

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

January 30, 2006

Mr. Michael Theodore
Land Development Resource Group
4503 Oakmoor Drive
Greensboro, North Carolina 27406

Reference: Report of Jurisdictional Waters/Wetland Determination
Approximate 86 Acre Tract
Union Cross Road
Kernersville, North Carolina
ECS, Ltd. Project G-12079

Dear Mr. Theodore:

Engineering Consulting Services, Ltd. (ECS) is pleased to submit this report of the jurisdictional waters/wetland determination for the approximate 86 acre tract located on Union Cross Road in Kernersville, Forsyth County, North Carolina. This report summarizes our findings for the site.

Background

ECS was contracted to identify the locations of waters of the U.S., including wetlands, at the above referenced site located in Kernersville, North Carolina. The northern portion of the site is developed with a single family residence and out-buildings. The remainder of the site consists of undeveloped, wooded land and fields.

Wetlands are defined by the U.S. Army Corps of Engineers and the United States Environmental Protection Agency as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions." In order for an area to be classified as wetland, hydrophytic vegetation, hydric soils, and wetland hydrology indicators must be present.

Literature Review

We have reviewed the USGS Topographic Map, the Soil Survey of Forsyth County and the Geologic Map of North Carolina to obtain information regarding the site.

- The USGS Topographic Map (Figure 1) indicates that a pond is located on the northern portion of the site. An unnamed tributary to Abbotts Creek exits the pond and crosses the approximate center of the site. An additional unnamed tributary to Abbotts Creek is located on the southeastern portion of the site. Surface drainage on the site is toward the pond and the tributaries to Abbotts Creek that cross the site.

- The USDA Soil Survey of Forsyth County (Figure 2) shows two additional streams on the northwestern portion of the site. Soils on the site are mapped as Appling sandy loam (ApB & ApC), Cecil sandy loam (CcB & CcC), Cecil clay loam (CeC2), Louisburg-Wedowee complex (LwE), Pacolet fine sandy loam (PaB & PaF), Pacolet clay loam (PcC2) and Vance sandy loam (VaC). The Appling series consists of well-drained, moderately permeable soils that occur on gently sloping uplands. The Cecil series consists of well drained, moderately permeable soils that occur on gently to strongly sloping uplands. The Louisburg series consists of well drained to excessively drained, rapidly permeable soils that occur on sloping to steep uplands. The Wedowee series consists of well drained, moderately permeable soils that occur on gently to strongly sloping uplands. The Vance series consists of well drained, slowly permeable soils that are located in the Piedmont on ridges and side slopes. The Pacolet series consists of well drained, moderately permeable soils that occur on gently sloping to steep uplands. The soils on the site are not included on the Hydric Soils List for Forsyth County.
- The Geologic Map of North Carolina indicates that the site is located in the Charlotte Belt of the Piedmont Physiographic Province. The soils encountered in this area are the residual product of in-place chemical weathering of rock presently underlying the site. In general, shallow unconfined groundwater movement within the overlying soils is controlled largely by topographic gradients. Recharge occurs primarily by infiltration along higher elevations and typically discharges into streams or other surface water bodies. The elevation of the shallow water table is transient and can vary greatly with seasonal fluctuations in precipitation. Movement in this water table is generally from higher to lower elevations. As such, shallow groundwater would be expected to flow to the pond and the tributaries to Abbotts Creek that cross the site.

Site Reconnaissance

ECS personnel conducted the site reconnaissance on January 27, 2006. The site is approximate 86 acre tract located on Union Cross Road in Kernersville, North Carolina. The northern portion of the site is developed with a single family residence and out-buildings. The remainder of the site consists of undeveloped, wooded land and fields.

During our reconnaissance, we observed the site for evidence of stream channels, wetlands and ponds. A pond is located on the northern portion of the site. A stream exits the pond and crosses the approximate center of the site. The majority of the stream has a defined bed and bank, contains meanders and had flowing water during our site reconnaissance. It is our opinion that the majority of the stream is perennial, flowing year round during most years. A portion of the stream appears to be intermittent. Small wetland pockets are located along the upper reaches of the stream. A larger wetland pocket is located along the lower reach of the stream, adjacent to the right-of-way of Interstate 40.

A stream also crosses the eastern portion of the site. This stream also appears to be perennial. Small wetland pockets are located along this stream.

Figure 3 shows our opinion of perennial and intermittent stream designations. Please note that the perennial and intermittent stream designations were made by ECS and should be used for preliminary planning purposes only. These designations are subject to change based on verification by the U. S. Army Corps of Engineers and the North Carolina Division of Water Quality.

Wetland hydrology indicators (including inundation and saturated soils), hydrophytic vegetation and hydric soils were observed adjacent to the streams in several locations. The pond, streams and wetland boundaries were flagged in the field by ECS personnel. Figure 3 shows the approximate locations of the pond, streams and wetlands located on the site. Routine Wetland Determination Data Forms containing field observations at locations identified on Figure 3 are included as Attachments.

The wetlands are separated from the uplands by distinct topographic breaks, vegetation breaks and soil breaks. Upland areas surrounding the wetland pockets are vegetated primarily with oaks, sweet gums and other hardwood species. The soils are bright and appear to be well drained to depths of at least twelve inches.

The site is located in an area that has been designated as WS-III and is part of the Abbotts Creek Watershed. State mandated buffers will be applied to streams and wetlands on the site.

Discussion

Section 404 of the Clean Water Act regulates the discharge of dredge and fill materials into waters of the United States (lakes, rivers, ponds, streams, etc.), including wetlands. Waters of the United States include the territorial seas, navigable coastal and inland lakes, rivers, streams (including intermittent streams) and wetlands. Activities that could be regulated under Section 404 include placement of fill for construction of roadways; residential, commercial or industrial structures; and the construction of water retention ponds along tributaries. The EPA and the U.S. Army Corps of Engineers jointly administer the Section 404 program. Section 401 of the Clean Water Act grants each state the authority to approve, condition, or deny any Federal permits that could result in a discharge to State waters.

The streams, wetlands and pond located on the site are regulated by the U.S. Army Corps of Engineers and the North Carolina Division of Water Quality. We recommend that a metes and bounds survey of the jurisdictional boundaries be prepared to determine their exact locations and extent. Upon completion, a copy of the wetland survey map should be submitted to the U.S. Army Corps of Engineers for final approval. A site/grading plan can then be developed to determine the extent of the proposed impacts to jurisdictional waters and wetlands, if any. An attempt should be made to minimize or avoid working in these areas, if possible.

Permits will be required prior to impacting more than 1/10 acre of wetlands or any open waters including perennial or intermittent streams. Mitigation and a stormwater management plan may be a condition of any permits issued for the site. Buffers may be required adjacent to the wetlands.

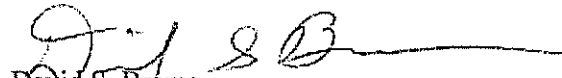
For impacts to more than one-half acre of wetlands or to more than 300 linear feet of stream channel, an individual permit (IP) may be required. An IP requires a habitat analysis, alternative site analysis, project justification, plans to avoid and minimize impacts, and a proposed mitigation plan. Depending on the habitat analysis and the extent of impacts, an Environmental Impact Statement may be required by the U.S. Army Corps of Engineers. An IP allows for a public comment period and may require 4 to 18 months to obtain depending on conditions arising during the U.S. Army Corps of Engineers review and public comment period.

Approximate 86 Acre Tract - Union Cross Road
Kernersville, North Carolina
ECS Project G-12079
January 30, 2006

ECS appreciates the opportunity to provide wetland services for your project. Please contact Michael Brame or Denise Poulos at (336) 866-7150 if you have questions concerning this report.

Sincerely,

ENGINEERING CONSULTING SERVICES, LTD.

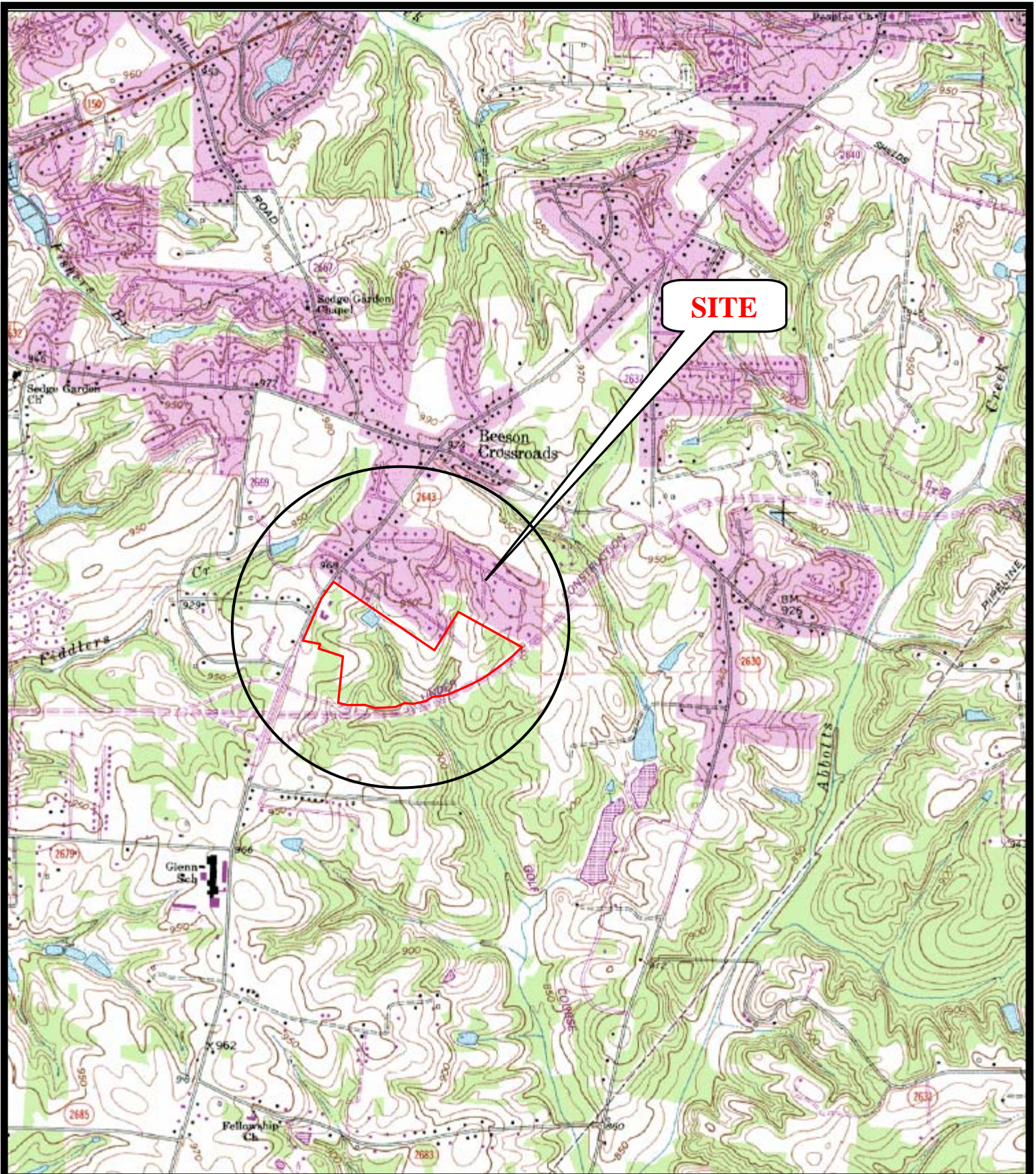


David S. Brame
Project Scientist



Denise M. Poulos, LSS
Principal Scientist

Attachments: Figure 1 - Site Location Map
Figure 2 - Soil Map
Figure 3 - Stream/Wetland Location Map
Routine Wetland Determination Data Forms



SITE



SOURCE:

USGS TOPOGRAPHIC MAP
 KERNERSVILLE, NORTH CAROLINA
 QUADRANGLE DATED 1969 REVISED 1994

SCALE: 1"=2,000'

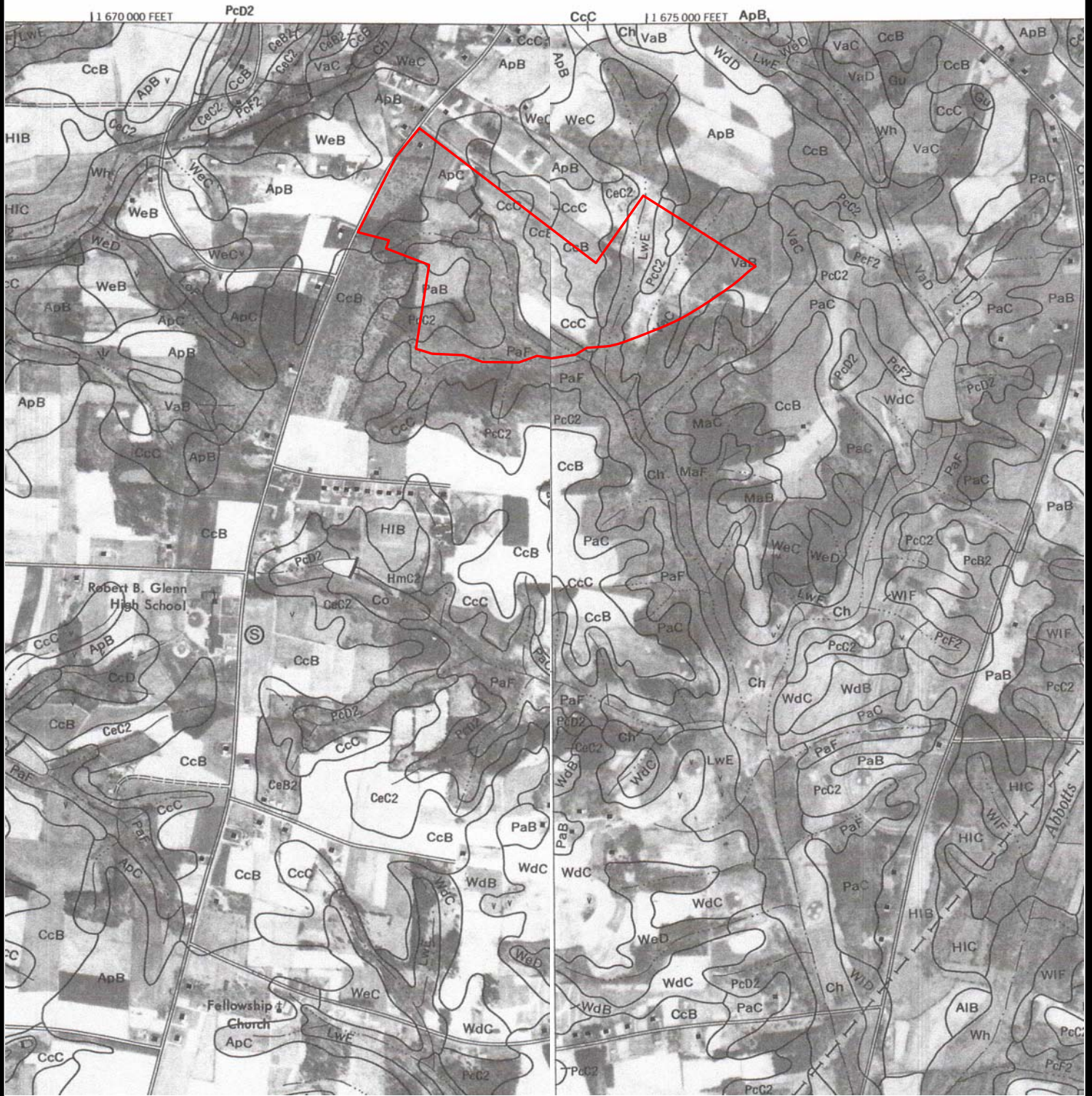


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FIGURE 1

SITE LOCATION MAP
 APPROXIMATE 86 ACRE TRACT
 UNION CROSS ROAD
 KERNERSVILLE, NORTH CAROLINA

ECS PROJECT NO. G-12079



SOURCE:

USDA SOIL SURVEY OF
 FORSYTH COUNTY, NC
 SHEET NOS. 40 AND 41
 ISSUED MAY 1976

NOT TO SCALE



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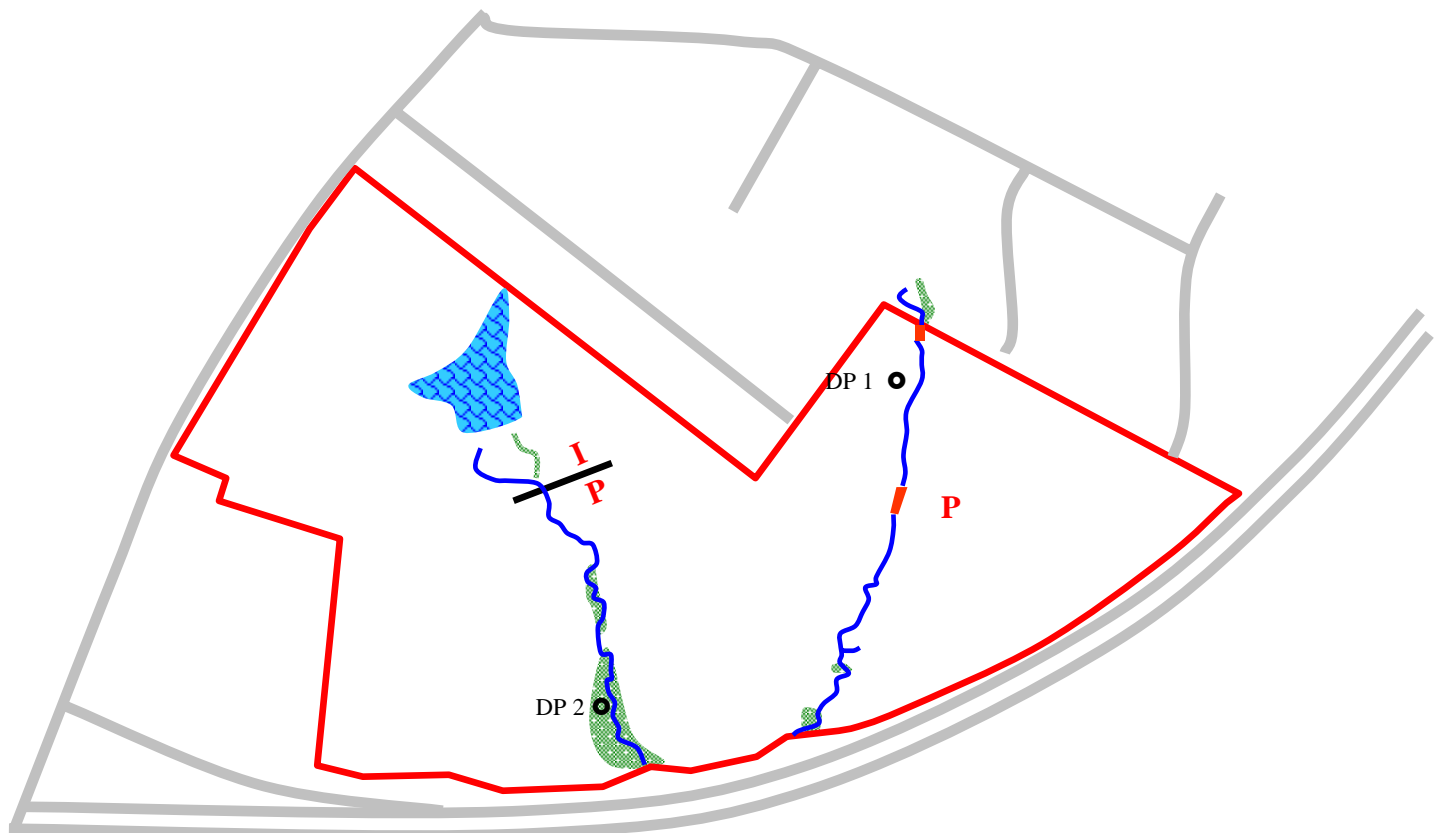
FIGURE 2

SOIL MAP
 APPROXIMATE 86 ACRE TRACT
 UNION CROSS ROAD
 KERNERSVILLE, NORTH CAROLINA








ECS PROJECT NO. G-12079

THE STREAM/WETLAND LOCATIONS SHOWN ON THIS MAP ARE APPROXIMATE. THEY HAVE BEEN FLAGGED IN THE FIELD BY ECS PERSONNEL. THEY HAVE NOT BEEN VERIFIED BY THE U.S. ARMY CORPS OF ENGINEERS AND THEY HAVE NOT BEEN SURVEYED.

THE PERENNIAL AND INTERMITTENT STREAM DESIGNATIONS WERE DETERMINED BY ECS AND SHOULD BE USED FOR PRELIMINARY PLANNING PURPOSES ONLY. THESE DESIGNATIONS ARE SUBJECT TO CHANGE BASED ON VERIFICATION BY THE U.S. ARMY CORPS OF ENGINEERS AND THE NORTH CAROLINA DIVISION OF WATER QUALITY.



LEGEND

-  Approximate Location of Wetland
-  Approximate Location of Stream
-  DP 1 Approximate Location of Data Point
-  Approximate Location of Pond
-  Existing Culvert
-  Perennial Stream
-  Intermittent Stream



SOURCE:

SITE PLAN PROVIDED BY
LAND DEVELOPMENT RESOURCE GROUP
AND FIELD NOTES BY
ECS PERSONNEL

NOT TO SCALE



ENGINEERING CONSULTING SERVICES, LTD.

FIGURE 3

STREAM/WETLAND LOCATION MAP
APPROXIMATE 86 ACRE TRACT
UNION CROSS ROAD
KERNERSVILLE, NORTH CAROLINA

ECS PROJECT NO. G-12079

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

Project/Site: Union Cross Road – Approximate 86 Acre Tract
 Applicant/Owner: Land Development Resource Group
 Investigators: ECS, Ltd.

Project No:
 G--12079

Date: January 27, 2006
 County: Forsyth
 State: North Carolina
 Plot ID: DP-1

Do Normal Circumstances exist on the site?

Yes No

Is the site significantly disturbed (Atypical Situation)?

Yes No

Is the area a potential Problem Area?

Yes No

(If needed, explain on the reverse side)

Community ID:

Transect ID:

Field Location: View Figure 3

VEGETATION

Dominant Plant Species (Latin/Common)	Stratum	Indicator	Plant Species (Latin/Common)	Stratum	Indicator
Carex sp.					
Sedge sp.	Herb	OBL			
Juniperus virginia					
Eastern red cedar	Tree/Sap	FACU-			
Juncus roemeranus					
Needlegrass rush	Herb	OBL			
Rubus argutus					
Blackberry	Herb	FACU+			

Percent of Dominant Species that are OBL, FACW or FAC: 50%
 (excluding FAC-)

FAC Neutral:
 Numeric Index:

Remarks:

50% of the vegetation is hydrophytic.

HYDROLOGY

Recorded Data (Describe in Remarks):
 Stream, Lake or Tide Gauge
 Aerial Photographs
 Other

No Recorded Data

Field Observations

Depth of Surface Water: 0"

Depth to Free Water in Pit: >12"

Depth to Saturated Soil: >12"

Wetland Hydrology Indicators

Primary Indicators

- Inundated
- Saturated in Upper 12 Inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators

- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

Wetland hydrology indicators are not present.

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

Project/Site: Union Cross Road – Approximate 86 Acre Tract Applicant/Owner: Land Development Resource Group Investigators: ECS, Ltd.	Project No: G--12079	Date: January 27, 2006 County: Forsyth State: North Carolina Plot ID: DP-1
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Map Unit Name (Series and Phase): Louisburg Wedowee Complex
 Map Symbol: LwE
 Drainage Class: Well Drained
 Taxonomy (Subgroup): Ruptic-Ultic Dystrochrepts
 Profile Description

Mapped Hydric Inclusion? Yes No
 Field Observations Confirm Mapped Type: Yes No

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		7.5YR 5/6	10YR 6/2	10%	Loam

Hydric Soil Indicators:

<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
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Remarks:

Hydric soil indicators are not present.

WETLAND DETERMINATION

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

Two of the wetland criteria are not present. The sampling point is not located within the wetland.

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

Project/Site: Union Cross Road – Approximate 86 Acre Tract Applicant/Owner: Land Development Resource Group Investigators: ECS, Ltd.	Project No: G--12079	Date: January 27, 2006 County: Forsyth State: North Carolina Plot ID: DP-2
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Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation:)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on the reverse side)	Community ID: Transect ID: Field Location: View Figure 3
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VEGETATION

Dominant Plant Species (Latin/Common)	Stratum	Indicator	Plant Species (Latin/Common)	Stratum	Indicator
Eulalia viminea					
Nepal microstegium	Herb	FAC+			
Salix nigra					
Black willow	Tree/Sap	OBL			
Juncus sp.					
Rush sp.	Herb	FACW			

Percent of Dominant Species that are OBL, FACW or FAC: 100% (excluding FAC-)	FAC Neutral: Numeric Index:
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Remarks:
The dominant vegetation is hydrophytic.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Field Observations Depth of Surface Water: 0" Depth to Free Water in Pit: 6" Depth to Saturated Soil: 4"	Wetland Hydrology Indicators Primary Indicators <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
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Remarks:
Wetland hydrology indicators are present.

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

Project/Site: Union Cross Road – Approximate 86 Acre Tract Applicant/Owner: Land Development Resource Group Investigators: ECS, Ltd.	Project No: G--12079	Date: January 27, 2006 County: Forsyth State: North Carolina Plot ID: DP-2
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Map Unit Name (Series and Phase): Pacolet fine sandy loam
 Map Symbol: PaF
 Drainage Class: Well Drained
 Taxonomy (Subgroup): Typic Hapludults
 Profile Description

Mapped Hydric Inclusion? Yes No
 Field Observations Confirm Mapped Type: Yes No

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 5/6		0%	Loam
5-12"		2.5Y 4/2	10YR 5/6	10%	Loam

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks:

Hydric soil indicators are present.

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:

The three wetland criteria are present. The sampling point is located within the wetland.