



Soil & Environmental Consultants, PA

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www.SandEC.com

February 18, 2008
S&EC Project # 10991.W1

Carolina Meadows, Inc.
Attn: Kevin McLeod
100 Carolina Meadows
Chapel Hill, NC 27517

Re: Wetland Delineation and Stream Buffer Evaluation
Carolina Meadows Site (+/- 37 acres)
Chatham County, NC

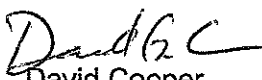
Mr. McLeod:

On February 4, 5, and 7, 2008, S&EC personnel conducted the wetland delineation and stream buffer evaluation on the Carolina Meadows Site in Chatham County, NC. You will find the attached report detailing our findings. Supporting maps, photographs, and data forms that further document the wetland and stream related site characteristics are also attached. Please review this information and call our office if you have questions.

The next step in the wetland and stream verification process is to visit the site with the Army Corps of Engineers' agent for Chatham County. In addition, site meetings will need to be conducted with the NC-DWQ agent for Chatham County and an agent designated by Chatham County. S&EC will contact you about scheduling a site meeting with the USACE and NC-DWQ. Furthermore, I am attaching a copy of our agent authorization form that you should complete and return; this will grant S&EC authority to correspond with the Corps on your behalf.

As you move forward in planning your development, S&EC personnel are available for site plan review and permit consultation services. Please contact S&EC if you have any questions related to wetland and stream regulations or if you need clarification of the attached report.

Sincerely,


David Cooper
Staff Biologist


David Gainey
Wetland Specialist/Project Manager

Attachments:

- | | |
|-------------------------------|---|
| 1) Wetland Delineation Report | 2) USGS site vicinity map |
| 3) NRCS Soil Survey | 4) Wetland & Stream Sketch Map |
| 5) Agent Authorization Form | 6) Requirements for Delineation
Maps |



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DETAILED WETLAND DELINEATION AND CHATHAM COUNTY BUFFER DETERMINATION FOR THE CAROLINA MEADOWS SITE

On February 4, 5, and 7, 2008, S&EC personnel conducted a detailed wetland delineation and buffer determination on the Carolina Meadows site (± 37 acres). The site is located on the west side of Old Farrington Road (SR 1726), immediately north of its junction with SR 1727. Figure 1 and Figure 2 shows the location of the site on a USGS topographic quadrangle and NRCS County Soil Survey, respectively.

EXECUTIVE SUMMARY

We have determined that three jurisdictional wetlands, one jurisdictional perennial stream, and three ephemeral streams exist on the site. These features will require buffers based on the Chatham County Watershed Protection Ordinance, as amended on January 23rd, 2008. In addition, three marginal channels exist on the site which may not require buffers. The attached wetland sketch map depicts the approximate locations of streams and wetlands identified during the field survey, as well as the buffers which will be applied to these features based on our evaluation. Please refer to the sketch map and the results and recommendations section below for more detailed information.

SCOPE OF WORK

The detailed wetland delineation consisted of traversing the property to examine soils, vegetation, and hydrology across the site in search of areas that meet the criteria for jurisdictional wetlands as described by the procedures set forth in the Corps of Engineers Wetlands Delineation Manual (January 1987 – Final Report). Areas on the site with positive indicators of hydric soils, evidence of wetland hydrology, and presence of hydrophytic vegetation were flagged with sequentially numbered, pink S&EC logo flagging approximated on the map. Proof of wetland hydrology would be the existence of hydric soils with oxidized root channels in the upper 12 inches of the soil profile, water borne deposits, drift lines, scour marks, drainage patterns, regional indicators of soil saturation, etc. Surface waters such as intermittent and perennial stream channels, ponds, and lakes, which are also subject to regulation by the US Army Corps of Engineers (USACE) as waters of the US, were also identified. These surface waters may also be referred to as jurisdictional waters to indicate that they are within the jurisdiction of the USACE. It is important to note that wetlands are also classified as waters of the US and regulated by the USACE under authority of the Clean Water Act (33 USC 1344).

In addition to features regulated by the USACE, we identified ephemeral streams and seeps, which are buffered by Chatham County. Ephemeral streams are channels which carry stormwater, with little or no water from groundwater. These streams must have a well-defined channel, show evidence of active conveyance of water, and score above a 3 on the NC-DWQ

stream form, version 3.1 or most current version approved by NC-DWQ. Seeps are areas that exhibit dominant Obligate (OBL) or Facultative Wetland (FACW) hydrophytic vegetation and have wetland hydrology, but do not meet the hydric soil requirement to be classified as a jurisdictional wetland.

S&EC's stream evaluation consisted of examining each feature on the site that is shown on the most recent version of the US Geological survey's 7.5 Minute Quadrangle or NRCS soil survey, using NC-DWQ stream evaluation techniques. Streams not shown on these maps that were evident in the field were also identified and evaluated.

RESULTS & RECOMMENDATIONS

Wetlands and Jurisdictional Waters:

We have determined that jurisdictional waters (i.e., streams, an isolated pond, and wetlands) exist on the site. Photographs, data forms, and NC-DWQ stream forms that document the characteristics of each aquatic feature on-site can be found in appendices A-C of this report. Please refer to the attached "Wetland Sketch Map" for specific flag numbers and approximate locations. Streams and ponds identified on-site are described below:

- Jurisdictional Feature A (Unnamed Tributary -UT to Morgan Creek) flows across the western property line in the southern portion of the site, continues along the western property line before flowing off property in the northern portion of the site. Feature A is shown on the NRCS Soil Survey as intermittent, but will likely be considered perennial by the NC-DWQ. This stream will likely be classified as important by USACE, based on our assessment. Within the evaluated boundaries of the Carolina Meadows site, Feature A is not within any Special Flood Hazard Areas, as depicted on the attached map. Based on our assessment, this stream will have a 100 foot buffer imposed by Chatham County.
- Ephemeral Feature 01 (UT to Feature A) starts on-site at flag "01 Start Ephemeral Channel" and flows west off property and into Feature A. This stream is not represented on the USGS Topographic Quadrangle or NRCS Soil Survey. Based on our assessment, this stream will have a 30 foot buffer imposed by Chatham County, but will not be considered jurisdictional.
- Ephemeral Feature 02 (UT to Feature A) starts on-site at two start points: flags "02 Start Ephemeral Channel" and "02A Start Ephemeral Channel" and flows west into Feature A. The flow of Feature 02 becomes diffuse as it enters the floodplain of Feature A. This stream is not represented on the USGS Topographic Quadrangle or NRCS Soil Survey. Based on our assessment, this stream will have a 30 foot buffer imposed by Chatham County, but will not be considered jurisdictional.
- Ephemeral Feature 03 (UT to Feature A) starts on-site at flag "03 Start Ephemeral/Marginal Intermittent Channel" and flows northwest into Feature A. The flow of Feature 03 becomes diffuse as it enters the wetland flagged with flags 05-11. For this reason, it loses its intermittent characteristics. Flag "04 Stop Marginal Intermittent Channel" denotes the point at which the stream is no longer potentially intermittent. "Downstream" of this point, Feature 03 is diverted by a large stormwater control device so that it runs parallel to Feature A for a span. Three rip-rap dams are in place within

Feature 03. This stream is not represented on the USGS Topographic Quadrangle or NRCS Soil Survey. Based on our assessment, this stream will have a 30 foot buffer imposed by Chatham County. The USACE and/or NC-DWQ may assert jurisdiction over the portion of the stream between flags "03" and "04", but we believe this is unlikely.

- Pond 1 is located in the southern portion of the property, along the eastern property line near SR 1726. This pond has no connection to any stream feature, and will therefore be considered isolated by the USACE and NC-DWQ. Pond 1 is shown on the USGS Topographic Quadrangle. Ponds are not buffered by the Chatham County Watershed Protection Ordinance.

Surface waters on this site flow into Morgan Creek in the Cape Fear River Basin, which has been classified in NC-DWQ's "Classification and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina" as (WS-IV; NSW) between Orange County SR 1919 and Chatham County SR 1726.

The wetlands on-site were identified as Headwater wetlands, as outlined in the publication ¹"A Field Guide to North Carolina Wetlands." This wetland type is common throughout the piedmont region of North Carolina and is found mainly along headwater streams like the ones on-site.

Water Supply Water Rules:

No surface waters on-site are shown as perennial streams on the USGS Topographic Quadrangle; therefore, no features on-site are subject to riparian buffers under the Water Supply Water Rules.

Chatham County Stream Buffers:

Streams on this site may be subject to buffer regulations administered by state and local authorities. The NC-DWQ is currently reviewing draft regulations that could potentially apply regulated buffers alongside streams and other surface waters within the Jordan Lake Watershed. Details of the rules are subject to change during the review process.

Local Chatham County stream buffer regulations will apply. A brief description of these buffers can be found in the regulations section of this report. The project engineer or planner should provide input toward the application of these regulations to the site plan during design and review. S&EC can provide reference information and feedback to your engineer regarding stream features observed on-site as needed to determine the appropriate buffer widths and locations as mandated by local authorities.

All S&EC flags comprising the wetland and jurisdictional waters delineation should be surveyed and a Wetland Delineation Map generated for use in site planning and USACE approval and permitting. The entire length of each stream feature was not flagged, but will need to be surveyed located for the Wetland Delineation Map. Stream features may be located either along the centerline (with channel widths noted at each survey point) or at the top-of-bank. The Wetland Delineation Map should include all of the information listed on the attached "**Requirements for Wetland Delineation Maps.**" S&EC delineation flag numbers should be shown on the wetland

¹"A Field Guide To North Carolina Wetlands"; Department of Environment, Health and Natural Resources, January 1996.

survey. Please have the property owner or contracting buyer complete the attached agent authorization form if you would like S&EC to act on their behalf for requesting approval of the wetland delineation. This form will also be used in preparing a permit application for impacts to wetlands or surface waters when we are provided with a plan showing the proposed impacts.

S&EC cannot conduct correspondence with the USACE unless we have agent authorization (see attached Agent Authorization). This authorization form must be filled out in its entirety and returned to S&EC (a faxed copy is acceptable).

Regulations

A general list of regulations that apply to jurisdictional and Chatham County regulated wetlands and waters present on the site can be found below. Please be aware that other local, state, and federal regulations not included in this list may also apply. S&EC personnel are available to discuss these regulations as they apply to your project.

Wetland Permitting:

Please note that new Nationwide Permits were issued by the USACE on March 19, 2007. The USACE Wilmington District issued revised Regional Conditions for the 2007 Nationwide Permits on June 5, 2007. Therefore, the USACE may once again review requests for impacts to jurisdictional waters. Due to the complexity of these revisions, we recommend you forward a conceptual site plan to our office for review by one of our permitting specialist, who can best advise you of the specific permitting needs as you progress through the planning process.

Generally, wetland impact permits are issued on a per-project basis as determined by the USACE. The USACE has determined that impacts on parcels sub-divided from larger tracts are sometimes considered to be cumulative to existing impacts for the large tract. If this is the case, then thresholds for notification may not apply to your project and impacts to streams/wetlands must be considered in light of existing permits.

Chatham County Watershed Protection Ordinance

The Chatham County Watershed Protection Ordinance was revised December 10, 2007 to require more stringent buffer requirements around surface water features in the County's jurisdiction. The ordinance requires all stream classifications to be conducted by a qualified professional who has received documented certification of training in classifying streams and surface waters in North Carolina. Additionally, all seep, spring and wetland delineations must be conducted by a qualified professional who has at least 2 years of demonstrated experience in conducting wetland delineations in North Carolina under the Clean Water Act Sections 401 and 404 provisions. All field determinations of streams, seeps and springs are subject to review and approval by the County.

The ordinance requires a one hundred (100') foot buffer along each side of perennial streams, or the full horizontal extent of the "Area of Special Flood Hazard 5" as most recently mapped by the North Carolina Floodplain Mapping Program, NC Division of Emergency Management, whichever is greater. Intermittent Streams require a fifty (50') foot riparian buffer along each side. Ephemeral Streams require a thirty (30') foot buffer along each side. Wetlands require a

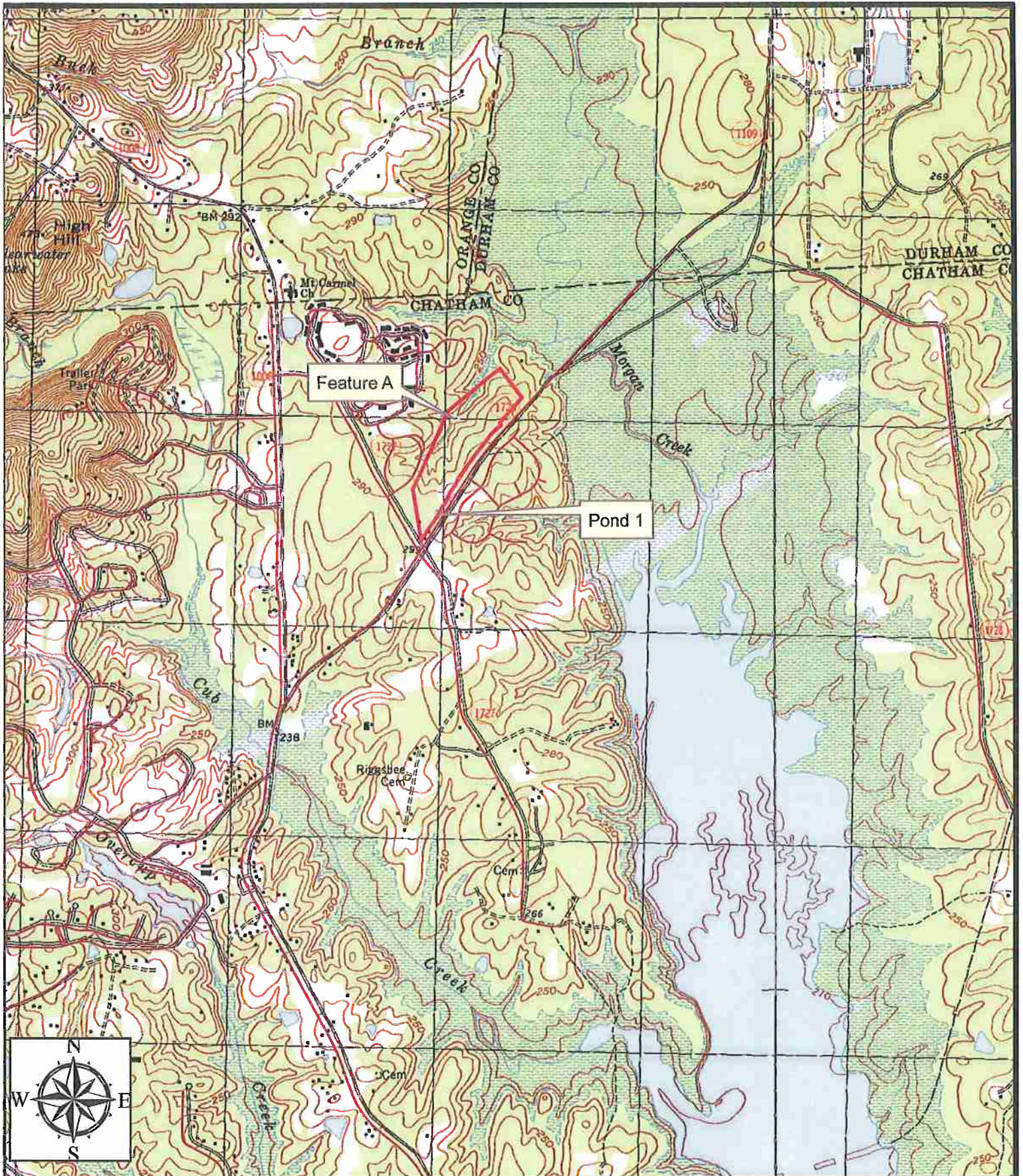
riparian buffer of fifty (50') feet from the delineated boundary, surrounding all features classified as wetlands and linear wetlands. Seeps and Springs (not considered jurisdictional wetlands by the USACE) require a thirty (30') foot buffer measured from the delineated boundary.

Before **any** land disturbance activities may begin, and in addition to any erosion control notification, the riparian buffer boundaries must be clearly flagged in the field and approved by county staff. Tree protection fencing or other approved protective measures must be installed along the approved flagging lines.

The Field Procedures for Classification of Streams and Waterbodies, as updated on November 13, 2007, specifies that "discontinuous or variant stream segments functioning as a hydrologic component of a stream network will have the same classification as the up-slope channel to the point down-slope where the classification changes to the higher score level or at its confluence with another stream." This means that, although a stream may disappear for a section of its length, it will still be considered a stream by Chatham County and buffered as such.

CONCLUSION

The detailed wetland delineation and buffer determination for the Carolina Meadows Site was completed by S&EC on February 7, 2008. This site contains jurisdictional streams and wetland areas that will require preconstruction authorization for impacts. USACE and NC-DWQ verification of our site assessment should be obtained. In addition, verification of our site assessment should be obtained from Chatham County. Following verification meetings with regulatory agencies, the next step in the stream and wetland identification and permitting process is to obtain a field survey of our delineation for formal approval by the USACE. Upon completing the survey, these site constraints may then be integrated into planning for property development.



Project Number: 10991.W1
 Project Manager: David Gainey
 Scale: 1" = 2,000'
 Date: 1/28/2008
 Prepared By: D. Cooper

USGS Topographic Map
 Farrington and Green
 Level Quadrangles

Carolina Meadows Site
 Chatham County, NC



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NOT TO SCALE

LEGEND

- INDICATE FLOOD DAMAGE POTENTIAL SUBJECT TO
- BASE FLOOD ELEVATION (BFE) DERIVED FROM
- PROJECTIONS OF SEA LEVEL RISE (SLR) ON THE
- DATE OF THE MAP (2018) FROM THE NATION'S RISE
- LEVEL (NREL) MODEL. THESE PROJECTIONS ARE
- BASED ON THE ASSUMPTIONS OF THE NREL MODEL.
- FOR MORE INFORMATION ON THE NREL MODEL, VISIT
- WWW.NREL.MODelling.COM.

BASE FLOOD ELEVATION (BFE)

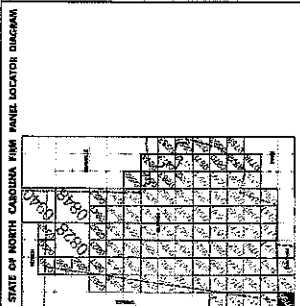
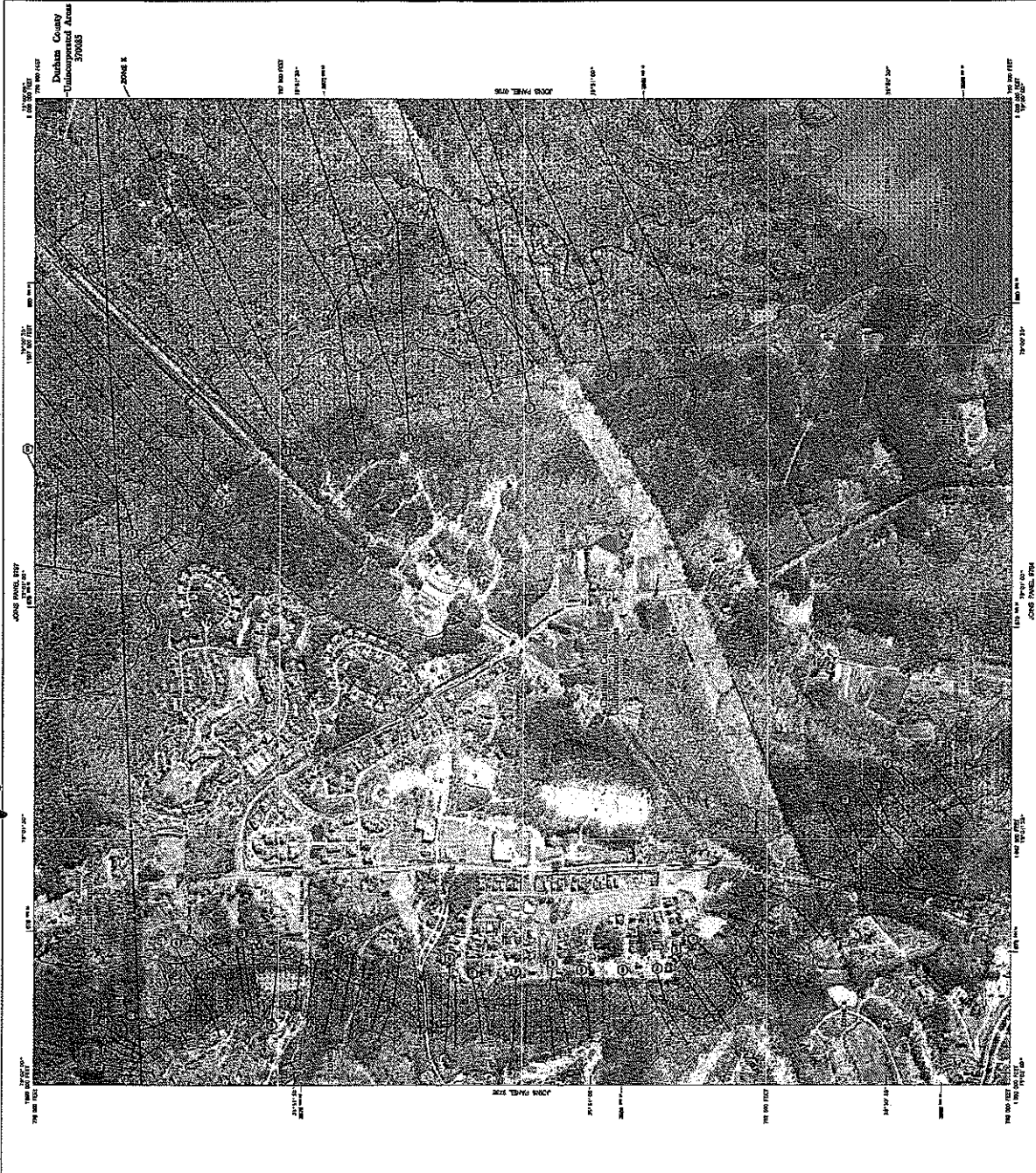
- BASE FLOOD ELEVATION (BFE) DERIVED FROM
- PROJECTIONS OF SEA LEVEL RISE (SLR) ON THE
- DATE OF THE MAP (2018) FROM THE NATION'S
- LEVEL (NREL) MODEL.

FLOOD DAMAGE POTENTIAL (FDP)

- FLOOD DAMAGE POTENTIAL (FDP) DERIVED FROM
- PROJECTIONS OF SEA LEVEL RISE (SLR) ON THE
- DATE OF THE MAP (2018) FROM THE NATION'S
- LEVEL (NREL) MODEL.

OTHER FLOOD ZONES

- OTHER FLOOD ZONES DERIVED FROM
- PROJECTIONS OF SEA LEVEL RISE (SLR) ON THE
- DATE OF THE MAP (2018) FROM THE NATION'S
- LEVEL (NREL) MODEL.



BASE FLOOD ELEVATION (BFE)

The projections used in the National Flood Insurance Program (NFIP) are based on the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data.

Base Flood Elevation (BFE)	10.0
Flood Damage Potential (FDP)	10.0
Other Flood Zones	10.0

OTHER FLOOD ZONES

OTHER FLOOD ZONES DERIVED FROM PROJECTIONS OF SEA LEVEL RISE (SLR) ON THE DATE OF THE MAP (2018) FROM THE NATION'S LEVEL (NREL) MODEL.

NOTES TO USERS

The map was prepared by the National Flood Insurance Program (NFIP) and is intended to provide information on flood damage potential. The map is based on the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data.

BASE FLOOD ELEVATION (BFE)

The base flood elevation (BFE) is the elevation of the water surface during a flood of 100-year recurrence interval. The BFE is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data.

FLOOD DAMAGE POTENTIAL (FDP)

The flood damage potential (FDP) is the potential for damage to property and infrastructure during a flood of 100-year recurrence interval. The FDP is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data. The data is derived from the National Flood Insurance Program (NFIP) data.

CONTACT INFORMATION

www.nrelmodelling.com

FIRM FLOOD INSURANCE RATE MAP

PANEL 586

NORTH CAROLINA

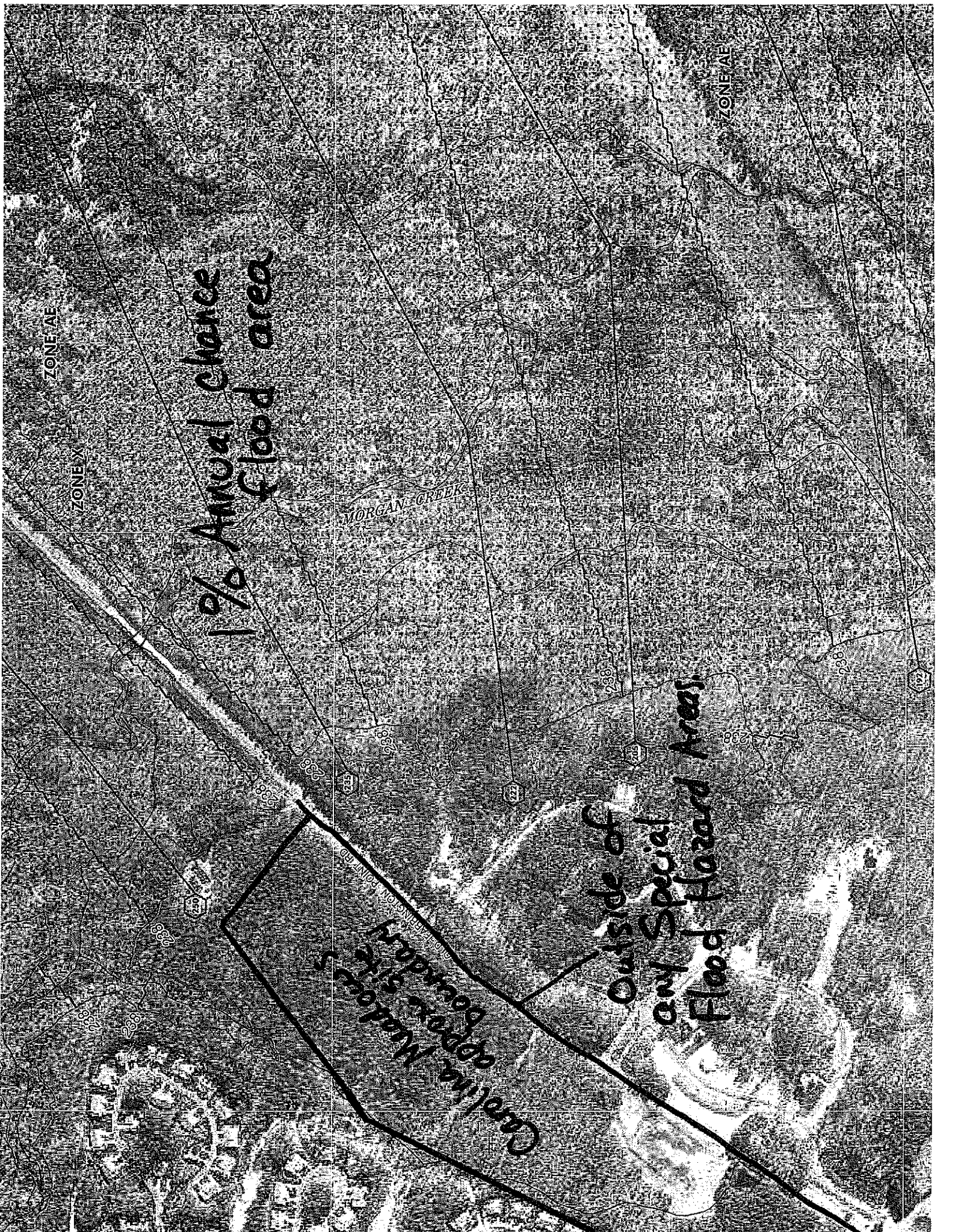
FIRE PANEL LOCATOR DIAGRAM

STATE OF NORTH CAROLINA

FIRE PANEL LOCATOR DIAGRAM

STATE OF NORTH CAROLINA

FIRE PANEL LOCATOR DIAGRAM



1% Annual Chance
Flood area

MORGAN CREEK

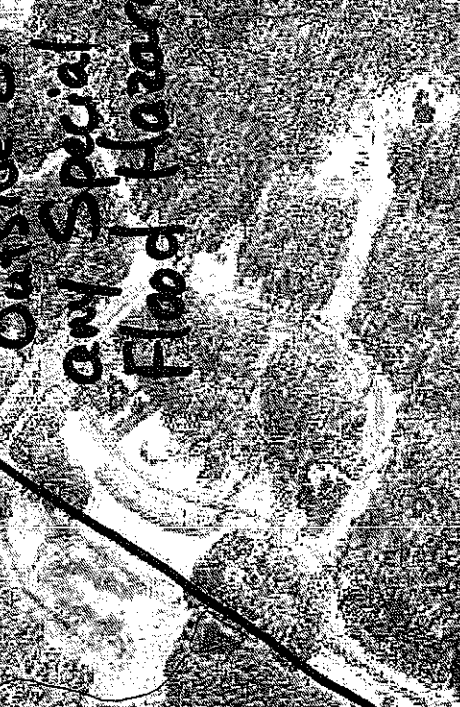
ZONE AE

ZONE X

ZONE AE

Caroline Mulford's
Property approx. site
boundary

Outside of
any Special
Flood Hazard Areas.





ORANGE COUNTY, NC

DURHAM COUNTY, NC

Project Number: 10991.W1
 Project Manager: David Gailey
 Scale: 1" = 2,000'
 Date: 1/28/2008
 Prepared By: D. Cooper

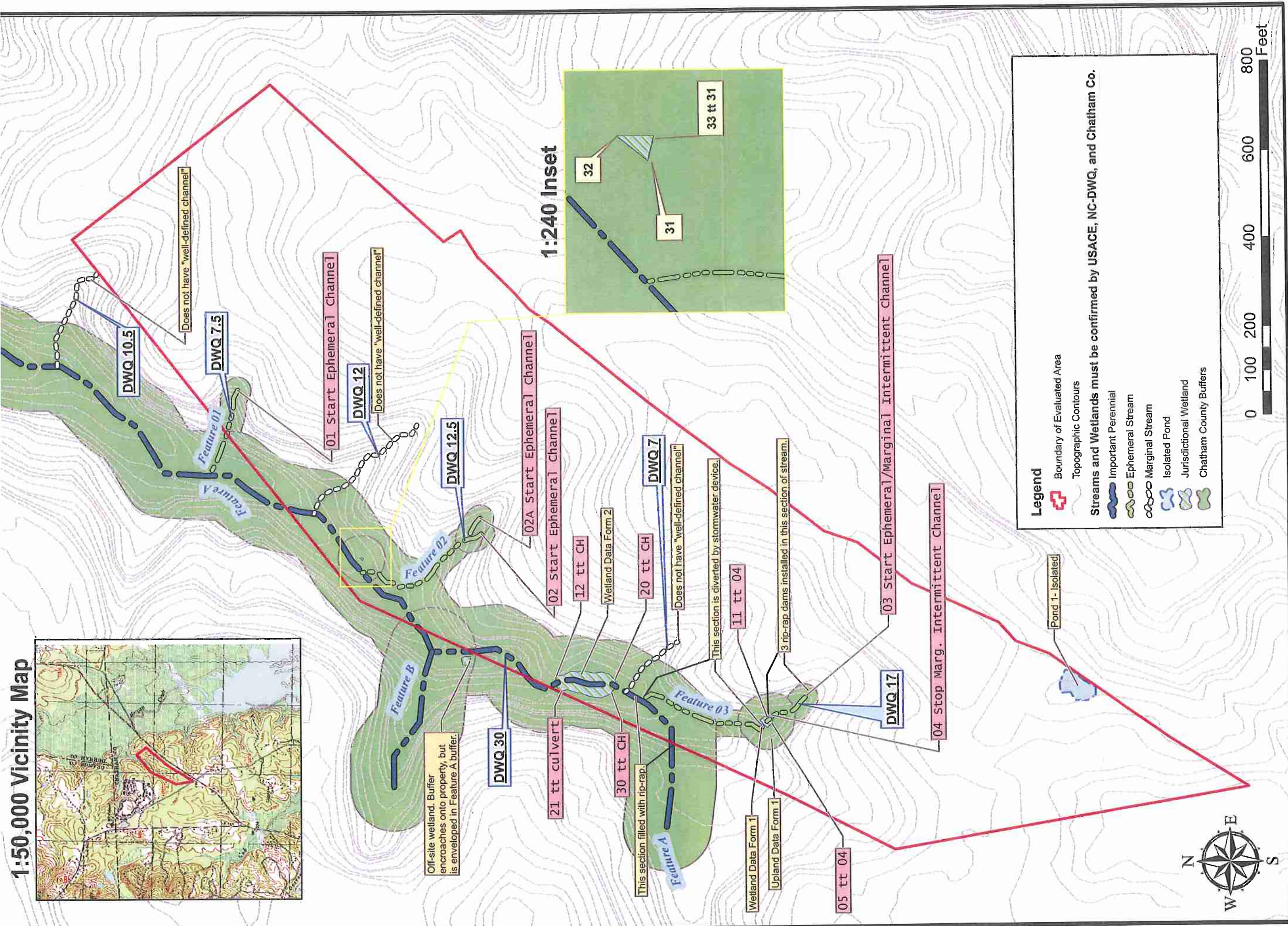
NRCS Soils Map
 Chatham County Soil Survey

 Carolina Meadows Site
 Chatham County, NC

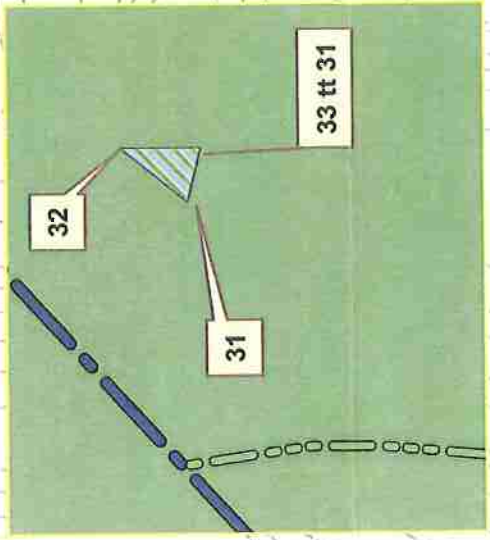


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1:50,000 Vicinity Map



1:240 Inset



Legend

- Boundary of Evaluated Area
- Topographic Contours
- Streams and Wetlands must be confirmed by USACE, NC-DWQ, and Chatham Co.**
- Important Perennial
- Ephemeral Stream
- Marginal Stream
- Isolated Pond
- Jurisdictional Wetland
- Chatham County Buffers



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Project Number:	10991.W1
Project Manager:	DG
Scale:	1" = 200'
Date:	2/18/2008
Wetland and Stream Sketch Map	
Carolina Meadows Site Chatham County, NC	