

**GRADY SITE MITIGATION PLAN
LENOIR COUNTY, NORTH CAROLINA**

**STATE PROJECT NO. 6.201014
TIP PROJECT NO. R-2001**

PREPARED FOR:

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL BRANCH
ENVIRONMENTAL UNIT**

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RESOURCE
SOUTHEAST, LTD.

ENGINEERS • SCIENTISTS • PLANNERS
1513 WALNUT STREET, SUITE 250 • CARY, NC 27511
(919) 460-6311 • FAX (919) 460-6270

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1.0 INTRODUCTION

1.1 Project Description

The Federal Highway Administration (FHWA) and the North Carolina Department of Transportation (NCDOT) propose to improve NC 11 in Lenoir County from south of Deep Run Creek to SR 1158 (TIP No. R-2001). The route will be upgraded to a multi-lane facility. The improvements include relocating a portion of NC 11 from 0.32 kilometers (0.20 miles) south of Deep Run Creek to SR 1158 and constructing a new bridge across Southwest Creek. The new bridge location is approximately 90 meters (300 feet) west of the current crossing. The proposed right-of-way (ROW) width in this area for the bypass averages approximately 55 meters (180 feet).

This project will impact jurisdictional wetlands as defined by the United States Army Corps of Engineers (USACE). A tract of land known as the Grady Property has been purchased by the NCDOT as part of the ROW acquisitions required for this project. The site will also provide some compensatory mitigation to offset unavoidable impacts to jurisdictional wetlands resulting from the construction of TIP No. R-2001.

1.2 Purpose

This mitigation plan describes the results of the jurisdictional wetland delineation, the consultation with the USACE Wilmington District, the water budget for the site, and the development of the mitigation plan. This report does not constitute final design of the mitigation site and does not include final construction drawings and plan specifications. Final design and construction drawings will be prepared following approval of this mitigation plan. Recommendations made in this report are based on the analysis of existing published data relative to this site and data collected during field investigations.

1.3 Wetland Mitigation Area

The Grady Property is located in Lenoir County just west of NC 11 and north of Southwest Creek, approximately 0.90 kilometers (0.56 miles) north of the town of Deep Run (Figure 1). The eastern property boundary is along NC 11 and Southwest Creek serves as the southern property boundary. The proposed project alignment extends northeast at a location approximately 90 meters (300 feet) west of the existing NC 11 alignment. The Deep Run Bypass ROW bisects the Grady Property into two segments. The 25.40 hectare (62.71 acre) Grady Mitigation Site has about 17.47 hectares (43.10 acres) available for wetland mitigation. Wetlands are found along Southwest Creek. The site is located within the Coastal Plain physiographic province of North Carolina.

1.4 General Methodology

Information sources used to prepare this report include: U.S. Geological Survey (USGS) 7.5 minute series topographic map of Deep Run, NC quadrangle (1980); Soil Conservation Service (SCS) Soil Survey of Lenoir County (1977); Lenoir County Property Maps (1991); Geologic Map of North Carolina (1985); Federal Emergency Management Agency (FEMA) Flood Insurance Maps (1984); topographical and property survey; and aerial photographs of the property (NCDOT, 1997). Research using these resources was conducted prior to the field investigation.

2.0 NATURAL RESOURCES AND WETLAND DELINEATION

2.1 Purpose and Methodology

The purpose of this section of the plan is to identify and locate the natural communities and wetland areas found on the Grady Mitigation Site. This section also describes the jurisdictional wetlands, including those wetlands that were delineated on the site and the subsequent consultations with the USACE. The areas presented apply to the mitigation areas and exclude the currently undeveloped ROW area.

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR 328.3 and in accordance with provisions of Section 404 of the Federal Water Pollution Control Act (33 U.S.C. 1344). Wetlands were delineated using the field delineation methods of the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987).

The initial field survey and wetland delineation was conducted on May 27 and July 14, 1998. The wetland delineations were GPS located on July 14, 1998. Wetland determinations were made along transects through transitional boundary areas on the property. The wetland/non-wetland boundaries were delineated with numbered flags and then surveyed and mapped (Figure 2). The USACE Routine Wetland Determination Data Sheets for each sample point were compiled (Appendix A). The wetland evaluations were conducted according to the North Carolina Division of Environmental Management (NCDEM - now known as North Carolina Division of Water Quality [DWQ]) Guidance for Rating the Values of Wetlands in North Carolina, Fourth Version.

Wetlands on the property had been previously delineated in 1990 for this project. This earlier delineation boundary extended east-west along the south side of a farm road serving the agricultural field extending along the northern limits of the property. These earlier wetland limits were re-evaluated to assess changes to the site.

Ecosystems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community type and the relationship of these biotic components. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species include the common name only. Vascular plant names follow nomenclature found in Radford et al. (1968) unless more current information is available. The presence of terrestrial and aquatic wildlife was determined through field observations, evaluation of habitat, and review of field guides and other documentation (Harlow et al., 1979; Justice and Bell 1968; Martof et al., 1980; Niering, 1997; Potter et al., 1980; Rohde et al., 1994; Webster et al., 1985). Additional information sources used to prepare this section include: United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (Deep Run NC, 1987) (Figure 3); National List of Plant Species that occur in Wetlands - Region 2 - Southeast (1995); and the Soil Survey of Lenoir County (SCS, 1977) (Figure 4). Soil survey mapped soil types were confirmed

through on-site verification. Soil colors were determined using Munsell Soil Color Charts (1994).

2.2 Natural Communities

Under Schafale and Weakley (1990) the natural plant community associated with the Southwest Creek drainage would be classified as a Coastal Plain Small Stream Swamp (Blackwater subtype). Prior to clearing, the agricultural field upslope to the north was most likely occupied by a Mesic Mixed Hardwood Forest (Coastal Plain Subtype).

2.2.1 Wetlands

Wetlands on the Grady Property (Figure 2), total 17.47 hectares (43.10 acres). The NWI wetland classification system classifies the area (Figure 3) adjacent to Southwest Creek as Palustrine Forested Broad-leaved Deciduous Saturated Seasonally Flooded (PFO1C), and the area further upslope as Palustrine Forested Broad-leaved Deciduous/Broad-leaved Evergreen Saturated (PFO1/3B) (Cowardin et al., 1979). Since this classification was mapped by the USFWS, the site has been logged and would currently be classified as Palustrine Scrub/Shrub Broad-leaved Deciduous Saturated (PSS1B) to indicate the cut-over condition (Figure 2). Near the creek however, the community is dominated by herbaceous hydrophytic plants. This Herbaceous Marsh community would be classified as Palustrine Emergent Persistent Seasonally Flooded/Saturated (PEM1E) under the NWI classification scheme.

The soils in this area are mapped by the Soil Survey of Lenoir County, North Carolina (USDA-SCS, 1977) as Pamlico muck, Norfolk loamy sand, and Wagram loamy sand (Figure 4). The field reconnaissance of these soils generally concur with these classifications. The Pamlico muck is a hydric soil (USDA-SCS, 1991) generally found in the wetter areas adjacent to the creek. The upland Wagram soils occur along the upslope boundary of the Pamlico muck soils. In this boundary area both soils are transitional and contain some mixed characteristics. The Norfolk loamy sand is also an upland soil bounding the Pamlico muck soils on the west.

2.2.1.1 Herbaceous Marsh Wetlands

Vegetation comprising the Herbaceous Marsh Wetlands (2.47 hectares [6.10 acres]) adjacent to the creek (Photo #1, Appendix B) (Figure 5) includes pennywort (*Hydrocotyle* sp.), arrow arum (*Peltandra virginica*), greenbriar (*Smilax rotundifolia*), cat-tail (*Typha latifolia*), Sphagnum (*Sphagnum* sp.), lizard's tail (*Saururus cernuus*), bulrush (*Scirpus* spp.), purple iris (*Iris virginica*), blackgum (*Nyssa sylvatica*), sweetbay (*Magnolia virginiana*), and other herbaceous hydrophytic species. Southwest Creek is braided into several channels in this area.

2.2.1.2 Scrub/Shrub Wetlands

Scrub/Shrub Wetlands (15.00 hectares [37.00 acres]) are located further upslope from the Herbaceous Marsh Wetlands (Photos #2 and #3, Appendix B). Species such as red maple (*Acer*

rubrum), sweet-gum (*Liquidambar styraciflua*) yellow-poplar (*Liriodendron tulipifera*), black willow (*Salix nigra*), blackberry (*Rubus* sp.), broom sedge (*Andropogon* sp.), winged sumac (*Rhus copallina*), green ash (*Fraxinus pennsylvanica*), devil's walking stick (*Aralia spinosa*), sycamore (*Platanus occidentalis*), honeysuckle (*Lonicera japonica*), goldenrod (*Solidago* sp.), netted chain fern (*Woodwardia areolata*), muscadine grape (*Vitis rotundifolia*), and swamp rose (*Rosa palustris*) can be found in this community. These species form a very dense impenetrable scrub/shrub stand throughout, with blackberry, grape, honeysuckle, and greenbrier tying the vegetation together. In most of these areas the ground surface is densely shaded.

2.2.2 Non-wetlands

2.2.2.1 Agricultural Field

A total of 6.07 hectares (15.01 acres) of the Grady Property has been cleared and is in agricultural use for row crops. Soils in this upland area are mapped as Wagram loamy sand 0 to 6 percent slopes (Figure 4). At the time of this assessment, herbaceous upland weed species were becoming established in the field. Based on other area forests in this landscape position, this area of the property was possibly a Mesic Mixed Hardwood Forest (Coastal Plain Subtype) prior to clearing.

2.2.2.2 Scrub/Shrub Cut-over

A 1.86 hectare (4.60 acre) Scrub/Shrub community (Photo #4, Appendix B) is located between the agricultural field on the north and the jurisdictional wetlands on the south (Figure 5). This area is transitional between the Agricultural Field and the Scrub/Shrub Wetlands communities. Vegetation in this community is succeeding from a cut-over which occurred approximately five to ten years ago. This community is a transitional area and receives the majority of the deposition of sediments actively eroding from the agricultural field upslope. Areas closer to the agricultural field to the north show signs of surface sediment deposition of materials eroding from the field and farm road. The plant community found here is very similar to that found in the adjacent wetlands to the south, except that the community has a larger component of facultative (FAC), facultative upland (FACU) and upland (UPL) species. These species include cherry (*Prunus serotina*), sassafras (*Sassafras albidum*), red maple, yellow-poplar, sweet-gum, greenbrier, dog-fennel (*Eupatorium capillifolium*), and blackberry.

The dominant soils in this upland area are mapped as Wagram loamy sand 0 to 6 percent slopes (Figure 4). A small area of Norfolk soils is mapped in this community on the west. There are areas of disturbance at a few locations. A logging deck was located just south of the agricultural field road, and fill appears to have been pushed into the community at two other locations (northeast corner and near the northwest corner).

2.3 Jurisdictional Wetlands Delineation

The field wetland delineation identified 17.47 hectares (43.10 acres) of jurisdictional wetlands on the Grady Mitigation Site (Figure 2). Wetland areas shown by the NWI were also evaluated (Figure 3). The delineated wetlands are located within the floodplain terrace of Southwest Creek. No non-wetland inclusions were identified within this wetland unit. The eastern boundary of these wetlands extends parallel to NC 11 along the edge of the fill slope of the roadway. A drainage ditch is located in the wetlands unit at the toe of this fill slope. The wetland/non-wetland boundary here is very distinct. The wetland boundary extends west from NC 11 essentially parallel to a field road along the southern edge of the cropland located along the north side of the property. An earlier wetland delineation, dating from 1990, identified the northern edge of the cut-over along this field road as the wetland delineation line. The current delineation predominantly identified this northern wetland boundary as being located, on average, about 10 meters (30 feet) south of the earlier line. At some locations the delineation lines are the same.

Pamlico muck soils dominate the delineated wetland area (Figure 4). Field reconnaissance confirmed the presence of this soil series (USDA-SCS, 1977), which is a listed hydric soil (USDA-SCS, 1991). High organic matter content in the surface layers of this soil was prevalent across the site. The non-wetland side of the delineation boundary showed obvious signs of sediment deposits across the surface. Hydrologic indicators found on the mitigation site include water-stained leaves, drainage patterns, sediment deposits, and water marks.

2.3.1 Consultation with Agencies

2.3.1.1 United States Army Corps of Engineers

On July 21, 1998, project field scientists met on-site with a representative of the USACE, Regulatory Field Office, Washington, North Carolina to confirm wetland delineations conducted on the Grady Mitigation Site. The USACE representative concurred with the most recent field delineation (Figure 2) during a site visit on July 21, 1998. A letter and delineation map were sent to the USACE (Appendix A), but no confirmation letter has been returned.

2.4 Wildlife

Wildlife observed on the Grady Property over the course of several site visits (May 27, July 14, July 20 and 21, 1998) included spotted turtle (*Clemmys guttata*), red-winged blackbird (*Agelaius phoeniceus*), and black racer (*Coluber constrictor*). An unidentified tree frog and a small number of toads were also observed.

This site is densely vegetated in many areas and could provide abundant cover for species that inhabit such places. Birds such as the white-eyed vireo (*Vireo griseus*) may nest in the scrub-shrub wetland community, and the swamp sparrow (*Melospiza georgiana*) could winter here, feeding on insects and seeds. The least shrew (*Cryptotis parva*) may find suitable nesting habitat

in the more open herbaceous dominated areas. Reptiles such as the eastern mud turtle (*Kinosternon subrubrum*) and snapping turtle (*Chelydra serpentina*) are among the species that may be part of the aquatic community at this site.

The Grady Property also provides a link with undeveloped forested areas that parallel Southwest Creek east and west of the site. This is beneficial in that it assists in providing a continuous corridor for wildlife to utilize.

2.5 Soils

The study identified three soil series dominating the Grady Mitigation Site. The soils mapped by the Soil Survey of Lenoir County, North Carolina (USDA-SCS, 1977) include Pamlico muck (Pc), Norfolk loamy sand 0 to 2 percent slopes (Nc), and Wagram loamy sand 0 to 6 percent slopes (Wb) (Figure 4). These soils comprise components of the Johnston-Chewacla-Kinston and the Pocalla-Wagram-Lakeland Soil Associations. The Johnston-Chewacla-Kinston Soil Association consists of very poorly drained to somewhat poorly drained soils that are mainly loamy throughout, but some are underlain by sandy material, on floodplains. The Pocalla-Wagram-Lakeland Soil Association consists of well drained to excessively drained soils that mainly have a loamy subsoil, on uplands.

2.5.1 Pamlico Muck

Very poorly drained Pamlico muck (Terric Medisaprists) soils are typically found in wide drainageways at the base of uplands (USDA-SCS, 1977). Slope is less than 1 percent. In this landscape position near streambanks this soil may have an overwash surface layer of mineral sediments. Infiltration is moderate if the water table is below the surface. Runoff is usually very slow and the surface is frequently ponded. These soils are subject to frequent flooding and have a seasonal high water table at the surface. Pamlico muck is listed as hydric and hydric soil inclusions include Torhunta, Johnston and Portsmouth soils (USDA-SCS, 1991).

2.5.2 Norfolk Loamy Sand

Norfolk loamy sand (Typic Paleudults) 0 to 2 percent slopes, soils consist of nearly level to sloping well drained upland soils. This phase of these soils is found on smooth, broad, slightly convex, irregularly shaped divides (USDA-SCS, 1977). Infiltration is moderate and runoff is slow. These soils are low in natural fertility and organic matter. Permeability is moderate and available water capacity is medium. The seasonal high water table is about 1.5 meters (5 feet) below the surface. The Norfolk series is not a listed hydric soil (USDA-SCS, 1991), and no hydric soil inclusions are listed, however wet spots in depressions can be found in these soils (USDA-SCS, 1977).

2.5.3 Wagram Loamy Sand

Wagram loamy sand (Arenic Paleudults) 0 to 6 percent slopes, soils consist of nearly level to strongly sloping, well drained upland soils (USDA-SCS, 1977). This phase of these soils is

found as irregular units on slightly convex divides. Permeability is moderately rapid and available water capacity is low. Infiltration is moderate and runoff is slow. These soils are low to very low in natural fertility and organic matter content. At this location the Wagram soils extend to the ridgeline along an interstream divide.

2.6 Rare and Protected Species

2.6.1 Federally Protected Species

Plants and animals with federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service lists two federally protected species for Lenoir County as of the May 14, 1998 listing (Table 1). Information pertinent to each species is provided below.

TABLE 1 FEDERALLY PROTECTED SPECIES FOR LENOIR COUNTY	
Scientific Name Common Name	Status
<i>Aeschynomene virginica</i> * (sensitive jointvetch)	T
<i>Picoides borealis</i> (red-cockaded woodpecker)	E

NOTES:

- E Denotes Endangered (a species that is in danger of extinction throughout all or a significant portion of its range).
- T Denotes Threatened (likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range).
- * Historic record - the species was last observed in the county more than 50 years ago.

Sensitive jointvetch is an annual plant in the Fabaceae family. It was federally listed as threatened on June 19, 1992. This plant reaches a height of approximately 1 to 2 meters (3 to 7 feet) and has compound leaves that fold slightly when touched. Habitat for the sensitive jointvetch consists of the intertidal zone where plants are flooded twice daily.

Habitat for this species was not found to occur on the Grady Mitigation Site, and the NCNHP records indicate no recorded occurrences of this plant on or in the vicinity of the property.

The red-cockaded woodpecker was federally listed as endangered on October 13, 1970. This bird is in the Picidae family and is approximately 20 centimeters (8 inches) in length, with a wingspan of about 38 centimeters (15 inches). Diet includes a variety of insects, and nesting

habitat consists of open stands of mature pine with a minimum age of 80 to 120 years. Appropriate foraging habitat includes pine and pine hardwood stands 30 years old or older and greater than 32 hectares (80 acres) in size.

The Grady Mitigation Site and adjacent habitats do not provide foraging or nesting habitat for this species. NCNHP records indicate no occurrences of the red-cockaded woodpecker on or in the vicinity of the property.

2.6.2 Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Species designated as FSC are defined as taxa which may or may not be listed in the future. These species were formerly Candidate 2 (C2) species or species under consideration for listing for which there is insufficient information to support listing. Some of these species are listed as Endangered, Threatened, or Special Concern by the NCNHP database of rare plant and animal species and are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. Table 2 provides the Federal Species of Concern in Lenoir County and their state classifications (NCDENR-DP-NHP, September, 1998; USFWS, 1998). The NCNHP database showed no recorded occurrences of FSCs in the vicinity of the Grady Mitigation Site.

TABLE 2 STATE STATUS OF FEDERAL SPECIES OF CONCERN IN LENOIR COUNTY	
Scientific Name Common Name	Status
<i>Amorpha georgiana</i> var. <i>georgiana</i> * (Georgia indigo-bush)	E
<i>Dionaea muscipula</i> * (Venus flytrap)	C-SC
<i>Procambarus medialis</i> (Tar River crayfish)	SR

NOTES:

- E Denotes Endangered - Continued existence as a viable component of the state's flora is determined to be in jeopardy.
- C Denotes Candidate - Species which are very rare within the state or have the majority of their distribution in North Carolina and therefore are dependent upon conservation in the state.
- SR Denotes Significantly Rare - Species which are very rare in North Carolina but are more common elsewhere. Also includes species with more abundant populations in North Carolina, but that are declining rangewide.

- SC Denotes Special Concern - A species which requires monitoring, but may be sold under certain regulations. SC species which are not also listed as T or E may be collected from the wild and sold under specific regulations. If also listed as T or E, propagated material only may be sold.
- * Historic record - the species was last observed in the county more than 50 years ago.

Potential habitat is present for the Georgia indigo-bush in sandy open areas of the Grady Mitigation Site such as the upland field. Southwest Creek provides habitat for the Tar River crayfish, which is found in the Neuse and Tar River basins in sluggish streams and ditches. Habitat is not present for the Venus flytrap.

3.0 EXISTING SITE CONDITIONS

The Grady Mitigation Site is located adjacent to NC 11 just north of Deep Run, in Lenoir County North Carolina (Figure 1). The site is bounded on the south by Southwest Creek and on the east by NC 11 and bisected by the right-of-way for the proposed road (1.95 hectares [4.80 acres]). The site consists of 16.86 hectares (41.60 acres) of previously forested habitat currently classified as scrub/shrub due to clearcutting (Table 3). Approximately 15.00 hectares (37.00 acres) of the scrub/shrub habitat is wetlands (Table 4). This clearcut appears to have occurred 5 to 10 years ago. The site is currently dominated by herbaceous species, woody coppice regeneration, and woody scrub/shrub species. The existing natural regeneration is dense, vigorous, and healthy; such that regeneration is thick and access to the cutover site is difficult. An herbaceous marsh plant community (2.47 hectares [6.10 acres]) is located adjacent to Southwest Creek. The remaining area (6.07 hectares [15.01 acres]) is in agricultural land which has been used for row crops and is currently vegetated by herbaceous "weedy" species.

The elevation of the Grady Mitigation Site extends from greater than 22 meters (72 feet) above mean sea level (msl) near the creek and NC 11 to 29.9 meters (98 feet) above msl near the northwest corner of the site (USGS, 1980). This change in elevation results in a south facing slope. The FEMA 10-year flood elevation at this location is 24.1 meters (79 feet) above msl (FEMA, 1984).

Tulls Millpond is located on Southwest Creek just west of SR 1111 approximately 2 kilometers (1¼ miles) upstream of the Grady Mitigation Site. The millpond dam likely restricts the flow of Southwest Creek in times of drought to the lower reaches of the creek including the Grady Mitigation Site. In spite of this dam, downstream floodplain wetlands, including those located on the Grady Mitigation Site, are viable. Thus, it can be concluded that during most years the dam's effect is not sufficiently significant to negatively alter the wetland hydrological regime for the floodplain wetlands.

	<i>hectares/acres</i>
Agricultural Land	6.07/15.01
Scrub/shrub	16.86/41.60
Herbaceous Marsh	2.47/6.10
Total	25.40/62.71

3.1 Bypass Location

The proposed Deep Run Bypass (NC 11) bisects the Grady Property into two mitigation areas excluding the area of the roadway impacts (Figure 6). The ROW extends approximately 365

meters (1,200 feet) north-south across the site. The center line is located approximately 90 meters (300 feet) west of the existing NC 11. The ROW is approximately 55 meters (180 feet) wide. Much of this crossing will be bridged in the wetlands.

TABLE 4 CALCULATED MITIGATION AREAS	
PLANT COMMUNITY	MITIGATION AREA <i>hectares/acres</i>
NON-WETLAND	
Agricultural land	6.07/15.01
Scrub/shrub	1.86/4.60
Total	7.93/19.61
WETLAND	
Scrub/shrub	15.00/37.00
Herbaceous Marsh	2.47/6.10
Total	17.47/43.10
TOTAL	25.40/62.71

	to site	Grady bridge	Total
Marsh			
CPSSWamp			
Total			

4.0 SPECIAL TOPICS

4.1 Utilities

The NC 11 ROW and its crossing over Southwest Creek is used by various utilities. Deep Run Community Water Corporation has a 15 centimeter (6 inch) water main on the west side of NC 11. This water main crosses over to the east side of NC 11 just south of Southwest Creek. Sprint has a fiber optic cable buried on the west side of NC 11. Carolina Power and Light (CP&L) has overhead power lines along the west side of NC 11. Multi Media Cable also has overhead lines on the west side of NC 11. The county has no sewer lines or storm water drainage along NC 11 or this section of Southwest Creek. No Cuts confirmed that there are buried cables and overhead wires on the west side of NC 11. AT&T has no lines at this location.

4.2 Flood Insurance Rate Maps

The Flood Insurance Rate Map (FEMA, 1984) for Lenoir County indicates that portions of the Grady Mitigation Site lie within the floodway, 100-year flood and 500-year flood boundaries (Figure 6). Cross sections of this area are available from FEMA. The FEMA 100-year flood elevation is approximately 24.8 meters (81.5 feet) above msl. The 500-year flood elevation is approximately 25.1 meters (82.5 feet) above msl.

4.3 Water Resources

According to the DWQ "Classifications and Water Quality Standards Applicable to the Surface Waters of North Carolina" (NCDEM, 1996), the area of Southwest Creek (Classification date: 5/1/88; Classification Index Number: 27-80) immediately adjacent to the Grady Mitigation Site is classified as a C Sw NSW waters in the Neuse River basin. Class C indicates that the best usage for which the waters must be protected are for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. The Sw supplemental classification identifies the waters as Swamp Waters; waters which have low velocities and other natural characteristics which are different from adjacent streams. The NSW supplemental classification identifies the waters as Nutrient Sensitive Waters; waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs. Southwest Creek is a tributary to the Neuse River, which has nutrient and sediment problems in the state.

The identified hydrologic unit number is 03020202 (NCDEHNR, 1993). This mitigation site is within a targeted hydrologic sub-unit of the NCDENR Division of Water Quality Wetland Reserve Program.

5.0 MITIGATION PLAN

5.1 Introduction

Field data collected from the Grady Mitigation Site includes plant community assessments, and soils and hydrology information. Evaluation of these data to assess mitigation opportunities on the site initially indicated that preservation and enhancement were feasible. Further evaluation of the site, including on-going successful development of natural regeneration, probability of mitigation success, agency comments, expected associated costs and implementation issues indicated that the Mitigation Plan should focus on enhancement of the existing wetlands on the site. These data indicate a high probability for successful vegetative enhancement of the existing cutover (scrub/shrub) wetland habitat on the mitigation site. Plans for implementing the proposed wetland enhancement are presented below.

5.2 Wetland Enhancement

The proposed wetland enhancement plan involves the elimination of undesirable woody species from the site and the creation of a vegetated buffer. Specifically, weed control and planting is planned for the scrub/shrub plant community. Revegetation of the agricultural field will be undertaken to stabilize exposed soil and to establish a vegetated buffer area upslope of the wetlands. These communities will add biotic diversity to the area.

5.2.1 Scrub/Shrub Wetlands

The Scrub/Shrub Wetland portion of the site (15.00 hectares [37.00 acres]) was occupied by a Coastal Plain Small Stream Swamp (Blackwater Subtype) forest community that was clearcut and left for natural regeneration to occur. This regeneration is composed of seed and sprout (coppice) origin vegetation. Coppice origin regeneration here is primarily woody. The site has recovered well from the clearcut and has obtained essentially 100 percent crown cover by resident and early successional species. The scrub/shrub regeneration on this site is dense and access is difficult. Hydric soils (Pamlico muck) dominate this plant community.

Wetland enhancement in the Scrub/Shrub portion of the site will consist of drum chopping of the site. Identified undesirable species consist of sweet-gum and red maple. The chopped debris and new sprouts on the site will then be burned. Herbicides will be applied by a licenced applicator in compliance with all label restrictions and approved application rates to control resprouting. Three or more herbicide treatments may be required to control weedy vegetation. The site will be planted with selected species (Table 5). These species are typical of the Coastal Plain Small Stream Swamp (Blackwater Subtype). A pre-emergent herbicide may be applied to control vegetation competing with the plantings.

5.2.1.1 Site Modifications

No grading or hydrologic modifications are required for the Scrub/Shrub Wetland community enhancement. The site will be drum chopped, burned, treated with herbicides, and planted. A KG blade will be used where necessary to break up large stems.

5.2.1.2 Vegetation

The Scrub/Shrub Wetlands will be planted with 6 to 8 of the species listed below (Table 5).

TABLE 5 SPECIES PROPOSED FOR WETLAND PLANTING			
COMMON NAME	SCIENTIFIC NAME	SE INDICATOR	PLANTING ZONE
willow oak	<i>Quercus phellos</i>	FACW-	1,2
water oak	<i>Quercus nigra</i>	FAC	2,3
laurel oak	<i>Quercus laurifolia</i>	FACW-	2
green ash	<i>Fraxinus pennsylvanica</i>	FACW	2
water tupelo	<i>Nyssa aquatica</i>	OBL	1
black-gum	<i>Nyssa sylvatica var biflora</i>	OBL	1
yellow-poplar	<i>Liriodendron tulipifera</i>	FAC	3
sycamore	<i>Platanus occidentalis</i>	FACW-	3

*Species
river
bank
selection
only*

The planting zones listed in Table 5 have been identified on the mitigation site in Figure 7. The zones in the Coastal Plain Small Stream Swamp extend from 1 to 3 (wettest to wet) in the wetland area along a general topographic gradient. Planting time will be from December through March.

Species designated for each planting zone will be randomly mixed and planted in each planting zone. Spacing of plants should be at 2.4 x 2.4 meters (8 x 8 feet) (approximately 1,680 stems/hectare [680 stems/acre]).

Water tupelo, black-gum and willow oak should dominate the planting zone adjacent to the Herbaceous Marsh Wetlands. Water oak, yellow-poplar, and sycamore will dominate Zone 3 on the upslope edge to the north.

5.2.1.3 Success Criteria

Success will be determined by achieving a survival rate of at least 50% by the end of year three.

5.2.1.4 Monitoring Plan

At age three (3) planting survival must be greater than 50% (840 stems/hectare [320 stems/acre]). Four plots, 0.02 hectares (0.05 acres) [15 x 15 meters (50 x 50 feet)], will be established to determine the survival rate. Plot areas will be representative of the entire scrub/shrub wetland community. Areas with less than 50% survival will be replanted.

5.2.2 Herbaceous Marsh Wetlands

The Herbaceous Marsh Wetlands (2.47 hectares [6.10 acres]) portion of the site is dominated by herbaceous hydrophytic vegetation, and has hydric soils and wetland hydrology. This area will be enhanced by the selected planting of bald cypress (*Taxodium distichum*) where access will allow due to the wet ground. Planting cypress along the upslope edge of this area will stabilize the soil and add some biological diversity without significantly altering the community. No drum chopping or other weed control is proposed in the Herbaceous Marsh area.

5.2.2.1 Site Modifications

No grading or hydrologic modifications are required for the Herbaceous Marsh Wetland community enhancement.

5.2.2.2 Vegetation

On no more than 0.4 hectares (1 acre) of the Herbaceous Marsh edge adjacent to the Scrub/Shrub Wetlands, bald cypress will be selectively planted. The plantings will be no closer than 12 x 12 meters (30 x 30 feet).

5.2.2.3 Success Criteria

A survival rate of 50% must be achieved at three (3) years.

5.2.2.4 Monitoring Plan

At two (2) and four (4) years, site inspections will determine the survival of the planted bald cypress. A survival rate of 50% must be achieved or the dead individuals will be replaced.

5.3 Enhancement of Non-Wetland Areas

The two non-wetland areas described below will be treated to protect and enhance the wetland areas down slope. These treatments will be undertaken at a biologically appropriate time and coordinated with the wetland enhancement activities described above. No monitoring or secondary treatments are planned for the activities in the non-wetland enhancement areas.

Planting and fertilizer application will be according to the NCDOT standard specifications. Understory weed competition will be controlled as needed especially during the first three years following planting. Herbaceous and woody understory/ground cover vegetation will actively volunteer onto this site.

5.3.1 Agricultural Field

The goal in the agricultural field planting (6.07 hectares [15.01 acres]) is to re-establish the Mesic Mixed Hardwood Forest (Coastal Plain Subtype) buffer that may have existed previously at this location. The agricultural field will be disked and treated with an approved pre-emergent herbicide to reduce the component of herbaceous weed species. The agricultural field will be planted with desirable species that will establish cover, provide mast, enhance wildlife food values and add biotic diversity. Individuals of each species will be planted in a random mix. This planting plan will reduce interspecific competition and increase the potential success for longterm survival in the developing community.

5.3.1.1 Site Modifications

Other than disking, no grading or other site modifications will be undertaken.

5.3.1.2 Vegetation and Planting Plan

The species proposed for planting in the agricultural field are listed in Table 6. At least four of these species will comprise the proposed planting mix. They will be planted on a 2.4 x 2.4 meter (8 x 8 foot) spacing (approximately 1,680 stems/hectare; 680 stems/acres) in a random mix of species. Ground cover will be obtained by seeding the field with clover (*Trifolium* sp.). This will provide a low, fast growing, herbaceous cover that fixes nitrogen but is also less competitive than grasses with the woody species to be planted.

5.3.2 Scrub/Shrub

Identified non-wetland Scrub/Shrub areas (1.86 hectares [4.60 acres]) will be altered to improve and protect the Scrub/Shrub Wetland enhancement area. The Scrub/Shrub non-wetlands will be drum chopped, burned, treated with herbicides and planted at the same time and the same way as the Scrub/Shrub Wetlands to reduce the component of undesirable species in this community.

5.3.2.1 Site Modifications

No grading or hydrologic site modifications are required.

**TABLE 6
SPECIES PROPOSED FOR PLANTING**

Common Name	Scientific Name	Southeast Region Indicator
white oak	<i>Quercus alba</i>	FACU
northern red oak	<i>Quercus rubra</i>	FACU
southern red oak	<i>Quercus falcata</i>	FACU-
white ash	<i>Fraxinus americana</i>	FACU
black cherry	<i>Prunus serotina</i>	FAC

*walnut
FAC*

5.3.2.2 Vegetation *poplar*

white oak

pruned

Species to be planted in this area are the same species proposed for the agricultural field.

5.3.2.3 Success Criteria

No strict success criteria are proposed for this non-wetland buffer area. However, a survival rate of greater than 50% is expected.

5.3.2.4 Monitoring Plan

No monitoring plan is proposed for this non-wetland buffer area.

5.4 Disposition of the Grady Mitigation Site

The NCDOT is in the process of soliciting conservation groups and natural resource agencies for final dispensation of its properties. However, until an acceptable agreement can be reached with an appropriate recipient of the property, ownership of the mitigation site will remain with the NCDOT. Deed restrictions will be included upon transfer to a recipient to ensure that the property remains as conservation land in perpetuity. In any event, the NCDOT accepts responsibility at the present time for development and long term management of the site.

6.0 CONCLUSIONS

Based upon the information developed in this mitigation plan, the following conclusions are presented:

1. The 25.40 hectare (62.71 acre) Grady Mitigation Site currently contains 17.47 hectares (43.10 acres) of jurisdictional wetlands available for mitigation. These wetlands include 2.47 hectares (6.10 acres) of Herbaceous Marsh Wetlands and 15.00 hectares (37.00 acres) of Scrub/Shrub Wetlands.
2. Sufficient water is currently available to the wetland areas. No hydrologic or grading modifications are required.
3. The site does not possess habitat for any known federal threatened or endangered species.
4. Enhancement of the Herbaceous Marsh and Scrub/Shrub Wetlands will be accomplished by reducing the numbers of undesirable individuals and species and increasing the numbers of desirable species.
5. Wetland enhancement will also be accomplished by eliminating undesirable weedy plants and species by revegetating the agricultural field and non-wetland scrub/shrub area with desirable species. Stabilization of the soils in the upland area will buffer and enhance the wetlands downslope.
6. The final implementation plan will include planting specifications and design for the enhancement areas.

7.0 LIST OF PREPARERS

ANDREA M. WARFIELD, Vice President (*B.S., Education, Mansfield University, B.S., Biology, Mansfield University, Minor, Chemistry and Mathematics, Mansfield*): Ms. Warfield has had sixteen years of combined management and operations experience with responsibilities including hiring, training, supervising personnel, policy formulation and implementation; budget development and execution; and company operations. She has demonstrated excellent technical ability and superior problem solving skills in the management of large task order contracts. She has served on numerous steering and task force committees in Virginia, North Carolina and Maryland, providing guidance for the successful implementation of public participation programs designed to inform and support alternative impact studies.

FRANK PRICE, P.E., R.L.S., Project Manager (*B.S.C.E., Civil Engineering, North Carolina State College, 1961; M.S.C.E., Civil Engineering, North Carolina State University, 1969; Certificate in Planning, Georgia Tech, 1964; Certificate in AASHTO Management, University of Mississippi, 1987*): Mr. Price has over 34 years of engineering, planning and management experience, and over 30 years of experience with the NCDOT as a project engineer, unit head, program manager and engineering manager. He has served as project planning engineer on numerous highway projects throughout North Carolina. Mr. Price has managed the planning and environmental development of transportation projects for Resource, the NCDOT, and other private consulting firms.

KENNETH R. ROEDER, Ph.D., Senior Environmental Scientist, (*Ph.D., Forestry, North Carolina State University, minor, soils, 1988; M.S., Forest Genetics, University of Florida, with concentration in statistics, 1981; B.S., Forest Resource Management, SUNY College of Environmental Science and Forestry, and Syracuse University, 1975*): Dr. Roeder has over twenty years of Natural Resource Assessment experience dealing with NEPA/SEPA and Section 401/404 Clean Water Act compliance of Transportation and other private and public sector projects. Dr. Roeder's technical areas of expertise include wetland delineations, permitting, and mitigation planning, soil studies, ecology, threatened and endangered species studies, feasibility studies, environmental impact studies, natural resource assessments and inventories, biomass productivity and yield, statistics, and field research. Dr. Roeder's experience also includes agency coordination, public involvement and public meetings/hearings.

LISA S. WARLICK, Project Scientist (*B.S., Natural Resources, concentration, ecosystem assessment, Minor, Zoology, North Carolina State University, 1996*): Ms. Warlick has experience in conducting research and field work for habitat assessments, inventories and land management. She has field skills in soil classification, forest and wetland plant identification, and terrestrial vegetation measurements. Additionally, Ms. Warlick has experience with federal and state governments working with insect monitoring and control, and in molecular botany and reproductive and developmental toxicology laboratories.

JOHN G. CONFORTI, R.E.M., Project Engineer (*B.E., Civil Engineering, Core Study: Transportation / Environmental, Pratt Institute Brooklyn New York*): Mr. Conforti has over 11 years of environmental and transportation engineering experience and is a Registered Environmental Manager. He has extensive experience in wetland identification and delineation, NEPA, Section 404, and Section (f)/6(f) evaluation procedures. Mr. Conforti's other areas of expertise include the development of erosion and sedimentation control plans, retrofitting and inspecting flood prone structures, Phase I/II Site Assessments, wetland field botany, environmental impact studies, field research, HEC-2 / HEC-RAS floodplain studies, hydraulic and hydrological studies. Mr. Conforti has managed various projects from preliminary design through construction for both private and government sectors. His experience includes agency coordination, public involvement, and functioning as a liaison between Districts and the Federal Highway Administration.

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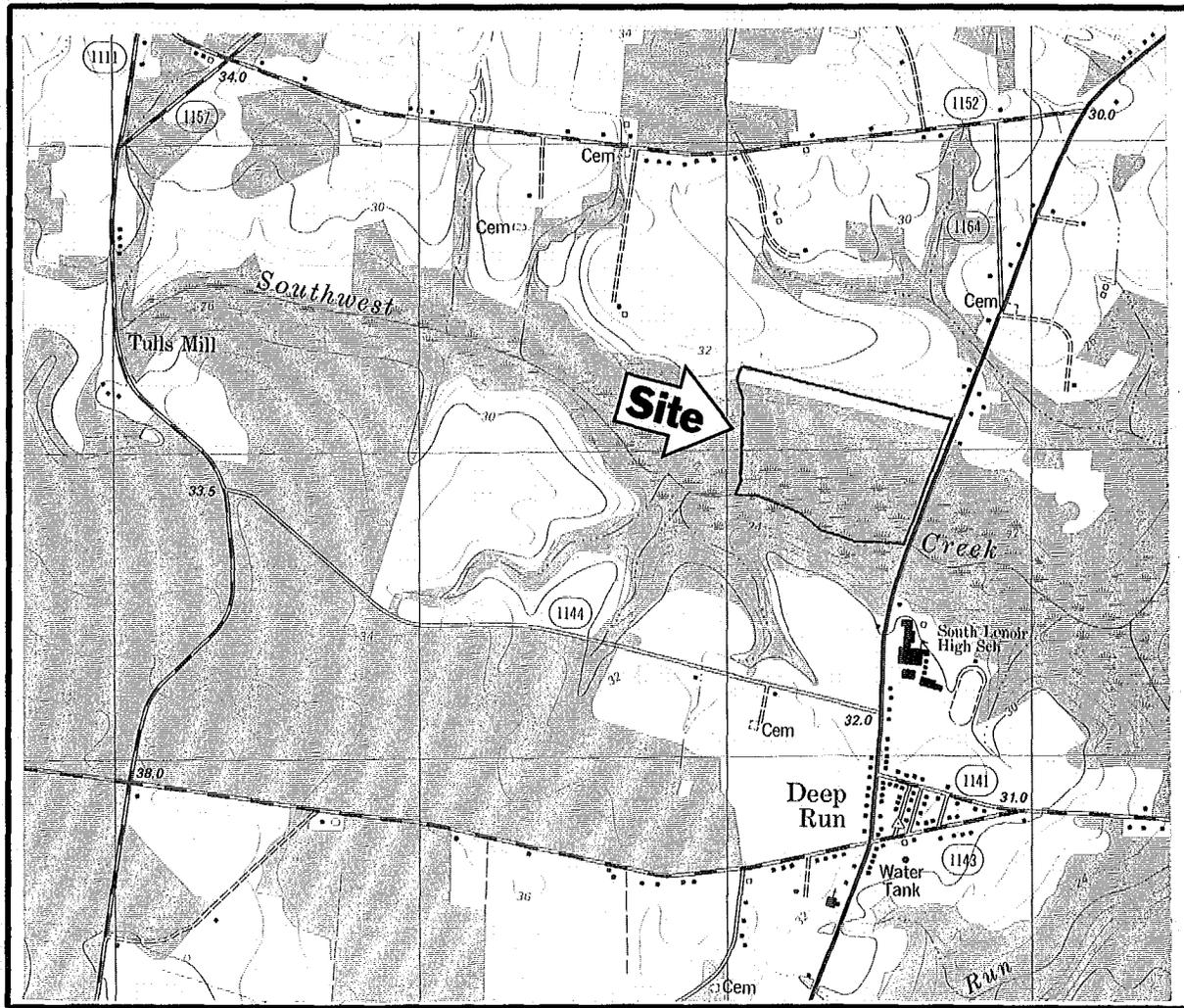
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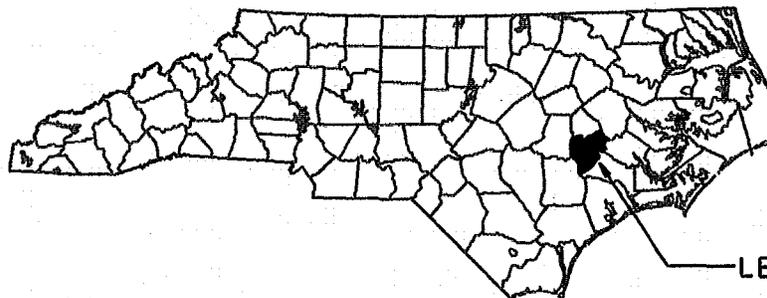
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FIGURES



U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE
 DEEP RUN, NORTH CAROLINA
 SCALE: 1 in = 2,000 FEET
 1 cm = 240 METERS



NOTE: LOCATIONS ARE APPROXIMATE

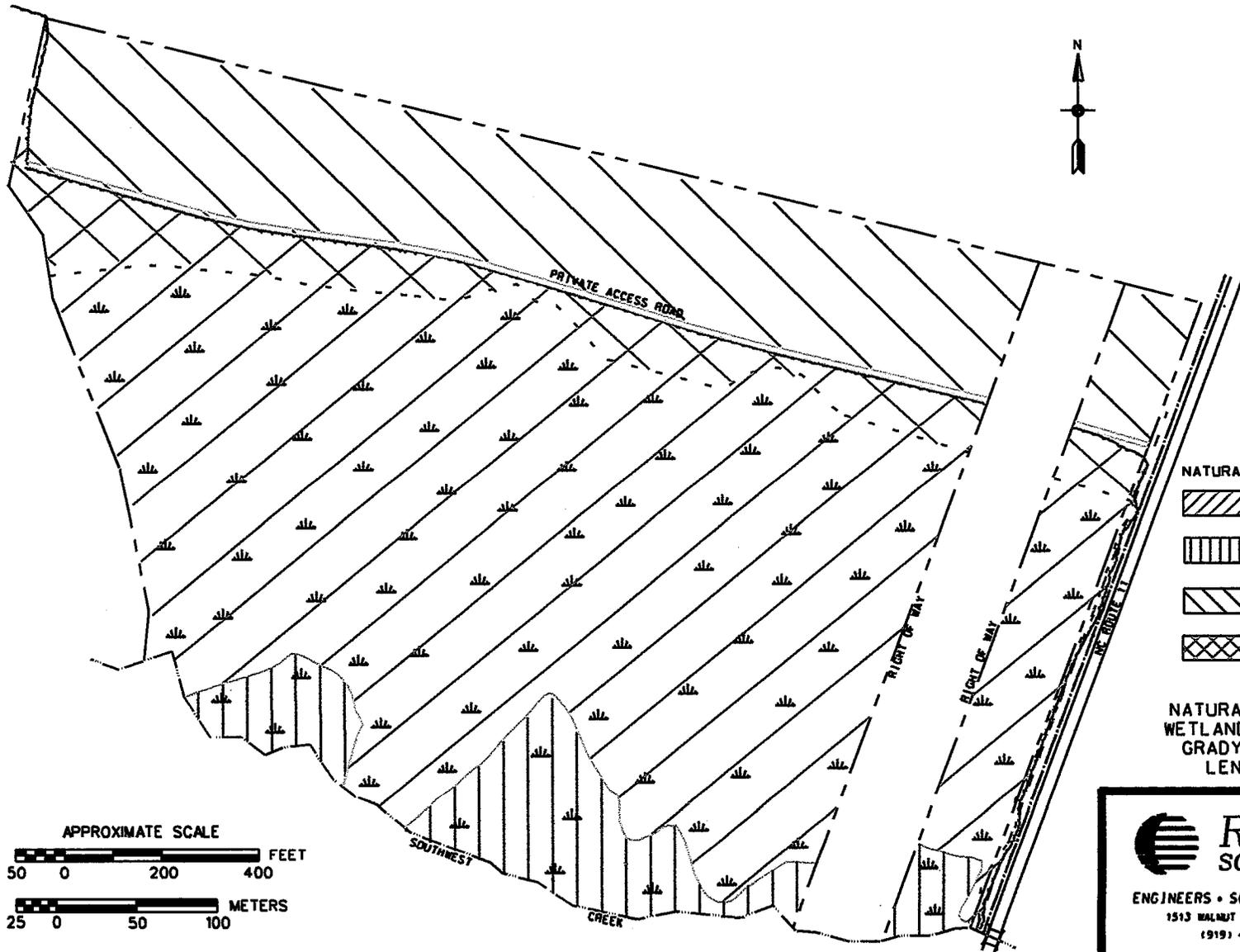
FIGURE 1
 AREA LOCATION MAP
 GRADY MITIGATION SITE
 LENOIR COUNTY, NC



RESOURCE
SOUTHEAST, LTD.

ENGINEERS • SCIENTISTS • SURVEYORS • PLANNERS
 1513 WALNUT STREET SUITE 250 CARY, NC 27511
 (919) 460-6311 • FAX (919) 460-6270

Cl:/Project.F11/92/14028-440-cob/11/92-050

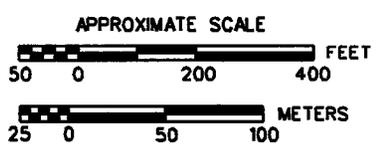


- LEGEND**
- - - WETLANDS/NON-WETLANDS BOUNDARY
 - — — PROPERTY LINE
 - ~~~~~ TREE/SHRUB LINE
 - - - - - POWER LINE
 - ==== EXISTING ROAD
 - ===== PRIVATE ROAD
 - — — STREAM
 - - - - - DRAINAGE DITCH
 - ▲▲▲ WETLANDS AREA

- NOTES:**
1. PROPERTY BOUNDARIES ARE APPROXIMATE
 2. WETLANDS DELINEATED BY RESOURCE SOUTHEAST LTD. IN JULY 1998
 3. AREA OF DELINEATED WETLANDS = 17.47 HECTARES (43.10 ACRES)

- NATURAL COMMUNITIES KEY:**
- SCRUB/SHRUB WETLANDS
 - HERBACEOUS MARSH WETLANDS
 - AGRICULTURAL FIELD
 - SCRUB/SHRUB NON-WETLANDS

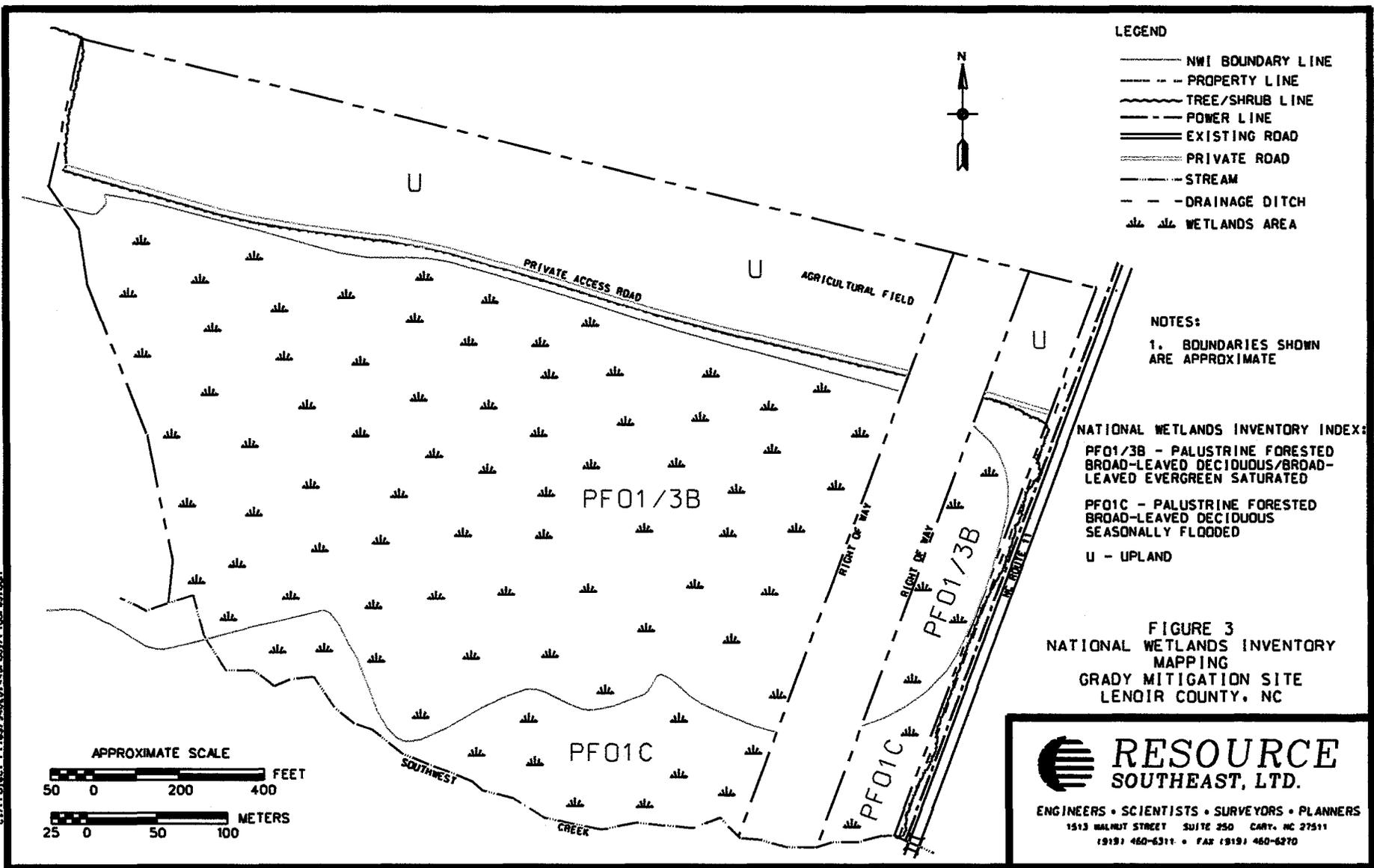
FIGURE 2
NATURAL COMMUNITIES AND WETLANDS DELINEATION MAP
GRADY MITIGATION SITE
LENOIR COUNTY, NC



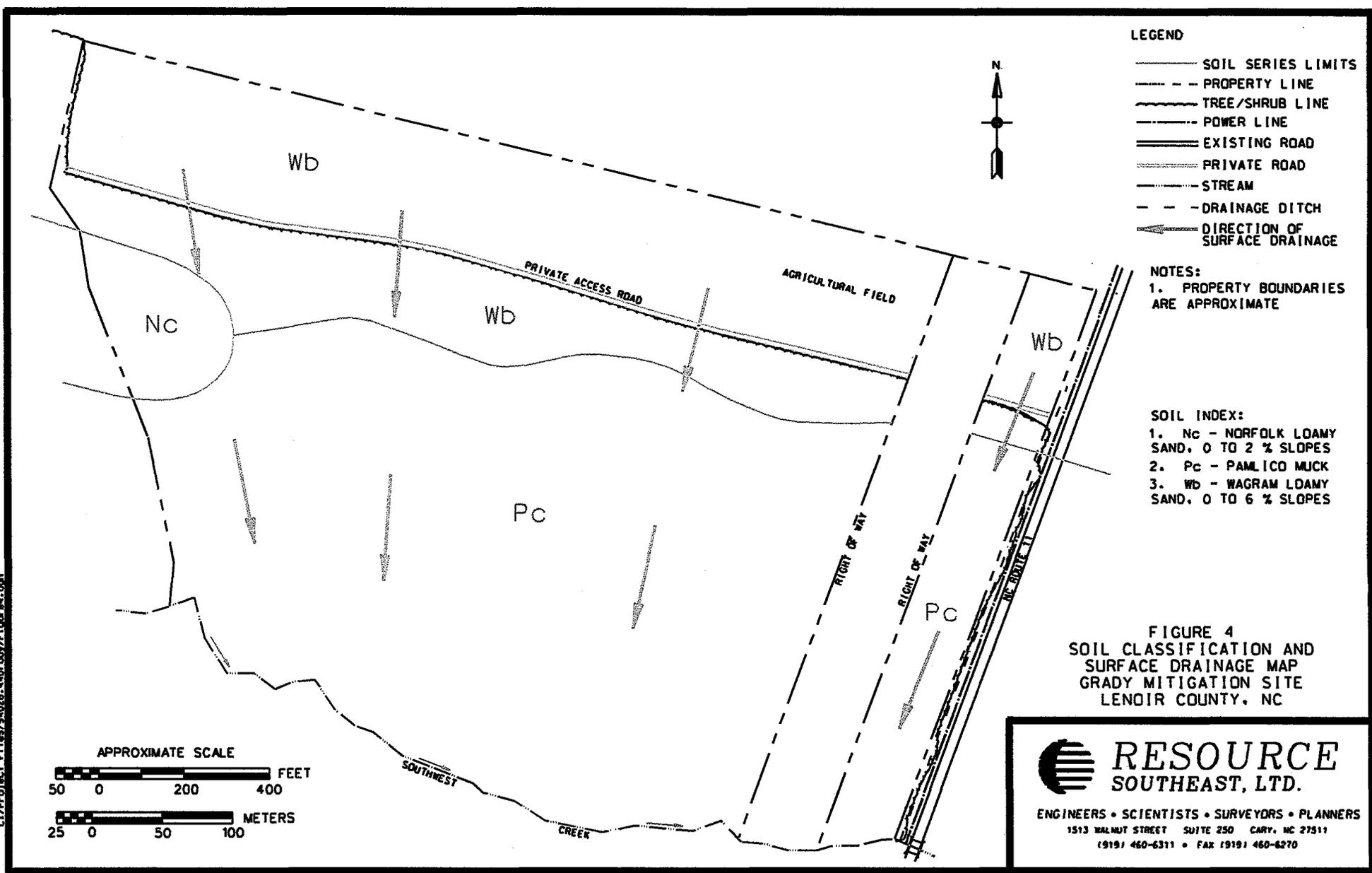
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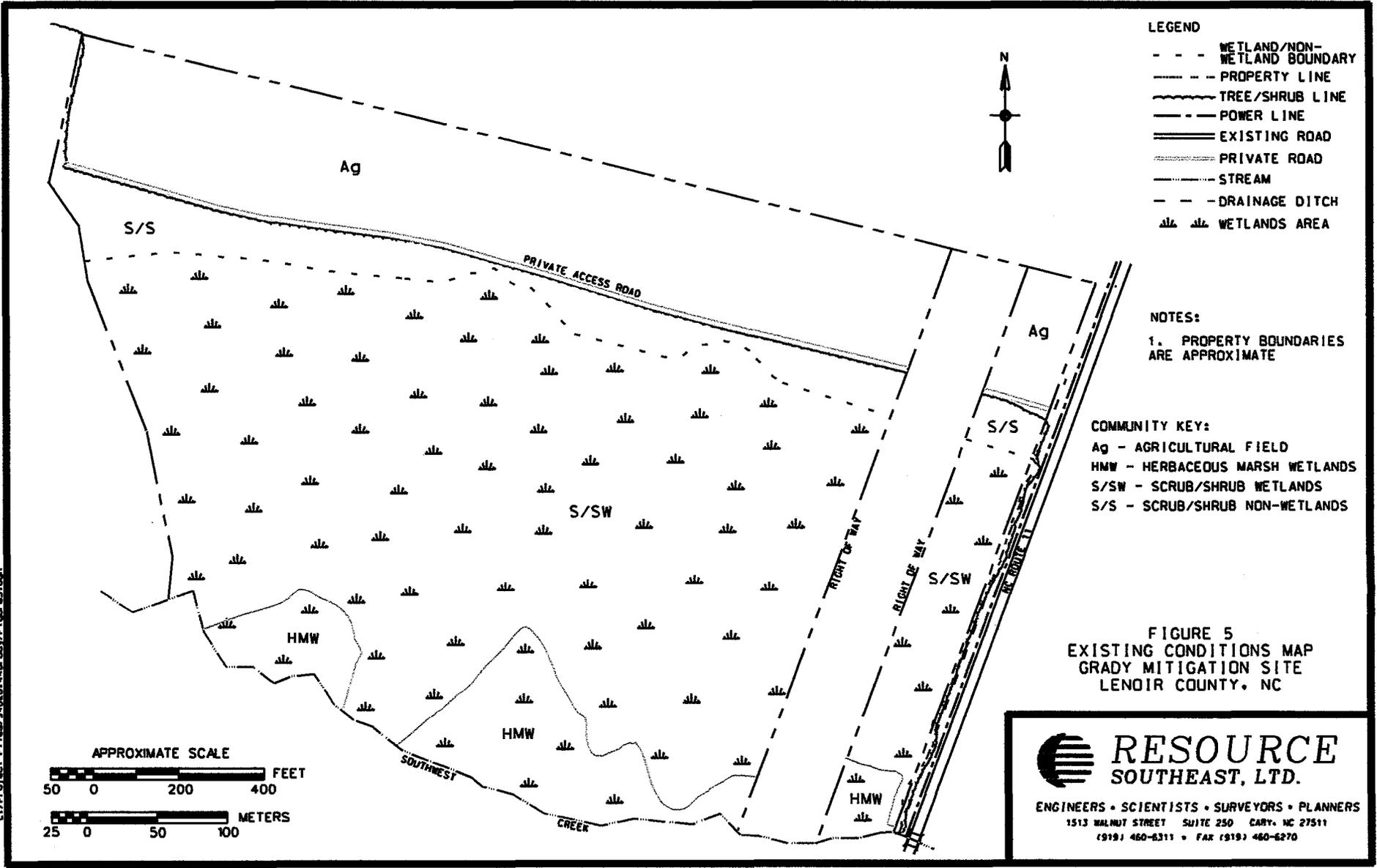
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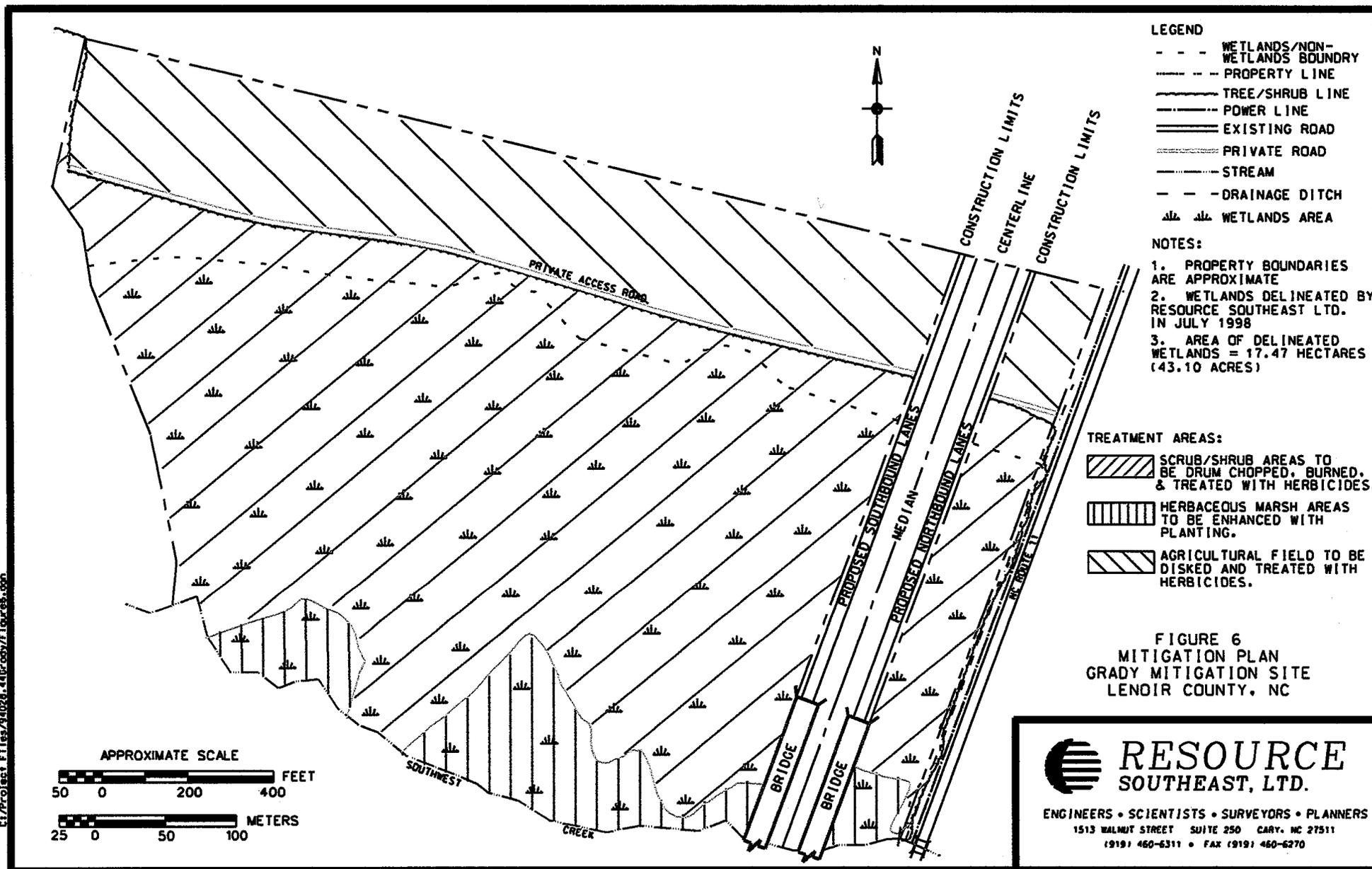
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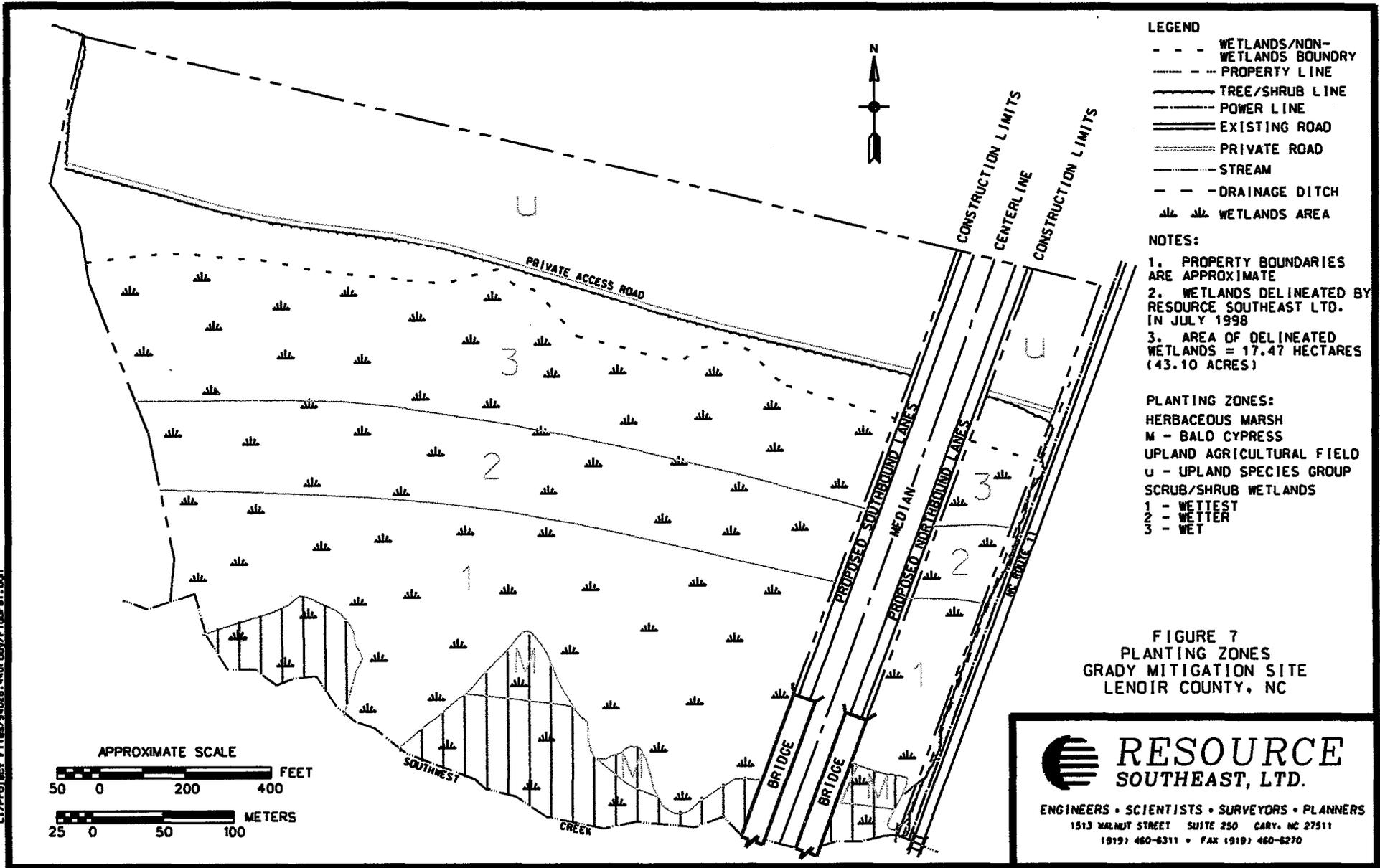
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APPENDICES

APPENDIX A
Correspondence and USACE Data Forms



RESOURCE
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July 30, 1998

P.N. 94028.44

Mr. Mike Bell
U.S. Army Corps of Engineers
P.O. Box 1000
Washington, NC 28560

RE: Grady Mitigation Site

Dear Mr. Bell:

Thank you for meeting with me at the above referenced site on July 21, 1998. Pursuant to our discussion, enclosed is a map of the Grady delineated wetlands as confirmed on-site.

If you should have any questions, please do not hesitate to contact me at 919/460-6311.

Sincerely,

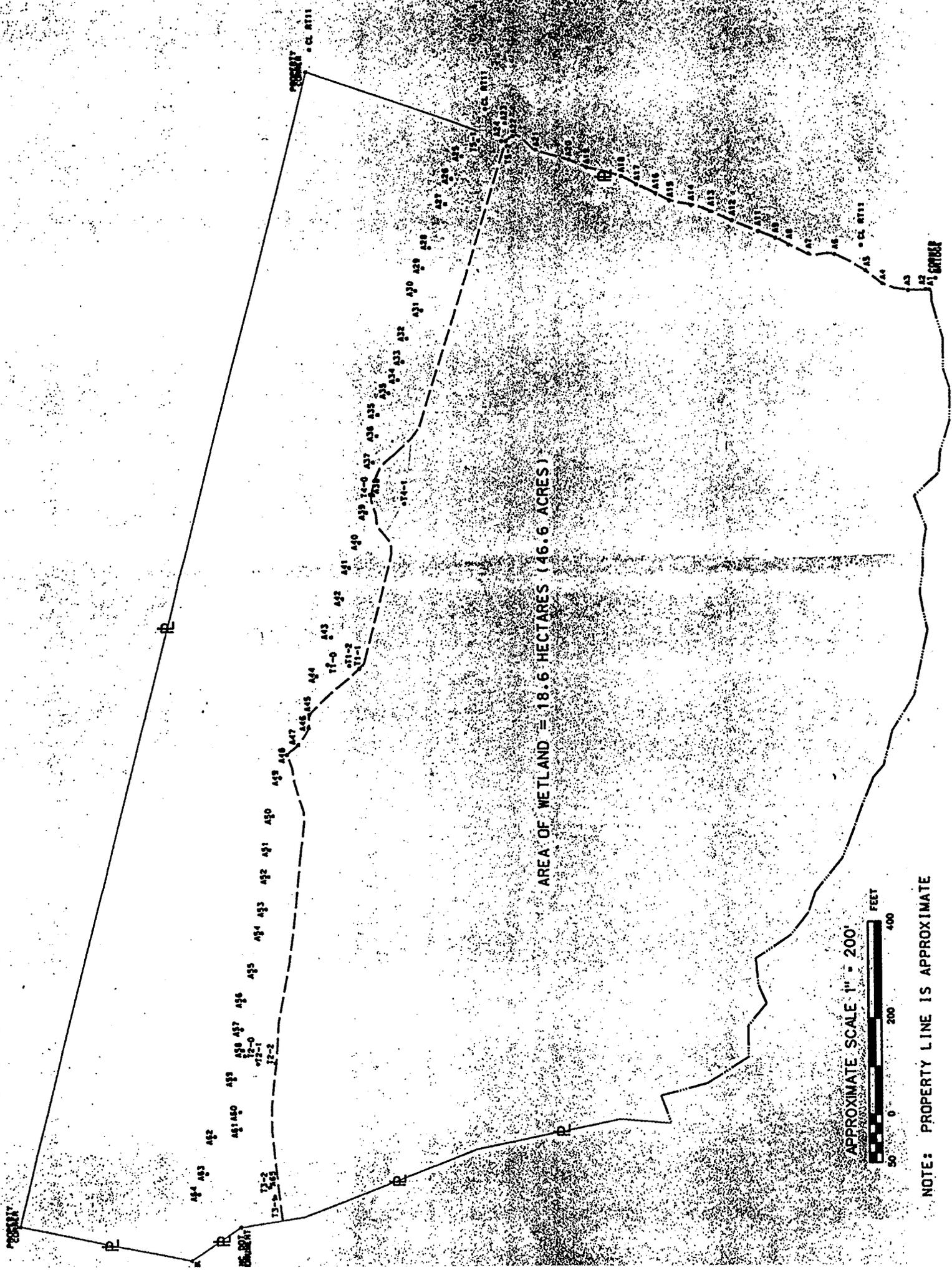


Kenneth R. Roeder, Ph.D.
Senior Environmental Scientist

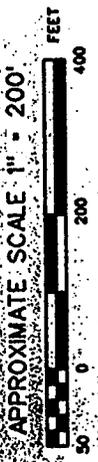
/lc

Enclosure





AREA OF WETLAND = 18.6 HECTARES (46.6 ACRES)



NOTE: PROPERTY LINE IS APPROXIMATE



ENGINEERS • SCIENTISTS • SURVEYORS • PLANNERS

August 4, 1998

P.N. 94028.44

Mr. Tanner Holland
NCDOT Planning and Environmental Branch
1 South Wilmington Street
Raleigh, NC 27611-5201

RE: Grady Mitigation Site

Dear Mr. Holland:

Enclosed is a map of the Grady delineated wetlands as confirmed on-site with Mr. Mike Bell on July 21, 1998. A copy of this map was also sent to Mr. Bell.

If you should have any questions, please do not hesitate to contact me at 919/460-6311.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth R. Roeder", is written over a light blue horizontal line.

Kenneth R. Roeder, Ph.D.
Senior Environmental Scientist

/lc

Enclosure





ENGINEERS • SCIENTISTS • SURVEYORS • PLANNERS

November 12, 1998

P.N. 94028.44

Mr. Tanner Holland
NCDOT Planning and Environmental Branch
1 South Wilmington Street
Raleigh, NC 27611-5201

RE: Draft Grady Site Mitigation Plan

Dear Mr. Holland:

Enclosed are three (3) draft copies of the Mitigation Plan for the Grady Site in Lenoir County, North Carolina, for your review. Upon receipt of the North Carolina Department of Transportation's comments we will begin processing the final copies of this report.

We have incorporated the ideas and points that were discussed in our meeting on October 21, 1998, and the design data that you provided afterwards. Note that the plan attempts to minimize disturbance to the existing wetland regeneration and does not require site grading. The plan results in 10.78 wetland enhancement credits based on a 4:1 ratio.

Mr. Mike Bell, of the USACOE, has concurred with the field wetland delineation. A letter and delineation map were sent to the USACOE, but no confirmation letter has been returned.

The figures attached to this draft report are 11 x 17 for your review. In the final plan these figures will be produced as 8 ½ x 11.

If you should have any questions, please do not hesitate in contacting us.

Sincerely,

A handwritten signature in black ink, appearing to read "Ken Roeder", is written over the typed name.

Kenneth R. Roeder, Ph.D.
Senior Environmental Scientist

/lc

Enclosure

cc: V. Charles Bruton, Ph.D.
David Robinson, Ph.D.
David Schiller
Alice Gordon



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, F. Price	Project No: 94028.44	Date: 27-May-1998 County: Lenoir State: North Carolina Plot ID: A14
---	-----------------------------	--

Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: scrub/shrub Transect ID: Field Location:
--	--	--	--	---

VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Liquidambar styraciflua</i> Gum,Sweet	Tree	FAC+	<i>Toxicodendron radicans</i> Ivy,Poison	Vine	FAC
<i>Saururus cernuus</i> Tail,Lizard's			Shrub		
<i>Vitis aestivalis</i> Grape,Summer	Vine	FAC-		<i>Liriodendron tulipifera</i> Tulip poplar	Tree

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/6 = 83.33%	FAC Neutral: 2/2 = 100.00% Numeric Index: 14/6 = 2.33
--	--

Remarks:

HYDROLOGY

<u>NO</u> Recorded Data(Describe in Remarks): N/A Stream, Lake or Tide Gauge N/A Aerial Photographs N/A Other <u>YES</u> No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: N/A (in.)	Wetland Hydrology Indicators Primary Indicators <u>YES</u> Inundated <u>YES</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>YES</u> Drift Lines <u>NO</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
--	--

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, F. Price	Project No: 94028.44	Date: 27-May-1998 County: Lenoir State: North Carolina Plot ID: A14
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SOILS

Map Unit Name (Series and Phase): Pamlico Muck	Map Symbol: Pc	Drainage Class: Very poorly drained	Mapped Hydric Inclusion?
Taxonomy (Subgroup): Terric Medisaprists	Field Observations Confirm Mapped Type? Yes <input type="radio"/> No <input checked="" type="radio"/>		
Profile Description			

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Mottle	Texture, Concretions, Structure, etc
N/A		N/A	N/A	N/A	N/A	n/a

Hydric Soil Indicators:

NO Histosol NO Histic Epipedon NO Sulfidic Odor NO Aquic Moisture Regime NO Reducing Conditions NO Gleyed or Low Chroma Colors	NO Concretions NO High Organic Content in Surface Layer in Sandy Soils NO Organic Streaking in Sandy Soils YES Listed on Local Hydric Soils List YES Listed on National Hydric Soils List NO Other (Explain in Remarks)
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Remarks:
 Soils data Not Available

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Remarks:

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Grady Property	Project No: 94028.44	Date: 27-May-1998
Applicant/Owner: NCDOT		County: Lenoir
Investigators: K. Roeder, F. Price		State: North Carolina
		Plot ID: A38

Do Normal Circumstances exist on the site?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	Community ID: scrub/shrub
Is the site significantly disturbed (Atypical Situation:)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	Transect ID:
Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input type="radio"/> Yes	<input checked="" type="radio"/> No	Field Location:

VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Rubus betulifolius</i> Blackberry	Shrub	FAC	<i>Rhus copallinum</i> Sumac,Winged	Shrub	FACU-
<i>Saururus cernuus</i> Tail,Lizard's	Herb	OBL	<i>Liriodendron tulipifera</i> Tulip poplar	Shrub	FAC
<i>Fraxinus pennsylvanica</i> Ash,Green	Shrub	FACW	<i>Liriodendron tulipifera</i> Tulip poplar	Tree	FAC
<i>Rubus betulifolius</i> Blackberry	Herb	FAC	<i>Lonicera japonica</i> Honeysuckle,Japanese	Vine	FAC-
<i>Smilax rotundifolia</i> Greenbrier,Common	Vine	FAC			
Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 7/9 = 77.78%			FAC Neutral: 2/3 = 66.67% Numeric Index: 25/9 = 2.78		

Remarks:

HYDROLOGY

<p><u>NO</u> Recorded Data(Describe in Remarks): <u>N/A</u> Stream, Lake or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other</p> <p><u>YES</u> No Recorded Data</p> <p>Field Observations</p> <p style="margin-left: 40px;">Depth of Surface Water: +/- 2 (in.)</p> <p style="margin-left: 40px;">Depth to Free Water in Pit: N/A (in.)</p> <p style="margin-left: 40px;">Depth to Saturated Soil: N/A (in.)</p>	<p>Wetland Hydrology Indicators</p> <p>Primary Indicators</p> <p><u>YES</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators</p> <p><u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>YES</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)</p>
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Remarks:
High water table in wet season

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, F. Price	Project No: 94028.44	Date: 27-May-1998 County: Lenoir State: North Carolina Plot ID: A46
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand	Mapped Hydric Inclusion?
Map Symbol: Wb Drainage Class: well drained	Field Observations Confirm Mapped Type? Yes <input type="radio"/> No <input checked="" type="radio"/>
Taxonomy (Subgroup): Arenic Paleudults	
Profile Description	

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Mottle	Texture, Concretions, Structure, etc
0-12+	A	10YR5/2	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:

<input type="checkbox"/> NO Histosol	<input type="checkbox"/> NO Concretions
<input type="checkbox"/> NO Histic Epipedon	<input type="checkbox"/> NO High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> NO Sulfidic Odor	<input type="checkbox"/> NO Organic Streaking in Sandy Soils
<input type="checkbox"/> NO Aquic Moisture Regime	<input type="checkbox"/> NO Listed on Local Hydric Soils List
<input type="checkbox"/> NO Reducing Conditions	<input type="checkbox"/> NO Listed on National Hydric Soils List
<input type="checkbox"/> NO Gleyed or Low Chroma Colors	<input type="checkbox"/> NO Other (Explain in Remarks)

Remarks:
 No mottles.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soils Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampling Point within the Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, F. Price	Project No: 94028.44	Date: 27-May-1998 County: Lenoir State: North Carolina Plot ID: A54
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: scrub/shrub Transect ID: Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Liquidambar styraciflua</i> Gum,Sweet	Tree	FAC+	<i>Vitis aestivalis</i> Grape,Summer	Shrub	FAC-
<i>Acer rubrum</i> Maple,Red			<i>Quercus nigra</i> Oak,Water		
<i>Smilax rotundifolia</i> Greenbrier,Common	Shrub	FAC			

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 4/5 = 80.00%	FAC Neutral: 0/0 = 0.00% Numeric Index: 15/5 = 3.00
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Remarks:
 Canopy 10 -15 feet high

HYDROLOGY

<p><u>NO</u> Recorded Data(Describe in Remarks): N/A Stream, Lake or Tide Gauge N/A Aerial Photographs N/A Other</p> <p><u>YES</u> No Recorded Data</p> <p>Field Observations</p> <p style="margin-left: 40px;">Depth of Surface Water: N/A (in.)</p> <p style="margin-left: 40px;">Depth to Free Water in Pit: N/A (in.)</p> <p style="margin-left: 40px;">Depth to Saturated Soil: > 12 (in.)</p>	<p>Wetland Hydrology Indicators</p> <p>Primary Indicators</p> <p><u>NO</u> Inundated</p> <p><u>NO</u> Saturated in Upper 12 Inches</p> <p><u>NO</u> Water Marks</p> <p><u>NO</u> Drift Lines</p> <p><u>NO</u> Sediment Deposits</p> <p><u>NO</u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators</p> <p><u>NO</u> Oxidized Root Channels in Upper 12 Inches</p> <p><u>NO</u> Water-Stained Leaves</p> <p><u>NO</u> Local Soil Survey Data</p> <p><u>NO</u> FAC-Neutral Test</p> <p><u>NO</u> Other(Explain in Remarks)</p>
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, F. Price	Project No: 94028.44	Date: 27-May-1998 County: Lenoir State: North Carolina Plot ID: A54
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand		Mapped Hydric Inclusion?	
Map Symbol: Wb	Drainage Class: well drained		
Taxonomy (Subgroup): Arenic Paleudults		Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Profile Description			

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12+		10R5/3	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:	
NO Histosol NO Histic Epipedon NO Sulfidic Odor NO Aquic Moisture Regime NO Reducing Conditions NO Gleyed or Low Chroma Colors	NO Concretions NO High Organic Content in Surface Layer in Sandy Soils NO Organic Streaking in Sandy Soils NO Listed on Local Hydric Soils List NO Listed on National Hydric Soils List NO Other (Explain in Remarks)

Remarks:
 Sand grain present
 Depositional Sand
 Disturbed

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampling Point within the Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Hydric Soils Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 wet1
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: Shrub/Scrub Transect ID: T-1 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Salix nigra</i> Willow, Black	Shrub	OBL	<i>Baccharis halimifolia</i> False-Willow, Eastern	Shrub	FAC
<i>Acer rubrum</i> Maple, Red	Shrub	FAC	<i>Rubus argutus</i> Blackberry, Serrate-Leaf	Shrub	FACU+
<i>Woodwardia areolata</i> Chainfern, Netted	Herb	OBL	<i>Aralia spinosa</i> Club, Hercules	Shrub	FAC
<i>Toxicodendron radicans</i> Ivy, Poison	Herb	FAC	<i>Liriodendron tulipifera</i> Tulip poplar	Shrub	FAC

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 7/8 = 87.50%	FAC Neutral: 2/3 = 66.67% Numeric Index: 21/8 = 2.63
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Remarks:

HYDROLOGY

<p>NO Recorded Data(Describe in Remarks): <u>N/A Stream, Lake or Tide Gauge</u> <u>N/A Aerial Photographs</u> <u>N/A Other</u></p> <p>YES No Recorded Data</p> <p>Field Observations</p> <p style="margin-left: 40px;"> Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: > 12 (in.) </p>	<p>Wetland Hydrology Indicators</p> <p>Primary Indicators</p> <p style="margin-left: 20px;"> <input type="checkbox"/> NO Inundated <input type="checkbox"/> NO Saturated in Upper 12 Inches <input checked="" type="checkbox"/> YES Water Marks <input type="checkbox"/> NO Drift Lines <input checked="" type="checkbox"/> YES Sediment Deposits <input type="checkbox"/> NO Drainage Patterns in Wetlands </p> <p>Secondary Indicators</p> <p style="margin-left: 20px;"> <input type="checkbox"/> NO Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> NO Water-Stained Leaves <input checked="" type="checkbox"/> YES Local Soil Survey Data <input type="checkbox"/> NO FAC-Neutral Test <input type="checkbox"/> NO Other(Explain in Remarks) </p>
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property	Project No: 94028.44	Date: 14-Jul-1998
Applicant/Owner: NCDOT		County: Lenoir
Investigators: K. Roeder, L. Warlick, J. Conforti		State: North Carolina
		Plot ID: 1 wet1

SOILS

Map Unit Name (Series and Phase): Pamlico Muck	Map Symbol: Pc	Drainage Class: Very poorly drained	Mapped Hydric Inclusion?
Taxonomy (Subgroup): Terric Medisaprists	Field Observations: Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Profile Description			

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-1	A	5Y2.5/1	N/A	N/A	N/A	Loam
1-8	B1	5Y2.5/2	N/A	N/A	N/A	Sandy loam
8+	B2	5Y2.5/1	N/A	N/A	N/A	Muck

Hydric Soil Indicators:

<input type="checkbox"/> NO Histosol	<input type="checkbox"/> NO Concretions
<input type="checkbox"/> NO Histic Epipedon	<input type="checkbox"/> NO High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> NO Sulfidic Odor	<input checked="" type="checkbox"/> YES Organic Streaking in Sandy Soils
<input type="checkbox"/> NO Aquic Moisture Regime	<input checked="" type="checkbox"/> YES Listed on Local Hydric Soils List
<input type="checkbox"/> NO Reducing Conditions	<input checked="" type="checkbox"/> YES Listed on National Hydric Soils List
<input checked="" type="checkbox"/> YES Gleyed or Low Chroma Colors	<input type="checkbox"/> NO Other (Explain in Remarks)

Remarks:
 B1 - Sand grains visible
 Plot at upslope transition with Wagram loamy sand

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 upland - T1
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand
Map Symbol: Wb **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Arenic Paleudults **Field Observations Confirm Mapped Type?** Yes No
Profile Description

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Mottle	Texture, Concretions, Structure, etc
0-5	A	10YR4/2	N/A	N/A	N/A	Loamy sand
5+	B	10YR3/1	N/A	N/A	N/A	Sand

Hydric Soil Indicators:

<input type="checkbox"/> NO Histosol	<input type="checkbox"/> NO Concretions
<input type="checkbox"/> NO Histic Epipedon	<input type="checkbox"/> NO High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> NO Sulfidic Odor	<input type="checkbox"/> NO Organic Streaking in Sandy Soils
<input type="checkbox"/> NO Aquic Moisture Regime	<input type="checkbox"/> NO Listed on Local Hydric Soils List
<input type="checkbox"/> NO Reducing Conditions	<input type="checkbox"/> NO Listed on National Hydric Soils List
<input type="checkbox"/> NO Gleyed or Low Chroma Colors	<input type="checkbox"/> NO Other (Explain in Remarks)

Remarks:
 Transition area to Pamlico Muck, sedimentation from field present

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampling Point within the Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Hydric Soils Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	

Remarks:

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 - T2
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: scrub/shrub Transect ID: T2 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Liquidambar styraciflua</i> Gum,Sweet	Shrub	FAC+	<i>Liriodendron tulipifera</i> Tulip poplar	Shrub	FAC
<i>Salix nigra</i> Willow,Black	Shrub	OBL	<i>Trichomanes punctatum</i> Fern,Dotted Brittle	Shrub	UPL
<i>Acer rubrum</i> Maple,Red	Shrub	FAC	<i>Parthenocissus quinquefolia</i> Creeper, Virginia	Shrub	FAC
<i>Aralia spinosa</i> Club,Hercules	Shrub	FAC	<i>Magnolia virginiana</i> Magnolia,Sweetbay	Shrub	FACW+
<i>Rubus betulifolius</i> Blackberry	Shrub	FAC	<i>Lonicera japonica</i> Honeysuckle,Japanese	Vine	FAC-
<i>Smilax rotundifolia</i> Greenbrier,Common	Vine	FAC			

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 9/11 = 81.82%	FAC Neutral: 2/3 = 66.67% Numeric Index: 32/11 = 2.91
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Remarks:
Organic soil variety of yellow poplar present.

HYDROLOGY

NO Recorded Data(Describe in Remarks): <u>N/A</u> Stream, Lake or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other YES No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: > 12 (in.) Depth to Saturated Soil: > 12 (in.)	Wetland Hydrology Indicators Primary Indicators <u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits YES Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves YES Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
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Remarks:

**DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)**

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 - T2
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SOILS

Map Unit Name (Series and Phase): Pamlico Muck Map Symbol: Pc Drainage Class: Very poorly drained Taxonomy (Subgroup): Terric Medisaprists	Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-1	O	N/A	N/A	N/A	N/A	Humic
1-4	A	10YR2/1	N/A	N/A	N/A	Sandy loam
4-6	B1	10YR4/1	N/A	N/A	N/A	Sand
6+	B2	10YR5/2	N/A	N/A	N/A	Sand

Hydric Soil Indicators:

<u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>YES</u> Reducing Conditions <u>YES</u> Gleyed or Low Chroma Colors	<u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>YES</u> Organic Streaking in Sandy Soils <u>YES</u> Listed on Local Hydric Soils List <u>YES</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks)
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Remarks:
 Organic content in A.
 Plot at upslope transition with Wagram loamy sand.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 upland - T2
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: scrub/shrub Transect ID: T2 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Aralia spinosa</i> Club,Hercules	Shrub	FAC	<i>Eupatorium capillifolium</i> Thorough-Wort,Small Dog-Fennel	Herb	FACU
<i>Rhus copallinum</i> Sumac,Winged	Shrub	FACU-	<i>Baccharis halimifolia</i> False-Willow,Eastern	Shrub	FAC
<i>Liquidambar styraciflua</i> Gum,Sweet	Shrub	FAC+	<i>vitis sp.</i> <i>vitis sp.</i>	Vine	NI
<i>Rubus argutus</i> Blackberry,Serrate-Leaf	Shrub	FACU+	<i>Sassafras albidum</i> Sassafras	Shrub	FACU

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/7 = 42.86%	FAC Neutral: 0/4 = 0.00% Numeric Index: 25/7 = 3.57
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Remarks:

HYDROLOGY

NO Recorded Data(Describe in Remarks): <u>N/A</u> Stream, Lake or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other YES No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: > 12 (in.) Depth to Saturated Soil: > 12 (in.)	Wetland Hydrology Indicators Primary Indicators <input checked="" type="checkbox"/> NO Inundated <input checked="" type="checkbox"/> NO Saturated in Upper 12 Inches <input checked="" type="checkbox"/> NO Water Marks <input checked="" type="checkbox"/> NO Drift Lines <input checked="" type="checkbox"/> NO Sediment Deposits <input checked="" type="checkbox"/> NO Drainage Patterns in Wetlands Secondary Indicators <input checked="" type="checkbox"/> NO Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> NO Water-Stained Leaves <input checked="" type="checkbox"/> NO Local Soil Survey Data <input checked="" type="checkbox"/> NO FAC-Neutral Test <input checked="" type="checkbox"/> NO Other(Explain in Remarks)
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 upland - T2
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand		Drainage Class: well drained		Mapped Hydric Inclusion?		
Map Symbol: Wb				Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Taxonomy (Subgroup): Arenic Paleudults						
Profile Description						
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-2	A	5Y2.5/1	N/A	N/A	N/A	Sand
2+	B	2.5Y4/2	N/A	N/A	N/A	Sand

Hydric Soil Indicators:

<input type="checkbox"/> NO Histosol	<input type="checkbox"/> NO Concretions
<input type="checkbox"/> NO Histic Epipedon	<input type="checkbox"/> NO High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> NO Sulfidic Odor	<input type="checkbox"/> NO Organic Streaking in Sandy Soils
<input type="checkbox"/> NO Aquic Moisture Regime	<input type="checkbox"/> NO Listed on Local Hydric Soils List
<input type="checkbox"/> NO Reducing Conditions	<input type="checkbox"/> NO Listed on National Hydric Soils List
<input type="checkbox"/> NO Gleyed or Low Chroma Colors	<input type="checkbox"/> NO Other (Explain in Remarks)

Remarks:
 Transition area to Pamlico muck, sedimentation from field present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampling Point within the Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Hydric Soils Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 -T3
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SOILS

Map Unit Name (Series and Phase): Pamlico Muck		Drainage Class: Very poorly drained		Mapped Hydric Inclusion?		
Map Symbol: Pc				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Taxonomy (Subgroup): Terric Medisaprists				Field Observations Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Profile Description						
Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-2	A	7.5YR5/2	7.5YR2.5/1	N/A	N/A	Sand
2-12+	B	7.5YR2.5/1	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:	
NO Histosol NO Histic Epipedon NO Sulfidic Odor NO Aquic Moisture Regime NO Reducing Conditions YES Gleyed or Low Chroma Colors	NO Concretions NO High Organic Content in Surface Layer in Sandy Soils NO Organic Streaking in Sandy Soils YES Listed on Local Hydric Soils List YES Listed on National Hydric Soils List NO Other (Explain in Remarks)

Remarks:
 A - streaked sand grains bright 50%
 B - muck
 Plot at upslope transition with Norfolk loamy sand.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampling Point within the Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 upland - T3
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: Shrub/Scrub Transect ID: T3 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Arundinaria gigantea</i> Cane,Giant	Shrub	FACW	<i>Aralia spinosa</i> Club,Hercules	Shrub	FAC
<i>Vitis aestivalis</i> Grape,Summer	Shrub	FAC-	<i>Rhus copallinum</i> Sumac,Winged	Shrub	FACU-
<i>Toxicodendron radicans</i> Ivy,Poison	Shrub	FAC	<i>Clethra alnifolia</i> Pepper-Bush,Coast	Shrub	FACW
<i>Smilax rotundifolia</i> Greenbrier,Common	Shrub	FAC			

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/7 = 71.43%	FAC Neutral: 2/3 = 66.67% Numeric Index: 20/7 = 2.86
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Remarks:

HYDROLOGY

<u>NO</u> Recorded Data(Describe in Remarks): N/A Stream, Lake or Tide Gauge N/A Aerial Photographs N/A Other <u>YES</u> No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: > 12 (in.)	Wetland Hydrology Indicators Primary Indicators <u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>NO</u> Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 upland - T3
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SOILS

Map Unit Name (Series and Phase): Norfolk loamy sand Map Symbol: Nc Drainage Class: well drained Taxonomy (Subgroup): Typic Paleudults Profile Description	Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Mottle	Texture, Concretions, Structure, etc
0-2	O	N/A	N/A	N/A	N/A	Humic
2+	A	7.5YR5/2	7.5YR2.5/1	Common	N/A	Sand

Hydric Soil Indicators: <u>NO Histosol</u> <u>NO Histic Epipedon</u> <u>NO Sulfidic Odor</u> <u>NO Aquic Moisture Regime</u> <u>NO Reducing Conditions</u> <u>NO Gleyed or Low Chroma Colors</u>	<u>NO Concretions</u> <u>NO High Organic Content in Surface Layer in Sandy Soils</u> <u>NO Organic Streaking in Sandy Soils</u> <u>NO Listed on Local Hydric Soils List</u> <u>NO Listed on National Hydric Soils List</u> <u>NO Other (Explain in Remarks)</u>
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Remarks:
 Salt and peeper
 O peatish material, roots
 Soils transitioning to Pamlico muck

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> <input checked="" type="radio"/> No Wetland Hydrology Present? Yes <input type="radio"/> <input checked="" type="radio"/> No Hydric Soils Present? Yes <input type="radio"/> <input checked="" type="radio"/> No	Is the Sampling Point within the Wetland? Yes <input type="radio"/> <input checked="" type="radio"/> No
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 wet - T4-1
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	Community ID: Shrub/Scrub Transect ID: T4-1 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Liriodendron tulipifera</i> Tulip poplar	Shrub	FAC	<i>Eupatorium capillifolium</i> Thorough-Wort, Small Dog-Fennel	Herb	FACU
<i>Rhus copallinum</i> Sumac, Winged	Shrub	FACU-	<i>Baccharis halimifolia</i> False-Willow, Eastern	Shrub	FAC
<i>Cyperus sp.</i> Cyperus sp.	Herb	NI	<i>Juncus effusus</i> Rush, Soft	Herb	FACW+

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/5 = 60.00%	FAC Neutral: 1/3 = 33.33% Numeric Index: 16/5 = 3.20
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Remarks:
 Disturbed, edge of skidder trail.

HYDROLOGY

<u>NO</u> Recorded Data(Describe in Remarks): N/A Stream, Lake or Tide Gauge N/A Aerial Photographs N/A Other <u>YES</u> No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: > 12 (in.) Depth to Saturated Soil: > 12 (in.)	Wetland Hydrology Indicators Primary Indicators <u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>YES</u> Water-Stained Leaves <u>YES</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 wet - T4-1
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SOILS

Map Unit Name (Series and Phase): Pamlico Muck Map Symbol: Pc Drainage Class: Very poorly drained Taxonomy (Subgroup): Terric Medisaprists Profile Description	Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
0-1	A	5Y6/1	N/A	N/A N/A	Sand
4-10	B1	5Y3/1	N/A	N/A N/A	Sand
10-12+	B2	5Y2.5/1	N/A	N/A N/A	Sand

Hydric Soil Indicators: <u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>YES</u> Gleyed or Low Chroma Colors	<u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>YES</u> Organic Streaking in Sandy Soils <u>YES</u> Listed on Local Hydric Soils List <u>YES</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks)
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Remarks:
 B1 = streaking, buried with woody material
 Plot is at upslope transition with Wagram loamy sand.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Remarks:
 Edge of Skidder Trail and Logging deck

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 0 upland - T4
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand	Mapped Hydric Inclusion?
Map Symbol: Wb Drainage Class: well drained	Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No
Taxonomy (Subgroup): Arenic Paleudults	
Profile Description	

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Mottle	Texture, Concretions, Structure, etc
0-2	A	7.5YR3/1	N/A	N/A	N/A	Sand
2+	B	5YR2.5/1	N/A	N/A	N/A	Loamy sand

Hydric Soil Indicators: NO Histosol NO Histic Epipedon NO Sulfidic Odor NO Aquic Moisture Regime NO Reducing Conditions NO Gleyed or Low Chroma Colors	NO Concretions NO High Organic Content in Surface Layer in Sandy Soils NO Organic Streaking in Sandy Soils NO Listed on Local Hydric Soils List NO Listed on National Hydric Soils List NO Other (Explain in Remarks)
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Remarks:
 Sandy soil
 Transition area to Pamlico Muck, sedimentation from field present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> <input checked="" type="radio"/> No	Is the Sampling Point within the Wetland? Yes <input type="radio"/> <input checked="" type="radio"/> No
Wetland Hydrology Present? Yes <input type="radio"/> <input checked="" type="radio"/> No	
Hydric Soils Present? Yes <input type="radio"/> <input checked="" type="radio"/> No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 wet - T5
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> Yes <input type="radio"/> Yes	<input type="radio"/> No <input checked="" type="radio"/> No <input checked="" type="radio"/> No	Community ID: Shrub/Scrub Transect ID: T5 Field Location:
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VEGETATION (USFWS Region No. 2)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Smilax rotundifolia</i>	Vine	FAC	<i>Vitis aestivalis</i>	Vine	FAC-
Greenbrier, Common			Grape, Summer		
<i>Ligustrum sinense</i>	Shrub	FAC	<i>Toxicodendron radicans</i>	Herb	FAC
Privet, Chinese			Ivy, Poison		
<i>Liquidambar styraciflua</i>	Shrub	FAC+	<i>Arundinaria gigantea</i>	Shrub	FACW
Gum, Sweet			Cane, Giant		
<i>Liriodendron tulipifera</i>	Shrub	FAC	<i>Acer rubrum</i>	Shrub	FAC
Tulip poplar			Maple, Red		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 7/8 = 87.50%	FAC Neutral: 1/1 = 100.00% Numeric Index: 23/8 = 2.88
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Remarks:

HYDROLOGY

<p>NO Recorded Data(Describe in Remarks): <u>N/A</u> Stream, Lake or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other</p> <p>YES No Recorded Data</p> <p>Field Observations</p> <p>Depth of Surface Water: N/A (in.)</p> <p>Depth to Free Water in Pit: N/A (in.)</p> <p>Depth to Saturated Soil: > 12 (in.)</p>	<p>Wetland Hydrology Indicators</p> <p>Primary Indicators</p> <p><u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>YES</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators</p> <p><u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>YES</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)</p>
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Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 2 wet - T5
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SOILS

Map Unit Name (Series and Phase): Pamlico Muck		Map Symbol: Pc		Drainage Class: Very poorly drained		Mapped Hydric Inclusion?	
Taxonomy (Subgroup): Terric Medisaprists						Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Profile Description							
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc	
0-2	A	10YR2/2	N/A	N/A	N/A	Humic	
2-12+	B	10YR2/1	N/A	N/A	N/A	Loamy sand	

Hydric Soil Indicators:

<u>NO</u> Histosol	<u>NO</u> Concretions
<u>NO</u> Histic Epipedon	<u>NO</u> High Organic Content in Surface Layer in Sandy Soils
<u>NO</u> Sulfidic Odor	<u>NO</u> Organic Streaking in Sandy Soils
<u>NO</u> Aquic Moisture Regime	<u>YES</u> Listed on Local Hydric Soils List
<u>YES</u> Reducing Conditions	<u>YES</u> Listed on National Hydric Soils List
<u>YES</u> Gleyed or Low Chroma Colors	<u>NO</u> Other (Explain in Remarks)

Remarks:
 B - mucky

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Grady Property Applicant/Owner: NCDOT Investigators: K. Roeder, L. Warlick, J. Conforti	Project No: 94028.44	Date: 14-Jul-1998 County: Lenoir State: North Carolina Plot ID: 1 upland - T5
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SOILS

Map Unit Name (Series and Phase): Wagram loamy sand Map Symbol: Wb Drainage Class: well drained Taxonomy (Subgroup): Arenic Paleudults Profile Description	Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No
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Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-7	A	10YR4/3	N/A	N/A	N/A	Loamy sand
7+	B	10YR3/3	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:

<u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>NO</u> Gleyed or Low Chroma Colors	<u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>NO</u> Organic Streaking in Sandy Soils <u>NO</u> Listed on Local Hydric Soils List <u>NO</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks)
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Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="radio"/> <input checked="" type="radio"/> No Wetland Hydrology Present? Yes <input type="radio"/> <input checked="" type="radio"/> No Hydric Soils Present? Yes <input type="radio"/> <input checked="" type="radio"/> No	Is the Sampling Point within the Wetland? Yes <input type="radio"/> <input checked="" type="radio"/> No
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Remarks:

Area located near NC 11 - fill present

WETLAND RATING WORKSHEET - Fourth Version

Project Name Grady Mitigation Site Nearest Road NC 11
 County Lenoir Wetland Area 6 acres Wetland Width >100 feet
 Name of evaluator Ken Roeder Date July 16, 1998

<p>Wetland Location</p> <p><input type="checkbox"/> on pond or lake <input checked="" type="checkbox"/> on perennial stream <input type="checkbox"/> on intermittent stream <input type="checkbox"/> within interstream divide <input type="checkbox"/> other _____</p> <p>Soil series <u>Pamlico Muck</u></p> <p><input checked="" type="checkbox"/> predominantly organic - humus, muck, or peat <input type="checkbox"/> predominantly mineral - non-sandy <input type="checkbox"/> predominantly sandy</p> <p>Hydraulic factors</p> <p><input type="checkbox"/> steep topography <input type="checkbox"/> ditched or channelized <input checked="" type="checkbox"/> total wetland width \geq 100 feet</p>	<p>Adjacent land use (within 1/2 mile upstream, upslope, or radius)</p> <p><input checked="" type="checkbox"/> forested/natural vegetation <u>55</u> % <input checked="" type="checkbox"/> agriculture, urban/suburban <u>44</u> % <input checked="" type="checkbox"/> impervious surface <u>1</u> %</p> <p>Dominant vegetation</p> <p>(1) <u>Sweetgum</u> (2) <u>Red maple</u> (3) <u>Yellow poplar</u></p> <p>Flooding and wetness</p> <p><input type="checkbox"/> semipermanently to permanently flooded or inundated <input checked="" type="checkbox"/> seasonally flooded or inundated <input type="checkbox"/> intermittently flooded or temporary surface water <input type="checkbox"/> no evidence of flooding or surface water</p>
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Wetland type (select one)*

<input checked="" type="checkbox"/> Bottomland hardwood forest	<input type="checkbox"/> Pine savanna
<input type="checkbox"/> Headwater forest	<input type="checkbox"/> Freshwater marsh
<input type="checkbox"/> Swamp forest	<input type="checkbox"/> Bog/fen
<input type="checkbox"/> Wet flat	<input type="checkbox"/> Ephemeral wetland
<input type="checkbox"/> Pocosin	<input type="checkbox"/> Carolina Bay
<input type="checkbox"/> Bog forest	<input type="checkbox"/> Other _____

The rating system cannot be applied to salt or brackish marshes or stream channels.

		<i>weight</i>			
R	Water Storage	<u>2</u>	x 4.00 =	<u>8</u>	
A	Bank/Shoreline stabilization	<u>2</u>	x 4.00 =	<u>8</u>	
T	Pollutant removal	<u>4</u>	x 5.00 =	<u>20</u>	
I	Wildlife habitat	<u>2</u>	x 2.00 =	<u>4</u>	
N	Aquatic life value	<u>1</u>	x 4.00 =	<u>4</u>	
G	Recreation/Education	<u>2</u>	x 1.00 =	<u>2</u>	
	Economic value	<u>0</u>	x .50 =	<u>0</u>	

Wetland Score

46

WETLAND RATING WORKSHEET - Fourth Version

Project Name Grady Mitigation Site Nearest Road NC 11
 County Lenoir Wetland Area 6 acres Wetland Width >50 feet
 Name of evaluator Ken Roeder Date July 16, 1998

<p>Wetland Location</p> <p><input type="checkbox"/> on pond or lake <input checked="" type="checkbox"/> on perennial stream <input type="checkbox"/> on intermittent stream <input type="checkbox"/> within interstream divide <input type="checkbox"/> other _____</p> <p>Soil series <u>Pamlico Muck</u></p> <p><input checked="" type="checkbox"/> predominantly organic - humus, muck, or peat <input type="checkbox"/> predominantly mineral - non-sandy <input type="checkbox"/> predominantly sandy</p> <p>Hydraulic factors</p> <p><input type="checkbox"/> steep topography <input type="checkbox"/> ditched or channelized <input checked="" type="checkbox"/> total wetland width \geq 100 feet</p>	<p>Adjacent land use (within 1/2 mile upstream, upslope, or radius)</p> <p><input checked="" type="checkbox"/> forested/natural vegetation <u>55</u> % <input checked="" type="checkbox"/> agriculture, urban/suburban <u>44</u> % <input type="checkbox"/> impervious surface <u>1</u> %</p> <p>Dominant vegetation</p> <p>(1) <u>Herbaceous</u> (2) _____ (3) _____</p> <p>Flooding and wetness</p> <p><input checked="" type="checkbox"/> semipermanently to permanently flooded or inundated <input type="checkbox"/> seasonally flooded or inundated <input type="checkbox"/> intermittently flooded or temporary surface water <input type="checkbox"/> no evidence of flooding or surface water</p>
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Wetland type (select one)*

<input type="checkbox"/> Bottomland hardwood forest	<input type="checkbox"/> Pine savanna
<input type="checkbox"/> Headwater forest	<input checked="" type="checkbox"/> Freshwater marsh
<input type="checkbox"/> Swamp forest	<input type="checkbox"/> Bog/fen
<input type="checkbox"/> Wet flat	<input type="checkbox"/> Ephemeral wetland
<input type="checkbox"/> Pocosin	<input type="checkbox"/> Carolina Bay
<input type="checkbox"/> Bog forest	<input type="checkbox"/> Other _____

The rating system cannot be applied to salt or brackish marshes or stream channels.

		<i>weight</i>			
R	Water Storage	<u>3</u>	x 4.00 =	<u>12</u>	
A	Bank/Shoreline stabilization	<u>5</u>	x 4.00 =	<u>20</u>	
T	Pollutant removal	<u>3</u>	x 5.00 =	<u>15</u>	
I	Wildlife habitat	<u>4</u>	x 2.00 =	<u>8</u>	
N	Aquatic life value	<u>4</u>	x 4.00 =	<u>16</u>	
G	Recreation/Education	<u>2</u>	x 1.00 =	<u>2</u>	
	Economic value	<u>0</u>	x .50 =	<u>0</u>	

Wetland Score

73

APPENDIX B

Photographs



Photo #1
Herbaceous Marsh Community viewed west from Bridge on NC 11.



Photo #2
Scrub/Shrub Wetland Community and portion of Southwest Creek.



Photo #3

Scrub/Shrub Wetland, open edge as viewed from Scrub/Shrub Upland.



Photo #4

Upland Scrub/Shrub western corner, cleared path of property boundary.