



CEDAR GROVE MITIGATION SITE

Orange County, North Carolina

Table of Contents

1 0	Project Location and Description	2
2 0	Project Area Existing Conditions	2
2 1	Geologic & Soil Characteristics	2
2 2	Vegetative Communities	4
2 3	Threatened and Endangered Species	4
2 4	Cultural Resources	5
2 5	Environmental Issues	5
2 6	FEMA Floodplain / Floodway Mapping	5
3 0	Proposed Neuse Buffer & Nutrient Offset Restoration Plan	6
4 0	Monitoring and Maintenance Plan	8
5 0	Financial Assurance	9
6 0	Neuse Buffer & Nutrient Offset Mitigation Potential	9
7 0	Required Permits prior to Project Construction	10
8 0	References	11

Tables

Table 1	Mapped Soils within the Site	3
Table 2	Plant List	8
Table 3	Mitigation Credit Summary	10

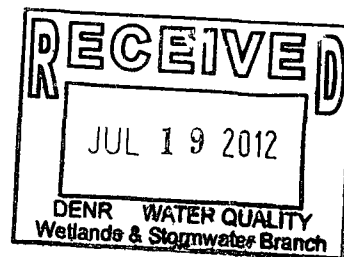
Appendix A Site Maps

Figure 1	Site Location Map
Figure 2A	Overall Proposed Neuse Buffer & Nutrient Offset Restoration Areas
Figure 2B	Neuse Buffer Enhancement Area #1
Figure 2C	Neuse Buffer Enhancement Area #2
Figure 2D	Neuse Buffer Enhancement Area #3
Figure 3	Bank Parcel Service Area
Figure 4	USGS Quad – Cedar Fork
Figure 5	Orange County Soil Survey
Figure 6	FEMA Floodplain / Floodway Exhibit

Appendix B Site Photographs

Appendix C Agency Correspondence

11-0720



1 0 Project Location and Description

Located off of McDade Store Road (NCSR 1354) just northwest of its intersection with Rick Road in Orange County North Carolina (**Figure 1**) is the proposed Neuse buffer and nutrient offset mitigation site currently known as the Cedar Grove Mitigation Site (Site). The Site is located approximately 0.8 miles southwest of the intersection of McDade Store Road and State Route 86 and approximately 0.7 miles northeast of the intersection McDade Store Road and Efland Cedar Grove Road.

The tract containing the Site is approximately 131.5 acres which includes area within the right of way along its frontage of McDade Store Road. A conservation easement will protect the Site and will be approximately 63 acres in size. Within the conservation easement existing riparian areas will be restored and enhanced to generate both Neuse buffer and nutrient offset (nitrogen and phosphorus) credits. In addition the dimension, pattern and profile of existing perennial and intermittent stream channels located within the conservation easement will be restored at the Site. The remaining +/- 68.5 acres not placed within a conservation easement will be developed as a low density subdivision that will consist of three (3) single family lots that are a minimum size of 28 acres along with driveways, existing walking trails and other infrastructure (**Figure 2A**). Please refer to **Table 3**, below for additional information regarding buffer restoration, buffer enhancement and nutrient offset credits proposed within this Site.

The Site is located within the Upper Falls Lake watershed in the Neuse River Basin (8 digit USGS HUC 03020201 12 digit USGS HUC 03020201 0301) more specifically within Neuse Sub basin 03 04 01. Stormwater runoff from this site drains into the East Fork Eno River (Stream Index #27 2 3) which is located in the northeastern section of the Site. According to the N.C. Division of Water Quality Basinwide Information Management System (BIMS) the East Fork Eno River is classified as WS II (Water Supply II) HQW (High Quality Waters) and NSW (Nutrient Sensitive Waters). The WS II classification is for *waters used as sources of water supply for drinking culinary or food processing purposes which are generally in predominantly undeveloped watersheds*. HQW is a *supplemental classification intended to protect waters that are rated excellent based on biological and physical/chemical characteristics* while the NSW designation is for *Nutrient Sensitive Waters*. The purpose of this Site is to improve water quality within the Neuse River Basin specifically the Falls Lake watershed by providing off site mitigation for development (both existing and proposed) requiring stream buffer mitigation and nutrient offset credits. The proposed Site Service Area is shown in **Figure 3**.

This Site shall be established under the terms and conditions of the EBX Upper Neuse Riparian Buffer and Nutrient Offset Umbrella Mitigation Bank (Bank) signed on February 10, 2012 made and entered into by Environmental Banc and Exchange LLC (EBX) acting as the Bank Sponsor (Sponsor) and the North Carolina Department of Environment and Natural Resources Division of Water Quality (DWQ).

2 0 Project Area - Existing Conditions

2 1 Geologic & Soil Characteristics

Based upon review of the United States Geological Survey (USGS) Cedar Fork, North Carolina Quadrangle the Site contains low to moderate relief with elevations ranging from $\pm$ 670 feet to $\pm$ 710 feet. The southwestern section of the Site has a topographic gradient that generally slopes northeast towards the East Fork Eno River while the northeastern section generally slopes southwest towards the East Fork Eno River. Surface drainage is generally directed towards the East Fork Eno River located in the northeastern section of the Site (**Figure 4**).



The Site is located within the Piedmont Physiographic Province of North Carolina and more specifically within the Carolina Slate Belt Ecoregion. A review of Ecoregions of North Carolina and South Carolina (Griffith et al. 2002) shows the physiography in the area is comprised of dissected irregular plains, some hills, linear ridges, and isolated monadocks with low to moderate gradient streams. The geology in the area is comprised of quaternary to tertiary silty to clayey saprolite, Precambrian to Cambrian felsic to mafic metavolcanic rock, metamudstone, and granite.

The Soil Survey of Orange County, North Carolina (Soil Conservation Service 1977) lists the soils within the Site as from the Appling-Helena Association. As stated in the soil survey, these soils can be generally classified as gently sloping with well and moderately well drained soils which have a surface layer of sandy loam and a subsoil of sandy clay loam, clay, or sandy clay. As described by the online USDA NRCS Official Soil Series Descriptions (OSD), the specific soils within the Site are shown on **Figure 5** and are listed below, in **Table 1**.

Table 1 Mapped Soils within the Site

Soil Type	Hydrologic Soil Group	General Description
Appling sandy loam 2 to 6% slopes (ApB)	HSG B	This well drained soil is on broad ridges which are crossed by intermittent drainage ways. The permeability is moderate, the available water capacity is medium, and the shrink swell potential is moderate. The seasonal high water table is below a depth of 72 inches.
Appling sandy loam 6 to 10% slopes (ApC)	HSG B	This well drained soil is on narrow side slopes which are crossed by intermittent drainage ways. The permeability is moderate, the available water capacity is medium, and the shrink swell potential is moderate. The seasonal high water table is below a depth of 72 inches.
Chewacla loam (Ch)	HSG C	This nearly level, somewhat poorly drained soil is on long, flat areas parallel to major streams on the flood plains. The permeability is moderate, the available water capacity is medium, and the shrink swell potential is low. Depth to the seasonal high water table is 6 to 18 inches during late winter and early spring. This soil is commonly flooded for brief periods and is considered hydric.
Helena sandy loam 2 to 8% slopes (HeB)	HSG C	This moderately well drained soil is on broad ridges. The permeability is slow, the available water capacity is low, and the shrink swell potential is high. The seasonal high water table is below a depth of 60 inches, but because of the slow permeability, a perched water table is 12 to 30 inches below the soil surface during wet seasons.
Helena Sedgfield sandy loam 0 to 2% slopes (HhA)	HSG C/C	This complex consists of moderately well drained to somewhat poorly drained, nearly level soils. The permeability is moderately slow, the available water capacity is low, and the shrink swell potential is high. The seasonal high water table is below a depth of 60 inches, but because of the slow permeability, a perched water table is 18 inches below the soil surface during wet seasons.

2.2 Vegetative Communities

Distribution and composition of plant communities throughout the Site reflect landscape level variations in topography soils hydrology and past and present land use practices. Historically the majority of the land within the Site was a maintained golf course that included fairways greenways a club house maintenance buildings driving range water features (i.e. ponds or streams) maintained fields and golf cart paths. Natural forested areas are limited within Site. These forested areas have been selectively timbered with much of the secondary understory cleared. Therefore existing conditions of the Site can be characterized as a maintained/disturbed land.

Field investigations were conducted by EcoEngineering to assess vegetative assemblages within forested areas of adjacent properties located to the south east and north of the Site. This exercise was conducted to interpret potential vegetative conditions for the Site. According to the North Carolina Natural Heritage Program (NCNHP) classification system (Schafale and Weakley 1990) the assessed forested areas would generally be characterized as a Dry Mesic Oak Hickory Forest. Tree species on the adjacent property include various oak species (*Quercus* spp.) American beech (*Fagus grandifolia*) tulip poplar (*Liriodendron tulipifera*) various hickory species (*Carya* spp.) loblolly pine (*Pinus taeda*) red maple (*Acer rubrum*), and sweet gum (*Liquidambar styraciflua*). Groundcover and secondary canopy layer species consist of common greenbrier (*Smilax rotundifolia*) giant cane (*Arundinaria gigantea*) sweet pepperbush (*Clethra alnifolia*), Virginia creeper (*Parthenocissus quinquefolia*) American holly (*Ilex opaca*) red cedar (*Juniperus virginiana*) various viburnum species (*Viburnum* spp.), Christmas fern (*Polystichum acrostichoides*) New York fern (*Thelypteris noveboracensis*) and netted chain fern (*Woodwardia aerolata*).

2.3 Threatened and Endangered Species

Some populations of plants and animals are declining because of natural forces or their inability to coexist with human activity. Plants and animals with Threatened or Endangered status are protected under the Endangered Species Act (ESA) of 1973 (16 US 1531 et seq.). According to the U.S. Fish and Wildlife Service (USFWS) web page (<http://www.fws.gov/nc/es/es/countyfr.html>) accessed January 13, 2012) there are four (4) endangered species (red cockaded woodpecker (*Picoides borealis*), dwarf wedgemussel (*Alasmidonta varicosa*), Michaux's sumac (*Rhus michauxii*) and smooth coneflower (*Echinacea laevigata*)) and 12 federal species of concern (American eel (*Anguilla rostrata*), Carolina darter (*Etheostoma collis lepidion*), Roanoke bass (*Ambloplites cavifrons*), Atlantic pigtoe (*Fusconaia masoni*), brook floater (*Alasmidonta varicosa*), green floater (*Lasmigona subviridis*), savannah lilliput (*Toxolasma pullus*), yellow lampmussel (*Lampsilis cariosa*), butternut (*Juglans cinerea*), creamy tick trefoil (*Desmodium ochroleucum*), sweet pinesap (*Monotropsis odorata*) and Torrey's mountain mint (*Pycnanthemum torrei*)) potentially occurring in Orange County. The bald eagle (*Haliaeetus leucocephalus*) is also listed as occurring in Orange County and is protected under the Bald and Golden Eagle Protection Act (BGPA) (16 US 668 668d). In addition a review of the NCNHP database of documented occurrences (<http://www.ncnhp.org/Pages/heritagedata.html>) accessed January 13, 2012) revealed the historical presence of two (2) state listed species (Carolina ladle crayfish (*Cambarus davidi*) and sweet pinesap) as potentially occurring within a two (2) mile radius of the Site.

Correspondence was submitted on January 31, 2012 by EcoEngineering to the NCNHP, USFWS and the North Carolina Wildlife Resource Commission (NCWRC) requesting information regarding natural heritage resources and threatened and endangered species. Formal correspondence with each of these agencies can be found in Appendix C of this



report In summary NCNHP and NCWRC do not have records of natural heritage resources or records of threatened and endangered species within the Site and the USFWS provided an opinion stating the proposed restoration activities are not likely to adversely affect any federally listed endangered species or threatened species their formally designated critical habitat, or species currently proposed for listing under the Act at these sites However NCWRC stated there are records for the state threatened creeper (*Strophitus undulatus*) and state special concern notched rainbow (*Villosa constricta*) in East Fork Eno River

To address the anticipated concerns noted by correspondence received from the regulatory agencies EcoEngineering conducted field surveys on January 16, 2012 by walking transects within the proposed Site parcel area to determine the presence of federally Threatened or Endangered species There were no federally Threatened or Endangered species observed during the field surveys and the work inherent in restoring stream and riparian buffers does not result in habitat destruction or modification for the above listed species Therefore it is reasonable to conclude the proposed work will have no effect on Threatened and Endangered species

2 4 Cultural Resources

A review of the N C State Historic Preservation Office (SHPO) HPOWEB GIS Service database (<http://gis.ncdcr.gov/hpweb/> accessed January 13, 2012) was also conducted as part of site due diligence According to their website HPOWEB has current location data for all National Register listings, most Study List entries and Determinations of Eligibility, and surveyed rural properties for many counties Based on the review no listings are located within the proposed Site parcel However, there are 16 properties that have been surveyed within a one mile radius of the Site Of the 16 properties, three (3) are on the study list (Captain John S Pope House 2010 – OR 1029 Willy Woods McDade Farm 1993 – OR 1035 and Rosie Wrenn House 1993 – OR 0685) There are no properties listed on the HPOWEB GIS service that fall under the National Register or Determined Eligible classification within one mile of the Site although there are properties shown on the National Register and Determined Eligible listings within a two mile radius

Correspondence was submitted on January 31 2012 to SHPO requesting information regarding architectural and archaeological resources associated with the proposed Site In summary correspondence was received on March 5 2012 from SHPO explaining that there is no need to conducted cultural resource surveys at the Site This correspondence can be found in Appendix C

2 5 Environmental Issues

Preliminary data was obtained from Environmental Data Resources Inc (EDR) regarding the potential for on site or nearby sources of contamination EDR maintains an updated database of current and historical sources of contamination All storage tanks whether above ground or underground are identified as well as superfund sites, landfills hazardous waste sites and other potential hazards According to EDR records the Site is not listed in any of the databases searched by EDR In addition there are no federal or state records within the required search distances of the Site

2 6 FEMA Floodplain / Floodway Mapping

As previously noted, the East Fork Eno River is located within the northeastern section of the Site Figure 6 shows the Site and the floodplain limits taken from FEMA FIRM Panel 3710985800J (effective February 2 2007) According to the effective FEMA FIRM panel and the Flood Insurance Study (FIS) for Orange County this section of the East Fork Eno



River is currently defined as a Special Flood Hazard Area (SFHA). This particular section of the East Fork Eno River has been studied by limited detailed methods and contains non encroachment areas in lieu of a delineated floodway on the FIRM panel. It is anticipated that activities within the non encroachment areas will be limited much like those within a delineated floodway and will be subject to the local Orange County floodplain management ordinance that meets the requirement of 44 CFR 60.3(c)(10). Per 44 CFR Ch 1 §60.3, when a regulatory floodway has been designated the community shall *prohibit encroachments including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge*. Since the proposed stream restoration project along East Fork Eno River will require construction within non encroachment areas one of the following options must be chosen:

- ❑ A Conditional Letter of Map Revision (CLOMR) request for the affected Flood Insurance Rate Map (FIRM) panels followed by a Letter of Map Revision (LOMR) request at the completion of construction. This series of requests will formally update the FEMA FIRM panels to show the effects of the proposed project and will require approval by Orange County and FEMA.
- ❑ A no rise calculation package showing that the proposed project will not cause a rise in 100 year floodplain elevations, floodway elevations, or floodway widths throughout the entire length of the studied stream. This option will not require a submittal to FEMA. It will only require local approval by Orange County.

Impacts to the floodplain and floodway are anticipated as part of the proposed restoration activities. However, the design of this restored section of stream is expected to maintain or decrease current flood elevations. The need for a CLOMR/LOMR or a no rise certification will be addressed during final design of the proposed stream restoration of the portions of East Fork Eno River occurring within the Site.

3.0 Proposed Neuse Buffer & Nutrient Offset Restoration Plan

As mentioned above in Section 1.0, existing perennial and intermittent stream channels located within the conservation easement will be restored at the Site. Therefore, portions of the site's proposed restoration of Neuse buffers and nutrient offset areas will depend upon approval of stream restoration from the Interagency Review Team (IRT). With the IRT approval taken into consideration, maintained/disturbed lands located outside forested areas within the Site will be considered for Neuse buffer restoration for areas less than or equal to 50 feet of the stream bank and nutrient offset restoration for areas located greater than 50 feet but less than or equal to 200 feet from the stream bank. These areas will be ripped and scarified prior to vegetation planting activities. The established microtopography on leveled surfaces will promote diffuse flow and surface water storage. In addition, subsurface hardpans will be eliminated to promote vegetation growth/survival and to increase groundwater recharge rates. Existing grasses may be treated with herbicide to reduce competition with planted species. Where necessary, invasive species will also be treated with herbicide to ensure they do not become dominant, or hinder the establishment, growth, and survival of planted vegetation. It is important to note the Bank Sponsor may elect to use the initial 50 feet on each side of the stream bank as either Neuse buffer or nutrient offset restoration, but not both.



As mentioned in Section 2.2, natural forested areas are limited within many areas of the Site. These forested areas have been selectively timbered with much of the secondary understory cleared. Neuse buffer enhancement will be considered for those forested areas that are within 50 feet of the stream, but lacking adequate stem counts. Neuse buffer enhancement is defined as the process of converting a sparsely woody vegetated area (greater than or equal to 100 trees per acre but less than 200 trees per acre that are greater than or equal to five inches dbh for trees (15A NCAC 02B 0233 (2)(m)) and greater than two feet in height for shrubs) to a forested riparian buffer area (15A NCAC 02B 0242). Nuisance and exotic vegetation are not included in the stem count. The areas proposed for enhancement are shown on **Figures 2A through 2D**. As noted in 15A NCAC 02B 0242, enhancement areas are credited at a ratio of 3:1 (1 acre for every three (3) acres of enhancement, 1 acre of credit is generated). The existing trees and shrubs within the proposed enhancement areas within the Site have been surveyed by EcoEngineering and the tree locations along with densities, are shown in **Figures 2B through 2D**.

The proposed riparian planting plan will be developed by integrating native plant species observed within the Site and adjacent property in addition to selected species known to inhabit a Dry Mesic Oak Hickory Forest community type as described in Classification of the Natural Communities of North Carolina (Schafale and Weakley 1990) and procedures outlined in Guidelines for Riparian Buffer Restoration (NCEEP 2004) to institute species diversity. The restored and enhanced riparian zones will be planted with bare root seedlings or containerized material. Bare root seedlings or containerized material, will be planted during the fall or early spring season. Supplemental planting will be utilized until the required densities have been achieved and maintained for five years.

The planting plan for Neuse buffer and nutrient offset restoration areas will consist of individual tree species as listed in **Table 2** below. For those areas, the goal is to plant 436 to 681 trees per acre with an approximate 8 foot to 10 foot spacing. Plant composition will consist of at a minimum of at least six (6) of the tree species. For areas specified as Neuse buffer enhancement areas on **Figures 2A-2D**, the planting plan shall include a minimum of at least two native hardwood tree species. In both instances, restoration and enhancement planting is required such that a density sufficient to provide an average of 320 trees per acre following five years of successful monitoring at the Site.



Table 2 Plant List

Scientific Name	Common Name
Trees	
<i>Fraxinus pennsylvanica</i>	green ash
<i>Platanus occidentalis</i>	sycamore
<i>Quercus pagoda</i>	cherrybark oak
<i>Betula nigra</i>	river birch
<i>Quercus nigra</i>	water oak
<i>Quercus lyrata</i>	overcup oak
<i>Quercus michauxii</i>	swamp chestnut oak
<i>Quercus phellos</i>	willow oak
<i>Quercus laurifolia</i>	laurel oak
<i>Ulmus americana</i>	American Elm
Small Trees	
<i>Cornus florida</i>	flowering dogwood
<i>Cercis Canadensis</i>	eastern redbud
<i>Asimina triloba</i>	pawpaw
<i>Symplocos tinctoria</i>	horse sugar sweetleaf
<i>Carpinus caroliniana</i>	ironwood
<i>Magnolia virginiana</i>	sweet bay
<i>Amelanchier arborea</i>	downy serviceberry shadbush

* Species composition may be adjusted based on local availability

Temporary and permanent native herbaceous seed will be applied simultaneously to existing grass areas located outside forested areas within the Site. Temporary seed will provide cover until the permanent seed becomes established. Temporary cover will consist of millet (*Echinochloa crusgalli*), annual rye grain (*Secale cereale*) and crimson clover (*Trifolium incarnatum*). Permanent ground cover will consist of switchgrass (*Panicum virgatum*), deertongue (*Panicum clandestinum*), black eyed susan (*Rudbeckia hirta*) and riverbank wildrye (*Elymus riparius*).

4.0 Monitoring and Maintenance Plan

The Site will be monitored for five (5) consecutive years or until the required success criteria has been met as determined by DWQ. Monitoring activities will begin immediately following the completion of planting in order to alleviate any potential problems as they occur. If necessary, supplemental planting and additional site modifications will be implemented. Planting of the Site is anticipated to occur in the Fall/early Winter of 2012. Therefore, the riparian restoration/enhancement will be monitored the following growing season, projected to be in the late summer and early fall (August-October) of 2013. First monitoring data shall not be measured less than five (5) months after completion of initial planting. DWQ will be notified when planting is to occur within Site. A monitoring report will be submitted annually to DWQ no later than December 31 of each monitoring year describing the conditions of the Site and relating those conditions to the success criteria. Monitoring activities will follow the terms and conditions of the EBX Upper Neuse Riparian Buffer and Nutrient Offset Umbrella Mitigation Bank made and entered into by EBX acting as the Bank Sponsor and the DWQ.

The Site will contain 12 vegetative monitoring plots which will be monitored in general accordance with the CVS EEP Protocol for Recording Vegetation (CVS EEP v4.2). Ten (10) by ten (10) meter square plots will be permanently established following completion of the planting phase and at least two opposing corners will be permanently installed and surveyed for



future use. The plant species density, survival rates, and the cause of mortality, if identifiable, will be recorded within each plot. Vegetation plots will be sampled and reported annually. The primary focus of the vegetative monitoring will be solely on the tree stratum although shrub and herbaceous species encountered may also be recorded.

Within Neuse buffer and nutrient offset restoration areas, success criteria will be based on the survival of a minimum density of 320 trees per acre after five years of monitoring. Within Neuse buffer enhancement areas, success criteria will be based on a minimum of at least two tree species at an average density of 320 trees per acre following five years of monitoring. Vegetation monitoring will occur between late summer and early fall (August-October). A determination will be made regarding the success of the project following the collection and evaluation of ecological and physical monitoring data, photographs, and site observations.

5.0 Financial Assurance

EBX agrees to provide financial assurances for this Site in accordance with the terms and conditions of the EBX Upper Neuse Riparian Buffer and Nutrient Offset Umbrella Mitigation Bank made and entered into by EBX acting as the Bank Sponsor and the DWQ.

Following approval of the Bank Parcel Development Package (BPDP), the Bank Sponsor shall provide a Performance Bond from a surety company that is rated no less than an A rated by A.M. Best. The Performance Bond amount shall be 100% of the estimated cost for implementation of the buffer restoration project as described in the approved BPDP but not less than \$150,000.00. Alternatively, in lieu of posting the Performance Bond, the Bank Sponsor may elect to construct the project prior to the first credit release. After completion of the restoration/construction, a separate Performance/Maintenance Bond will be secured for 100% of the estimated cost to implement the monitoring and maintenance plan not less than \$100,000.00. The Performance/Maintenance Bond shall be in effect for a minimum of five years and until DWQ has released all mitigation credits to the Bank Sponsor. Upon DWQ approval, this may be lowered each year based on the adjusted cost to complete the monitoring.

6.0 Neuse Buffer & Nutrient Offset Mitigation Potential

The Cedar Grove Site will provide Neuse buffer and nutrient offset mitigation credits for development impacts within the Neuse River Basin USGS HUC 03020201, specifically the Falls Lake watershed (**Figure 3**). Of the 63.40 acres conservation easement (**Figure 2A**), approximately 43.74 acres will be dedicated to Neuse buffer restoration / enhancement and nutrient offset restoration. A Neuse buffer restoration area of 14.82 acres (645,640 sf) will be used to generate 14.82 acres (645,640 sf) of Neuse buffer credits. A Neuse buffer enhancement area of 1.10 acres (47,837 sf) will be used to generate 0.37 acres (15,945 sf) (enhancement area divide by 3) of Neuse buffer credits. Therefore, a total of 15.19 acres (661,585 sf) of Neuse buffer credit will be generated. The remaining 27.82 acres of riparian restoration area within the Site (i.e. areas outside of the Neuse buffer) will provide nutrient offset credits for nitrogen and phosphorus. The Site will provide 63,235.42 pounds of Nitrogen Nutrient Offset credit and 4,072.85 pounds of Phosphorous Nutrient Offset credit. The exact amount of nutrient offset mitigation potential (currently based on 2,273.02 lbs of nitrogen/ac and 146.4 lbs of phosphorous/ac of riparian restoration) will be included in the As Built Report and on the corresponding Bank Ledger.

Table 3, below provides a summary of mitigation credit for the Site.



Table 3 Mitigation Credit Summary

NEUSE BUFFER RESTORATION/ENHANCEMENT			
Conservation Area	Neuse River Buffer (Acres)		
	Restoration	Enhancement	
1	1 44 (62 853 sf)	0 00	
2	2 79 (121 629 sf)	0 84 (36 698 sf)	
3	10 59 (461 158 sf)	0 26 (11 139)	
TOTAL ACERAGE	14 82 (645 640 sf)	1 10 (47 837 sf)	
RATIO	1 1	3 1	
TOTAL CREDITS	14 82 (645 640 sf)	0 37 (15 945 sf)	
NUTRIENT OFFSET RESTORATION			
Conservation Area	Nutrient Offset Restoration (Acres)	Nitrogen Credit (2 273 02 lbs/ac)	Phosphorus Credit (146 4 lbs/ac)
1	2 82	6 409 92	412 85
2	7 14	16 229 36	1 045 30
3	17 86	40 596 14	2 614 70
TOTAL	27 82	63 235 42	4 072 85

7 0 Required Permits prior to Project Construction

In order to construct the proposed project, a number of permits / documentation will be required prior to construction These are as follows

- USACE Section 404 Permit
- NCDWQ 401 Permit
- Orange County Soil & Erosion Control Permit
- Orange County Floodplain Development Permit (for East Fork Eno River)

The Bank Sponsor intends to apply for and receive the permits listed above prior to construction The Bank Sponsor will also construct the mitigation project utilizing the Guidance Memorandum provided by & recommended by USFWS in their letter dated 2/16/12 (as applicable) Please refer to Appendix C for additional agency correspondence



8 0 References

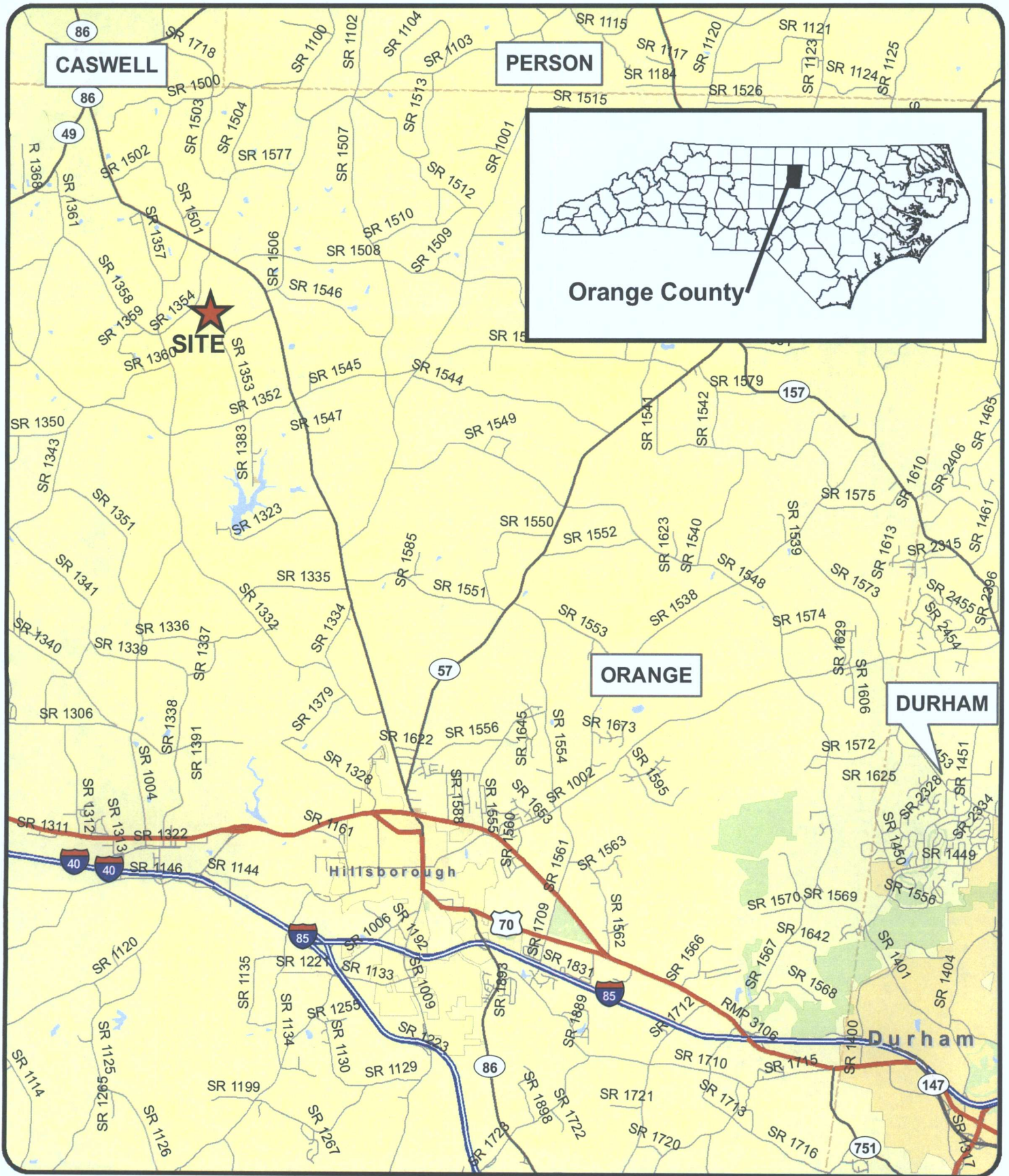
- Endangered Species Threatened Species Federal Species of Concern and Candidate Species Orange County North Carolina* United States Fish and Wildlife Service Available at internet site <http://www.fws.gov/nc/es/es/countyfr.html> Accessed January 13 2012
- Environmental Data Resources, Inc The EDR Radius Map™ Report with GeoCheck® Inquiry Number 3248471 2s January 31 2012
- Griffith, G E Omernik J M Comstock J A Schafle M P McNab W H Lenat D R MacPherson T F Glover, J B and Shelburne V B 2002, Ecoregions of North Carolina and South Carolina (color poster with map descriptive text summary tables and photographs) Reston, Virginia U S Geological Survey (map scale 1 1,500,00)
- Heritage Data* North Carolina Natural Heritage Program Available at internet site <http://www.ncnhp.org/Pages/heritagedata.html> Accessed January 31 2012
- Lee Michael T Peet Robert K , Roberts Steven D and Wentworth Thomas R , 2008 CVS EEP Protocol for Recording Vegetation Level 1 2 Plot Sampling Only Version 4 2
- North Carolina Ecosystem Enhancement Program (NCEEP) 2004 *Guidelines for Riparian Buffer Restoration* Available at internet site <http://www.nceep.net/news/reports/buffers.pdf> Accessed January 31 2012
- North Carolina Historic Preservation Office HPOWEB GIS Service* North Carolina Historic Preservation Office Available at internet site <http://gis.ncdcr.gov/hpoweb/> Accessed January 31 2012
- Schafale MP and AS Weakley 1990 Classification of the Natural Communities of North Carolina Third Approximation North Carolina Natural Heritage Program, Division of Parks and Recreation Department of Environment and Natural Resources Raleigh North Carolina
- State of North Carolina Requests For Proposals November 16, 2011 Full Delivery Projects to Provide Stream, Riparian Wetland and Riparian Buffer Mitigation Within the Targeted Local Watershed for Cataloging Unit 03030002 of the Cape Fear River Basin as Described in the Scope of Work RFP# 16 004357
- United States Army Corp of Engineers (USACE) 2033 April 2003 *Stream Mitigation Guidelines*
- United States Department of Agriculture, Natural Resources Conservation Service *Official Soil Series Description (OSD) with Series Extent Mapping Capabilities* Available at internet site <http://soils.usda.gov/technical/classification/osd/index.html> Accessed January 31 2012
- United States Department of Agriculture Soil Conservation Service Soil Survey of Orange County, North Carolina 1977
- United States Geological Survey 7 5 Minute, Topographic Map of the Cedar Fork, North Carolina Quadrangle, 1967



APPENDIX A

Site Maps





**CEDAR GROVE MITIGATION SITE
VICINITY MAP**



0 5,000 10,000 20,000
Feet

1 inch equals 10,000 feet



EcoEngineering
A division of The John R. McAdams Company, Inc.

Figure 1



ENHANCEMENT AREA 1
TREES IN AREA
TREE DENSITY

0.27 ACRES (11,824 SF)
41 TREES
152 TREES/ACRE



PROJECT NO. EBX-11070

FILENAME: EBX-11070-EX1

SCALE: 1"=50'

DATE: 07-17-2012

**CEDAR GROVE
MITIGATION SITE
ENHANCEMENT AREA 1**
ORANGE COUNTY, NORTH CAROLINA



Eco
Engineering
FIGURE 2B



ENHANCEMENT AREA 2
TREES IN AREA
TREE DENSITY

0.57 ACRES (24,874 SF)
58 TREES
102 TREES/ACRE



PROJECT NO. EBX-11070

FILENAME: EBX-11070-EX1

SCALE: 1"=50'

DATE: 07-17-2012

**CEDAR GROVE
MITIGATION SITE
ENHANCEMENT AREA 2
ORANGE COUNTY, NORTH CAROLINA**



Eco
Engineering
FIGURE 2C



ENHANCEMENT AREA 3
TREES IN AREA
TREE DENSITY

0.26 ACRES (11,139 SF)
26 TREES
100 TREES/ACRE

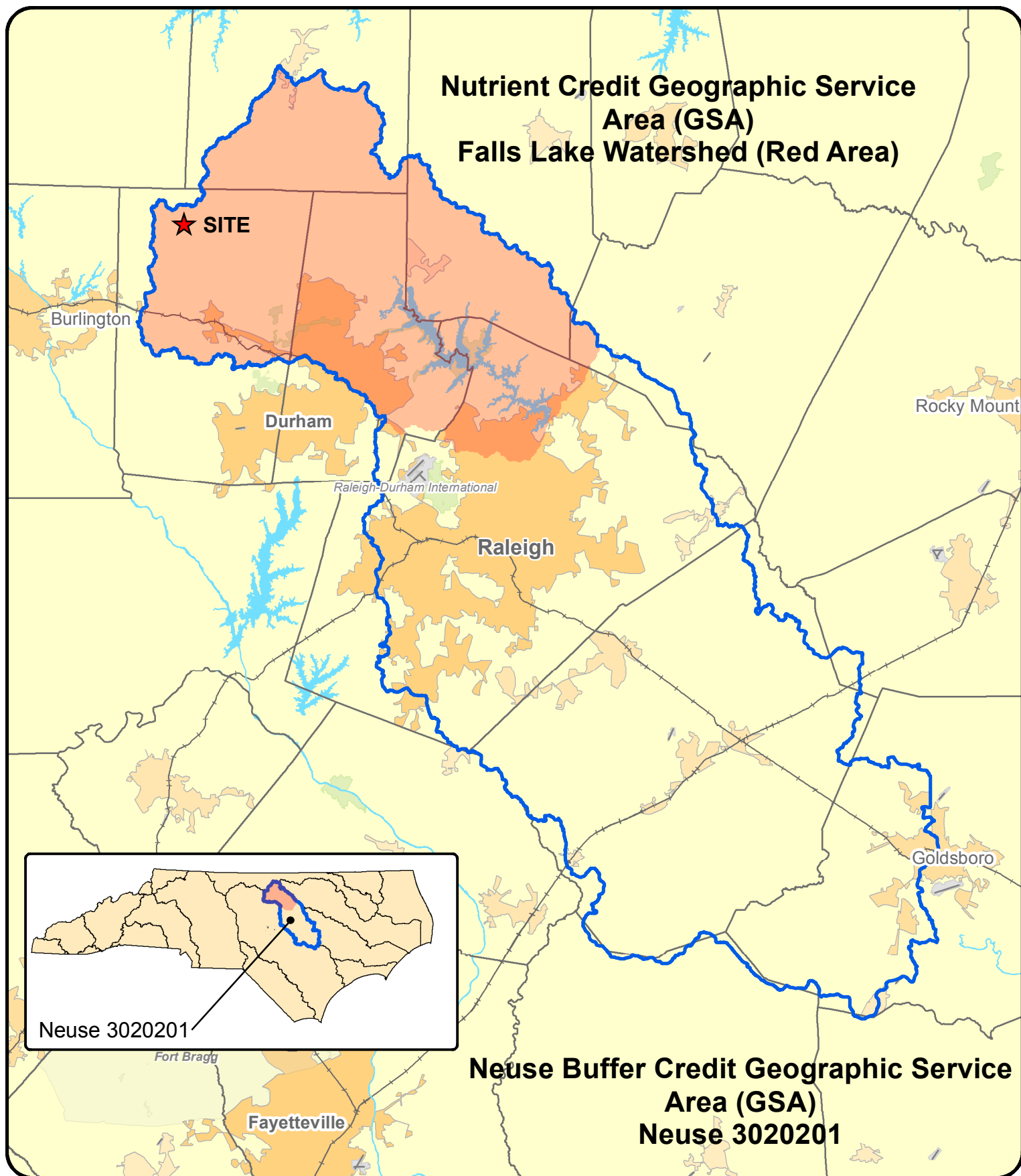
McADAMS

PROJECT NO. EBX-11070
FILENAME: EBX-11070-EX1
SCALE: 1"=50'
DATE: 07-17-2012

**CEDAR GROVE
MITIGATION SITE
ENHANCEMENT AREA 3
ORANGE COUNTY, NORTH CAROLINA**



Eco
Engineering
FIGURE 2D



N



CEDAR GROVE MITIGATION SITE
GEOGRAPHIC SERVICE AREA (GSA)

0 30,000 60,000 120,000
 Feet

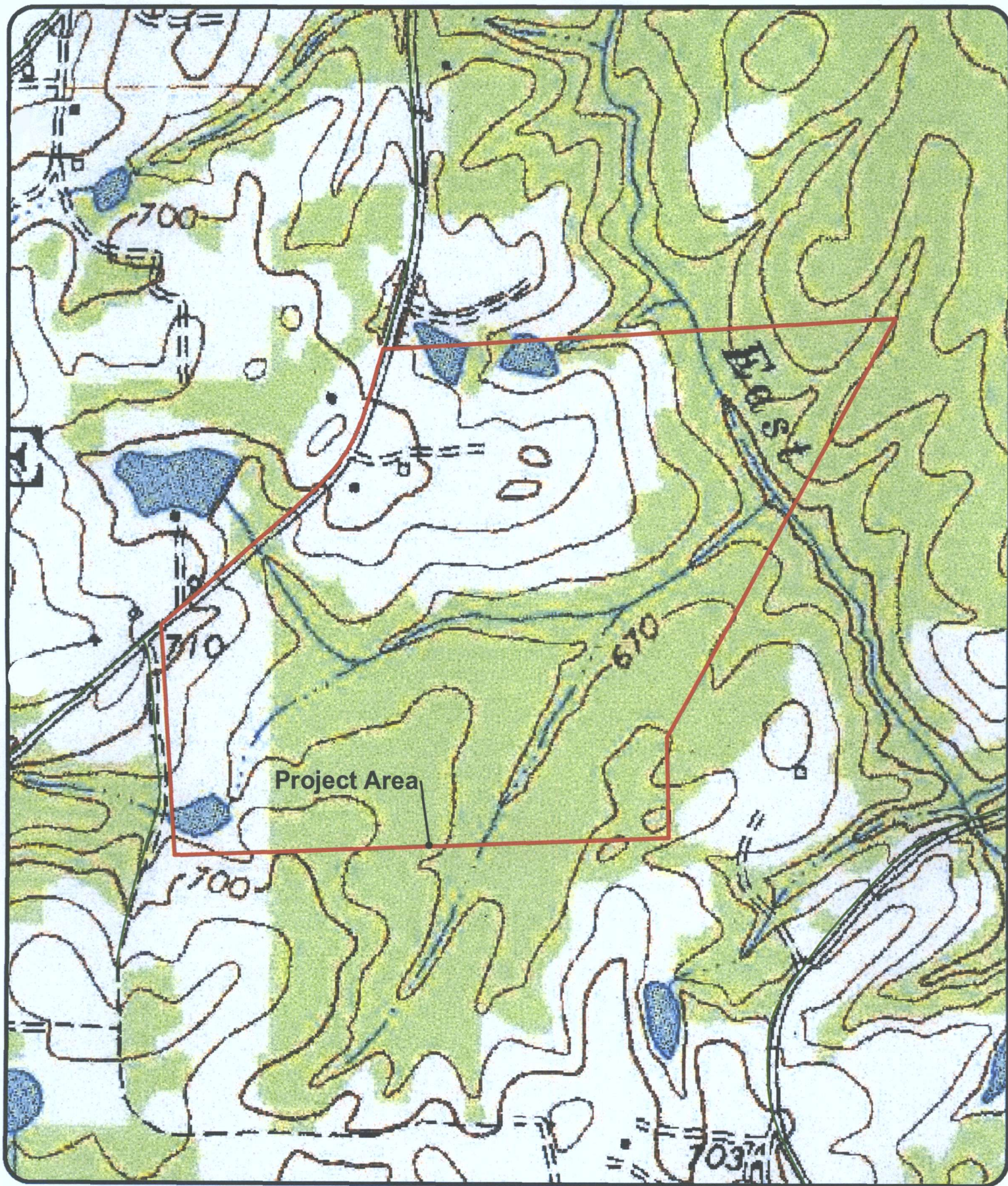
1 inch = 60,000 feet



EcoEngineering

A division of The John R. McAdams Company, Inc.

Figure 3





CEDAR GROVE MITIGATION SITE
USGS SITE MAP

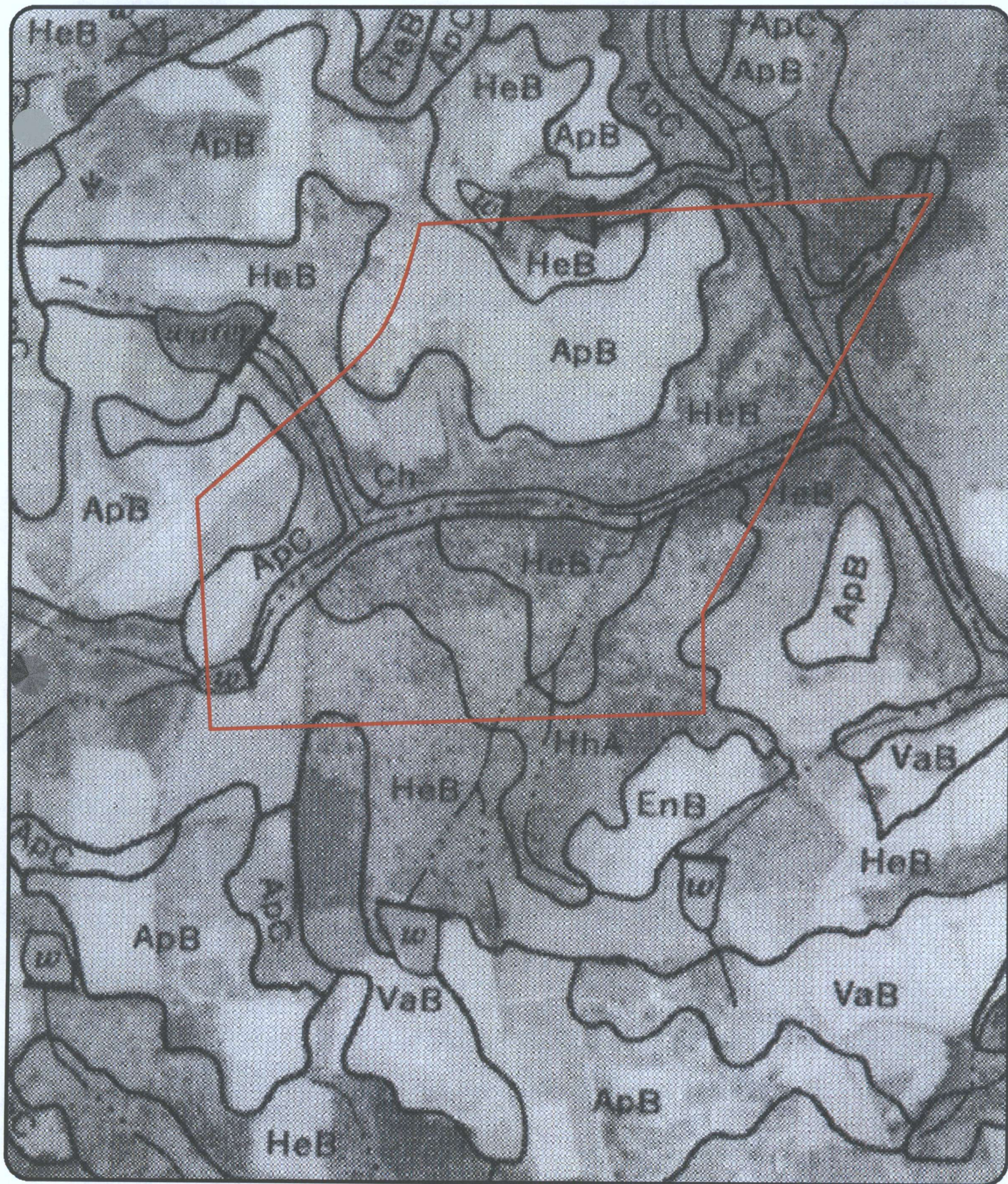
0 300 600 1,200
Feet

1 inch equals 600 feet



EcoEngineering
A division of The John R. McAdams Company, Inc.

Figure 4



✓ CEDAR GROVE MITIGATION SITE
SOIL SURVEY MAP



0 300 600 1,200
Feet

1 inch = 600 feet



EcoEngineering
A division of The John R. McAdams Company, Inc.

Figure 5

Figure 6

APPENDIX B

Site Photographs





Picture 1: East Fork Eno River – Facing Southeast



Picture 2: UT1 – Facing southwest Towards East Fork Eno



Picture 3: UT3 - Facing Northeast

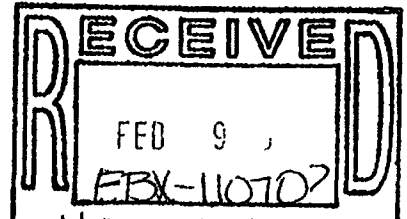


Picture 4: UT2 - Facing Northeast

APPENDIX C

Agency Correspondence





North Carolina Department of Environment and Natural Resources
Office of Conservation, Planning, and Community Affairs

Beverly Eaves Perdue
Governor

Linda Pearsall
Director

Dee Freeman
Secretary

February 8 2012

Mr George Buchholz
EcoEngineering
P O Box 14005
Research Triangle Park NC 27709

Subject Cedar Grove Mitigation Bank – Initial Project Review Orange County
FBX 11070

Dear Mr Buchholz

The Natural Heritage Program has no record of rare species significant natural communities significant natural heritage areas or conservation/managed areas at the project site nor within a mile of the project area. Roughly a mile to the southeast is Cedar Grove Park administered by Orange County. Although our maps do not show records of such natural heritage elements in the project area it does not necessarily mean that they are not present. It may simply mean that the area has not been surveyed. The use of Natural Heritage Program data should not be substituted for actual field surveys particularly if the project area contains suitable habitat for rare species significant natural communities or priority natural areas.

You may wish to check the Natural Heritage Program database website at www.ncnhp.org for a listing of rare plants and animals and significant natural communities in the county and on the quad map. Our Program also has a new website that allows users to obtain information on element occurrences and significant natural heritage areas within two miles of a given location <http://nhpweb.enr.state.nc.us/public/virtual_workroom.phtml>. The user name is guest and the password is your e-mail address (see instructions on log in screen). You may want to click Help for more information.

Please do not hesitate to contact me at 919 707 8603 if you have questions or need further information.

Sincerely

Harry E LeGrand Jr Zoologist
Natural Heritage Program

Mailing address 1601 Mail Service Center Raleigh North Carolina 27699 1601
Location 217 W Jones Street Raleigh NC 27604
Phone 919-707 8600 Webpage www.oneNCSNaturally.org
An Equal Opportunity \ Affirmative Action Employer

One
North Carolina
Naturally
Natural Resources Planning and Conservation



⊠ North Carolina Wildlife Resources Commission ⊠

Gordon Myers, Executive Director

16 February 2012

Mr George Buchholz
EcoEngineering
P O Box 14005
Research Triangle Park NC 27709

Subject Cedar Grove Mitigation Bank Initial Project Review Orange County North Carolina EBX 11070

Dear Mr Buchholz

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject information and we are familiar with the habitat values of the area. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat 401 as amended 16 U S C 661-667e) and North Carolina General Statutes (G S 113 131 et seq).

A request for information has been made regarding threatened or endangered species that may be associated with the proposed Cedar Grove Mitigation Bank site. The site would include stream and riparian buffer mitigation and a low density residential development. There are no jurisdictional wetlands, six jurisdictional ponds, and seven jurisdictional stream features within the proposed mitigation bank.

The site includes East Fork Eno River and its tributaries in the Neuse River basin. There are records for the state threatened creeper (*Strophitus undulatus*) and state special concern notched rainbow (*Villosa constricta*) in East Fork Eno River. Although we do not have any records for threatened or endangered aquatic or terrestrial wildlife species within proposed mitigation bank site boundaries, an on site survey is the only definitive means to determine whether the proposed project would impact threatened or endangered species. We suggest you consult with the U S Fish and Wildlife Service at (919) 856 4520 to ensure that any issues related to federally listed species are addressed.

If we can provide further assistance, please contact our office at (336) 449 7625 or shari_bryant@ncwildlife.org

Sincerely,

Shari L Bryant
Piedmont Region Coordinator
Habitat Conservation Program

EBX-11070
Buchholz, Sandra



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh North Carolina 27636 3726

February 16 2012

George Buchholz
EcoEngineering
PO Box 14005
Research Triangle Park, NC 27709

Re Cedar Grove Mitigation Bank Orange County NC

Dear Mr. Buchholz:

This letter is to inform you that a list of all federally protected endangered and threatened species with known occurrences in North Carolina is now available on the U.S. Fish and Wildlife Service's (Service) web page at <http://www.fws.gov/raleigh>. Therefore, if you have projects that occur within the Raleigh Field Office's area of responsibility (see attached county list), you no longer need to contact the Raleigh Field Office for a list of federally protected species.

Our web page contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act) and a list of federal species of concern¹ that are known to occur in each county in North Carolina.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally protected species list, information on the species' life histories and habitats and information on completing a biological assessment or evaluation can be found on our web page at <http://www.fws.gov/raleigh>. Please check the web site often for updated information or changes.

¹ The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

However, the Service is concerned about the potential impacts the proposed action might have on aquatic species. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby down gradient surface waters. In addition, we recommend maintaining natural vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission has developed a Guidance Memorandum (a copy can be found on our website at (<http://www.fws.gov/raleigh>)) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial wildlife resources and water quality. We recommend that you consider this document in the development of your projects and in completing an initiation package for consultation (if necessary).

We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species lists. If you have any questions or comments please contact John Ellis of this office at (919) 856-4520 ext 26

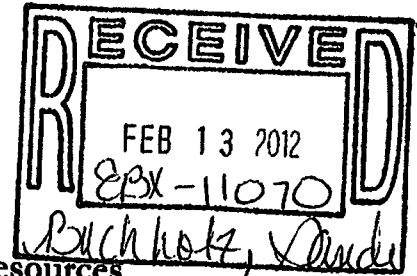
Sincerely

A handwritten signature in black ink, appearing to read "Pete Benjamin". The signature is fluid and cursive, with the first name "Pete" being more prominent and the last name "Benjamin" written in a more compact, cursive style.

Pete Benjamin
Field Supervisor

List of Counties in the Service's Raleigh Field Office Area of Responsibility

Alamance	Perquimans
Beaufort	Person
Bertie	Pitt
Bladen	Randolph
Brunswick	Richmond
Camden	Robeson
Carteret	Rockingham
Caswell	Sampson
Chatham	Scotland
Chowan	Tyrrell
Columbus	Vance
Craven	Wake
Cumberland	Warren
Currituck	Washington
Dare	Wayne
Duplin	Wilson
Durham	
Edgecombe	
Franklin	
Gates	
Granville	
Greene	
Guilford	
Halifax	
Harnett	
Hertford	
Hoke	
Hyde	
Johnston	
Jones	
Lee	
Lenoir	
Martin	
Montgomery	
Moore	
Nash	
New Hanover	
Northampton	
Onslow	
Orange	
Pamlico	
Pasquotank	
Pender	



North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Beverly Laves Lerdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

February 9, 2012

George Buchholz
EcoEngineering
PO Box 14005
Research Triangle Park, NC 27709

Re Cedar Grove Mitigation Bank, EBX 11070, Orange County, ER 12 0178

Dear Mr. Buchholz:

Thank you for your letter of January 31, 2012, concerning the above cited project. We have reviewed the information and offer the following comments:

There are no recorded archaeological sites within the proposed mitigation bank project area. However, given the topographic and hydrologic features found on the property, there is a high probability for the presence of Native American archaeological sites.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are submitted by the consulting archaeologist and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

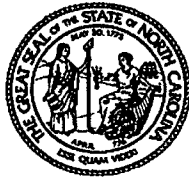
The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

I thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill Earley, environmental review coordinator, at 919 807 6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos



**North Carolina Department of Cultural Resources
State Historic Preservation Office**

Ramona M. Bartos, Administrator

Becky LaFollette, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crook, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

March 5, 2012

George Buchholz
EcoEngineering
PO Box 14005
Research Triangle Park, NC 27709

Re: Cedar Grove Mitigation Bank, EBX 11070, Orange County, ER 12-0178

Dear Mr. Buchholz:

Thank you for your email of February 16, 2012, providing additional information concerning the proposed Cedar Grove Mitigation Bank in Orange County.

Given that the past land use of the parcel was that of a golf course, it is likely that any archaeological resources that may have been present have been destroyed or at least greatly disturbed. We therefore withdraw our earlier recommendation for an archaeological survey of the proposed project area. In the future, please send us as much information as is available concerning the past land use of project areas and the types of activities involved in mitigation.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

A handwritten signature in black ink that reads "Renee Gledhill-Earley".

for Ramona M. Bartos



North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Charles Wakild PE
Director

Dee Freeman
Secretary

June 15, 2012

Tommy Cousins
EBX
909 Capability Drive Suite 3100
Raleigh NC 27606

NBRRO#12-099
Orange County

Determination Type	
Buffer Call	Isolated or EIP Call
☒ Neuse (15A NCAC 2B 0233) ☐ Tar Pamlico (15A NCAC 2B 0259) ☐ Jordan (15A NCAC 2B 0267)	☐ Ephemeral/Intermittent/Perennial Determination ☐ Isolated Wetland Determination

Project Name Cedar Grove Golf Course

Location/Directions West of McDade Store Road

Subject Stream UT to East Fork Eno River, and East Fork Eno River

Date of Determination 2/16/12

Feature	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
A		X	throughout		X	X
B	X				X	X
C (East Fork Eno)		X	throughout		X	X
D (portion piped)*		X	Point D culvert		X	
E (piped)*	X		Off site	At property boundary	X	X
F (piped)*	X		Off site	At property boundary	X	
G		X	Point G culvert		X	X
H (piped)*	X				X	
Pond A	X				X	X
Pond B	X				X	X
Pond C		X			X (as stream)	X (as stream)
Pond D*	X				X (as stream)	X (as stream)
Pond E		X			X	X

*Stream feature has been piped or is a pond that has been determined to be Not Subject but has potential for buffer mitigation if stream is restored

One North Carolina
Naturally

Explanation The feature(s) listed above has or have been located on the Soil Survey of Orange County North Carolina or the most recent copy of the USGS Topographic map at a 1:24,000 scale. Each feature that is checked 'Not Subject' has been determined not to be a stream or is not present on the property. Features that are checked 'Subject' have been located on the property and possess characteristics that qualify it to be a stream. There may be other streams located on your property that do not show up on the maps referenced above but, still may be considered jurisdictional according to the US Army Corps of Engineers and/or to the Division of Water Quality.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWQ or Delegated Local Authority may request a determination by the Director. An appeal request must be made within sixty (60) days of date of this letter or from the date the affected party (including downstream and/or adjacent owners) is notified of this letter. A request for a determination by the Director shall be referred to the Director in writing c/o Karen Higgins, DWQ WeBSCaPe Unit, 1650 Mail Service Center, Raleigh, NC 27699.

If you dispute the Director's determination you may file a petition for an administrative hearing. You must file the petition with the Office of Administrative Hearings within sixty (60) days of the receipt of this notice of decision. A petition is considered filed when it is received in the Office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00 am and 5:00 pm, except for official state holidays. To request a hearing, send the original and one (1) copy of the petition to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. The petition may also be faxed to the attention of the Office of Administrative Hearings at (919) 733-3478, provided the original and one (1) copy of the document is received by the Office of Administrative Hearings within five (5) days following the date of the fax transmission. A copy of the petition must also be served to the Department of Natural Resources, c/o Mary Penny Thompson, General Counsel, 1601 Mail Service Center, Raleigh, NC 27699 1601.

This determination is final and binding unless, as detailed above, you ask for a hearing or appeal within sixty (60) days.

The owner/future owners should notify the Division of Water Quality (including any other Local, State, and Federal Agencies) of this decision concerning any future correspondences regarding the subject property (stated above). This project may require a Section 404/401 Permit for the proposed activity. Any inquiries should be directed to the Division of Water Quality (Central Office) at (919)-733-1786, and the US Army Corp of Engineers (Raleigh Regulatory Field Office) at (919)-554-4884.

Respectfully



Lauren Witherspoon
Environmental Senior Specialist

cc WeBSCaPe – 1650 Mail Service Center
RRO/SWP File Copy

Pond A Pond B B

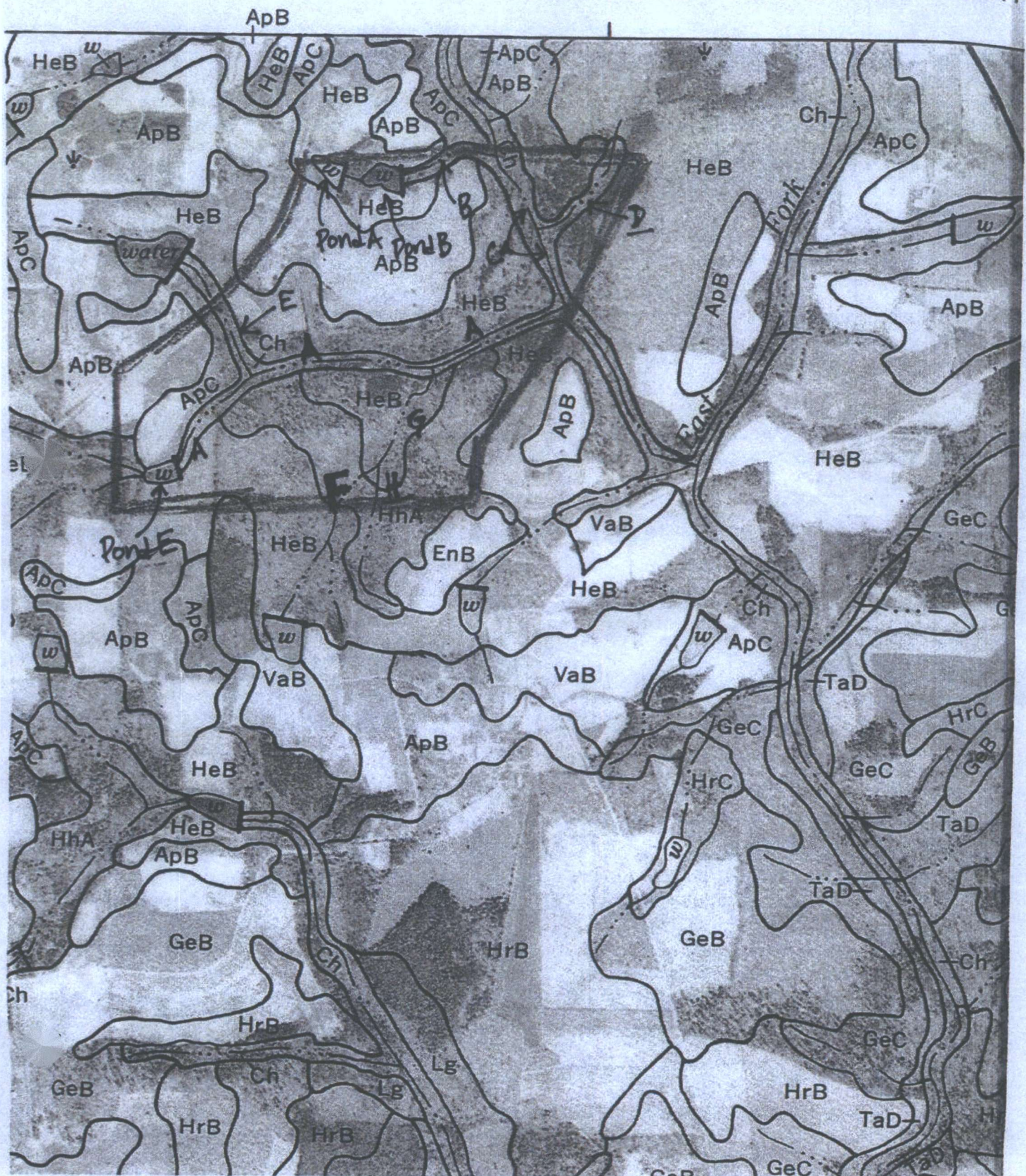
STREAM RESTORATION SUMMARY TABLE							
STREAM REACH	EXISTING STREAM FEATURE		DESIGN SLOPE	LENGTH [FT]	TREATMENT	RATIO	STREAM MIGRATION UNITS
	PEREN.	INTER.					
EAST FORK AND RIVER	944	-----	944	1.0	944	RESTORATION	1:1 944
UT1	894	-----	894	1.2	1,025	RESTORATION	1:1 1,025
UT2	1,857	-----	1,857	1.2	2,228	RESTORATION	1:1 2,228
UT3	3,090	-----	3,090	1.2	2,412	RESTORATION	1:1 2,412
UT4	-----	267	267	1.2	320	RESTORATION	1:1 320
UT5	319	-----	319	1.2	372	RESTORATION	1:1 372
TOTAL	5,975	267	6,242	-----	7,301	RESTORATION	1:1 7,301

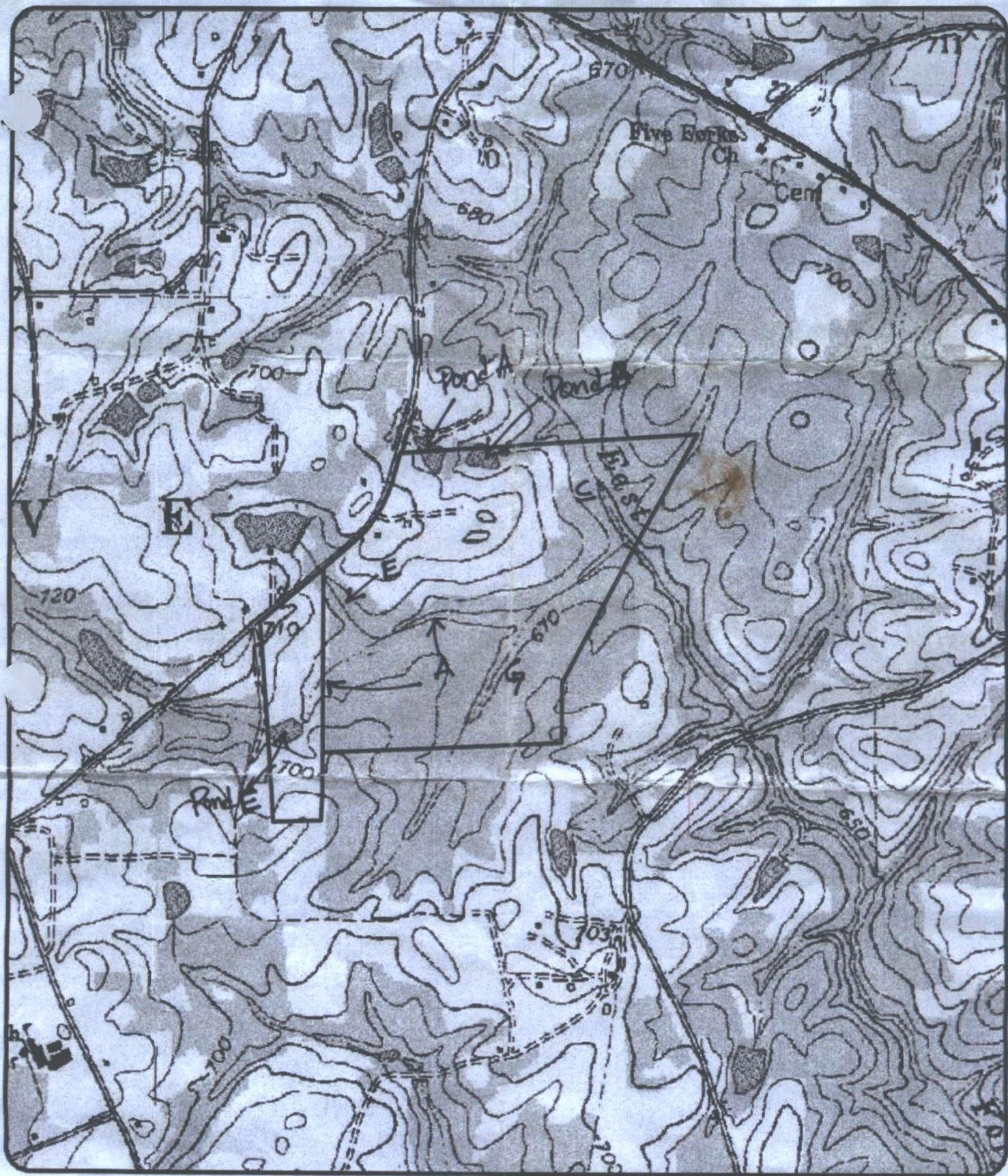


- LEGEND**
- CONSERVATION EASEMENT
 - AREA #1 = 16.12 a
 - AREA #2 = 5.05 a
 - AREA #3 = 7.35 a
 - AREA #4 = 3.72 a
 - AREA #5 = 18.42 a
 - AREA #6 = 4.35 a
 - AREA #7 = 6.75 a
 - NUTRIENT OFFSET RESTO
 - WITHIN CE AREA #1
 - WITHIN CE AREA #2
 - WITHIN CE AREA #3
 - WITHIN CE AREA #4
 - WITHIN CE AREA #5
 - WITHIN CE AREA #6
 - WITHIN CE AREA #7
 - NEUSE BUFFER RESTOR
 - WITHIN CE AREA #1
 - WITHIN CE AREA #2
 - WITHIN CE AREA #3
 - WITHIN CE AREA #4
 - WITHIN CE AREA #5
 - WITHIN CE AREA #6
 - WITHIN CE AREA #7
 - NEUSE BUFFER ENHANC
 - WITHIN CE AREA #1
 - WITHIN CE AREA #2
 - WITHIN CE AREA #3
 - WITHIN CE AREA #4
 - WITHIN CE AREA #5
 - WITHIN CE AREA #6
 - WITHIN CE AREA #7
 - HORSE TRAIL / FARM P
- GRAPHIC SCALE
1" = 100'

NBRRO 12-099

ORANGE COUNTY, NORTH





CEDAR GROVE GOLF COURSE

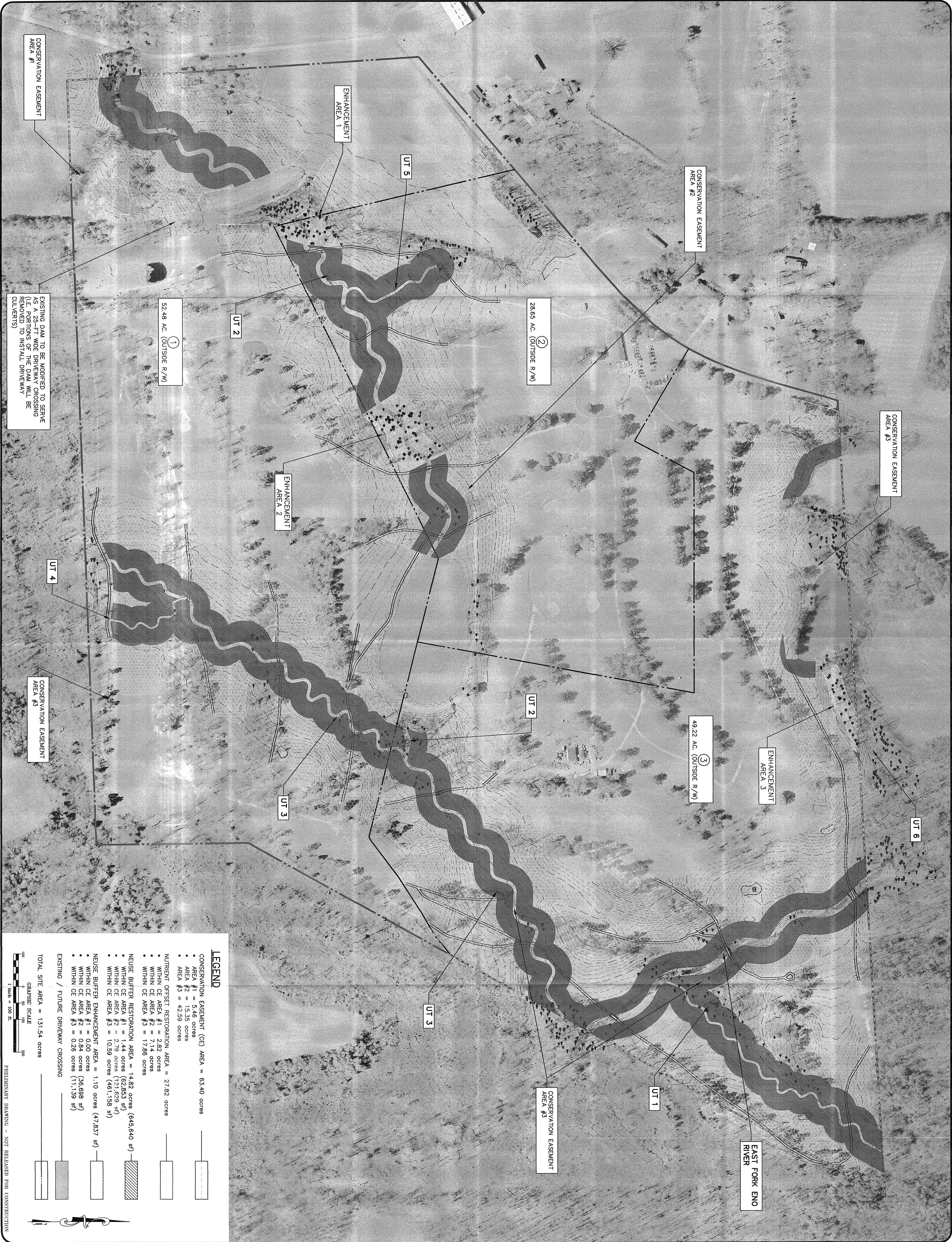
0 500 1,000 2,000
Feet

1 inch equals 1,000 feet



EcoEngineering

A division of The John R. McAdams Company, Inc.



LEGEND

CONSERVATION EASEMENT (CE) AREA = 63.40 acres

• AREA #1 = 5.46 acres

• AREA #2 = 15.35 acres

• AREA #3 = 42.59 acres

NUTRIENT OFFSET RESTORATION AREA = 27.82 acres

• WITHIN CE AREA #1 = 2.82 acres

• WITHIN CE AREA #2 = 7.14 acres

• WITHIN CE AREA #3 = 17.86 acres

NEUSE BUFFER RESTORATION AREA = 14.82 acres (645,640 sf)

• WITHIN CE AREA #1 = 1.44 acres (62,853 sf)

• WITHIN CE AREA #2 = 2.79 acres (121,629 sf)

• WITHIN CE AREA #3 = 10.59 acres (461,158 sf)

NEUSE BUFFER ENHANCEMENT AREA = 1.10 acres (47,837 sf)

• WITHIN CE AREA #1 = 0.00 acres (36,698 sf)

• WITHIN CE AREA #2 = 0.84 acres (11,139 sf)

• WITHIN CE AREA #3 = 0.26 acres

EXISTING / FUTURE DRIVEWAY CROSSING

TOTAL SITE AREA = 131.54 acres

GRAPHIC SCALE

1 inch = 100 ft.

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION