians?	☐ Yes ☐ No ☒ N/A
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4. Have the effects of the project on this site been considered?	☐ Yes ☐ No ☒ N/A
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1. Is the project located on Federal lands?	☐ Yes ☒ No
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4. Is the project "likely to adversely affect" the specie and/or "likely to adversely modify" Designated Critical Habitat?	☐ Yes ☐ No ☒ N/A
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3. Is sufficient design information available to make a determination of the effect of the project on EFH?	☐ Yes ☐ No ☒ N/A
4. Will the project adversely affect EFH?	☐ Yes ☐ No ☒ N/A
5. Has consultation with NOAA-Fisheries occurred?	☐ Yes ☐ No ☒ N/A
Migratory Bird Treaty Act (MBTA)	
1. Does the USFWS have any recommendations with the project relative to the MBTA?	☐ Yes ☒ No
2. Have the USFWS recommendations been incorporated?	☐ Yes ☐ No ☒ N/A
Wilderness Act	
1. Is the project in a Wilderness area?	☐ Yes ☒ No
2. Has a special use permit and/or easement been obtained from the maintaining federal agency?	☐ Yes ☐ No ☒ N/A

No-Rise Certification Letter

North Carolina Department of Public Safety
Emergency Management

Pat McCrory, Governor
Frank L. Perry, Secretary

Michael A. Sprayberry, Director

November 7, 2014

Robert Moore, Jr., CFM, Senior Planner
Clinton-Sampson Planning and Development
Post Office Box 199
Clinton, NC 28329-0199

Subject: No-Rise Certification for Norman's Pasture / Norman's Pasture II Restoration Sites, Stewarts Creek, Sampson County

Dear Mr. Moore:

The North Carolina Department of Public Safety Division of Emergency Management Risk Management National Flood Insurance Program (NCNFIP) staff has reviewed the Engineering No-Rise Analysis for the proposed environmental restoration project near Stewarts Creek. The report was prepared by KCI Associates of NC, P.A., Kristin E. Knight, P.E., dated October 27, 2014. The report was received in this office on November 3, 2014.

Based on the information provided, the NCNFIP review indicates the report meets the requirements of the Federal Emergency Management Agency's (FEMA) guidance for a no-rise certification. The NCNFIP finds no objection to the conclusion of no increase in base flood elevation or floodway elevation as contained in the report.

The No-Rise Certification Study is used to measure impacts due to the proposed development within the floodway. It should not be used to establish base flood elevations.

All work in the Special Flood Hazard Area must still comply with the Sampson County Flood Damage Prevention Ordinance and NFIP regulations. A floodplain development permit will be required prior to starting work.

If you have any questions or concerns with the items herein, please feel free to contact Dan Brubaker at (919) 825-2300, by email at dan.brubaker@ncdps.gov or at the address shown on the footer of this document.

Sincerely,

Kenneth W. Ashe, P.E., CFM
Assistant Director
Risk Management

MAILING ADDRESS:
4218 Mail Service Center
Raleigh NC 27699-4218
www.ncem.org

GTM OFFICE LOCATION:
4105 Reedy Creek Road
Raleigh, NC 27607
Telephone: (919) 825-2341
Fax: (919) 825-0408

FEMA Floodplain Checklist

EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. State NFIP Engineer), NC Floodplain Mapping Unit (attn. State NFIP Coordinator) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	Norman's Pasture Restoration Site Norman's II Restoration Site
Name if stream or feature:	Stewarts Creek
County:	Sampson County
Name of river basin:	Cape Fear
Is project urban or rural?	Rural
Name of Jurisdictional municipality/county:	Sampson County
DFIRM panel number for entire site:	2442
Consultant name:	KCI Technologies, Inc.
Phone number:	919-783-9214
Address:	4601 Six Forks Rd. Raleigh, NC 27609

Design Information

Provide a general description of project (one paragraph). Include project limits on a reference orthophotograph at a scale of 1" = 500".

The proposed work will restore drained wetlands at two adjacent EEP projects, Norman's Pasture and Norman's Pasture II. These two projects exist on the upper portion of the mapped 100-year floodplain (Zone AE) of Stewarts Creek in Sampson County. The actions to restore the wetlands will include redirecting seepage flow to historic wetland flow patterns, filling field ditches, reestablishing wetland roughness, and restoring or enhancing native wetland vegetation. A small section (843 lf) of stream enhancement is also included in Norman's Pasture II. The channel of Stewarts Creek will not be changed as part of this project.

Summarize stream reaches or wetland areas according to their restoration priority.

Reach	Length	Priority
Wetland Re-establishment (Norman's Pasture)	*15.5 acres*	*Restoration (Re-establishment)*
Wetland Rehabilitation (Norman's Pasture)	*0.7 acre*	*Restoration (Rehabilitation)*
Wetland Preservation (Norman's Pasture)	*9.0 acres*	*Preservation*
Wetland Restoration (Norman's Pasture II)	*8.8 acres*	*Restoration (Re-establishment)*
Wetland Rehabilitation (Norman's Pasture II)	*1.4 acres*	*Restoration (Rehabilitation)*
Wetland Preservation (Norman's Pasture II)	*0.8 acre*	*Preservation*
Stream Enhancement II (Norman's Pasture II)	*843 lf*	*Stream Enhancement II*

Floodplain Information

Is project located in a Special Flood Hazard Area (SFHA)?

◉ Yes ○ No

If project is located in a SFHA, check how it was determined:

☐ Redelineation

☐ Detailed Study

☑ Limited Detail Study

☐ Approximate Study

☐ Don't know

List flood zone designation:

Check if applies:

☑ AE Zone

- ○ Floodway
- ◉ Non-Encroachment
- ○ None

☐ A Zone

- ○ Local Setbacks Required
- ○ No Local Setbacks Required

If local setbacks are required, list how many feet:

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?

○ Yes ◉ No

Land Acquisition (Check)

☐ State owned (fee simple)

☐ Conservation easment (Design Bid Build)

☑ Conservation Easement (Full Delivery Project)

Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program?

◉ Yes ○ No

Note: if community is not participating, then all requirements should be addressed to NFIP (attn: State NFIP Engineer, (919) 715-8000)

Name of Local Floodplain Administrator: Lyle Moore
Phone Number: (910) 299-4904, ext. 3035

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

☐ No Action

☑ No Rise

☐ Letter of Map Revision

☐ Conditional Letter of Map Revision (CLOMR)

☐ Other Requirements

List other requirements:

Comments:

Name: _____ Signature: _____

Title: _____ Date: _____

Appendix C. Mitigation Work Plan Data and Analyses

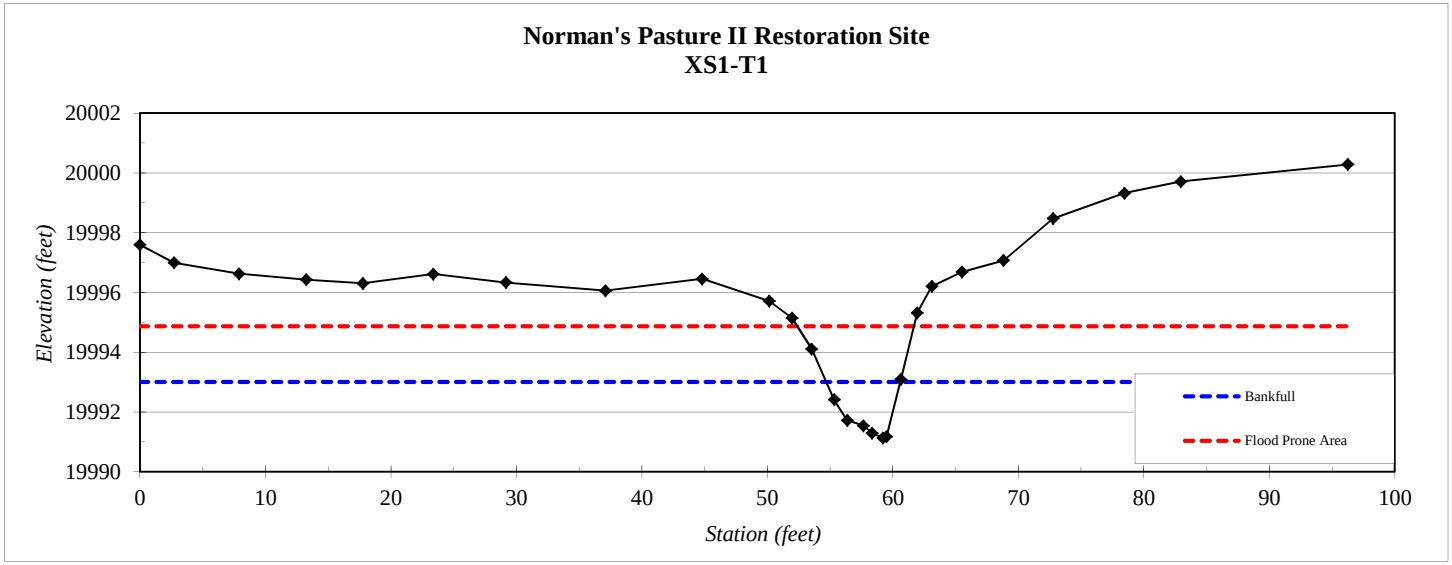
Existing Conditions

Cross-Sections

River Basin:	Cape Fear
Watershed:	Normans Pasture II, Existing Conditions (T1)
XS ID	XS1
Drainage Area (sq mi):	
Date:	4/14/2014
Field Crew:	A. French, T. Seelinger

Station	Elevation
0.0	19997.59
2.7	19996.99
7.9	19996.62
13.3	19996.43
17.8	19996.30
23.4	19996.61
29.2	19996.33
37.1	19996.06
44.8	19996.45
50.2	19995.71
52.0	19995.14
53.5	19994.11
55.3	19992.41
56.4	19991.72
57.7	19991.54
58.3	19991.29
59.2	19991.13
59.5	19991.17
60.6	19993.09
61.9	19995.32
63.1	19996.20
65.5	19996.68
68.8	19997.07
72.8	19998.47
78.5	19999.32
82.94	19999.71
96.26	20000.28

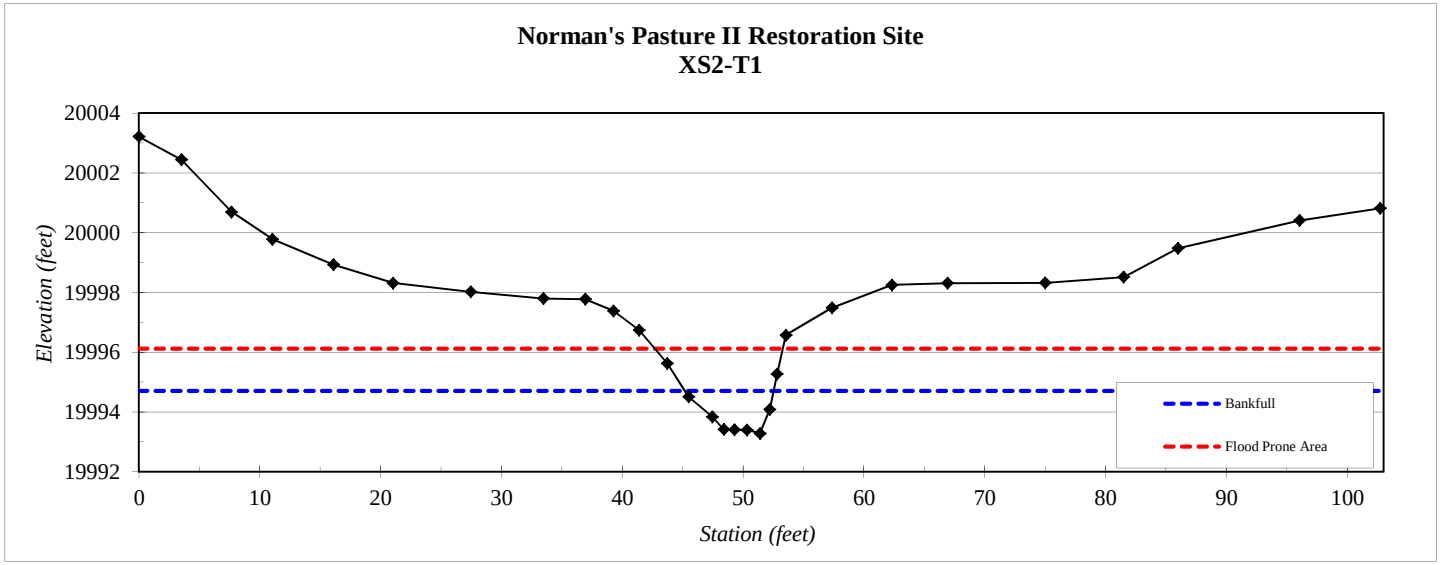
SUMMARY DATA	
Bankfull Elevation:	19993.0
Bankfull Cross-Sectional Area:	7.1
Bankfull Width:	5.9
Flood Prone Area Elevation:	19994.9
Flood Prone Width:	10
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.2
W / D Ratio:	4.9
Entrenchment Ratio:	1.7
Bank Height Ratio:	2.8



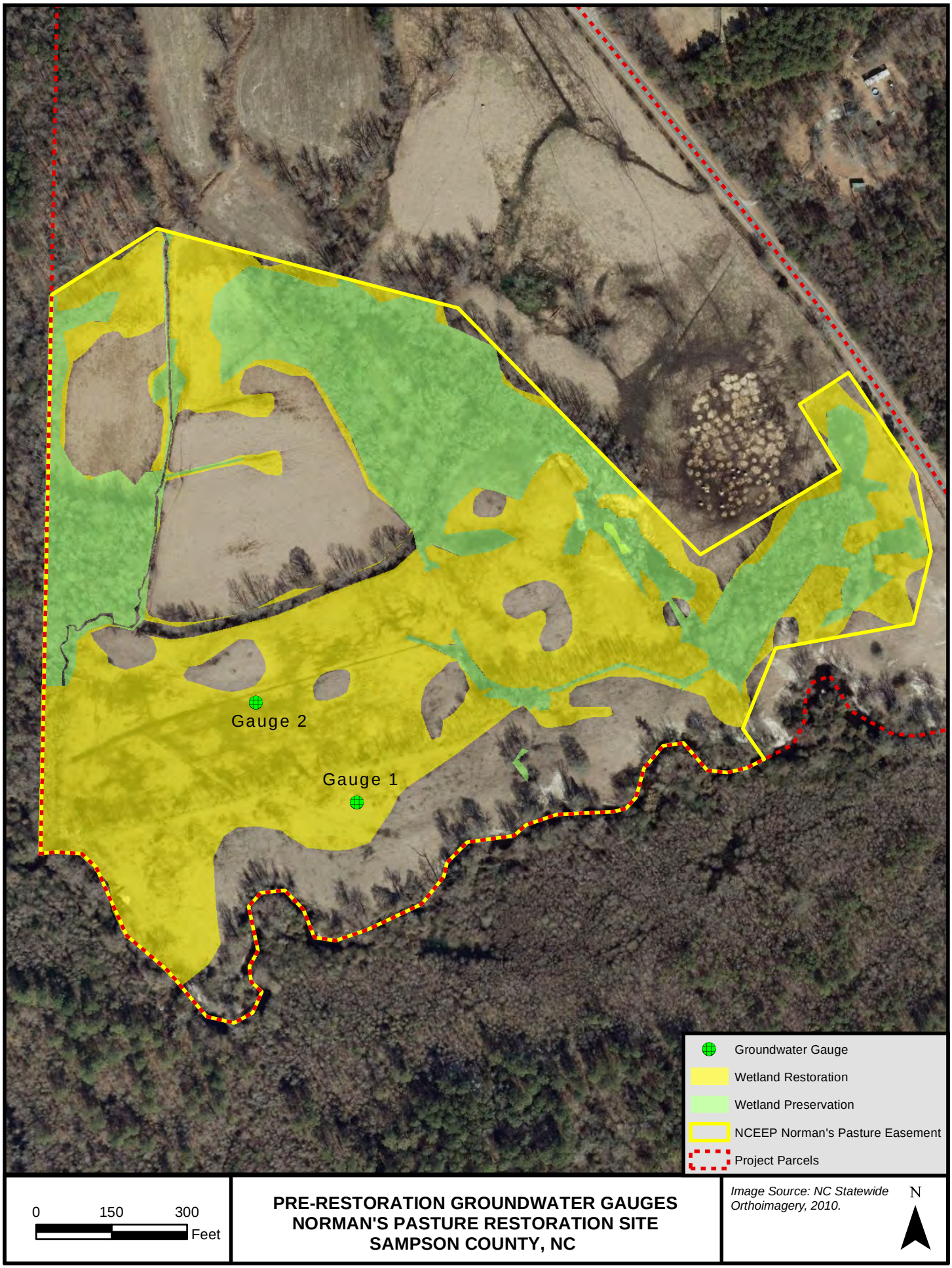
River Basin:	Cape Fear
Watershed:	Normans Pasture II, Existing Conditions (T1)
XS ID	XS2
Drainage Area (sq mi):	
Date:	4/14/2014
Field Crew:	A. French, T. Seelinger

Station	Elevation
0.0	20003.22
3.5	20002.44
7.7	20000.69
11.0	19999.78
16.1	19998.93
21.0	19998.31
27.5	19998.02
33.5	19997.79
36.9	19997.77
39.3	19997.38
41.4	19996.73
43.7	19995.62
45.5	19994.51
47.5	19993.83
48.4	19993.41
49.3	19993.40
50.3	19993.40
51.4	19993.28
52.2	19994.08
52.8	19995.27
53.5	19996.57
57.4	19997.48
62.3	19998.25
66.9	19998.31
75.0	19998.32
81.5	19998.51
86.0	19999.48
96.1	20000.41
102.7	20000.82

SUMMARY DATA	
Bankfull Elevation:	19994.7
Bankfull Cross-Sectional Area:	7.0
Bankfull Width:	7.3
Flood Prone Area Elevation:	19996.1
Flood Prone Width:	10
Max Depth at Bankfull:	1.4
Mean Depth at Bankfull:	1.0
W / D Ratio:	7.6
Entrenchment Ratio:	1.4
Bank Height Ratio:	3.2



DRAINMOD Model Results



PRE-RESTORATION GROUNDWATER GAUGES
NORMAN'S PASTURE RESTORATION SITE
SAMPSON COUNTY, NC

Image Source: NC Statewide Orthoimagery, 2010.

Normans_Gauge1_Existing.WET

```
-----------------------------------------------------
*              DRAINMOD version 6.1                 *
* Copyright 1980-2011 North Carolina State University *
-----------------------------------------------------
```

Proposed Normans Gauge 1
Elizabethtown, NC 312732

****

```
 ----------RUN STATISTICS ----------          time: 10/16/2013  @  9:58
input file:   C:\DrainMod\inputs\Normans_Gauge1_Existing.prj
parameters:    free drainage              and yields not calculated
              drain spacing =    4420. cm   drain depth =   27.5 cm
```

DRAINMOD --- WET PERIOD EVALUATION
****** Version 6.1 ******

Number of periods with water table closer than 30.00 cm
for at least   32 days. Counting starts on day
59 and ends on day 325 of each year

YEAR	Number of Periods of 32 days or more with WTD < 30.00 cm	Longest Consecutive Period in Days
1959	1.	44.
1960	0.	30.
1961	0.	26.
1962	1.	32.
1963	0.	27.
1964	0.	31.
1965	1.	33.
1966	0.	23.
1967	1.	44.
1968	1.	33.
1969	0.	30.
1970	1.	37.
1971	2.	44.
1972	1.	32.
1973	0.	22.
1974	1.	33.
1975	1.	50.
1976	1.	34.
1977	0.	24.
1978	1.	36.
1979	0.	23.
1980	0.	28.
1981	0.	15.
1982	0.	31.
1983	1.	43.
1984	1.	39.
1985	0.	22.
1986	0.	0.
1987	1.	41.
1988	0.	24.

	Normans_Gauge1_Existing.WET	
1989	0.	29.
1990	0.	0.
1991	0.	27.
1992	0.	0.
1993	0.	31.
1994	0.	18.
1995	0.	16.
1996	0.	27.
1997	0.	22.
1998	0.	18.
1999	1.	33.
2000	0.	0.
2001	0.	0.
2002	1.	35.
2003	0.	26.
2004	0.	14.
2005	0.	29.
2006	2.	37.
2007	0.	21.
2008	0.	30.
2009	1.	34.
2010	0.	27.
2011	0.	24.
2012	0.	15.

Number of Years with at least one period = 19. out of 54 years.

Normans_Gauge1_Proposed.WET

```
-----------------------------------------------------
*              DRAINMOD version 6.1                 *
* Copyright 1980-2011 North Carolina State University *
-----------------------------------------------------
```

Proposed Normans Gauge 1
Elizabethtown, NC 312732

****

----------RUN STATISTICS ---------- time: 10/16/2013 @ 9:59
input file: C:\DrainMod\inputs\Normans_Gauge1_Proposed.prj
parameters: free drainage and yields not calculated
drain spacing = 4420. cm drain depth = 2.5 cm

DRAINMOD --- WET PERIOD EVALUATION
****** Version 6.1 ******

Number of periods with water table closer than 30.00 cm
for at least 32 days. Counting starts on day
59 and ends on day 325 of each year

YEAR	Number of Periods of 32 days or more with WTD < 30.00 cm	Longest Consecutive Period in Days
1959	3.	67.
1960	3.	79.
1961	3.	68.
1962	2.	59.
1963	1.	40.
1964	2.	86.
1965	2.	69.
1966	2.	58.
1967	1.	82.
1968	2.	33.
1969	3.	57.
1970	3.	55.
1971	3.	52.
1972	2.	34.
1973	1.	54.
1974	1.	72.
1975	2.	59.
1976	1.	34.
1977	3.	62.
1978	3.	53.
1979	2.	54.
1980	1.	54.
1981	2.	63.
1982	0.	31.
1983	1.	74.
1984	2.	81.
1985	1.	47.
1986	0.	0.
1987	2.	63.
1988	2.	122.

	Normans_Gauge1_Proposed.WET	
1989	2.	57.
1990	0.	0.
1991	2.	63.
1992	0.	0.
1993	2.	72.
1994	0.	29.
1995	2.	64.
1996	1.	123.
1997	1.	32.
1998	1.	32.
1999	1.	68.
2000	0.	0.
2001	0.	0.
2002	4.	45.
2003	2.	64.
2004	0.	26.
2005	4.	62.
2006	3.	83.
2007	0.	28.
2008	2.	113.
2009	2.	56.
2010	2.	56.
2011	1.	92.
2012	2.	63.

Number of Years with at least one period = 45. out of 54 years.

Normans_Gauge2_Existing.WET

```
-----------------------------------------------------
*              DRAINMOD version 6.1                 *
* Copyright 1980-2011 North Carolina State University *
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```

Pre-existing Normans Gauge 2
Elizabethtown, NC 312732

****

```
 ----------RUN STATISTICS ----------          time: 10/16/2013  @ 10: 0
input file:   C:\DrainMod\inputs\Normans_Gauge2_Existing.prj
parameters:    free drainage              and yields not calculated
              drain spacing =    5029. cm   drain depth =   27.5 cm
```

DRAINMOD --- WET PERIOD EVALUATION
****** Version 6.1 ******

Number of periods with water table closer than 30.00 cm
for at least 32 days. Counting starts on day
59 and ends on day 325 of each year

YEAR	Number of Periods of 32 days or more with WTD < 30.00 cm	Longest Consecutive Period in Days
1959	1.	36.
1960	0.	27.
1961	0.	20.
1962	0.	19.
1963	0.	24.
1964	0.	18.
1965	0.	29.
1966	0.	13.
1967	0.	10.
1968	0.	16.
1969	0.	26.
1970	1.	35.
1971	0.	16.
1972	0.	16.
1973	0.	18.
1974	0.	23.
1975	0.	16.
1976	0.	23.
1977	0.	12.
1978	0.	14.
1979	0.	15.
1980	0.	22.
1981	0.	9.
1982	0.	17.
1983	0.	20.
1984	0.	19.
1985	0.	12.
1986	0.	0.
1987	0.	26.
1988	0.	14.

Normans_Gauge2_Existing.WET

1989	0.	18.
1990	0.	0.
1991	0.	13.
1992	0.	0.
1993	0.	16.
1994	0.	10.
1995	0.	14.
1996	0.	12.
1997	0.	10.
1998	0.	15.
1999	0.	17.
2000	0.	0.
2001	0.	0.
2002	0.	13.
2003	0.	15.
2004	0.	5.
2005	0.	14.
2006	0.	14.
2007	0.	8.
2008	0.	15.
2009	0.	11.
2010	0.	21.
2011	0.	14.
2012	0.	13.

Number of Years with at least one period = 2. out of 54 years.

Normans_Gauge2_Proposed.WET

```
-----------------------------------------------------
*              DRAINMOD version 6.1                 *
* Copyright 1980-2011 North Carolina State University *
-----------------------------------------------------

Pre-existing Normans Gauge 2
Elizabethtown, NC 312732
********************************************************************************


  ----------RUN STATISTICS ----------          time: 10/16/2013  @ 10: 1
 input file:   C:\DrainMod\inputs\Normans_Gauge2_Proposed.prj
 parameters:    free drainage              and yields not calculated
               drain spacing =    5029. cm   drain depth =    5.0 cm
--------------------------------------------------------------------------
```

DRAINMOD --- WET PERIOD EVALUATION
****** Version 6.1 ******

Number of periods with water table closer than 30.00 cm
for at least 32 days. Counting starts on day
59 and ends on day 325 of each year

YEAR	Number of Periods of 32 days or more with WTD < 30.00 cm	Longest Consecutive Period in Days
1959	3.	43.
1960	3.	52.
1961	3.	63.
1962	2.	58.
1963	0.	27.
1964	2.	82.
1965	2.	43.
1966	2.	42.
1967	1.	74.
1968	1.	32.
1969	3.	36.
1970	2.	49.
1971	2.	52.
1972	1.	32.
1973	1.	53.
1974	1.	50.
1975	2.	58.
1976	1.	34.
1977	2.	60.
1978	2.	51.
1979	2.	47.
1980	1.	45.
1981	2.	60.
1982	0.	31.
1983	1.	71.
1984	2.	78.
1985	1.	37.
1986	0.	0.
1987	1.	44.
1988	1.	84.

	Normans_Gauge2_Proposed.WET	
1989	1.	57.
1990	0.	0.
1991	1.	38.
1992	0.	0.
1993	2.	65.
1994	0.	22.
1995	1.	41.
1996	1.	110.
1997	0.	30.
1998	0.	31.
1999	1.	68.
2000	0.	0.
2001	0.	0.
2002	2.	44.
2003	2.	51.
2004	0.	19.
2005	3.	47.
2006	3.	78.
2007	0.	27.
2008	2.	95.
2009	1.	55.
2010	1.	38.
2011	1.	87.
2012	1.	62.

Number of Years with at least one period = 42. out of 54 years.

Soil Delineation and Characterization

A detailed soils investigation at the NPRS was conducted by a licensed soil scientist (# 187) to determine the extent and distribution of the hydric soils and to classify the predominate soils to the soil series level. The investigation consisted of delineating the hydric soil boundaries with pink flagging and wooden survey stakes in accordance with the US Army Corps of Engineers, Wetland Delineation Manual (1987) and the USDA Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0 (2010). Areas that were identified as possible hydric soil mapping units were surveyed at a higher intensity until the edge of the mapping unit was identified. The boundary of the hydric and non-hydric soil mapping units were then followed by continual sampling and observations as the boundary line was identified and delineated. In those areas where the boundary was found to be a broad gradient rather than a distinct break, microtopography, landscape position, soil textural changes, redoximorphic features, and depleted matrices were additionally considered to identify the extent of the hydric soils.

In developing a detailed soils map, several soil borings were advanced on the site in the general hydric soil areas identified by landscape position, vegetation and slope. Once the hydric soil borings were identified, the soil scientist marked the points and established a visual line to the next auger boring where again hydric soil conditions were confirmed by additional borings. The soil scientist moved along the edges of the mapping unit and marked each point along the line. To confirm the hydric soil mapping unit and taxonomic classification, soil borings were advanced to a depth of 50 inches. The soil profile descriptions identified the individual horizons in the topsoil and upper subsoil as well as the depth, color, texture, structure, boundary, and evidence of restrictive horizons and redoximorphic features. Delineated hydric soils boundaries were in contrast to those mapped in the Soil Survey of Sampson County, North Carolina. The delineated hydric soil boundaries are shown in the following figure, Detailed Soils Map.

Taxonomic Classification
The predominant soils identified on the site were of the Lumbee sandy loam (Fine-loamy over sandy or sandy-skeletal, siliceous, subactive, thermic Typic Endoaquults), Bibb and Johnston (Coarse-loamy, siliceous, active, acid, thermic Typic Fluvaquents), Johnston loam (Coarse-loamy, siliceous, active, acid, thermic Cumulic Humaquepts), Chipley sand (Thermic, coated Aquic Quartzipsamments), Johns fine sandy loam (Fine-loamy over sandy or sandy-skeletal, siliceous, semiactive, thermic Aquic Hapludults), Lynn Haven sand (Sandy, siliceous, thermic Typic Alaquods), and Torhunta fine sandy loam (Coarse-loamy, siliceous, active, acid, thermic Typic Humaquepts) soil series. All of these series except for Chipley sand are listed as hydric soils in Sampson County, North Carolina. They are defined as hydric due to saturation for a significant period during the growing season. This soil is listed as hydric on the federal, state and local lists. They are also listed by the Natural Resources Conservation Service (NRCS) as hydric soils.

Profile Description
Typical Pedon Descriptions:

LUMBEE SERIES
TAXONOMIC CLASS: Fine-loamy over sandy or sandy-skeletal, siliceous, subactive, thermic Typic Endoaquults

TYPICAL PEDON: Lumbee find sandy loam--woodland. (Colors are for moist soil unless otherwise stated.)

A--0 to 6 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; many fine and coarse roots; very strongly acid; clear wavy boundary. (6 to 10 inches thick)

Eg--6 to 14 inches; light brownish gray (2.5Y 6/2) loamy sand; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary. (0 to 12 inches thick)

Btg1--14 to 30 inches; light gray (10YR 7/1) sandy clay loam; common fine and medium brownish yellow (10YR 6/6) masses of oxidized iron; weak medium and coarse subangular blocky structure; few clay films in pores; 2 percent, by volume quartz pebbles; few fine and medium pores; very strongly acid; gradual irregular boundary.

Btg2--30 to 36 inches; light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; friable; 2 percent, by volume quartz pebbles; very strongly acid; gradual irregular boundary. (Combined thickness of the Btg horizons is 14 to 32 inches.)

2Cg--36 to 60 inches; light gray (10YR 7/1) loamy sand; common medium distinct very pale brown (10YR 7/4) and brownish yellow (10YR 6/6) masses of oxidized iron; 10 percent, by volume fine quartz pebbles; very strongly acid.

TYPE LOCATION: Scotland County, North Carolina; about 4.0 miles north of Maxton on State Road 1407; 0.5 mile east of Laurinburg-Maxton Airbase hangers, 25 feet north of farm road.

RANGE IN CHARACTERISTICS:
Thickness of the sandy surface and subsurface layers: 6 to 19 inches
Depth to top of the Argillic horizon: 6 to 19 inches
Depth to the base of the Argillic horizon: 14 to 40 inches
Depth to contrasting soil material (lithologic discontinuity): 14 to 40 inches
Soil reaction: Very strongly acid or strongly acid throughout, except where limed
Depth to bedrock: Greater than 80 inches
Depth to Seasonal High Water Table: 0 to 12 inches, November to April
Rock Fragment content: 0 to 15 percent, by volume; mostly fine quartz pebbles

RANGE OF INDIVIDUAL HORIZONS:
A horizon or Ap horizon (where present):
Color--hue of 10YR or 2.5Y, value of 2 to 5, chroma of 1 to 3, or is neutral with value of 2 to 5
Texture--loamy sand, sandy loam, fine sandy loam, loam, or silt loam

Eg horizon:
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture--loamy sand, sandy loam, fine sandy loam, loam, or silt loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

EBg or BEg horizon (where present):
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture--sandy loam, fine sandy loam, or loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

Btg horizon:
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture--sandy loam, loam, sandy clay loam, or clay loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

BCg or CBg horizon (where present):
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture-- loamy coarse sand, loamy sand, or sandy loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

Cg horizon (where present):
Color--hue of 10YR to 5Y, value of 4 to 8, chroma of 1 or 2 or is variegated in shades of these colors
Texture--loamy sand or sandy loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

2Cg horizon:
Color--hue of 10YR to 5Y, value of 4 to 8, chroma of 1 or 2 or is variegated in shades of these colors
Texture--coarse sand, sand, fine sand, loamy coarse sand, loamy sand, or loamy fine sand. Some pedons below 40 inches have thin lenses of sandy loam, loam, or clay loam
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

BIBB AND JOHNSTON SEIRES
TAXONOMIC CLASS: Coarse-loamy, siliceous, active, acid, thermic Typic Fluvaquents

TYPICAL PEDON: Bibb sandy loam--forested. (Colors are for moist soils.)

A--0 to 4 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; friable; common fine roots and pores; strongly acid; abrupt wavy boundary. (2 to 6 inches thick)

Ag--4 to 12 inches; mottled dark gray (N 4/) and dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; friable; few fine roots and pores; common fine strong brown (7.5YR 5/6) stains around old roots; strongly acid; clear wavy boundary. (0 to 19 inches thick)

Cg1--12 to 37 inches; gray (5Y 5/1) sandy loam; massive; friable; few fine roots and pores; common medium strong brown (7.5YR 5/6) stains around old roots; common thin strata of silt loam to loamy sand; some strata have bits of partially decomposed organic materials; very strongly acid; clear wavy boundary. (10 to 40 inches thick)

Cg2--37 to 60 inches; gray (N 5/) silt loam; massive; slightly sticky; common strata of sandy loam and loamy sand; common thin strata with partially decomposed organic materials; strongly acid.

TYPE LOCATION: Autauga County, Alabama; 300 yards north of where Martin Boulevard crosses Pine Creek in Prattville, in the SE1/4, SW1/4, SW1/4 of Sec. 26, T. 13 N., R. 16 E.

RANGE IN CHARACTERISTICS: Reaction ranges from extremely acid to strongly acid throughout. Content of mica flakes ranges from none to common. Content of rounded gravel typically ranges from 0 to 10 percent throughout, but may range to 35 percent in thin strata below a depth of 40 inches. Buried soil horizons, present in many pedons, have the same range in color and texture as the Ag horizon.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 1 to 3. It is sand, loamy sand, loamy fine sand, fine sandy loam, and sandy loam, loam, or silt loam.

The Ag horizon, present in most pedons, has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 2 or less; or it is neutral with value of 3 to 7. Combined thickness of the A and Ag horizons with value of 3 or less is less than 6 inches. Mottles in shades of brown and yellow range from none to common. Texture is sand, loamy sand, loamy fine sand, fine sandy loam, and sandy loam, loam, or silt loam.

The Cg horizon has hue of 10YR through 5BG, value of 3 to 7, and chroma of 2 or less; or it is neutral with value of 3 to 7. Mottles in shades of red, yellow, and brown range from few to many. The upper part of the Cg horizon is sandy loam, fine sandy loam, loam, or silt loam; or is stratified with these textures. Thin strata of finer or coarser textured material are in most pedons. Texture of the lower part of the Cg horizon includes sand, loamy sand, and loamy fine sand in addition to those of the upper part.

JOHNSTON SERIES

TAXONOMIC CLASS: Coarse-loamy, siliceous, active, acid, thermic Cumulic Humaquepts

TYPICAL PEDON: Johnston mucky loam--forested. (Colors are for moist soil unless otherwise stated.)

A--0 to 30 inches; black (10YR 2/1) mucky loam; massive; friable; very strongly acid; abrupt smooth boundary. (24 to 48 inches thick)

Cg1--30 to 34 inches; dark gray (10YR 4/1) loamy fine sand; single grained; loose; very strongly acid; abrupt smooth boundary.

Cg2--34 to 60 inches; gray (10YR 5/1) fine sandy loam; lenses and pockets of loamy sand and sand; massive; very friable; dark colored loam in old root channels; very strongly acid.

TYPE LOCATION: Scotland County, North Carolina; 3 miles south of Wagram; 50 feet west of Shoe Heel Creek; 1.5 miles north of Lee's pond; 25 feet south of a paved road.

RANGE IN CHARACTERISTICS:
Depth to Bedrock: Greater than 80 inches
Depth to Seasonal High Water Table: 0 to 12 inches, November to May
Rock fragment content: Below 40 inches, 0 to 35 percent, by volume, mostly rounded quartz gravel
Soil Reaction: Extremely acid to strongly acid
Other Features: Some pedons have a few inches of recent alluvium deposited over the dark colored a horizon or thin (less than 8 inches thick) organic layers.

RANGE OF INDIVIDUAL HORIZONS:

Oa horizon (where present):

Color--hue of 10YR, value of 2 or 3, chroma of 1 or 2, hue of 2.5Y, value of 2.5 or 3, chroma of 1 or 2, or is neutral with value of 2.5 or 3
Texture--muck

A horizon:
Color--hue of 10YR, value of 2 or 3, chroma of 1 or 2, hue of 2.5Y or 5Y, value of 2.5 or 3, chroma of 1 or 2, or is neutral with value of 2.5 or 3
Texture (fine-earth fraction)--coarse sandy loam, sandy loam, fine sandy loam, or loam and may include the mucky texture modifier.
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray
Other features--Organic matter content of the A horizon ranges from 3 to about 20 percent

Cg horizon:
Color--hue of 10YR to 5Y, value of 4 to 8, chroma of 1 to 2, or is neutral with value of 4 to 7
Texture (fine-earth fraction)--coarse sand, sand, fine sand, loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, or loam. Some pedons have thin strata of sandy clay loam.
Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray

CHIPLEY SERIES
TAXONOMIC CLASS: Thermic, coated Aquic Quartzipsamments

TYPICAL PEDON: Chipley sand--wooded. (Colors are for moist soil.)

A1--0 to 3 inches; very dark gray (10YR 3/1) sand; single grained; loose; many fine roots; strongly acid; gradual smooth boundary.

A2--3 to 6 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine roots; strongly acid; gradual irregular boundary. (Combined thickness of the A horizons range from 3 to 16 inches.)

C1--6 to 16 inches; light yellowish brown (10YR 6/4) sand; common fine and medium distinct yellowish brown coats and few medium distinct dark gray (10YR 4/1) streaks along the root channels; single grained; loose; few fine roots; strongly acid; gradual irregular boundary. (8 to 13 inches thick)

C2--16 to 32 inches; brownish yellow (10YR 6/6) sand; single grained; loose; few fine roots; common fine and medium faint strong brown (7.5YR 5/6) masses of iron accumulation; few fine faint streaks of light gray (10YR 7/1) iron depletions; strongly acid; gradual wavy boundary. (14 to 24 inches thick)

C3--32 to 55 inches; 34 percent brownish yellow (10YR 6/6), 33 percent light gray (10YR 7/2) and 33 percent strong brown (7.5YR 5/6) sand; single grained; loose; few fine roots; the areas in colors of brownish yellow and strong brown are masses of iron accumulation and the areas in colors of light gray are iron depletions; strongly acid; gradual irregular boundary. (10 to 24 inches thick)

Cg--55 to 77 inches; light gray (10YR 7/2) sand; single grained; loose; very few fine roots; many coarse distinct very pale brown (10YR 7/4) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid; gradual smooth boundary.

TYPE LOCATION: Washington County, Florida, approximately 0.75 mile southwest of Greenhead Community, NW1/4, NW1/4, sec. 17, R. 14 W., T. 1 N.

RANGE IN CHARACTERISTICS: Silt plus clay content between depths of 10 and 40 inches is 5 to 10 percent. Reaction ranges from extremely acid to moderately acid in the A horizon except where limed and from very strongly acid to slightly acid in the C horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 3. Where value is 3.5 or less, thickness is less than 10 inches. Texture is sand or fine sand.

The C horizon has hue of 10YR to 5Y, value of 4 to 8, and chroma of 1 to 8. Redoximorphic features in shades of gray, red, brown or yellow range from few to many. Some pedons have a few streaks of gray to light gray uncoated sand grains along root channels in the upper part of the C horizon. Texture is sand or fine sand.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 8, and chroma of 2 or less; or it is neutral with value of 4 to 8. Redoximorphic features in shades of red, brown, yellow or gray range from few to many. Some pedons have a few streaks of gray to light gray uncoated sand grains along root channels in the upper part of the C horizon. Texture is sand or fine sand.

JOHNS SERIES

TAXONOMIC CLASS: Fine-loamy over sandy or sandy-skeletal, siliceous, semiactive, thermic Aquic Hapludults

TYPICAL PEDON: Johns fine sandy loam--cultivated field. (Colors are for moist soils unless otherwise stated.)

Ap--0 to 8 inches; dark gray (10YR 4/1) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt wavy boundary. (5 to 10 inches thick)

E--8 to 15 inches; very pale brown (10YR 7/3) loamy sand; weak medium granular structure; very friable; few brittle areas at contact with Bt horizon; strongly acid; clear wavy boundary. (0 to 10 inches thick)

Bt1--15 to 18 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; weak medium subangular blocky structure; friable; few medium faint strong brown (7.5YR 5/8) and brownish yellow (10YR 6/6) masses of oxidized iron and light brownish gray (2.5Y 6/2) iron depletions; strongly acid; clear wavy boundary.

Bt2--18 to 32 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; many medium and coarse distinct gray (10YR 6/1) iron depletions and strong brown (7.5YR 5/8) masses of oxidized iron; very strongly acid; gradual smooth boundary. (Combined thickness of Bt is 12 to 25 inches thick.)

2Cg--32 to 60 inches; light gray (10YR 7/1) sand; single grained; loose; lenses and pockets of sandy loam and loamy sand; common coarse distinct brownish yellow (10YR 6/8) masses of oxidized iron; very strongly acid.

TYPE LOCATION: Scotland County, North Carolina; 4 miles north of Maxton on North Carolina Highway 71, and 1 mile northwest of Sycamore Hill Church.

RANGE IN CHARACTERISTICS:
Thickness of the sandy surface and subsurface layers: 6 to 19 inches
Depth to top of the Argillic horizon: 5 to 19 inches
Depth to the base of the Argillic horizon: 18 to 40 inches
Depth to Contrasting Soil Material (lithologic discontinuity): 15 to 40 inches
Rock Fragment Content: 0 to 5 percent, by volume in the A, E, and B horizon and 0 to 15 percent in the C horizon
Soil Reaction: Very strongly acid to moderately acid, except where limed
Depth to Bedrock: Greater than 80 inches
Depth to Seasonal High Water Table: 12 to 36 inches, December to April
Other features: Average content of 18 to 35 percent clay in the particle-size control section and less than 30 percent silt.

RANGE OF INDIVIDUAL HORIZONS:
Ap horizon or A horizon (where present):
Color--10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4, or is neutral with value of 3 to 5
Texture--loamy sand, loamy fine sand, sandy loam, or fine sandy loam

E horizon:
Color--10YR or 2.5Y, value of 5 to 7, chroma of 3 or 4, or is neutral with value of 5 to 7
Texture--loamy sand, loamy fine sand, sandy loam, or fine sandy loam

BE horizon (where present):
Color--10YR or 2.5Y, value of 5 to 7, chroma of 3 to 6, or is neutral with value of 4 to 8
Texture--sandy loam or fine sandy loam

Bt horizon:
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 3 to 8
Texture--sandy clay loam or sandy loam
Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

Btg horizon (where present):
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture--sandy clay loam or sandy loam
Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

BCg horizon (where present):
Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2
Texture--loamy sand, loamy fine sand, sandy loam, or fine sandy loam. Some pedons are thinly stratified with heavier textures.
Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

2C horizon (where present):
Color--hue of 10YR or 2.5Y, value of 5 to 8, chroma of 3 to 8
Texture--coarse sand, sand, loamy coarse sand, or loamy sand. Some pedons have thin lenses of sandy loam or loam.
Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

2Cg horizon:
Color--hue of 10YR or 2.5Y, value of 5 to 8, chroma of 1 or 2, or is neutral with value of 4 to 8
Texture--coarse sand, sand, loamy coarse sand, or loamy sand. Some pedons have thin lenses of sandy loam or loam.
Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

LYNN HAVEN SERIES
TAXONOMIC CLASS: Sandy, siliceous, thermic Typic Alaquods

TYPICAL PEDON: Lynn Haven fine sand--range. (Colors are for moist soil)

A--0 to 12 inches; black (10YR 2/1) fine sand; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary. (8 to 20 inches thick)

Eg--12 to 16 inches; gray (N 6/0) fine sand; single grain; loose; common fine and medium roots; many uncoated sand grains; very strongly acid; abrupt wavy boundary. (2 to 18 inches thick)

Bh1--16 to 22 inches; dark reddish brown (5YR 3/2) fine sand; weak fine granular structure; friable; many fine and medium roots; few fine and medium pores; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

Bh2--22 to 30 inches; dark brown (7.5YR 3/2) fine sand; weak fine granular structure; friable; few fine roots; few fine pores; most sand grains are coated with organic matter; few small pockets of uncoated sand grains; very strongly acid; gradual wavy boundary. (Combined thickness of the Bh horizons is from 6 to more than 50 inches thick.)

Cg--30 to 75 inches; gray (5Y 6/1) fine sand; single grain; loose; common medium distinct brown (10YR 5/3) and light yellowish brown (10YR 6/4) masses of iron accumulation; very strongly acid.

TYPE LOCATION: Bay County, Florida. Approximately 1 mile south of intersection of U. S. Highway 98 and State Highway 392 and about 50 feet east of Highway 392 in Sec. 4, T. 4 S., R. 15 W.

RANGE IN CHARACTERISTICS: Reaction ranges from extremely acid to strongly acid throughout the profile.

The Oa, horizon, where present, is less than 7 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. Texture is muck.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or is neutral with value of 2 or 3. When dry, this horizon has a salt-and-pepper appearance due to mixing of organic matter and white sand grains. Texture is sand, fine sand or mucky fine sand.

The Eg or E horizon, where present, has hue of 10YR or 2.5YR, value of 4 to 7, and chroma of 1 or 2; or is neutral with value of 5 to 7. Redoximorphic features in shades of yellow and brown range from none to common. Texture is sand or fine sand.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4. Sand grains are coated with organic matter. Vertical or horizontal tongues or pockets of grayish sand occur in the Bh horizon in some pedons. Texture is sand, fine sand, loamy sand or loamy fine sand.

Some pedons have a C/B horizon with hue of 10YR to 5YR, value of 3 to 5, and chroma of 3 or 4 with redoximorphic features in shades of gray, brown, or yellow. Texture is sand, fine sand, loamy sand or loamy fine sand.

Some pedons have a bisequum of E'g and B'h. Colors and textures are similar to the Eg and Bh horizons.

The Cg horizon has hue of 7.5YR to 5Y, value of 4 to 7, and chroma of 1 to 3. Redoximorphic features in shades of brown, yellow, or red range from few to many. Texture is sand, fine sand, loamy sand or loamy fine sand.

TORHUNTA SERIES
TAXONOMIC CLASS: Coarse-loamy, siliceous, active, acid, thermic Typic Humaquepts

TYPICAL PEDON: Torhunta fine sandy loam--cultivated.
(Colors are for moist soil unless otherwise stated.)

Ap--0 to 9 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; many fine roots; strongly acid; abrupt wavy boundary. (0 to 12 inches thick.)

A--9 to 15 inches; very dark gray (10YR 3/1) loamy sand; weak medium granular structure; very friable; many fine roots; thin coats of organic matter on grains; very strongly acid; gradual wavy boundary. (4 to 15 inches thick.)

Bg--15 to 40 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure; friable; slightly sticky and slightly plastic; many fine roots in upper part; thin silt coatings on sand grains; few loamy sand and sand pockets; extremely acid; gradual wavy boundary. (10 to 25 inches thick.)

Cg1--40 to 48 inches; dark grayish brown (10YR 4/2) loamy sand; common medium faint gray (10YR 5/1) and brown (10YR 5/3) mottles; single grained; very friable; few sand pockets; extremely acid; diffuse wavy boundary. (0 to 10 inches thick.)

Cg2--48 to 80 inches; grayish brown (10YR 5/2) sand; single grained; loose; uncoated sand grains; very strongly acid.

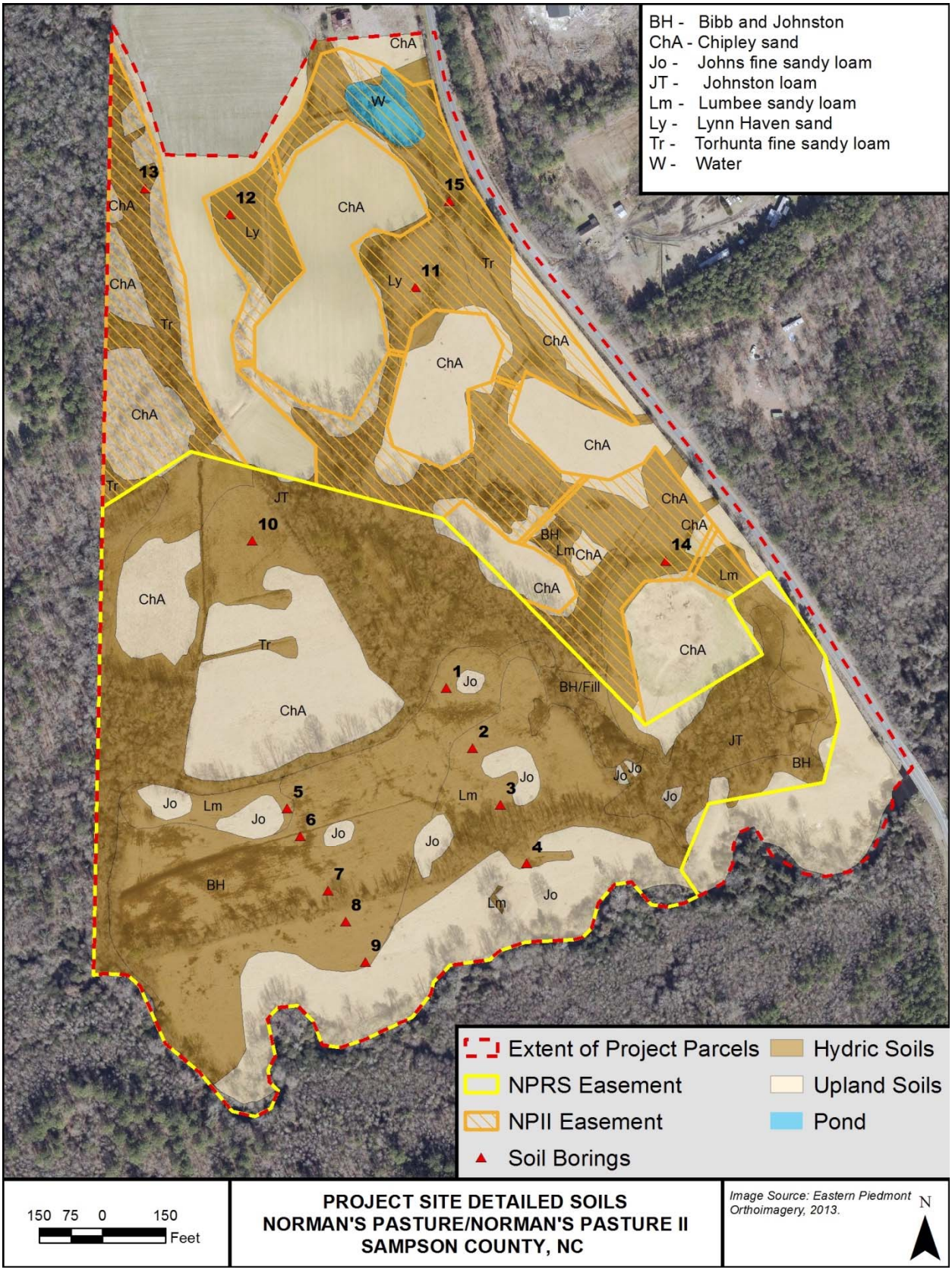
TYPE LOCATION: Wayne County, North Carolina; 1.5 miles south of New Hope; 0.4 mile northeast of intersection of Roads 1712 and 1713, 50 feet south of Road 1713 and 50 feet northeast of power line poles.

RANGE IN CHARACTERISTICS: Torhunta soil has loamy textured horizons that range from 20 to 50 inches thick. The soil reaction ranges from extremely acid through strongly acid, unless the surface has been limed.

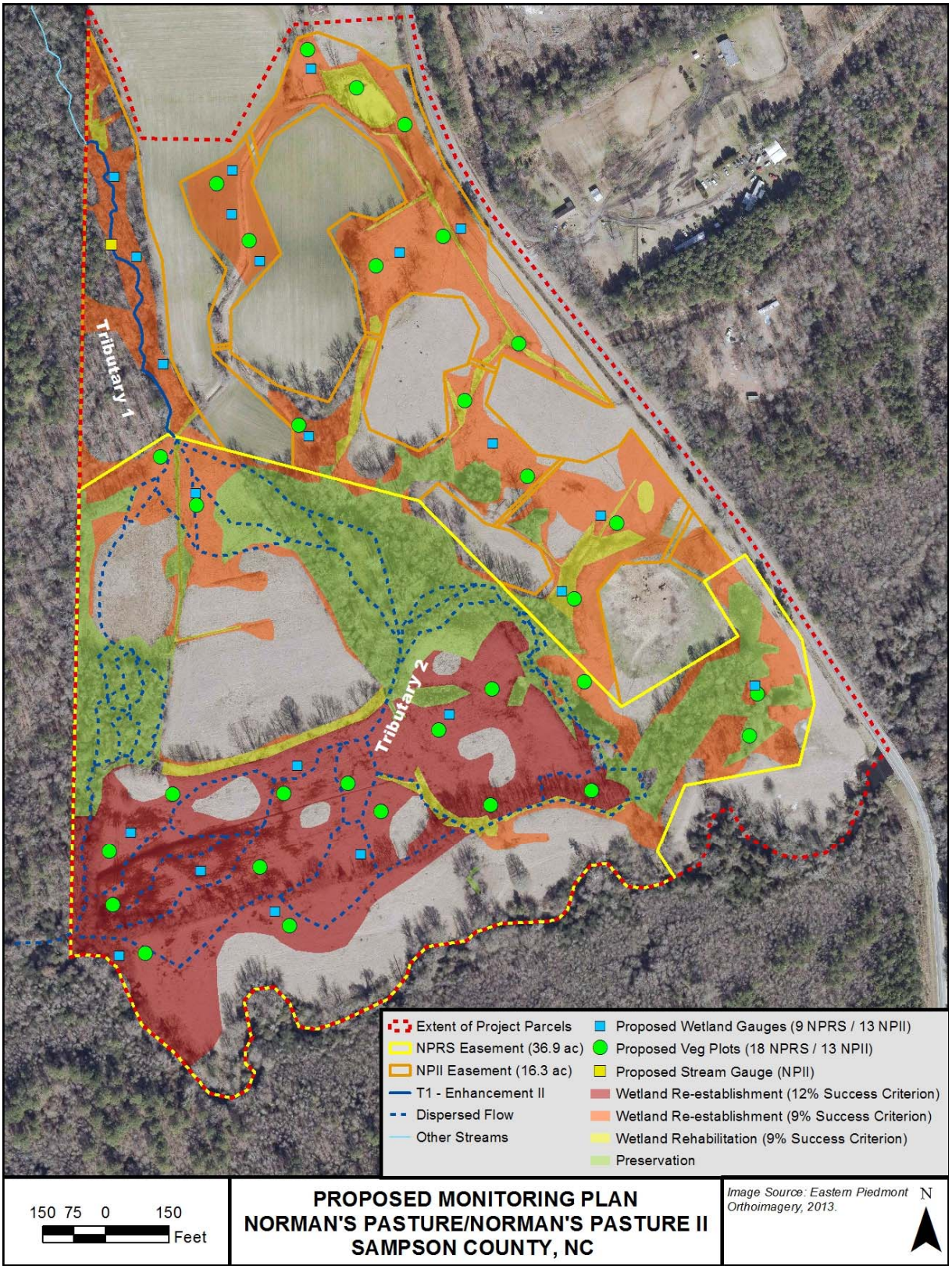
The Ap or A horizon has hue of 10YR, 2.5Y, or it is neutral, value of 2 or 4, and chroma of 0 to 2. It is sandy loam, fine sandy loam, loam, loamy sand or their mucky analogues.

The Bg horizon has hue of 10YR, 2.5Y, or it is neutral, value of 4 to 6, and chroma of 0 to 2. Mottles are in shades of brown or yellow. It is sandy loam or fine sandy loam.

The BCg horizon, where present, has hue of 10YR, 2.5Y, or it is neutral, value of 4 to 7, and chroma of 0 to 2. Mottles are in shades of yellow or brown. It is sandy loam, fine sandy loam, loamy sand, or sand.


BH - Bibb and Johnston
ChA - Chipley sand
Jo - Johns fine sandy loam
JT - Johnston loam
Lm - Lumbee sandy loam
Ly - Lynn Haven sand
Tr - Torhunta fine sandy loam
W - Water
Extent of Project Parcels
NPRS Easement
NPII Easement
Soil Borings
Hydric Soils
Upland Soils
Pond
150 75 0 150
Feet
PROJECT SITE DETAILED SOILS
NORMAN'S PASTURE/NORMAN'S PASTURE II
SAMPSON COUNTY, NC
Image Source: Eastern Piedmont Orthoimagery, 2013.
N

Proposed Monitoring Plan


Tributary 1
Tributary 2
Extent of Project Parcels
NPRS Easement (36.9 ac)
NPII Easement (16.3 ac)
T1 - Enhancement II
Dispersed Flow
Other Streams
Proposed Wetland Gauges (9 NPRS / 13 NPII)
Proposed Veg Plots (18 NPRS / 13 NPII)
Proposed Stream Gauge (NPII)
Wetland Re-establishment (12% Success Criterion)
Wetland Re-establishment (9% Success Criterion)
Wetland Rehabilitation (9% Success Criterion)
Preservation
150 75 0 150
Feet
PROPOSED MONITORING PLAN
NORMAN'S PASTURE/NORMAN'S PASTURE II
SAMPSON COUNTY, NC
Image Source: Eastern Piedmont Orthoimagery, 2013.
N

Appendix D. Project Plan Sheets

CONTRACT #: NORMAN'S PASTURE = 005010 KCI JOB# : 20122905
NORMAN'S PASTURE II = 005787 KCI JOB# : 20145090

STATE OF NORTH CAROLINA
ECOSYSTEM ENHANCEMENT PROGRAM

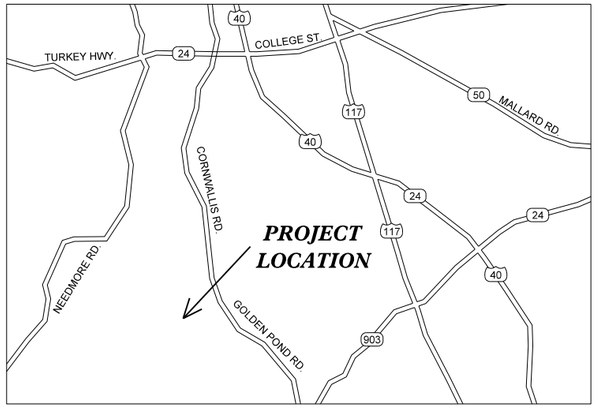
STATE	EEP PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
N.C.	NORMAN'S PASTURE = 95717 NORMAN'S II = 96310	1	17

A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014
SYM.	DESCRIPTION	DATE
REVISIONS		

NORMAN'S PASTURE / NORMAN'S PASTURE II RESTORATION SITES

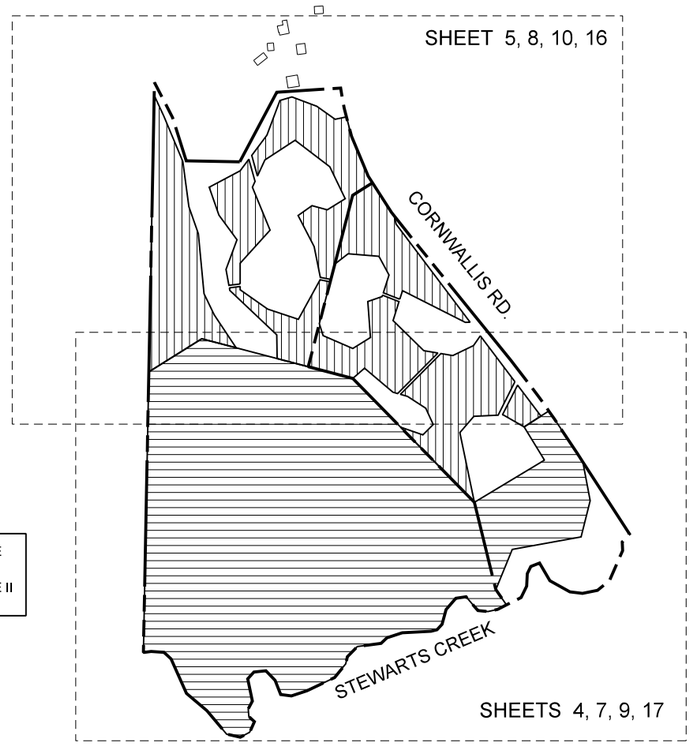
SAMPSON COUNTY, NORTH CAROLINA
CAPE FEAR RIVER BASIN

STEWARTS CREEK LOCAL WATERSHED
03030006110040



VICINITY MAP
NOT TO SCALE

FROM RALEIGH TAKE I-40 EAST TOWARDS WILMINGTON. FOLLOW I-40 FOR 65 MILES. TAKE EXIT 356 AND TURN RIGHT ONTO NC-24 WEST. IN ABOUT A MILE, TAKE A LEFT ONTO CARROLS ROAD. TAKE THE FIRST RIGHT ONTO BLANCHARD ROAD. MERGE SLIGHTLY TO THE RIGHT TO STAY ON CORNWALLIS ROAD AND FOLLOW FOR 6 MILES. THE SITE WILL BE ON THE RIGHT, JUST PAST A WHITE HOUSE.



INDEX OF SHEETS

NORMAN'S PASTURE EASEMENT
NORMAN'S PASTURE II EASEMENT

NC GRID
NAD 83

GRAPHIC SCALES

–80 –40 0 80 160
SHEETS 4, 5, 7, 8

–150 –75 0 150 300
SHEET 11

PROJECT DATA

	WETLAND REESTABLISHMENT (1:1)	WETLAND REHABILITATION (1.5:1)	WETLAND PRESERVATION (NO CREDIT)	STREAM ENHANCEMENT II (2.5:1)
NORMANS PASTURE CREDITS	15.5 AC./ 15.5 CR.	0.7 AC./ 0.5 CR.	9.0 AC./ 0 CR.	–
NORMANS PASTURE II CREDITS	8.8 AC./ 8.8 CR.	1.4 AC./ 0.9 CR.	0.8 AC./ 0 CR.	843 L.F./ 337 CR.
TOTAL CREDITS	24.3 AC./ 24.3 CR.	2.1 AC./ 1.4 CR.	9.8 AC./ 0 CR.	843 L.F./ 337 CR.

TOTAL DISTURBED AREA = 40.1 AC

Prepared In the Office of:
KCI Associates of North Carolina, P.A.
SUITE 220 LANDMARK CENTER II, 4601 SIX FORKS RD., RALEIGH, NC 27609
ENGINEERS • PLANNERS • ECOLOGISTS

GARY M. MRYNCZA, P.E.
PROJECT ENGINEER

JOSEPH PFEIFFER
WETLAND DESIGN

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

P.E.
SIGNATURE:

Prepared for:
Ecosystem Enhancement PROGRAM
JEFF JUREK
CONTRACT ADMINISTRATOR

GENERAL NOTES:

BEARING AND DISTANCES:
ALL BEARINGS ARE NAD 1983 GRID BEARINGS.
ALL DISTANCES AND COORDINATES SHOWN ARE HORIZONTAL (GROUND) VALUES.

GRADING:
-PROPOSED GRADING NOTES IN THE PLANS ARE A GENERAL GUIDE FOR GRADING. EXACT TIE OUTS FROM THE DITCH TO THE RESTORED WETLAND SHALL BE GRADED UNDER THE DIRECTION OF THE ENGINEER.

UTILITY/SUBSURFACE PLANS:
-NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. EXISTING UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING A UTILITY LOCATOR AND ESTABLISHING THE EXACT LOCATION OF ANY AND ALL EXISTING UTILITIES IN THE PROJECT REACH.

CONTROL POINTS:

	NORTHING	EASTING	ELEVATION
KCI#1	421327.02	2255180.03	84.25
KCI#2	420802.02	2255524.70	80.44
KCI#3	421074.48	2254096.57	77.81
KCI#4	420719.93	2254192.33	78.53
KCI#5	420159.95	2254533.95	76.72
KCI#6	420020.91	2253983.21	75.53
KCI#7	420589.61	2254676.16	76.12
KCI#8	420347.62	2255065.72	77.47
KCI#9	420497.08	2255378.18	77.48
KCI#10	421978.76	2254649.55	95.68
KCI#11	423050.98	2254450.09	115.17
KCI#12	420425.44	2253972.07	75.46
KCI#13	420267.67	2254832.42	76.59
KCI#14	421456.93	2254046.76	86.27
KCI#15	421798.55	2253885.11	88.59
KCI#16	421588.92	2253884.54	85.93
KCI#17	421943.33	2253888.17	91.11
KCI#18	422093.54	2253839.07	96.46

PROJECT LEGEND:

Existing Ditch to be Filled .....

Proposed Ditch Plug .....

Proposed Stabilized Drainage Outfall .....

Proposed Seep Enhancement .....

Existing Woods Line .....

Minor Contour Line .....

Major Contour Line .....

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

		DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

REVISIONS

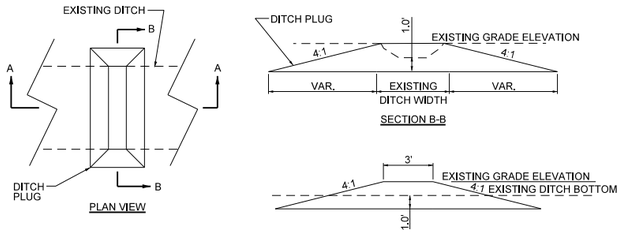
Ecosystem Enhancement Program

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: N.T.S.

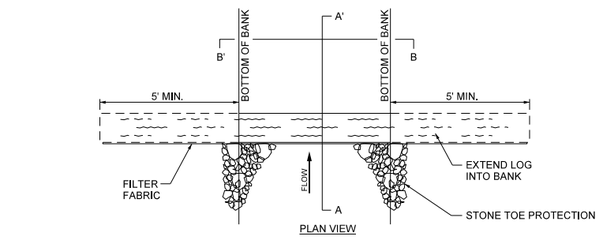
GENERAL NOTES & PROJECT LEGEND



NOTE:
SEE PLAN SHEETS FOR LOCATIONS OF DITCH PLUGS.
USE SELECT MATERIAL, CLASS I OR SUITABLE SALVAGED MATERIAL, IF AVAILABLE FOR DITCH PLUGS.

DITCH PLUG DETAIL

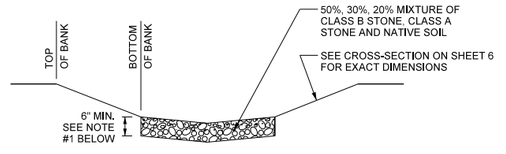
SCALE: NTS



NOTE:
FOOTER BOULDERS MAY BE REPLACED WITH TWO 12" DIAMETER (MIN.) LOGS IF AVAILABLE. ENSURE LOGS ARE STRAIGHT WITH NO GAPS WHEN PLACED TOGETHER.

LOG DROP DETAIL

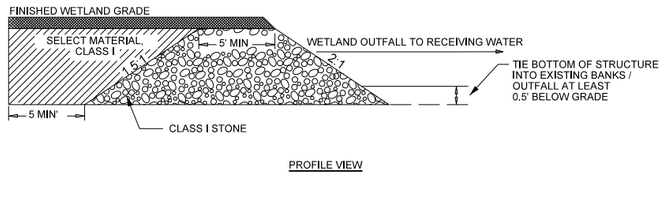
SCALE: NTS



NOTE:
1. START BY INSTALLING CLASS B STONE AND CLASS A STONE MIXTURE. FINISH BY WASHING IN NATURAL STREAM MATERIAL TO OBTAIN FINAL GRADE.

RIFFLE ENHANCEMENT DETAIL

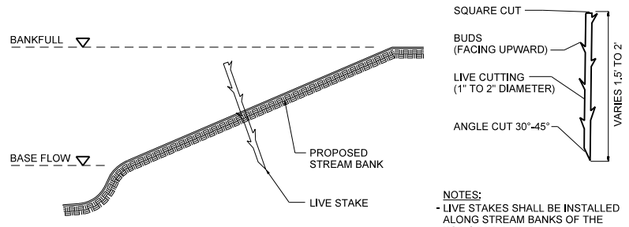
SCALE: NTS



NOTE:
IF AVAILABLE SUITABLE SALVAGED MATERIAL MAY BE SUBSTITUTED FOR SELECT MATERIAL, CLASS I.

STABILIZED DRAINAGE OUTFALL

SCALE: NTS



NOTES:
- LIVE STAKES SHALL BE INSTALLED ALONG STREAM BANKS OF THE TOP OF TRIBUTARY 1 (STREAM ENHANCEMENT AREA) AND IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS AND AS DIRECTED BY THE DESIGNER.
- LIVE STAKES SHALL BE PLANTED AT 3' CENTER SPACING (EACH BANK), RANDOM SPECIES PLACEMENT.

LIVE STAKES

SCALE: NTS

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

	REVISIONS	DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

Ecosystem Enhancement Program

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RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II
RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: N.T.S.

DETAILS

MATCHLINE - SEE SHEET 5

INSTALL DITCH PLUG, RE-GRADE TO DISPERSE FLOW THROUGHOUT FLOODPLAIN.

REMOVE DITCH SPOIL PILE AND RE-ESTABLISH NATURAL GRADE

FILL EXISTING DITCH

CONTRACTOR TO TAKE CARE NOT TO COMPACT EXISTING SEEP WHILE FILLING UPSTREAM DITCH

EXISTING SECTION OF REACH T1 TO REMAIN UNFILLED

INSTALL DITCH PLUG

INSTALL DITCH PLUG

FILL EXISTING DITCH

EXISTING SECTION OF REACH T1 TO REMAIN UNFILLED

FILL EXISTING DITCH

USE SPOIL PILE TO FILL CHANNELIZED SECTION OF REACH T1

INSTALL STABILIZED DRAINAGE OUTFALL AT END OF REACH T1 (SEE DETAIL SHEET 3)

CONSERVATION EASEMENT NORMAN'S PASTURE I

CONSERVATION EASEMENT NORMAN'S PASTURE II

CONSERVATION EASEMENT NORMAN'S PASTURE I

CONSERVATION EASEMENT NORMAN'S PASTURE I

CONSERVATION EASEMENT NORMAN'S PASTURE I

CONSERVATION EASEMENT NORMAN'S PASTURE I

KCI#1 KCI#2 KCI#3 KCI#4 KCI#5 KCI#6 KCI#7 KCI#8 KCI#9 KCI#12 KCI#13

REMOVE AND REGRADE EXISTING ACCESS CROSSING

STABILIZED AT GRADE CROSSING

STABILIZED AT GRADE CROSSING

FILL EXISTING DITCH

REMOVE DITCH SPOIL PILE AND RE-ESTABLISH NATURAL GRADE

REMOVE DITCH SPOIL PILE AND RE-ESTABLISH NATURAL GRADE

CORNWALLIS ROAD

SEEP ENHANCEMENT:
A 50' BY 50' WATER QUALITY BMP WILL BE INSTALLED IN THIS AREA TO MAXIMIZE SEEP PRODUCTION. THIS BMP WILL BE CREATED BY UNDERCUTTING APPROXIMATELY 2' OF EXISTING SUBSOIL AND REPLACING THAT MATERIAL WITH A 6" LAYER OF #57 STONE OVER FILTER FABRIC. THE STONE WILL BE COVERED BY 1' LIFT OF A CERTIFIED COMPOST PRODUCT COVERED BY 6" OF WOOD CHIPS. LOG SILLS WILL BE USED TO LOCK THE BMP IN PLACE.

USE SPOIL PILE TO FILL DITCH

FILL NORTHERN PORTION OF DITCH USING SPOIL PILE ALONG TOP OF BANK

CONTRACTOR TO TAKE CARE NOT TO COMPACT EXISTING SEEP WHILE FILLING UPSTREAM DITCH

FILL EXISTING DITCH

INSTALL DITCH PLUG

STEWARTS CREEK

RE-ESTABLISH HISTORIC GRADE/ DRAINAGE PATTERN (FILL DITCHES - REMOVE SPOIL)

WETLAND CROSS-SECTION

NC GRID NAD 83

–80 –40 0 80 160

GRAPHIC SCALE

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

		DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

REVISIONS

Ecosystem Enhancement Program

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS • SURVEYORS
4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

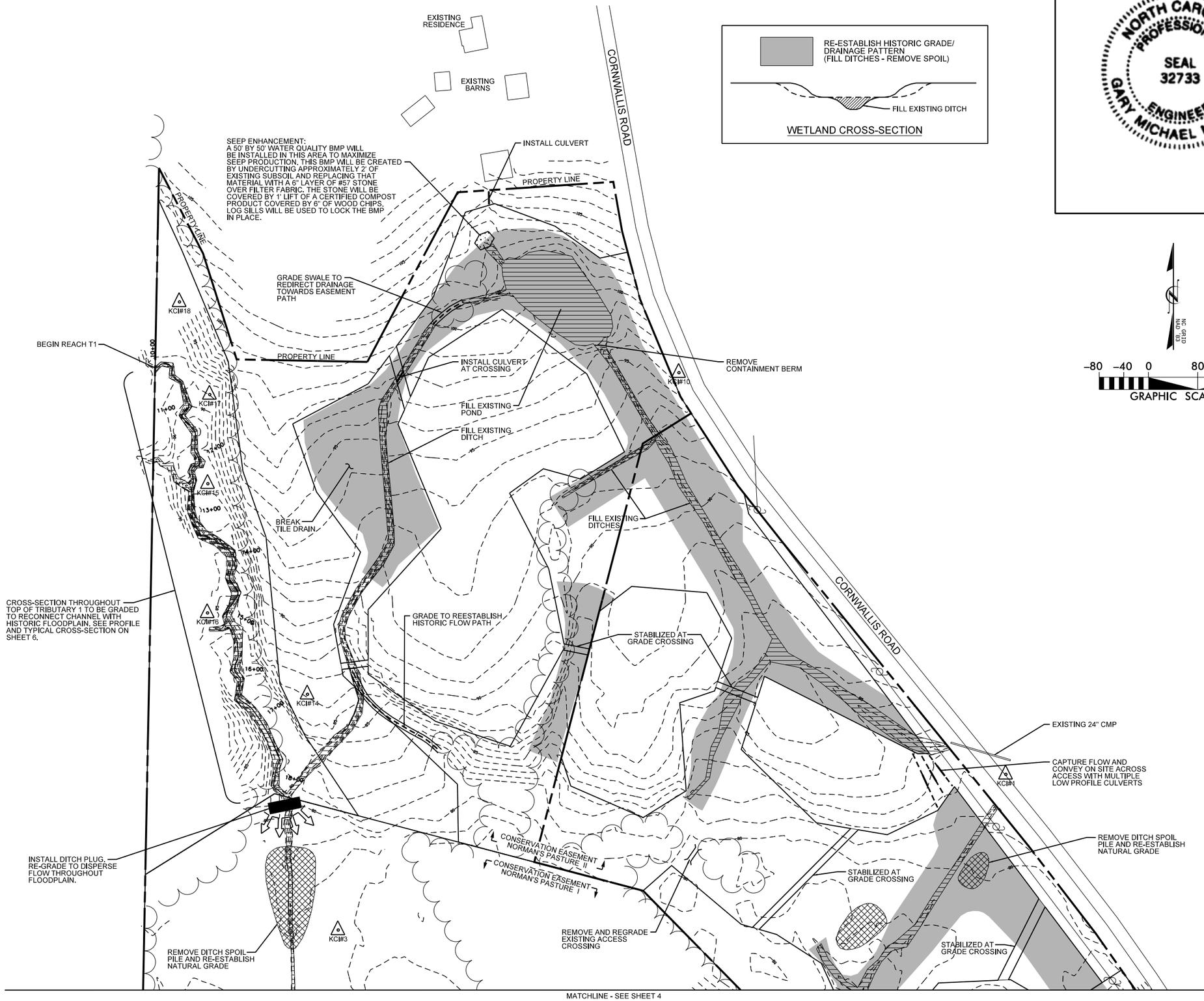
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014

SCALE: GRAPHIC

SITE PLAN

SHEET 4 OF 17



RE-ESTABLISH HISTORIC GRADE/ DRAINAGE PATTERN (FILL DITCHES - REMOVE SPOIL)

FILL EXISTING DITCH

WETLAND CROSS-SECTION

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

NC 6910 NAD 83

–80 –40 0 80 160

GRAPHIC SCALE

		DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

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NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

SAMPSON COUNTY, NORTH CAROLINA

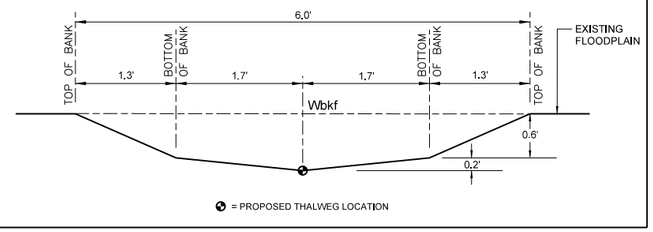
DATE: JUNE 2014
SCALE: GRAPHIC

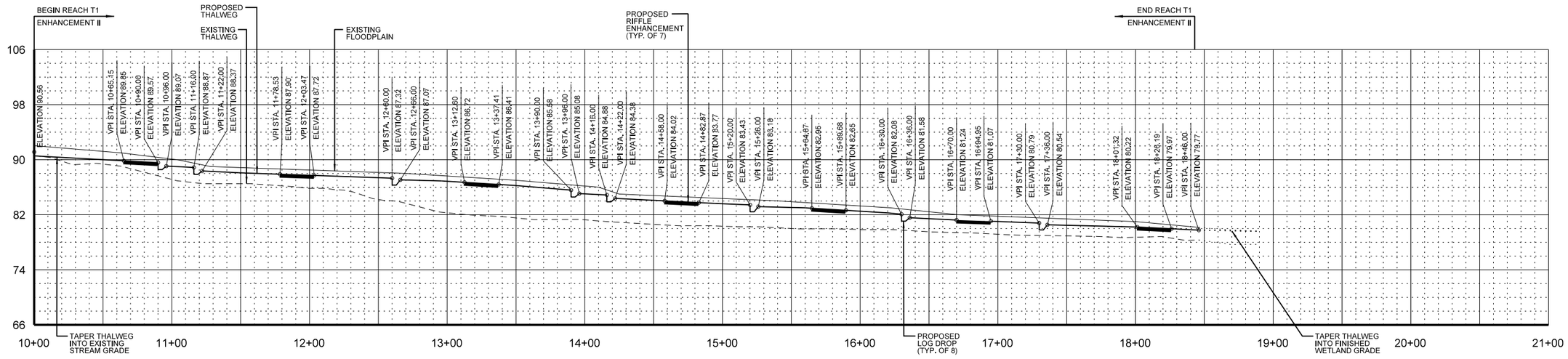
SITE PLAN

SHEET 5 OF 17

TYPICAL CROSS-SECTION
"C5" STREAM TYPE

TRIBUTARY 1
STATION 10+00 TO 19+43





NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MARYNCZA

		DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

REVISIONS

Ecosystem Enhancement Program

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RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: GRAPHIC

TYPICAL CROSS-SECTION AND PROFILE

MATCHLINE - SEE SHEET 8

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	RESUBMITTED FOR COMMENTS	SEPT 2014
	REVISIONS	DATE

Ecosystem Enhancement Program

KCI ASSOCIATES OF NC
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RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II
RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: GRAPHIC

PLANTING PLAN

SHEET 7 OF 17

N
NC GRID
NAD 83

–80 –40 0 80 160
GRAPHIC SCALE

16.00 ACRES

HEADWATER FOREST COMMUNITY

18" - 24" BARE ROOT MATERIAL
968 STEMS/ACRE (9' X 5' SPACING), RANDOM SPECIES PLACEMENT

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR	% OF TOTAL	# OF PLANTS
SWAMP CHESTNUT OAK	QUERCUS MICHAUXII	FACW	12	1850
GREEN ASH	FRAXINUS PENNSYLVANICA	FACW	12	1850
TULIP POPLAR	LIRIODENDRON TULIPIFERA	FACU	10	1550
BALD CYPRESS	TAXODIUM DISTICHUM	OBL	10	1550
RIVER BIRCH	BETULA NIGRA	FACW	12	1850
WATER OAK	QUERCUS NIGRA	FAC	10	1550
AMERICAN ELM	ULMUS AMERICANA	FAC	10	1550
SWEET BAY MAGNOLIA	MAGNOLIA VIRGINIANA	FACW	12	1850
LAUREL OAK	QUERCUS LAURIFOLIA	FACW	12	1850
			100	15,450

NOTE: THE DISTRIBUTION OF THE STEMS MAY BE CHANGED AT THE ENGINEER'S DISCRETION. HOWEVER, ONE SPECIES MAY OCCUPY NO MORE THAN 25% OF THE TOTAL STEMS AND AT LEAST FIVE SPECIES MUST BE USED.

17.55 ACRES

RIVERINE SWAMP FOREST

18" - 24" BARE ROOT MATERIAL
968 STEMS/ACRE (9' X 5' SPACING), RANDOM SPECIES PLACEMENT

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR	% OF TOTAL	# OF PLANTS
RIVER BIRCH	BETULA NIGRA	FACW	5	850
SWEET BAY MAGNOLIA	MAGNOLIA VIRGINIANA	FACW	5	850
WATER TUPELO	NYSSA AQUATICA	OBL	25	4,250
SWAMP BAY	PERSEA PALUSTRIS	FACW	5	850
LAUREL OAK	QUERCUS LAURIFOLIA	FACW	10	1,700
OVERCUP OAK	QUERCUS LYRATA	OBL	10	1,700
SWAMP CHESTNUT OAK	QUERCUS MICHAUXII	FACW	10	1,700
BALD CYPRESS	TAXODIUM DISTICHUM	OBL	30	5,100
			100	17,000

4.89 ACRES

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR	% OF TOTAL	# OF PLANTS
RIVER BIRCH	BETULA NIGRA	FACW	25	1,200
SWEET BAY MAGNOLIA	MAGNOLIA VIRGINIANA	FACW	5	250
WATER TUPELO	NYSSA AQUATICA	OBL	5	250
SWAMP BAY	PERSEA PALUSTRIS	FACW	10	500
LAUREL OAK	QUERCUS LAURIFOLIA	FACW	20	1,000
OVERCUP OAK	QUERCUS LYRATA	OBL	5	250
SWAMP CHESTNUT OAK	QUERCUS MICHAUXII	FACW	25	1,200
BALD CYPRESS	TAXODIUM DISTICHUM	OBL	5	250
			100	4,900

NOTE: THE DISTRIBUTION OF THE STEMS MAY BE CHANGED AT THE ENGINEER'S DISCRETION. HOWEVER, ONE SPECIES MAY OCCUPY NO MORE THAN 25% OF THE TOTAL STEMS AND AT LEAST FIVE SPECIES MUST BE USED.

STREAM ZONE PLANTING:

LIVE STAKES: 1.5' TO 2' LENGTHS, 1/2' TO 2" DIAMETER, 1 ROW AT 3' CENTER SPACING (EACH BANK), RANDOM SPECIES PLACEMENT

COMMON NAME	SCIENTIFIC NAME
BLACK WILLOW	SALIX NIGRA
SILKY WILLOW	SALIX SERICEA
SILKY DOGWOOD	CORNUS AMOMUM
ELDERBERRY	SAMBUCUS CANADENSIS

NOTES:

LIVE STAKES SHALL BE INSTALLED ONLY ALONG THE STREAM BANKS.

AT LEAST THREE OF THE LISTED SPECIES MUST BE INSTALLED AND NO SINGLE LIVE STAKING SPECIES SHALL COMPOSE MORE THAN 40% OF THE TOTAL NUMBER OF LIVE STAKES TO BE INSTALLED.

BEFORE COMMENCING WITH ANY CLEARING ACTIVITIES IN THE STREAM ENHANCEMENT AREA, CONTRACTOR SHALL CONTACT THE DESIGN REPRESENTATIVE TO COORDINATE WHICH TREES WILL BE REMOVED TO ENABLE CONSTRUCTION ACTIVITES, AND WHICH TREES SHALL REMAIN. CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO MINIMIZE DISTURBANCE TO MATURE AND DESIRABLE TREE SPECIES THROUGHOUT THE STREAM ENHANCEMENT AREA.

ONLY THE DISTURBED AREAS CAUSED BY STREAM RESTORATION ACTIVIES SHALL BE PLANTED IN THE STREAM ENHANCEMENT II AREA.

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

		DATE
A	SUBMITTED WITH MITIGATION PLAN	JUNE 2014
B	SUBMITTED FOR PERMITS	SEPT 2014

REVISIONS

Ecosystem Enhancement Program

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4601 SIX FORKS ROAD, SUITE 220
RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014

SCALE: GRAPHIC

PLANTING PLAN

SHEET 8 OF 17

MATCHLINE - SEE SHEET 10

CORNWALLIS ROAD

STEWARTS CREEK

NC GRID MAG BIS

-80 -40 0 80 160

GRAPHIC SCALE

EASEMENT BOUNDARY MARKING

THE EASEMENT BOUNDARY WILL BE MARKED WITH METAL POSTS AND CONSERVATION EASEMENT SIGNS AT THE CORNERS AND AT A MINIMUM OF 200' INTERVALS ALONG THE BOUNDARY.

- 6-FOOT TALL DURABLE WITNESS POSTS AND 5/8" REBAR 30" IN LENGTH WITH 3-1/4" ALUMINUM CAPS ON ALL EASEMENT CORNERS. CAPS SHALL MEET EEP SPECIFICATIONS (BERNSTEN RBD5325 IMPRINTED WITH NC STATE LOGO #B9087 OR EQUIVALENT). AFTER INSTALLATION, CAPS SHALL BE STAMPED WITH THE CORRESPONDING NUMBER.
- 6-FOOT TALL DURABLE WITNESS POST ALONG BOUNDARY OF CONSERVATION EASEMENT. POSTS SHALL BE MADE OF MATERIAL THAT WILL LAST A MINIMUM OF 20 YEARS. THE PROVIDER SHALL ATTACH A CONSERVATION EASEMENT SIGN TO EACH WITNESS POST AND PLACE ADDITIONAL SIGNS AT NO MORE THAN 150-FOOT INTERVALS ON BOUNDARY LINES.

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DATE: JUNE 2014
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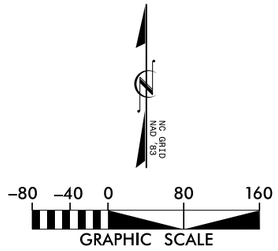
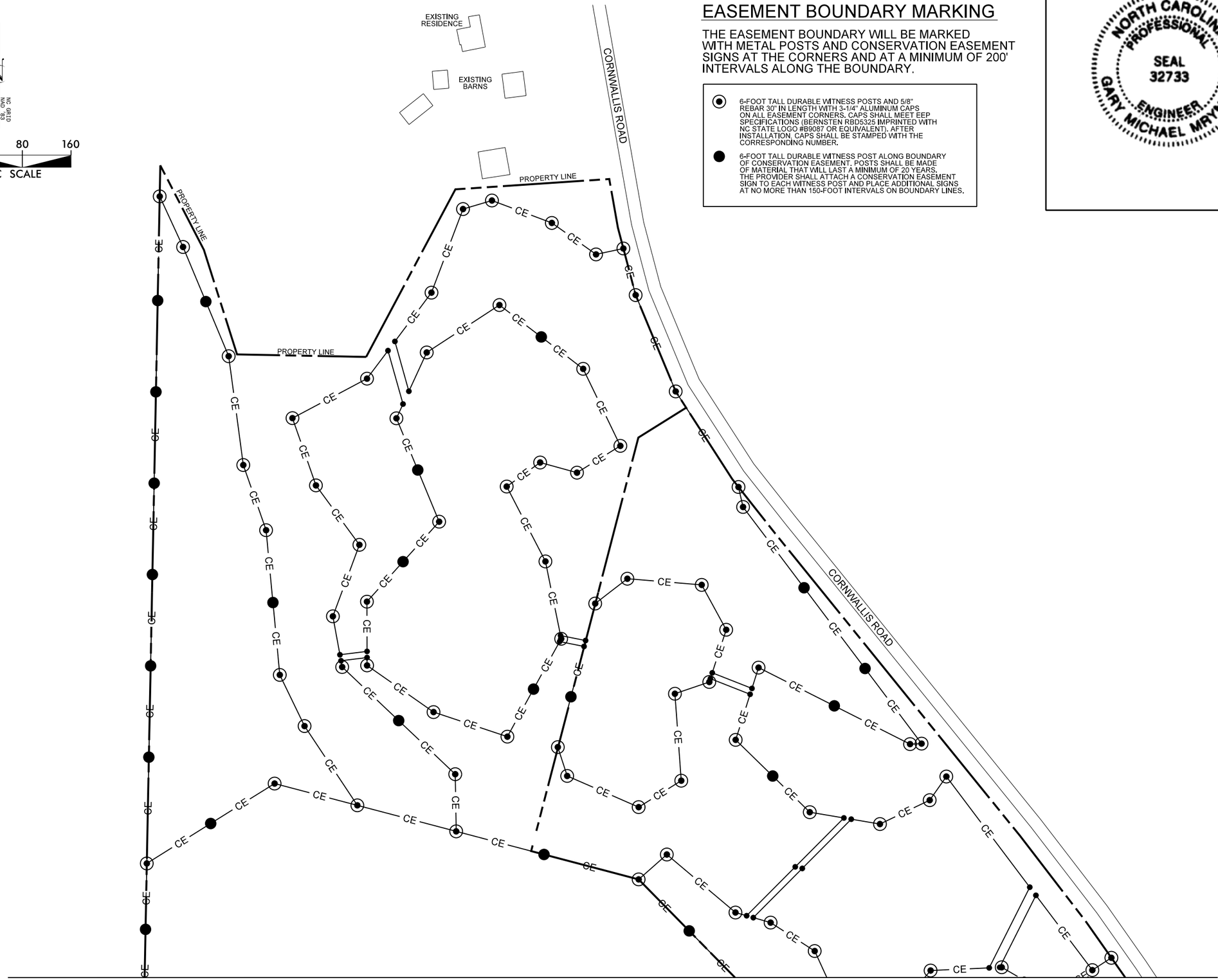
BOUNDARY MARKING PLAN

SHEET 9 OF 17





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NORMAN'S PASTURE & NORMAN'S PASTURE II
RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
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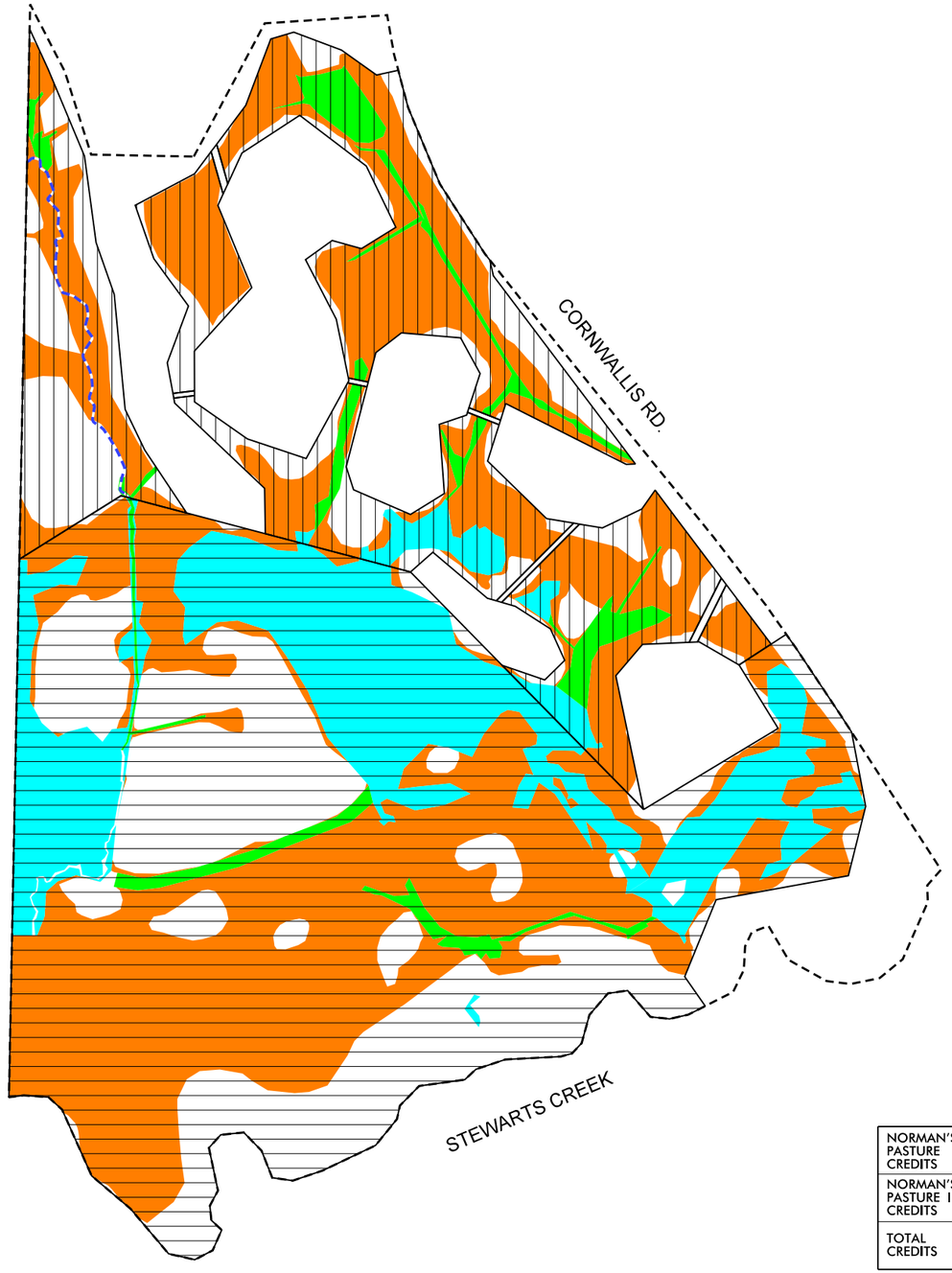
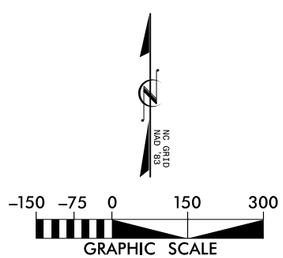
BOUNDARY MARKING PLAN

SHEET 10 OF 17





NORMAN'S PASTURE EASEMENT

NORMAN'S PASTURE II EASEMENT

STREAM ENHANCEMENT II

PROPERTY BOUNDARY

	WETLAND REESTABLISHMENT (1:1)	WETLAND REHABILITATION (1.5:1)	WETLAND PRESERVATION (NO CREDIT)	STREAM ENHANCEMENT II (2.5:1)
NORMAN'S PASTURE CREDITS	15.5 AC./ 15.5 CR.	0.7 AC./ 0.5 CR.	9.0 AC./ 0 CR.	-
NORMAN'S PASTURE II CREDITS	8.8 AC./ 8.8 CR.	1.4 AC./ 0.9 CR.	0.8 AC./ 0 CR.	843 L.F./ 337 CR.
TOTAL CREDITS	24.3 AC./ 24.3 CR.	2.1 AC./ 1.4 CR.	9.8 AC./ 0 CR.	843 L.F./ 337 CR.

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

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NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: GRAPHIC

MITIGATION CLASSIFICATION

NOTES:

1. IT IS THE INTENT OF THESE PLANS THAT AS SOON AS AN AREA OF GRADING IS COMPLETE IT SHALL BE STABILIZED IN ACCORDANCE WITH THE EROSION CONTROL PRACTICES DESCRIBED IN THESE PLANS.DUE TO THE ANTICIPATED DURATION AND SEQUENCE OF THE CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS REQUIRED TO MINIMIZE, AS MUCH AS POSSIBLE, THE AMOUNT 0F THE AREA THAT IS DISTURBED AT ONE TIME.

2. THE CONTRACTOR SHALL EXERCISE EVERY REASONABLE PRECAUTION THROUGHOUT THE CONSTRUCTION OF THE PROJECT TO PREVENT EROSION AND SEDIMENTATION. EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROJECT PLANS, NORTH CAROLINA SEDIMENT AND EROSION CONTROL GUIDELINES AND AS DIRECTED BY THE DESIGNER.

3. ALL EXCAVATED MATERIAL SHALL BE STOCKPILED WITHIN THE LIMITS OF DISTURBANCE FOR LATER USE AS FILL MATERIAL. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING APPROPRIATE STABILIZATION MEASURES AROUND THE STOCKPILE AREA(S) AND ANY TEMPORARY OR PERMANENT SPOIL AND TOPSOIL PILES TO PREVENT EROSION AND SEDIMENTATION.

4. IN THE EVENT OF A STORM, THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OR PROTECTION OF ANY EQUIPMENT, TOOLS, MATERIALS OR OTHER ITEMS NEEDED TO COMPLETE THE WORK THAT COULD BE AFFECTED BY STORMWATER.

5. AFTER THE WETLAND GRADING CALLED FOR IN THE PLANS IS COMPLETED, THE CONTRACTOR SHALL IMMEDIATELY INSTALL APPROPRIATE STABILIZATION MATERIALS AS CALLED FOR IN THE PLANS TO STABILIZE THE SOIL AND PROVIDE IMMEDIATE SEDIMENT/EROSION CONTROL.

6. EACH SEDIMENT CONTROL DEVICE WILL BE REMOVED AFTER ALL WORK IN THE CORRESPONDING CONSTRUCTION PHASE HAS BEEN COMPLETED AND THE AREAS HAVE BEEN STABILIZED.

7. THE CONSTRUCTION ENTRANCES AND STAGING AREAS IDENTIFIED ON THE PLANS PROVIDE THE ONLY ACCESS POINTS INTO THE LIMITS OF DISTURBANCE. NO ADDITIONAL ACCESS POINTS SHALL BE USED WITHOUT APPROVAL OF THE DESIGNER.

8. SILT FENCE SHALL BE INSTALLED ON THE LOW SIDE OF ANY TEMPORARY OR PERMANENT SPOIL AND TOPSOIL PILES. THESE SPOIL PILES SHALL ALSO BE SEEDED AND MULCHED FOR VEGETATIVE STABILIZATION ON THE SAME DAY THEY ARE CREATED. ALL SPOIL MATERIAL SHALL STAY ON THE SITE AND SHALL NOT BE REMOVED FROM THE SUBJECT PROPERTY.

9. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND FUNCTIONAL OPERATION FOLLOWING EVERY RUNOFF PRODUCING RAIN EVENT AND/OR AT LEAST ONCE PER WEEK. ANY NEEDED MAINTENANCE OR REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN ALL MEASURES AS DESIGNED. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM CONTROL MEASURES WHEN THEY REACH APPROXIMATELY 50% OF THEIR FUNCTIONAL CAPACITY. THESE MEASURES SHALL BE REPAIRED IF DISTURBED DURING MAINTENANCE. ALL SEEDED AREAS SHALL BE FERTILIZED, RESEEDED AND MULCHED, AS NECESSARY, TO PROMOTE THE ESTABLISHMENT OF VEGETATION COVER.

10. THE CONSTRUCTION MANAGER AND EROSION CONTROL CONTACT FOR THIS SITE IS TIM MORRIS. OFFICE PHONE - 919-783-9214 CELL PHONE - 919-793-6886

SEQUENCE OF CONSTRUCTION:

THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE SEQUENCE OF CONSTRUCTION IN ACCORDANCE WITH THE PLANS AND THE FOLLOWING PROVISIONS, AS DIRECTED BY THE DESIGNER. CONSTRUCTION SHALL PROCEED IN THE SPECIFIED MANNER UNLESS OTHERWISE DIRECTED OR APPROVED BY THE DESIGNER. THE FOLLOWING PROVISIONS, ALONG WITH THE INSTRUCTIONS CONTAINED IN THE PLANS, CONSTITUTE THE SEQUENCE OF CONSTRUCTION.

GENERAL SITE NOTES:

I. THE CONTRACTOR SHALL ONLY CONDUCT STREAM WORK, INCLUDING ALL IN-STREAM STRUCTURES, GRADING, STABILIZATION MEASURES, AND SEEDING, MULCHING, AND MATTING WORK, ON A SECTION OF STREAM THAT SHALL BE ENTIRELY COMPLETED WITHIN A SINGLE DAY. EACH SECTION OF COMPLETED STREAM MUST BE STABILIZED AND MATTED BEFORE FLOW CAN BE RETURNED INTO THE CHANNEL

II. IF APPROVED BY THE DESIGNER, THE CONTRACTOR MAY WORK SIMULTANEOUSLY ON MORE THAN ONE PHASE OR CHANGE THE ORDER OF PHASES 2-3. IF PHASE 3 IS DECIDED TO BEGIN BEFORE PHASE 2, THE CONTRACTOR MUST INSTALL ALL SOUTHERN SEDIMENTATION AND EROSION STRUCTURES ALONG STEWARTS CREEK PRIOR TO INITIATING ANY SITE GRADING.

II. WHEN WORKING IN STREAMS WITH NO ACTIVE FLOW THE CONTRACTOR IS REQUIRED TO HAVE APPROPRIATELY SIZED PUMPS AND MATERIALS TO INSTALL AND MAINTAIN A TEMPORARY STREAM DIVERSION IN ANTICIPATION OF PENDING STORM EVENTS. WORKING IN A DRY CHANNEL DOES NOT PRECLUDE THE CONTRACTOR FROM HAVING TO COMPLY WITH NOTE I ABOVE.

PHASE 1: INITIAL SITE PREPARATION
- A. IDENTIFY PROJECT BOUNDARY, LIMITS OF DISTURBANCE, SENSITIVE AREAS, STAGING AREAS, STABILIZED ENTRANCES, AND ACCESS POINTS WITH THE DESIGNER.
- B. CONSTRUCT ENTRANCE AND STAGING AREAS AND THEIR ASSOCIATED SEDIMENT AND EROSION CONTROL DEVICES IN A MANNER TO SUPPORT EXECUTION OF THE WETLAND RESTORATION IN PHASES AS INDICATED IN THE PLANS AND AS DIRECTED BY THE DESIGNER.

PHASE 2: WETLAND RESTORATION GRADING
- A. FILLING EXISTING DITCHES/DEPRESSIONS
  - i. CLEAR VEGETATION AS NEEDED TO INSTALL SEDIMENT AND EROSION CONTROL MEASURES. INSTALL SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THE PLANS.
  - ii. INSTALL PROPOSED OUTLET STABILIZATION STRUCTURES.
  - iii. FILL DITCHES/DEPRESSIONS AS INDICATED IN THE PLANS USING ADJACENT SPOIL MATERIAL, MAKING SURE TO DEWATER THE EXISTING DITCHES AS INDICATED ON THE PLANS.
  - iv. INSTALL ROCK SILT SCREENS AT OUTLET STABILIZATION STRUCTURES.
  - v. SEED AND MULCH COMPLETED WORK AREAS. THIS SHALL BE DONE WITHIN 72 HOURS OF REACHING FINAL GRADE WHEN FILLING DITCHES/PONDS/DEPRESSIONS AND MAY OCCUR PRIOR TO PHASE 2.A.iii.
- B. SURFACE ROUGHENING
  - i. BEGINNING ON THE NORTH SIDE OF THE WETLAND RESTORATION AREA AND PROGRESSING TOWARDS THE SOUTHERN SIDE OF THE SITE, ROUGHEN THE SOIL TO AN APPROXIMATE DEPTH OF 8" TO ALLEVIATE COMPACTION AND MIMIC NATURAL WETLAND MICROTOPOGRAPHY. THIS WILL INCREASE THE STORAGE OF SURFACE WATER IN THE WETLAND AND PROMOTE VEGETATION ESTABLISHMENT.
  - ii. SEED AND MULCH COMPLETED WORK AREAS. THIS SHALL BE DONE WITHIN 72 HOURS OF SURFACE ROUGHENING.

PHASE 3: REACH T1 STA. 10+00 TO STA. 18+43
- A. COMPLETE CHANNEL AND WETLAND WORK IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:
  - i. CLEAR VEGETATION AS NEEDED TO INSTALL SEDIMENT AND EROSION CONTROL MEASURES. INSTALL SEDIMENT AND EROSION CONTROL MEASURES ALONG EXISTING CHANNEL AS DEPICTED ON THE PLANS.
  - ii. ESTABLISH AN ISOLATED WORK AREA BY INSTALLING IMPERVIOUS DIKES AND TEMPORARY CHANNEL DIVERSION AND DIVERT FLOWS AROUND THE DESIGNATED WORK AREA (LENGTH OF ISOLATED WORK AREA IS LEFT TO THE DISCRETION OF THE CONTRACTOR).
  - iii. COMPLETE CHANNEL AND WETLAND GRADING AND INSTALL ANY BANK STABILIZATION TREATMENTS OR STRUCTURES AS DIRECTED IN THE PLANS.
  - iv. SEED AND MULCH COMPLETED WORK AREAS.

PHASE 4: TREE PLANTING
- A. PLANTS SHOULD BE PLANTED DURING THE DORMANT SEASON (NOVEMBER 17 - MARCH 17).
- B. PREPARE AND PLANT TREES IN ACCORDANCE WITH PLAN SHEETS 7-8 AND AS DIRECTED BY THE DESIGNER.

PHASE 5: COMPLETION OF PROJECT SITE
- A. PHASE 5 CAN BE INITIATED AFTER THE STREAM AND WETLAND GRADING WORK IS COMPLETED, AFTER THE SITE IS STABLIZED WITH REQUIRED VEGETATIVE COVER.
- B. REMOVE ALL REMAINING WASTE MATERIALS, AND THE EROSION CONTROL MEASURES AND RESTORE THE REMAINING STAGING AND STOCKPILING AREAS AND CONSTRUCTION ENTRANCES TO THEIR PRIOR CONDITION. SEED AND MULCH ALL DISTURBED AREAS UTILIZING THE SEED/MULCH MIXES SPECIFIED IN THE PLANS.

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS
HIGH QUALITY WATER (HQW) ZONES	7 DAYS
SLOPES STEEPER THAN 3:1	7 DAYS
SLOPES 3:1 OR FLATTER	7 DAYS
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	7 DAYS

INSPECTIONS

WEEKLY INSPECTIONS REQUIRED.

RAIN GAUGE MUST BE PRESENT AT SITE. INSPECTIONS REQUIRED AFTER 0,5" RAIN EVENTS.

INSPECTIONS ARE ONLY REQUIRED DURING "NORMAL BUSINESS HOURS".

INSPECTION REPORTS MUST BE AVAILABLE ON-SITE DURING BUSINESS HOURS UNLESS A SITE SPECIFIC EXEMPTION IS APPROVED.

RECORD MUST BE KEPT FOR 3 YEARS AND AVAILABLE UPON REQUEST.

ELECTRONICALLY-AVAILABLE RECORDS MAY BE SUBSTITUTED UNDER CERTAIN CONDITIONS.

SEDIMENTATION & EROSION CONTROL PLAN LEGEND

DITCHES TO BE FILLED

STABILIZED CONSTRUCTION ENTRANCE

SILT FENCE — SF

STRAW WADDLE — W

LIMITS OF DISTURBANCE — LOD

BRIDGE MAT STREAM CROSSING

ROCK SILT SCREEN

EXISTING TREELINE

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

TEMPORARY SEED MIX

THE CONTRACTOR SHALL UTILIZE THE FOLLOWING SEED/FERTILIZER MIX IN SEEDING ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS:

SUMMER MIX (MAY 15 - AUGUST 15)
GERMAN MILLET. . . . . SETARIA ITALICA . . . . . 20 LBS / ACRE
BROWNTOP MILLET. . . . UROCHLOA RAMOSA. . . . 20 LBS / ACRE

WINTER MIX (AUGUST 15 - MAY 15)
RYE GRAIN. . . . . .SECALE CEREALE. . . . . .120 LBS / ACRE

PERMANENT SEED MIX

SUMMER MIX (MAY 15 -- AUGUST 15)

SPECIES	APPLICATION RATE (IN MIX) % OF MIX	LBS / ACRE
REDTOPPANICGRASS - PANICUM RIGIDULUM	28	5.6
BEAKED PANICGRASS - PANICUM ANCEPS	20	4.0
RIVER OATS - CHASMANTHIUM LATIFOLIUM	20	4.0
VIRGINIA WILDRYE - ELYMUS VIRGINICUS	20	4.0
SWITCHGRASS - PANICUM VIRGANTUM	10	2.0
LEATHERY RUSH - JUNCUS CORIACEUS	2	0.4
	100	20

NOTE:
ADD 10 LBS/ACRE OF MILLET TO ABOVE MIXTURE FOR A TOTAL OF 30 LBS/ACRE

WINTER MIX (AUGUST 15 -- MAY 15)

SPECIES	APPLICATION RATE (IN MIX) % OF MIX	LBS / ACRE
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LEATHERY RUSH - JUNCUS CORIACEUS	2	0.4
	100	20

NOTE:
ADD 10 LBS/ACRE OF RYE TO ABOVE MIXTURE FOR A TOTAL OF 30 LBS/ACRE

FERTILIZER. . . . . 750 LBS / ACRE
LIMESTONE. . . . . 2000 LBS / ACRE

FERTILIZER SHALL BE 10-10-10 ANALYSIS. UPON SOIL ANALYSIS A DIFFERENT RATIO OF FERTILIZER MAY BE USED.

SEEDBED PREPARATION
THE SEEDBED SHALL BE COMPRISED OF LOOSE SOIL AND NOT COMPACTED. THIS MAY REQUIRE MECHANICAL LOOSENING OF THE SOIL. SOIL AMENDMENTS SHOULD FOLLOW THE FERTILIZER AND LIMING DESCRIPTION IN THE ABOVE SECTIONS. FOLLOWING SEEDING, MULCHING SHALL FOLLOW THE BELOW APPLICATION METHODS AND AMOUNTS. AREAS CONTAINING SEVERE SOIL COMPACTION WILL BE SCARIFIED TO A DEPTH OF 8 INCHES.

MULCHING
SEEDED AREAS ARE TO BE PROTECTED BY SPREADING STRAW MULCH UNIFORMLY TO FORM A CONTINUOUS BLANKET (75% COVERAGE = 2 TONS/ACRE).

NOTE: FERTILIZER IS ONLY TO BE APPLIED ONCE. IF TEMPORARY SEED AND FERTILIZER IS APPLIED PRIOR TO PERMANENT SEED, THEN FERTILIZER SHALL NOT BE APPLIED WITH THE PERMANENT SEED.

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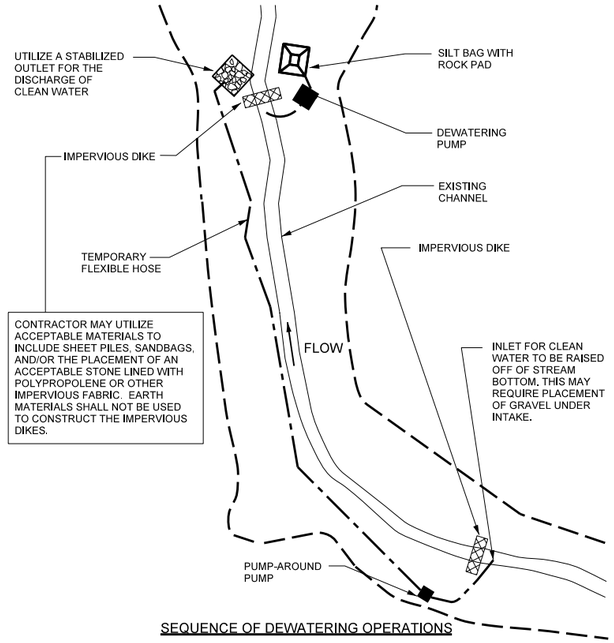
NORMAN'S PASTURE & NORMAN'S PASTURE II
RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: N.T.S.

EROSION CONTROL PLAN



SEQUENCE OF DEWATERING OPERATIONS

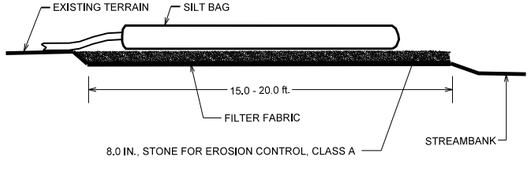
* ANY DEVIATION FROM ABOVE DEWATERING PLAN WILL REQUIRE DESIGNER APPROVAL.

1. INSTALL SILT BAGS(S) AND ROCK PAD(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA.
5. PERFORM REPAIR WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. REMOVE SILT BAG(S) AND STABILIZE DISTURBED AREA WITH SEED AND MULCH.

EXAMPLE OF PUMP-AROUND OPERATION

SCALE: NTS

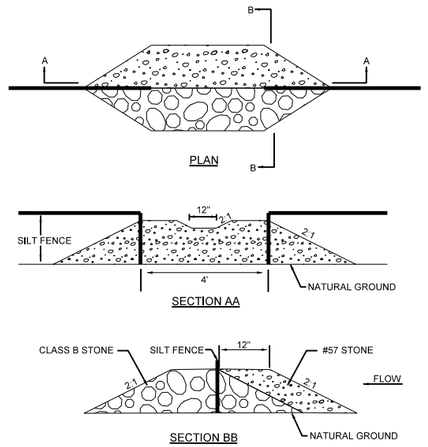
STILLING BASIN MAINTENANCE:
1. SEDIMENT BAGS SHOULD BE REPLACED WHEN THE CAPACITY OF THE SEDIMENT BAG HAS EXCEEDED 50%.
2. ACCUMULATED SEDIMENT SHOULD BE DISPOSED OF IN A DESIGNATED DISPOSAL AREA.
3. SPENT BAGS SHOULD BE DISPOSED OF PROPERLY AND NOT BURIED.
4. GRAVEL PADS SHOULD BE CHECKED DAILY DURING USE TO ENSURE THAT GRAVEL HAS NOT BEEN WASHED AWAY OR BEEN CHOKED BY EXCESSIVE SEDIMENTATION.
5. REPLACE PAD WITH CLEAN GRAVEL, AS NEEDED.



NOTE: PROVIDE STABILIZED OUTLET DOWN BANK TO STREAM

SPECIAL STILLING BASIN (SILT BAG) WITH ROCK PAD

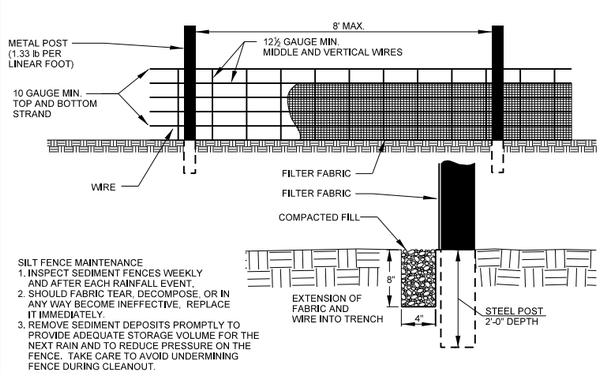
SCALE: NTS



SILT FENCE ROCK OUTLET MAINTENANCE:
1. REMOVE SEDIMENT WHEN IT ACCUMULATES TO ONE-HALF THE DESIGN VOLUME.
2. CHECK STRUCTURE AND ABUTMENTS FOR EROSION, PIPING, OR ROCK DISPLACEMENT. REPAIR IMMEDIATELY.
3. REMOVE ROCK OUTLET WHEN CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED, INSPECTED AND APPROVED. REMOVE ALL WATER AND SEDIMENT PRIOR TO REMOVING SCREEN. DISPOSE OF WASTE MATERIAL IN DESIGNATED DISPOSAL AREA.

TEMPORARY SILT FENCE ROCK OUTLET

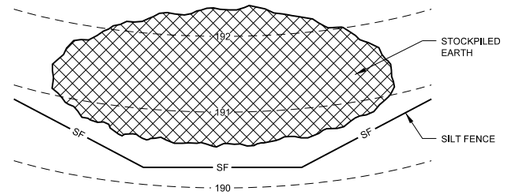
SCALE: NTS



SILT FENCE MAINTENANCE
1. INSPECT SEDIMENT FENCES WEEKLY AND AFTER EACH RAINFALL EVENT.
2. SHOULD FABRIC TEAR, DECOMPOSE, OR IN ANY WAY BECOME INEFFECTIVE, REPLACE IT IMMEDIATELY.
3. REMOVE SEDIMENT DEPOSITS PROMPTLY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING FENCE DURING CLEANOUT.
4. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, INSPECTED AND APPROVED. BRING THE DISTURBED AREA TO GRADE AND STABILIZE AS SHOWN IN THE VEGETATION PLAN.

SILT FENCE DETAIL

SCALE: NTS



NOTES:

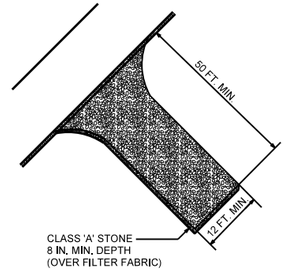
TEMPORARY SEEDING MUST BE APPLIED TO STOCKPILES IF NOT RELOCATED WITHIN 7 DAYS.

ALL STOCKPILES SHALL BE WITHIN LIMITS OF DISTURBANCE.

SILT FENCE SHALL BE INSTALLED DOWN GRADIENT OF ALL STOCK-PILES.

TEMPORARY STOCKPILE DETAIL

SCALE: NTS



NOTES:
1. TURNING RADIUS SUFFICIENT TO ACCOMODATE LARGE TRUCKS SHALL BE PROVIDED.
2. ENTRANCE(S) SHOULD BE LOCATED TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. GRAVEL CONSTRUCTION ENTRANCE SHALL BE LOCATED AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.

STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

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B	SUBMITTED FOR PERMITS	SEPT 2014

Ecosystem Enhancement Program

KCI ASSOCIATES OF NC
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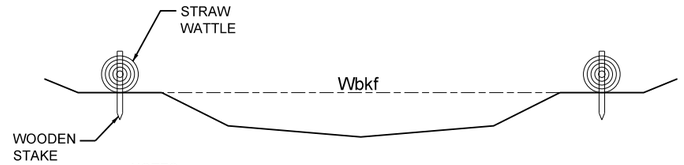
RALEIGH, NORTH CAROLINA 27609

NORMAN'S PASTURE & NORMAN'S PASTURE II
RESTORATION SITES
SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014
SCALE: N.T.S.

EROSION CONTROL PLAN

SHEET 13 OF 17



NOTES:

WATTLES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURERS SPECIFICATIONS.

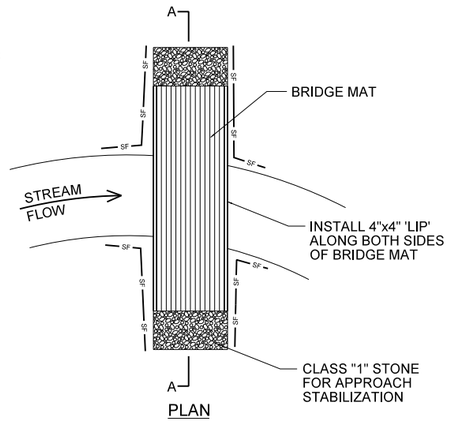
WATTLES SHALL BE INSTALLED ADJACENT TO THE TOP OF REACH T1 CHANNEL BANKS.

STRAW WATTLE

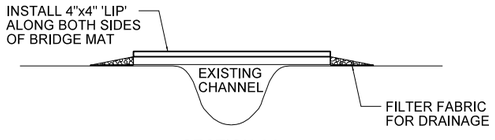
NOT TO SCALE

STREAM CROSSING MAINTENANCE:

1. INSPECT TEMPORARY CROSSING AFTER EACH RAINFALL EVENT FOR ACCUMULATION OF DEBRIS, BLOCKAGE, EROSION OF ABUTMENTS AND OVERFLOW AREAS, CHANNEL SCOUR, RIPRAP DISPLACEMENT, OR PIPING ALONG CULVERTS.
2. REMOVE DEBRIS, REPAIR AND REINFORCE DAMAGED AREAS IMMEDIATELY TO PREVENT FURTHER DAMAGE TO THE INSTALLATION.



PLAN



SECTION AA

NOT TO SCALE

1. BRIDGE LOCATIONS DEPICTED ON SITE PLANS ARE APPROXIMATE AND ARE SUBJECT TO CHANGE DEPENDING ON THE AREA THAT IS BEING WORKED UPON.
2. WIDTH OF EACH MAT IS DEPENDENT ON THE SIZE OF THE EQUIPMENT MEANT TO CROSS IT.
3. DISTANCE BETWEEN MATS IS DEPENDENT ON THE DISTANCE BETWEEN TRACKS ON THE EQUIPMENT MEANT TO CROSS IT.
4. APPROACH STABILIZATION, COMPOSED OF CLASS 1 STONE, WILL BE REQUIRED FOR EACH SECTION OF THE BRIDGE.

TEMPORARY BRIDGE MAT CROSSING

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

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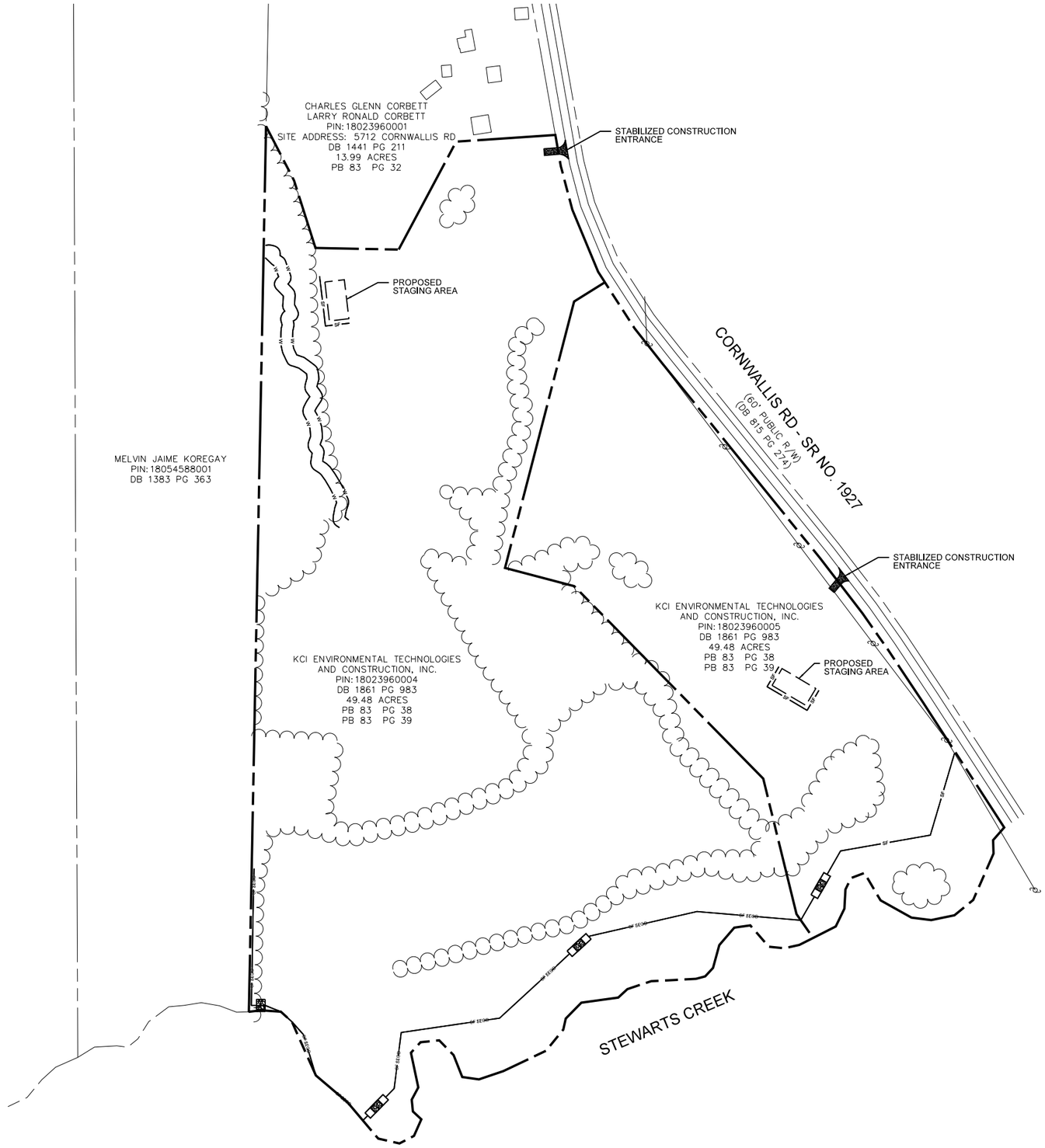
EROSION CONTROL PLAN

SHEET 14 OF 17



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TOTAL DISTURBED AREA = 40.1 AC

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NORMAN'S PASTURE & NORMAN'S PASTURE II RESTORATION SITES

SAMPSON COUNTY, NORTH CAROLINA

DATE: JUNE 2014

SCALE: GRAPHIC

EROSION CONTROL PLAN -OVERVIEW-

MATCHLINE - SEE SHEET 17

LOD

SF

SF / LOD

STABILIZED CONSTRUCTION ENTRANCE

CORNWALLIS ROAD

PROPOSED STAGING AREA

FILL EXISTING DITCH (TYPICAL ALL HATCHING)

EXISTING SECTION OF REACH T1 TO REMAIN UNFILLED

TEMPORARY BRIDGE MAT CROSSING

TEMPORARY SILT FENCE ROCK OUTLET (TYP.)

INSTALL STABILIZED DRAINAGE OUTFALL AT END OF REACH T1 (SEE DETAIL SHEET 3)

STEWARTS CREEK

NC GRID NAD '83

–80 –40 0 80 160

GRAPHIC SCALE

NOTE: TEMPORARY BRIDGE MAT CROSSING MAY BE MOVED AS NECESSARY AND AS APPROVED BY THE DESIGNER.

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

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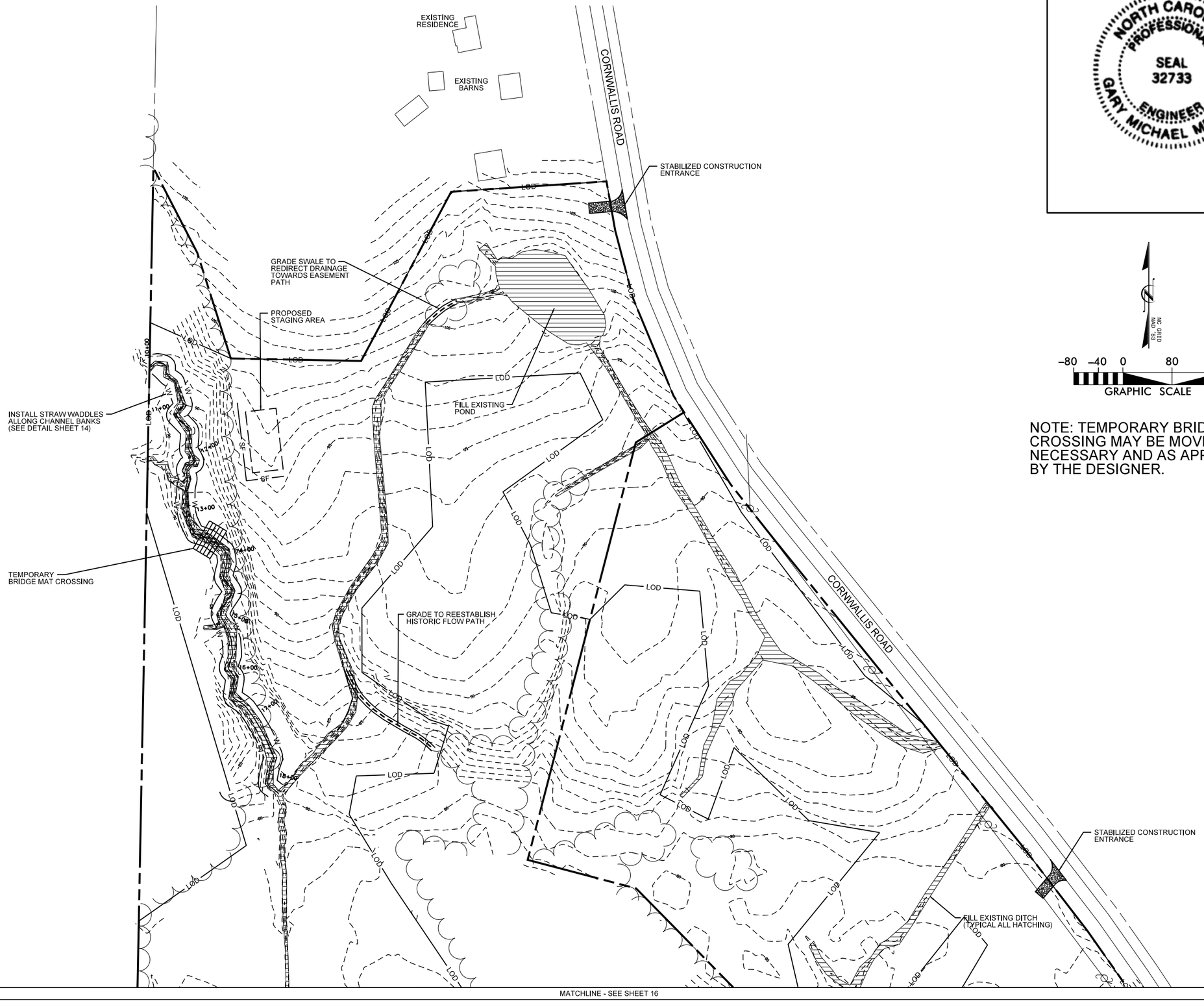
EROSION CONTROL PLAN

SHEET 16 OF 17



NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

NAD 83 GRID NC

–80 –40 0 80 160

GRAPHIC SCALE

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EROSION CONTROL PLAN

SHEET 17 OF 17