BASELINE MONITORING DOCUMENT AND AS-BUILT BASELINE REPORT

Green Valley Farm Site
Riparian Buffer Restoration
EEP Project ID Number 003994-EEP Site 95012

Randolph County, North Carolina
Cape Fear River Basin
HUC 03030003010070

Prepared for:

NC Department of Environment and Natural Resources
Ecosystem Enhancement Program
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Data Collection Period: June 2012
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EXECUTIVE SUMMARY

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

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

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

The Green Valley Buffer Mitigation Project was identified as an opportunity to improve water quality and riparian habitat within the Randleman Lake watershed (03030003 Catalog Unit) through 8.74 to 9.6 acres (380,714 to 418,176 square feet) of riparian buffer restoration. The Green Valley Buffer Mitigation Site is located on Hockett Dairy Road (SR 1938) in Randolph County approximately 12 miles north of Asheboro, NC. The site includes four unnamed tributaries that drain into Randleman Lake.

The project's watershed is primarily used for agricultural production. Much of the surrounding land use is currently row crop production for dairy silage. The tributaries have limited hardwood trees present within the buffer, and lack significant ground cover. The mature trees are less than 100 stems per acre. The project area has been in agricultural use for several decades.

There are few constraints at the Green Valley Farms site. Three farm access crossings are present on buffer restoration reaches. These crossings are necessary for property access, and will remain in place. Two crossings have been improved with properly sized and embedded corrugated pipe, and embankment stabilization. An existing ford crossing has been improved with appropriately sized rock and filter fabric. The crossings have been constructed such that farm equipment will have access, and to prevent future degradation. No overhead or underground utilities are located within the proposed buffer. There are no active livestock uses on the Site; therefore, no fencing was installed for the easement boundary.

The riparian buffer is in poor condition throughout most of the project area. Most of the riparian buffer is devoid of trees or shrubs, and row crops are actively cultivated up to the edge of the existing channel. Current buffer conditions demonstrate significant degradation with a loss of stabilizing vegetation because of continued agricultural activities and past land management actions. Field counts of woody vegetation greater than five inches dbh, where present, document the absence of a forested buffer. Saplings necessary for buffer regeneration were minimal or absent.

Buffer restoration was performed on four unnamed tributaries (UT1, UT2, UT3, and UT4). Buffer restoration included removal of invasive species where present and planting appropriate bottomland hardwood species. UT1 serves as the primary drainage feature with UT2 and UT4 flowing from south to north into UT1 on the left bank. UT3 drains north to south before emptying into UT1 on the right bank. The upper 400 feet of UT4 was determined on September 1, 2011 as not suitable for buffer restoration by Ms. Sue Homewood because of the lack of a poorly defined channel bank, but stated that if a channel formed at the end of the five-year monitoring period, then credit would be allowed. This resulted in a loss of 0.92 acres of buffer credit. EBX feels the determination was not appropriate because of the watershed size and effects of the ongoing agricultural activities and restoration of the buffer was performed. Final determination of credit will be at the end of the five-year monitoring period and is based upon this portion of UT4 meeting the NCDWQ Stream Determination Manual criteria for an intermittent or perennial stream. One unnamed tributary downstream of a farm pond will remain un-buffered to allow agricultural

drainage maintenance. This un-buffered stream reach enters UT 1 on the left bank. The target natural community is a Piedmont Alluvial Forest as described in Schafale and Weakley (1990). This type of community is common throughout Piedmont drainages and when established will provide numerous water quality and ecological benefits.

Bare root tree seedlings were planted during the week of June 4, 2012. Seven species of hardwood resulting in a total of 7,450 stems were planted. The average planted density is 927 stems per acre. Eleven CVS vegetation plots of 100 square meters were established to verify and document plantings and provide the baseline for monitoring. Ten of the plots are 10 meters x 10 meters and one plot is 20 meters x 5 meters. Prior to planting, areas having dense fescue were mowed and sprayed with an herbicide. Most of the site was ripped prior to planting.

The result will be a restored riparian habitat that functions to filter nutrient and sediment inputs from the surrounding uplands, provide soil stability, and increase dissolved oxygen concentrations through shading/cooling of the channel. The permanent conservation easement extends a minimum of 50 feet from the top of bank on all outside bends and is marked with yellow metal easement poles and signs.

The site will be monitored on a regular basis and a physical inspection of the site will be conducted a minimum of once per year throughout the post-construction monitoring period or until performance standards are met. These site inspections will identify site components and features that require routine maintenance. The measure of vegetative success for the site will be the survival of at least 320 5-year old planted trees per acre at the end of year five of the monitoring period. Annual monitoring data will be reported using the NCEEP monitoring template and CVS-NCEEP vegetation monitoring protocol. The monitoring report will provide a project data chronology that will facilitate an understanding of project status and trends, population of EEP databases for analysis, research purposes, and assist in decision making regarding project closeout.

Upon approval for closeout by the NC Division of Water Quality, the site will be transferred to the State of North Carolina (State). The State shall be responsible for periodic inspection of the site to ensure that restrictions required in the conservation easement or the deed restriction document(s) are upheld.

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APPENDICES

1.0 PROJECT GOALS, BACKGROUND, AND ATTRIBUTES

1.1 Location and Setting

The Green Valley Farms Riparian Buffer Mitigation Site is located on Hockett Dairy Road (SR 1938) in Randolph County approximately 12 miles north of Asheboro, NC (**Figure 1**). The site is located in the Cape Fear River Basin within Cataloging Unit 03030003010070 (NCDWQ sub-basin 03-06-08). The site has four unnamed tributaries (UT) that drain into Randleman Lake. The proposed project consists of 8.74 to 9.6 acres of buffer restoration.

1.2 Project Goals and Objectives

The Green Valley Buffer Mitigation Project is located in the 03030003 Catalog Unit (CU), in the Cape Fear River Basin. Assets of this CU include the Deep River, the Randleman Reservoir, and major communities including High Point, Asheboro, Siler City, and Sanford. Restoration goals for CU 03030003 as identified in the 2009 Cape Fear River Basin RBRP include protection of several species of mussel and the Cape Fear Shiner. Additional goals include the improvement in water quality to waters draining to Randleman Reservoir.

The Green Valley Buffer Mitigation Project was identified as a buffer opportunity to improve water quality and habitat within the CU. The project goals address stressors identified in the CU. The following table lists the project goals and the project objectives through which the goals will be addressed:

Goals	Objectives
1. Nutrient removal 2. Sediment removal 3. Runoff filtration 4. Increase dissolved oxygen concentration 5. Restore riparian habitats 6. Reduce water temperature	• Restore minimum 50-foot riparian buffer by planting appropriate bottomland hardwood species to filter runoff. • Convert active farm fields to forested buffers. • Plant buffer vegetation to shade channel. • Restore riparian buffer habitat to appropriate bottomland hardwood ecosystem. • Restore canopy tree species in the stream buffer areas to shade channel. • Eliminate and control exotic invasive species. • Replace three (two culverts and one ford) undersized and/or failing channel crossings with appropriately sized structures.

1.3 Project Structure, Restoration Type, and Approach

The Green Valley Farms mitigation project provides high quality riparian buffer restoration. Stream buffer mitigation for the Green Valley Farms Site involves buffering four streams that flow directly and indirectly into Randleman Lake. The mitigation design divides the site into four distinct reaches (**Figure 6**). Buffer restoration was performed along all four channels. Three existing farm access crossings have been upgraded and stabilized to prevent erosion.

Buffer restoration along the tributaries to Randleman Lake was accomplished through the planting, establishment, and protection of a hardwood forest community. The result is a restored riparian habitat that functions to mitigate nutrient and sediments inputs from the surrounding uplands. This project provides 8.74 to 9.6 acres of stream buffer restoration in the Randleman Lake watershed.

The riparian buffer was in poor condition throughout most of the project area. Most of the riparian buffer was devoid of trees or shrubs and row crops were actively cultivated up to the edge of the existing

channel. The prior buffer conditions demonstrated significant degradation from a loss of stabilizing vegetation because of the past land management actions and agricultural activities. Field counts of woody vegetation of stems greater than five inches dbh documented the absence of an adequate woody buffer. Saplings necessary for buffer regeneration were minimal or absent. The conceptual plan is provided in **Figure 6** and the As-built plans are provided in **Appendix C**. Specific restoration treatments performed for each reach are described below.

Buffer restoration typically included removal of invasive species where present and the planting of appropriate bottomland hardwood species. Stabilization and implementation of dispersal techniques will were utilized where surface flows had become concentrated. Buffer restoration was performed on four unnamed tributaries (UT1, UT2, UT3, and UT4). UT1 serves as the primary drainage feature with UT2 and UT4 flowing from south to north into UT1 on the left bank. UT3 drains north to south before emptying into UT1 on the right bank. The upper 400 feet of UT4 was determined on September 1, 2011 as not suitable for buffer restoration by Ms. Sue Homewood because of the lack of a poorly defined channel bank, but she stated that if a channel formed at the end of the five-year monitoring period that meets the definition of an intermittent or perennial stream, as determined by the NCDWQ Stream Determination Manual, then credit would be allowed. See the summary of this Site Visit in **Appendix D**). This resulted in a loss of 0.92 acres of buffer credit. EBX feels the determination was not appropriate because of the watershed size and effects of the ongoing agricultural activities and restoration of the buffer was performed in anticipation of a channel becoming defined by the end of the monitoring period. The conservation boundary along this section is measured 50 feet extending outward from the edge of the defined drainages swale. Final determination of credit will be addressed at the end of the five-year monitoring period. One unnamed tributary downstream of a farm pond remains un-buffered to allow agricultural drainage maintenance. This un-buffered stream reach enters UT1 on the left bank. No fencing is required on the Green Valley Buffer Restoration Site since cattle or livestock are not present. Stable crossings were constructed to access fields. The easement boundary has been marked with metal poles and signs.

1.4 Project History, Contacts, and Attribute Data

Physiography, Topography, and Land Use

The Green Valley Farms Buffer site is located in the Piedmont Physiographic Province and in the Carolina Slate Belt. The region is underlain by felsic metavolcanic rocks, which can be seen in the streambed of UT 1 and UT 3. The topography of the project area is generally rolling with elevations ranging from 670 to 760 feet (**Figure 2**). The four unnamed tributaries to Randleman Lake comprise the principle drainage features. The project's watershed is primarily used for agricultural production. Much of the site is currently used for row crop production for dairy silage. These tributaries have limited hardwood trees present within the buffer and lack significant ground cover. The mature trees are less than 100 stems per acres. The project area has been in agricultural use for several decades (**Figure 3**).

Soils

The Randolph County Soil Survey (NRCS, 2006), shows four mapping units across the project site (**Figure 4**). The map units are Chewacla loam with a slope phase of 0 to 2 percent slopes and subject to frequently flooding, Mecklenburg clay loam with a slope phases of 8 to 15 percent, Wynott-Enon complex with a slope phase of 8 to 15 percent, and Wynott-Enon complex with a slope phase of 8 to 15 percent that is moderately eroded. The Wynott-Enon complex is 59 percent Wynott or similar soils and 33 percent Enon or similar soils.

The Chewacla soils formed in recent alluvium along major streams and drainage ways. This very deep soil is somewhat poorly drained, 0.5 foot to 1.5 feet to a seasonal high water table, have moderate permeability, and runoff is slow. Chewacla soil has a low shrink-swell potential. Theses soils occur on nearly level to slightly concave floodplains. The Mecklenburg and Wynott-Enon complex soils formed

residuum weathered from mafic high-grade metamorphic or igneous rocks. These moderate to very deep soils are well drained, greater than six feet to a seasonal high water table, have slow permeability, and medium runoff. Wynott-Enon soils have a high shrink-swell potential and Mecklenburg soils have a moderate shrink-swell potential. Theses soils occur across a range of landforms including summits, ridges, and sideslopes. Wynott soils are 20 to 40 inches to soft bedrock and 40 to more than 60 inches to hard bedrock. Enon and Mecklenburg soils are more than 60 inches to bedrock. Theses soils occur on Piedmont upland summits, ridges, and hill slopes. All soils within the watershed are classified as hydrologic soil group C. Only the Chewlaca soil is listed on the National Hydric Soil List as potentially having hydric inclusions (5 percent).

Water Quality

Water quality assessments are based upon published resource information and field observations. The project is in a mostly rural watershed draining into Randleman Lake, a water supply watershed. Small farms, forested areas, and rural home sites are the most common land uses. Agricultural fields, dairy operations, and home sites are two common disturbances to the natural communities in the project vicinity. Adjacent agricultural fields to the Green Valley Farms Buffer Restoration Site serve as application areas for a local dairy waste water application. Potential threats to stream quality in this area are increased soil erosion and excessive nutrient input, both non-point sources of pollution.

The Cape Fear Basin-wide Assessment Report (October 2005) list a number of impaired waters within the 03-06-08 sub-basin where the project study area is located. The sub-basin watershed is 13 percent urbanized and includes portions of the municipalities of Archdale, Greensboro, Highpoint, Kernersville and Randleman. Nearly 55 percent is forested and 25 percent is managed pastureland. Streams are rated as impaired due to fecal coliform violations and impaired benthic communities due to stressor that include sedimentation, habitat degradation and urban runoff. Where a TMDL has been developed for these streams significant reduction in fecal coliform is called for.

The site drains directly into Randleman Lake. The Randleman Lake has a best usage classification of Water Supply IV (WS-IV);CA: These waters are protected and used as sources of water supply for drinking, culinary or food processing purposes and are also protected for Class C uses. WS-IV waters are generally in moderately to highly developed watersheds. The CA designation identifies waters that are within a designated Critical Supply Watershed and are subject to a special management strategy specified in 15A NCAC 2B .0248. The 100yr. floodplain (FEMA Zone AE) is located along UT 1 and the lower portion of UT 2 (**Figure 5**). The US fish and Wildlife Service does not show National Wetlands Inventory (NWI) wetlands within the project area (**Figure 5**).

2.0 SUCCESS CRITERIA

Vegetative Success Criteria

Specific and measurable success criteria for plant density within the riparian buffer on the site is based on the recommendations found in the NCDENR Buffer Restoration guidance documents and correspondence from review agencies on buffer restoration sites recently approved. The measure of vegetative success for the site will be the survival of at least 320 5-year old planted trees per acre at the end of year five of the monitoring period.

Invasive and noxious species have been controlled. These species will be monitored so that none become dominant or alter the desired community structure of the site. If necessary, EBX will develop a species-specific control plan.

Method of Reporting Success Criteria
As-built drawings documenting buffer restoration activities have been developed after completion of the planting on the mitigation site (**Appendix C**). The as-built report includes all information required by NCEEP mitigation plan guidelines including photographs, sampling plot locations, and a description of initial species composition by community type. The report also includes a list of the species planted and the associated densities. Baseline vegetation monitoring follows CVS-NCEEP Protocol for Recording Vegetation Version 4.0. Level 1 and Level 2 monitoring has conducted. This baseline report follows the Baseline Monitoring Report Template and Guidance version 2.0 (10/14/10).

The monitoring program has been implemented to document system development and progress toward achieving the success criteria. The restored buffer vegetation will be assessed in the fall annually to determine the success of the mitigation. The monitoring program will be undertaken for five years or until the final success criteria are achieved, whichever is longer.

Monitoring reports will be prepared in the fall of each year of monitoring and submitted to NCEEP. The monitoring reports will include all information and be in the format required by NCEEP in Version 2.0 of the NCEEP Monitoring Report Template.

3.0 MONITORING PLAN GUIDELINES

3.1 Vegetation

The vegetative success criteria are defined in Section 2.0. In order to determine if the success criteria are achieved and the planted areas are developing toward the target community, NCEEP-CVS Protocol for Recording Vegetation Version 4.0 will be utilized. The vegetation monitoring will include Level I and Level II plots distributed across the planted area. An interim vegetation monitoring will occur in spring after leaf-out has occurred. The CVS monitoring will be conducted toward the end of the growing season. Individual plot data for will be provided to NCEEP and CVS following NCEEP-CVS guidance.

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

Table 1. Annual Monitoring Requirements

Required	Parameter	Quantity	Frequency	Notes
X	Vegetation	11 Plots Located randomly across the project area	Annual	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols
X	Exotic and nuisance vegetation	N/A	Semi-Annual	Exotic vegetation will be evaluated and spot treatment applied as needed
X	Project boundary	N/A	Semi-annual	Locations of fence damage, vegetation damage, boundary encroachments, etc. will be mapped

3.2 Digital Photo Reference Stations

Reference photos have been taken and will be used to visually document restoration success. Reference photo stations are marked with wooden stakes. Reference stations will be photographed annually for at least seven years following construction. Photographers will make every effort to maintain consistently

the same area in each photo over time. Photographs will be used to subjectively evaluate vegetation establishment. A series of photos over time should indicate successional maturation of riparian vegetation.

3.3 The Watershed

The site watershed is rural and predominantly forested and agricultural with limited residential. Changes to the site watershed will be noted in the annual monitoring report. Specifically, watershed changes that threaten the project success and stability will be documented.

3.4 Monitoring Plan View

A monitoring plan view is located in **Appendices A.** This figure shows locations of all Vegetation Monitoring Plots, stream crossings and a general overview of the Site.

4.0 MAINTENANCE AND CONTINGENCY PLANS

4.1 Maintenance Plan

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

Table 2. Proposed Maintenance Schedule

Component/Feature	Maintenance through project close-out
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.
Ford Crossing	Ford crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Road Crossing	Road crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.

4.2 Long-Term Management Plan

Upon approval for closeout by the NC Division of Water Quality, the site will be transferred to the State of North Carolina (State). The State shall be responsible for periodic inspection of the site to ensure that restrictions required in the conservation easement or the deed restriction document(s) are upheld.

4.3 Adaptive Management Plan

Upon completion of site construction post-construction monitoring protocols previously defined in this document will be implemented. Project maintenance will be performed as described previously in this document. If, during the course of annual monitoring it is determined the site's ability to achieve site performance standards are jeopardized, EEP will be notified of the need to develop a Plan of Corrective Action.

5.0 BASELINE DATA COLLECTION

5.1 Verification of Plantings

Bare root tree seedlings were planted during the week of June 4, 2012. Seven species of hardwood resulting in a total of 7,450 stems were planted (**Table 3**). The average planted density is 927 stems per acre. Eleven CVS vegetation plots of 100 square meters were established to verify and document plantings and provide the baseline for monitoring. Ten of the plots are 10 meters x 10 meters and one plot is 20 meters x 5 meters. Prior to planting, areas having dense fescue were mowed and sprayed with an herbicide. Most of the site was ripped prior to planting.

Table 3. Planted Stems

Common Name	Scientific Name	Stems
Green Ash	Fraxinus pennsylvanica	1600
River Birch	Betula nigra	1200
Northern Red oak	Quercus rubra	800
Swamp Chestnut Oak	Quercus michauxii	450
Water Oak	Quercus nigra	800
White Oak	Quercus alba	800
Sycamore	Platanus occidentalis	1800
	Total stems planted	**7,450**

5.2 Vegetation Photo Documentation

Photo 1-Vegetation Plot #1 along UT 4 (11 June 2012)

Photo 4-Vegetation Plot #3 along UT 1 Upstream (12 June 2012)

Photo 2-UT4 Reference Condition(January 2011).

Photo 5-Vegetation Plot #4 along UT 1 upstream (11 June 2012)

Photo 3-Vegetation Plot #2 along UT 1 Upstream (12 June 2012)

Photo 6-UT1 upstream Reference Condition (January 2011).

Photo 7-Vegetation Plot #5 along UT 1 downstream (12 June 2012)

Photo 10-Vegetation Plot #7 along UT 3 (12 June 2012)

Photo 8-Vegetation Plot #6 along UT 1 downstream (12 June 2012)

Photo 11-Vegetation Plot #8 along UT 3 (12 June 2012)


Photo 9-UT1 upstream Reference Condition (January 2011).


Photo 12-UT3 Reference Condition (January 2011).

Photo 13-Vegetation Plot #9 along UT 2 (12 June 2012)


Photo 16-UT2 upstream Reference Condition (January 2011).)

Photo 14-Vegetation Plot #10 along UT 2 (12 June 2012)


Photo 17-UT1-Forward Stream Crossing after stabilization (November 2012).

Photo 15-Vegetation Plot #11 along UT 2 (12 June 2012)


Photo 18-UT3-Stream Crossing pre-stabilization (January 2011).

Photo 19- UT3-Stream Crossing after stabilization (November 2012).

Photo 21- UT4-Stream Crossing after stabilization (November 2012).

Photo 20- UT4-Stream Crossing pre-stabilization (January 2011).

Photo 22-UT3-Downstream view from top of reach (January 2011).

6.0 REFERENCES

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Appendix A
Tables and Figures

Table 1. Project Components and Mitigation Credits
Green Valley, Randolph County
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Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	N/A	N/A	N/A	N/A	N/A	N/A	Restoration	N/A	N/A
Totals*	N/A	N/A	N/A	N/A	N/A	N/A	8.74 Ac. to 9.6 Ac.	N/A	N/A

Project Components

Reach ID	Stationing/ Location	Existing Footage (LF)	Approach (PI, PII, etc.)	Restoration -or- Restoration Equivalent	Restoration Area (acres)	Mitigation Ratio
Reach UT1	N/A	2,450	N/A	Buffer Restoration	3.51	1:1
Reach UT2	N/A	1,156	N/A	Buffer Restoration	2.65	1:1
Reach UT3	N/A	1,105	N/A	Buffer Restoration	2.30	1:1
Reach UT4*	N/A	190 to 590	N/A	Buffer Restoration	0.28 to 1.14	1:1

Component Summation

Restoration Level	**Stream (linear feet)**	**Riparian Wetland**		**Non-Riparian Wetland (acres)**	**Buffer (square feet)**	**Upland (acres)**
		Riverine	**Non-Riverine**			
Restoration*	N/A	N/A	N/A	N/A	380,714 to 418,176	N/A
Enhancement	N/A	N/A	N/A	N/A	N/A	N/A
Enhancement I	N/A	N/A	N/A	N/A	N/A	N/A
Enhancement II	N/A	N/A	N/A	N/A	N/A	N/A
Creation	N/A	N/A	N/A	N/A	N/A	N/A
Preservation	N/A	N/A	N/A	N/A	N/A	N/A
High Quality Preservation	N/A	N/A	N/A	N/A	N/A	N/A

BMP Elements

Element	Location	Purpose/Function	Notes
N/A	N/A	N/A	N/A

*Currently, the upper 400 LF of UT4 is not subject to the Randleman Buffer Rules; however, the lower 190 LF is subject to the buffer rules and consists of 0.28 acres of proposed buffer restoration. It is anticipated that performing buffer restoration along the entire reach (590 LF) will result in a defined channel within the 5-year monitoring period and ultimately yield 1.14 acres of buffer restoration.

Table 2. Project Activity and Reporting History Green Valley, Randolph County EEP Project ID Number 003994-EEP Site 95012		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Mitigation Plan	January 2012	May 2012
Final Design - Construction Plans	NA	May 2012
Construction	NA	October 2012
Temporary S&E mix applied to entire project area	NA	June 2012
Permanent seed mix applied to _____	NA	June 2012
Containerized and B&B plantings for reach_____	NA	June 2012
Baseline Monitoring Document (Year 0 Monitoring - baseline)	June 2012	Decemeber 2012
Year 1 Monitoring	Fall 2013	
Year 2 Monitoring	Fall 2014	
Year 3 Monitoring	Fall 2015	
Year 4 Monitoring	Fall 2016	
Year 5 Monitoring	Fall 2017	

Table 3. Project Contact Table Green Valley, Randolph County EEP Project ID Number 003994-EEP Site 95012	
Designer	WK Dickson & Co., Inc.
Primary project design POC	Daniel Ingram - (919) 782-0495
Construction Contractor	KBS Earthworks
Construction contractor POC	Kory Strader - (336) 362-0289
Planting Contractor	Taylors Lawn and Landscape
Planting contractor POC	Brant Taylor - (919) 606-2431
Seeding Contractor	Taylors Lawn and Landscape
Planting contractor POC	Brant Taylor - (919) 606-2431
Seed Mix Sources	Evergreen Seed, Inc
Nursery Stock Suppliers	ArborGen
Monitoring Performers	WK Dickson & Co., Inc.
Vegetation Monitoring POC	Daniel Ingram - (919) 782-0495

Table 4. Project Baseline Information and Attributes
Green Valley, Randolph County
EEP Project ID Number 003994-EEP Site 95012

Project Information	
Project Name	Green Valley Farm Site - Riparian Buffer Restoration
County	Randolph
Project Area (acres)	11.45
Project Coordinates (latitude and longitude)	35° 54' 17.672" N, 79° 50' 3.490"W

Project Watershed Summary Information	
Physiographic Province	Piedmont Physiographic Province
River Basin	Cape Fear River Basin
USGS Hydrologic Unit 8-digit	03030003
USGS Hydrologic Unit 14-digit	03030003010070
DWQ Sub-basin	03-06-08
Project Drainage Area (acres)	389.1
Project Drainage Area Percentage of Impervious Area	1%
CGIA Land Use Classification	1.01 Residential 2.01 Cropland and Pasture 2.03 Confined Animal Operations 2.99 Other Agricultural Land 3.02 Passively Managed Forest Stands

Reach Summary Information

Parameters	**Reach UT1**	**Reach UT2**	**Reach UT3**	**Reach UT4***
Length of reach (linear feet)	2,450	1,156	1,105	190 to 590
Valley Classification	X	X	X	X
Drainage area (acres)	221	18.5	64	19.4
NCDWQ stream identification score	38	20.5	23	26
NCDWQ Water Quality Classification	WS-IV;CA	WS-IV;CA	WS-IV;CA	WS-IV;CA
Morphological Description (stream type)	C	C	C	C
Evolutionary trend	Stable	Stable	Stable	Stable
Underlying mapped soils	Chewacla loam ChA	Mecklenburg CL MeC2, Wynott-Enon complex WvC2	Wynott-Enon complex WtC	Wynott-Enon complex WtC
Drainage class	somewhat poorly drained	well drained	well drained	well drained
Soil Hydric status	Non-hydric	Non-hydric	Non-hydric	Non-hydric
Slope (ft/ft)	0.002	0.024	0.014	0.010
FEMA classification	Zone AE	Zone AE	Zone AE	N/A
Native vegetation community	Cultivated	Cultivated	Cultivated	Cultivated
Percent composition of exotic invasive vegetation	<1%	<1%	<1%	<1%

Regulatory Considerations

Regulation	**Applicable**	**Resolved**	**Supporting Documentation**
Waters of the United States - Section 404	Yes	Yes	see Appendix B
Waters of the United States - Section 401	Yes	Yes	see Appendix B
Endangered Species Act	Yes	Yes	see Appendix B
Historic Preservation Act	Yes	Yes	see Appendix B
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

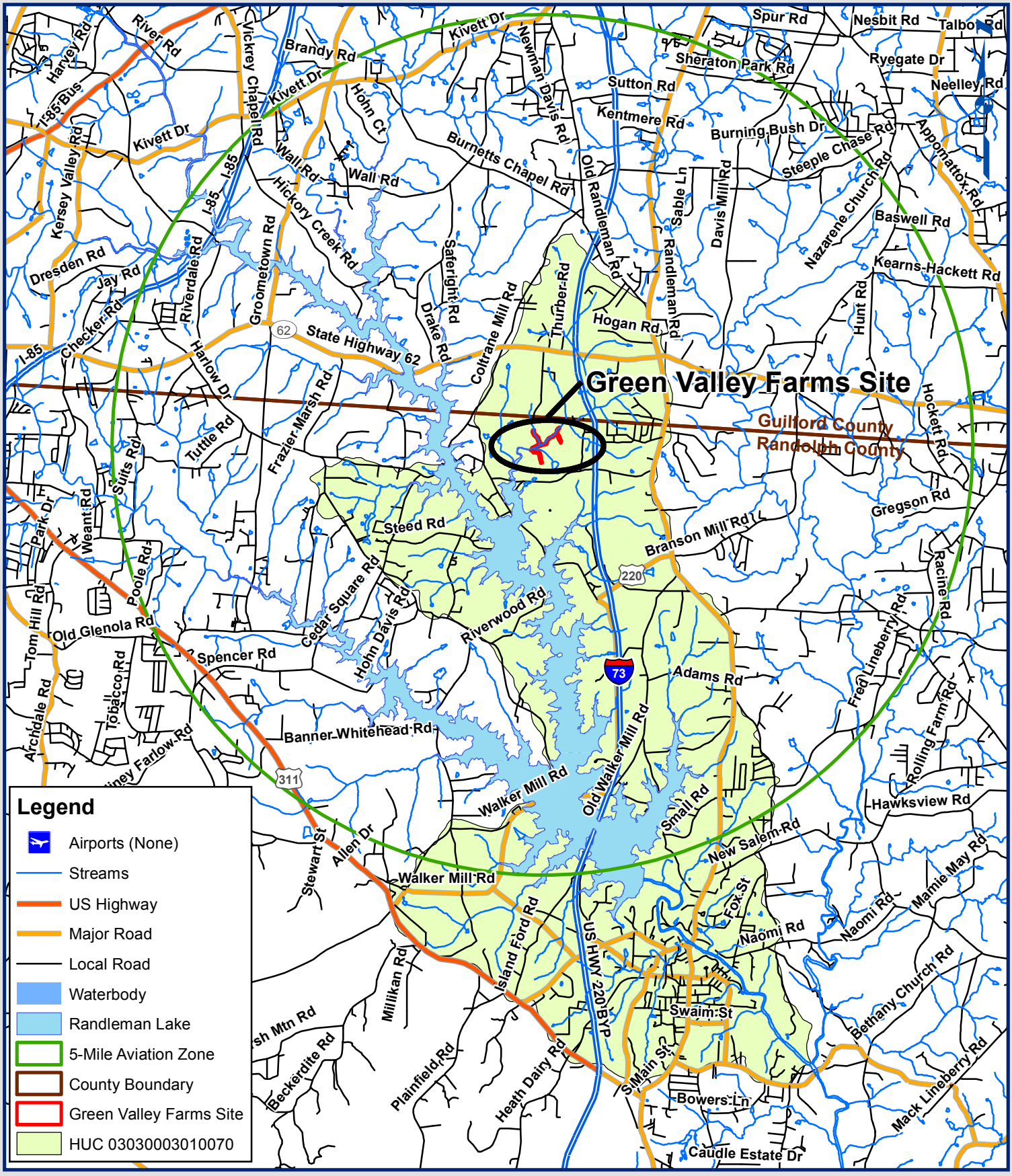
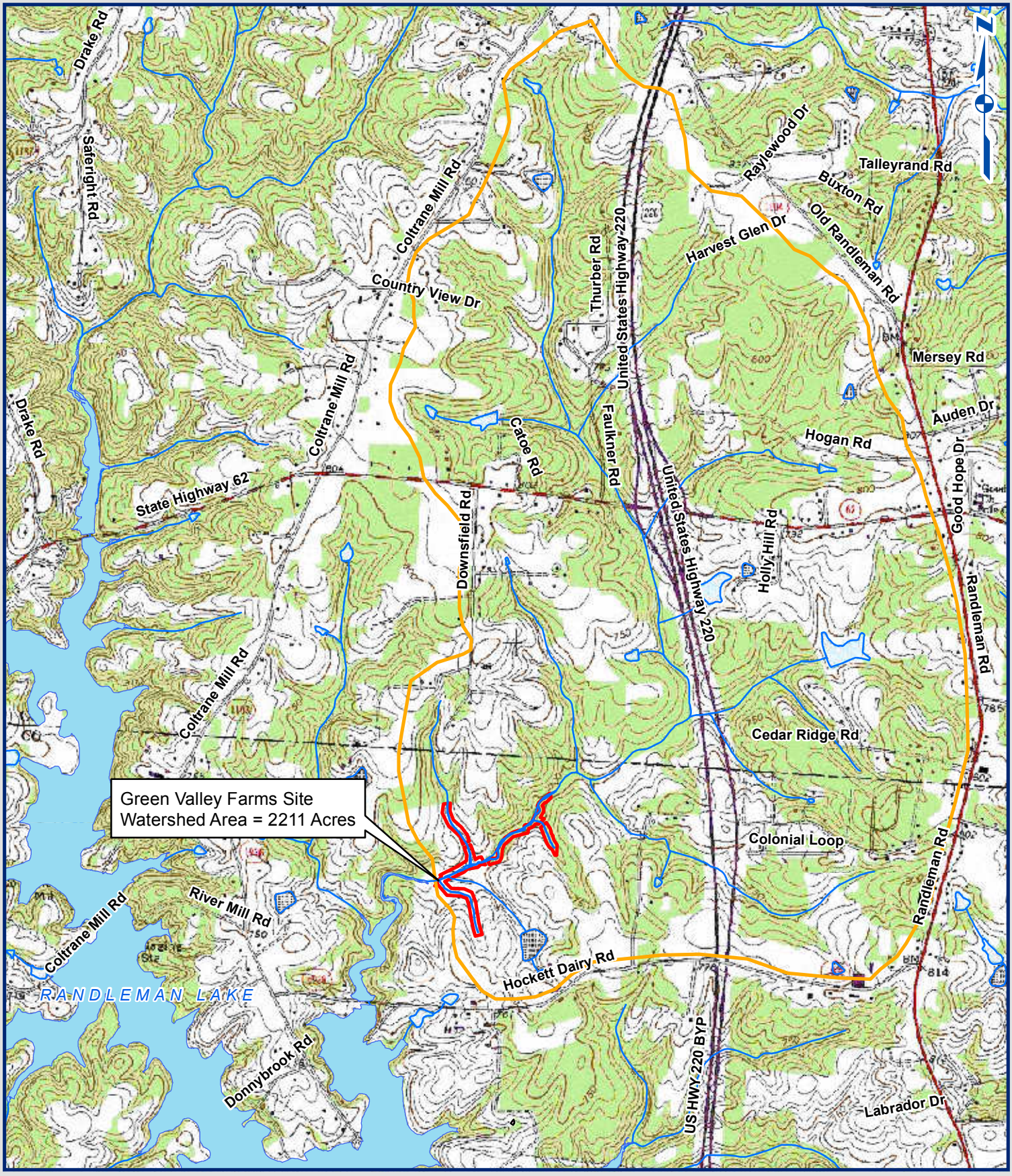


Figure 1.
Project Vicinity Map
Green Valley Farms Buffer Restoration Site

0 0.75 1.5 3 Miles

1 inch = 1.5 miles

RANDOLPH COUNTY
Scale: NTS



EBX

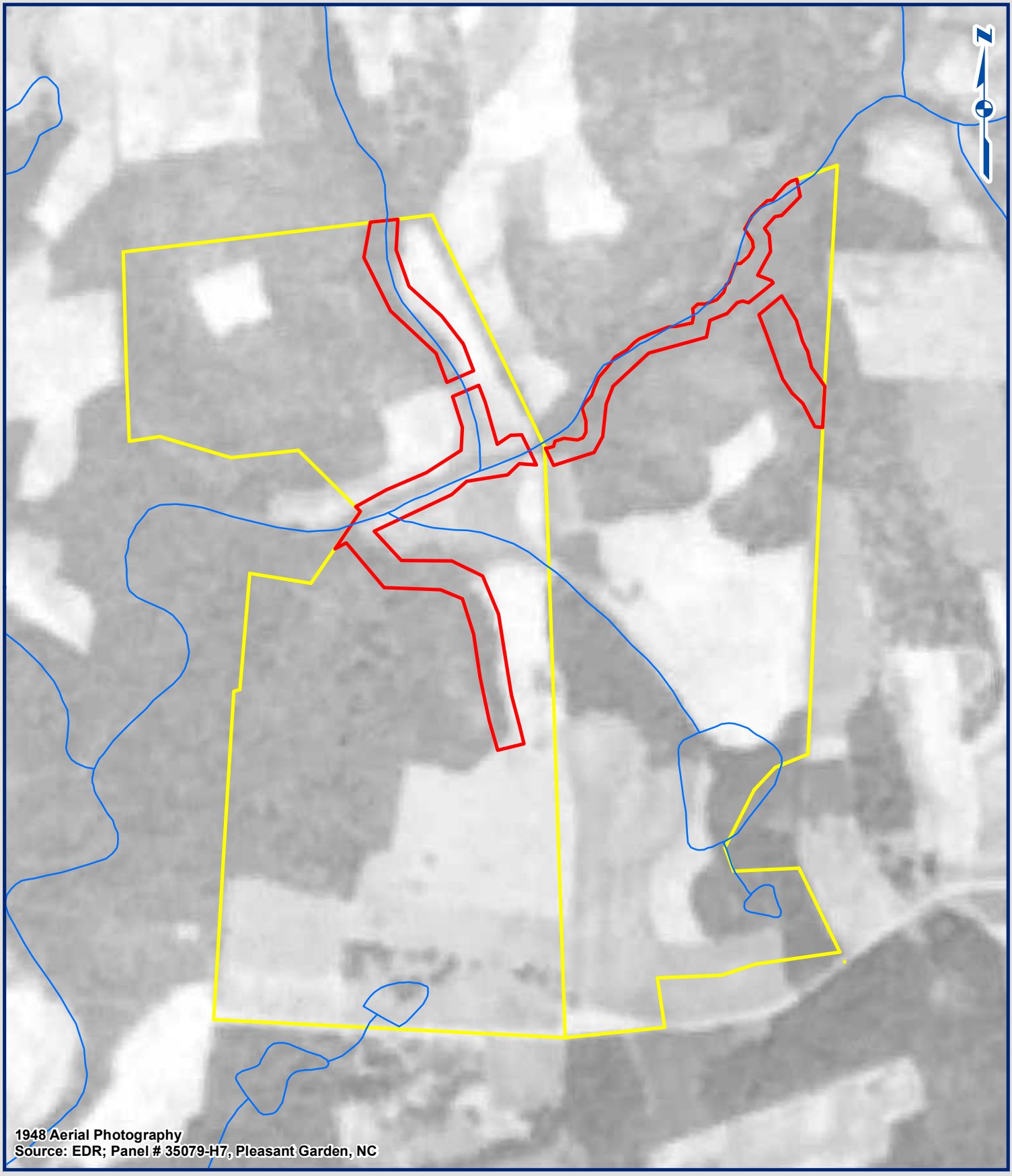
Figure 2.
USGS/Watershed Map
Green Valley Farms Buffer Restoration Site

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

Legend

- Streams
- Randleman Lake
- Drainage Area
- Green Valley Farms Site



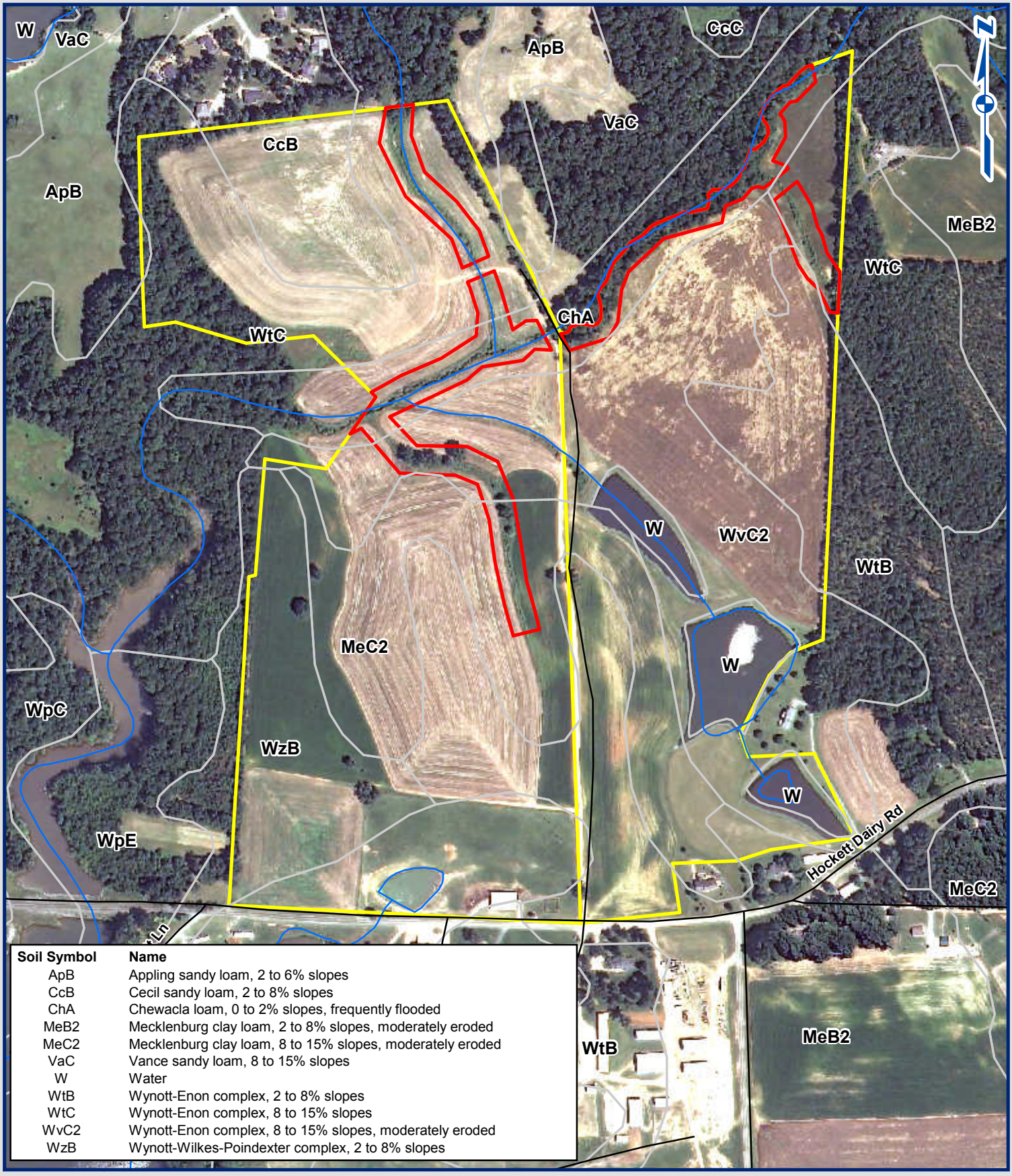
EBX

Figure 3.
1948 Historical Aerial Map
Green Valley Farms Buffer Restoration Site

0 250 500 1,000 Feet

1 inch = 500 feet

Streams
Parcel Boundary Lines
Green Valley Farms Site



Soil Symbol	Name
ApB	Appling sandy loam, 2 to 6% slopes
CcB	Cecil sandy loam, 2 to 8% slopes
ChA	Chewacla loam, 0 to 2% slopes, frequently flooded
MeB2	Mecklenburg clay loam, 2 to 8% slopes, moderately eroded
MeC2	Mecklenburg clay loam, 8 to 15% slopes, moderately eroded
VaC	Vance sandy loam, 8 to 15% slopes
W	Water
WtB	Wynott-Enon complex, 2 to 8% slopes
WtC	Wynott-Enon complex, 8 to 15% slopes
WvC2	Wynott-Enon complex, 8 to 15% slopes, moderately eroded
WzB	Wynott-Wilkes-Poindexter complex, 2 to 8% slopes

EBX

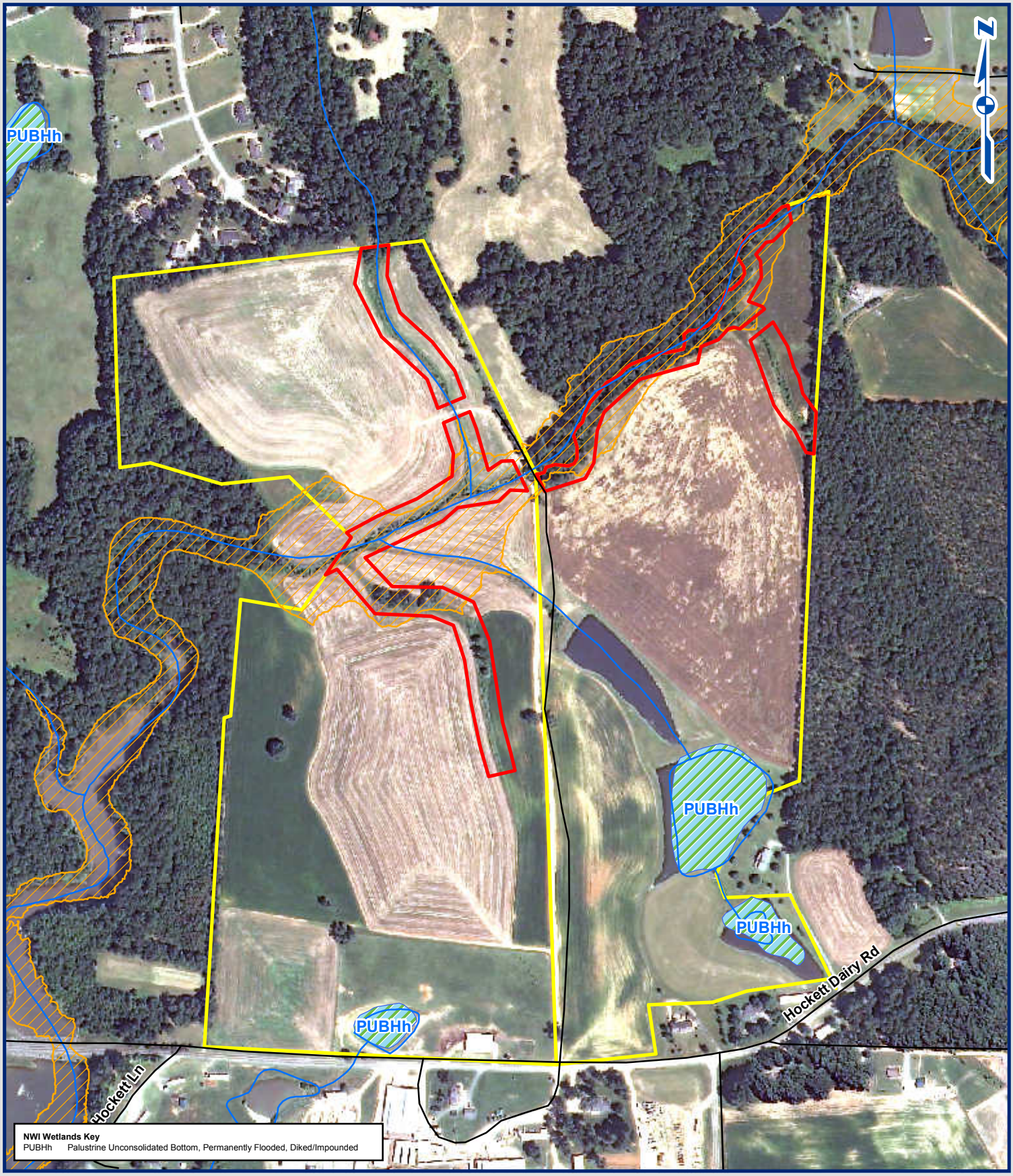
Figure 4.
Soils Map
Green Valley Farms Buffer Restoration Site

0 250 500 1,000 Feet

1 inch = 500 feet

Legend

- Streams
- Parcel Boundary Lines
- Randolph County Soils
- Green Valley Farms Site



EBX

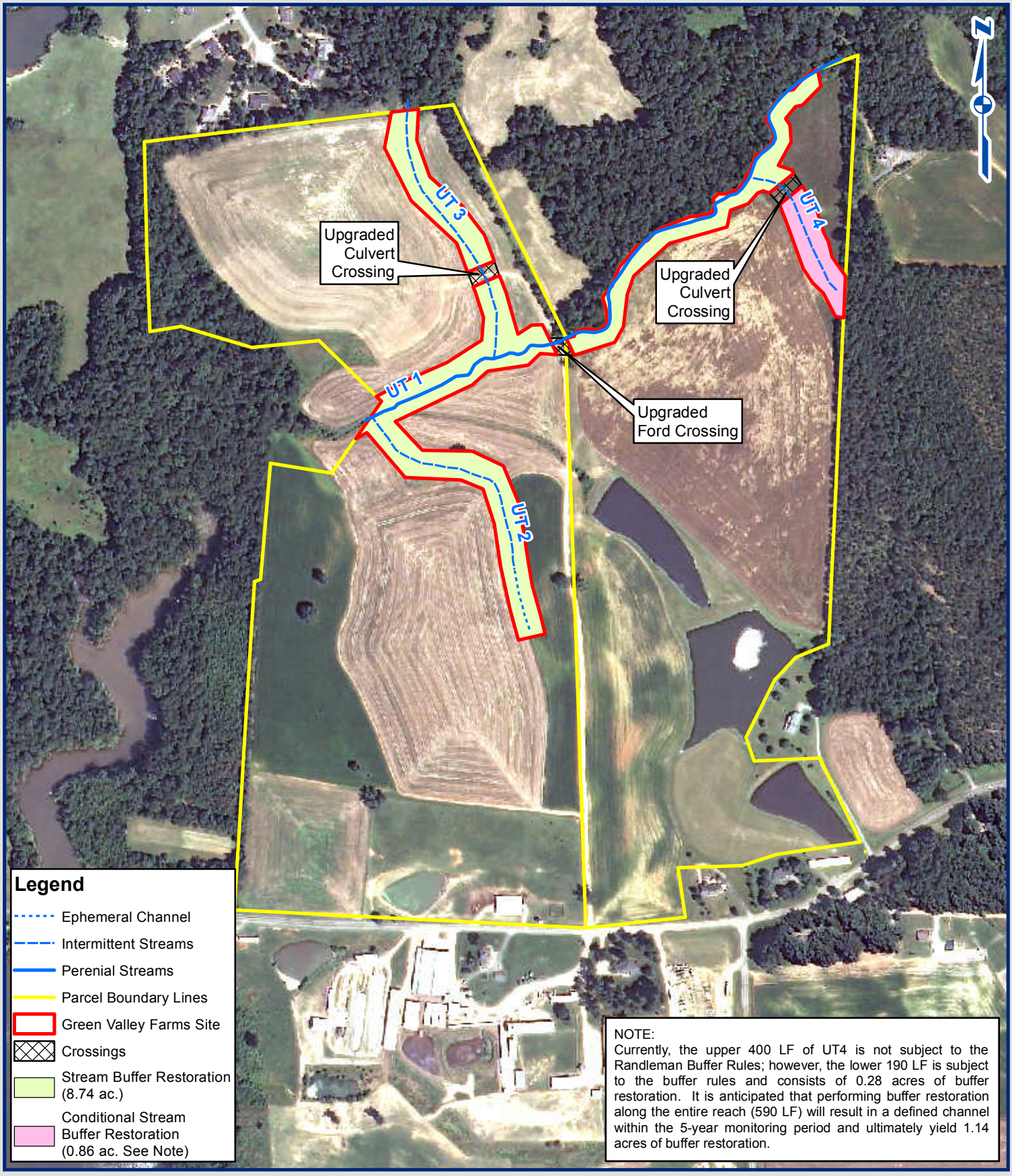
Figure 5.
FEMA Flood Insurance and NWI Map
Green Valley Farms Buffer Restoration Site

0 250 500 1,000 Feet

1 inch = 500 feet

Legend

- Streams
- Parcel Boundary Lines
- Green Valley Farms Site
- NWI Wetlands
- FEMA Zone AE - Detailed 100yr. Floodplain

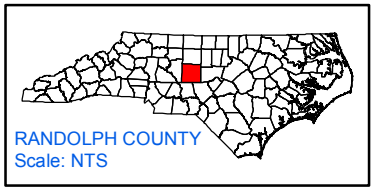


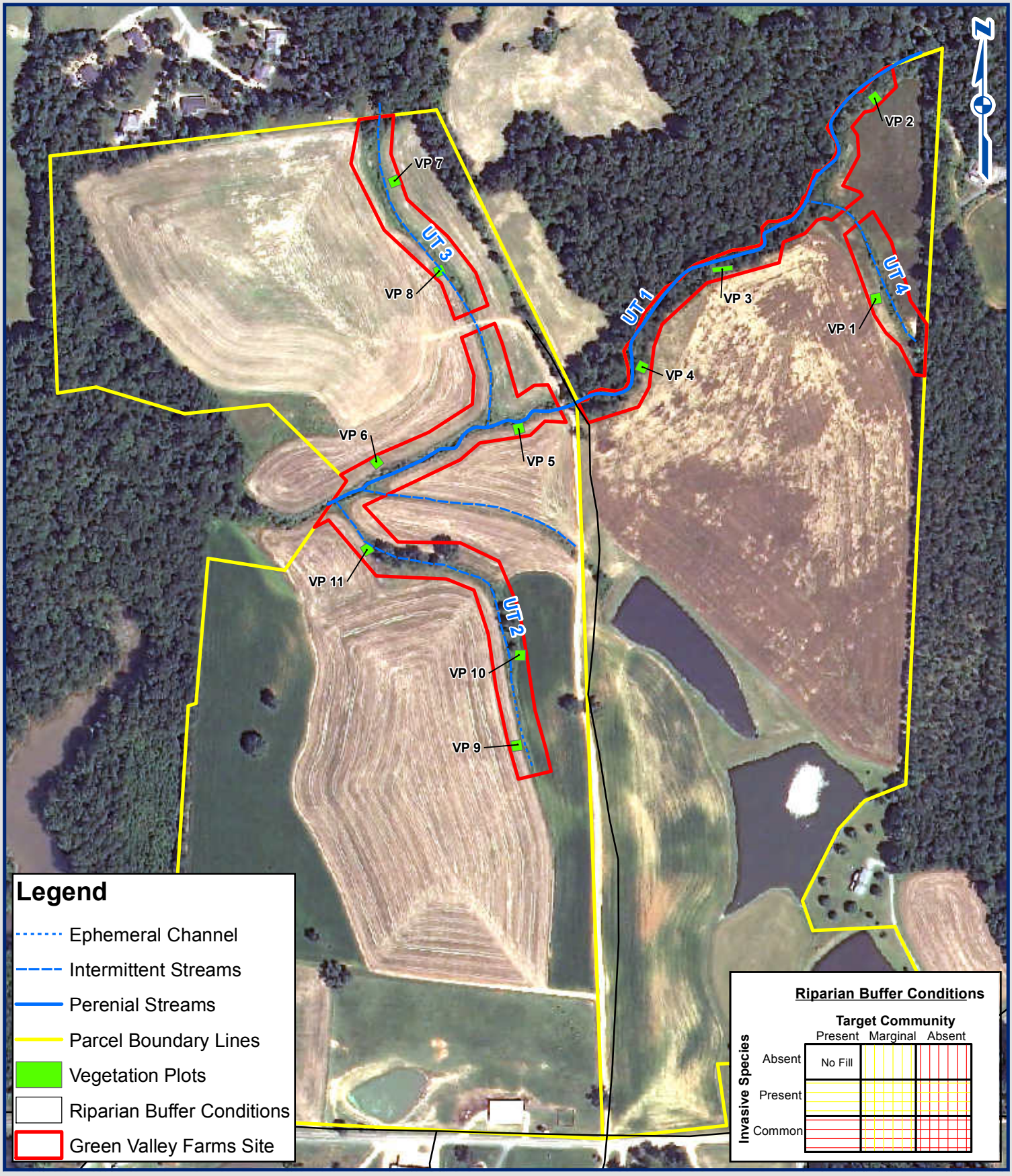
EBX

Figure 6.
Conceptual Design
Green Valley Farms Buffer Restoration Site

0 250 500 1,000 Feet

1 inch = 500 feet



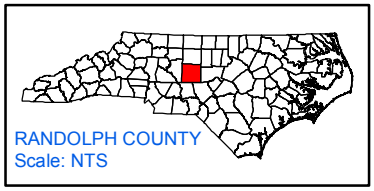


EBX

Figure 7.
Monitoring Plan View
Green Valley Farms Buffer Restoration Site

0 200 400 800 Feet

1 inch = 400 feet



Appendix B
Vegetation Data

Table B.1 CVS Entrytool Metadata

Report Prepared By	George Lankford
Date Prepared	6/15/2012 8:52
database name	Green Valley Farms -entrytool-v2.2.7.mdb
database location	I:\Projects\EBX\2012005200RA - EEP Full Delivery Buffer Restoration Green Valley Farms and Hockett Dairy\Documents\Reports\Green Valley\Mitigation Plan\CVS-Vegetation Mo
computer name	RAL1403
file size	47603712
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	95012
project Name	Green Valley Farm
Description	Buffer mitigation along 4 tributaries to Randleman Lake
River Basin	Cape Fear
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	11

Table B.2 Vigor by Species – Green Valley Farms Site (Baseline Monitoring)

	Species	Common Name	4	3	2	1	0	Missing	Unknown
	Betula nigra	River Birch			35	2			
	Fraxinus pennsylvanica	Green Ash			60	1			
	Quercus*	Oak sp.			53	2			
	Platanus occidentalis	American sycamore			99				
TOT:	**4**	**4**			**247**	**5**			

*****When baseline monitoring was performed, most of the planted bare root stems were absent of leaves making it difficult to get a true identification.

Table B.3 Damage by Plot - Green Valley Farms Site (Baseline Monitoring)

	plot	Count of Damage Categories	(no damage)	Human Trampled		
	95012-01-0001	0	20			
	95012-01-0002	0	16			
	95012-01-0003	0	35			
	95012-01-0004	0	27			
	95012-01-0005	0	25			
	95012-01-0006	0	26			
	95012-01-0007	0	19			
	95012-01-0008	0	20			
	95012-01-0009	1	22	1		
	95012-01-0010	0	22			
	95012-01-0011	0	19			
TOT:	**11**	**1**	**251**	**1**		

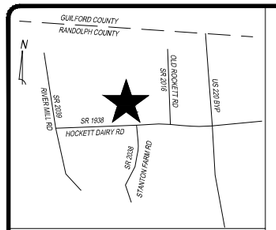
Table B.4 Damage by Species - Green Valley Farms Site (Baseline Monitoring)

	Species	CommonName	Count of Damage Categories	(no damage)	Human Trampled		
	Betula nigra	river birch	0	37			
	Fraxinus pennsylvanica	green ash	1	60	1		
	Platanus occidentalis	American sycamore	0	99			
	Quercus	oak	0	55			
TOT:	**4**	**4**	**1**	**251**	**1**		

Table B.5 Stem Count by Plot and Species - Green Valley Farms Site (Baseline Monitoring)

	Comment	Species	CommonName	Total Planted Stems	# plots	avg# stems	plot 95012-01-0001	plot 95012-01-0002	plot 95012-01-0003	plot 95012-01-0004	plot 95012-01-0005	plot 95012-01-0006	plot 95012-01-0007	plot 95012-01-0008	plot 95012-01-0009	plot 95012-01-0010	plot 95012-01-0011		
		Betula nigra	river birch	37	8	4.62			9	1	7	2	5	4		6	3		
		Fraxinus pennsylvanica	green ash	61	10	6.1	2	8	2	7	3	7	2	7	12		11		
		Platanus occidentalis	American sycamore	99	11	9	11	7	21	9	14	6	6	6	4	10	5		
		Quercus	oak	55	10	5.5	7	1	3	10	1	11	6	3	7	6			
TOT:	**0**	**4**	**4**	**252**	**4**		**20**	**16**	**35**	**27**	**25**	**26**	**19**	**20**	**23**	**22**	**19**	Average Stems per Acre	
		Stems Per Acre					809	890	769	647	1416	1093	1012	1052	769	809	931	927	

Appendix C
As-Built Plan Sheets



VICINITY MAP
NOT TO SCALE

N/F
HUBBARD ROCKETT
PIN #7758465862
D.B. 1113, PG. 254

N/F
MILDRED ROSENTHAL
TRUSTEE
PIN #7758453630
D.B. 1553, PG. 297

N/F
HERSCHEL NEEDHAM
HOCKETT, JR.
D.B. 2109, PG. 20

N/F
HERSCHEL NEEDHAM
HOCKETT, JR.
D.B. 2109, PG. 16

N/F
KENNETH G.
HOCKETT
D.B. 1959, PG. 270

STANTON FARM
RD-SR 2038

N/F
HERSCHEL NEEDHAM HOCKETT, JR.
PID #7758353599
D.B. 2109, PG. 14
P.B. 118, PG. 98
TRACT #2

N/F
B.W. COLTRANE
PIN # 7758278612
D.B. 2011, PG. 114
(GUILFORD COUNTY REGISTER OF DEEDS)

RIPARIAN
BUFFER LINE

UPGRADED CULVERT
CROSSING (20 LF 36" CMP)

UT 4

VP 1

VP 2

CE AREA A

CENTERLINE
EXISTING STREAM IS
PROPERTY LINE
D.B. 1056, PG 235

CONSERVATION
EASEMENT LINE

CONSERVATION
EASEMENT LINE

VP 3

ACCESS PATH

VP 4

UT 1

CE AREA B

UPGRADED FORD
CROSSING

ACCESS PATH

UPGRADED CULVERT
CROSSING (20 LF 36" CMP)

RIPARIAN
BUFFER LINE

CONSERVATION
EASEMENT LINE

VP 5

CE AREA D

VP 8

CENTERLINE
EXISTING STREAM

VP 7

UT 3

CENTERLINE
EXISTING STREAM

CONSERVATION
EASEMENT LINE

VP 6

CE AREA C

40' DRAINAGE EASEMENT

20' DRAINAGE EASEMENT

PHASE FOUR
DOWNSFIELD MEADOWS
P.B. 63, PG. 62

SENEPOLE RD

18
19
20
21
22

N/F
HERSCHEL NEEDHAM HOCKETT, JR.
PID #7758254510
D.B. 2109, PG. 12
P.B. 118, PG. 98
TRACT #1

N/F
PIEDMONT TRIAD REGIONAL
WATER AUTHORITY
PIN #7758157985
D.B. 1667, PG. 557

CONSERVATION
EASEMENT LINE

VP 10

VP 9

UT 2

CENTERLINE
EXISTING STREAM

RIPARIAN
BUFFER LINE

N/F
HERSCHEL NEEDHAM HOCKETT, JR.
PID #7758254510
D.B. 2109, PG. 12
P.B. 118, PG. 98
TRACT #1

VP 11

N/F
PIEDMONT TRIAD REGIONAL
WATER AUTHORITY
D.B. 1377, PG. 898

N/F
STANLEY MATEER
PIN #7758144896
D.B. 1744, PG. 2214

N/F
GARLAND HENLEY
PIN # 7758143270
D.B. 1371, PG. 441

HOCKETT DAIRY RD - S.R. 1938
60'R/W

NC GRID NAD 83

GRAPHIC SCALE
0 50 100 200 300 400 500
SCALE: 1"=200'

N/F
JAMES J. MARTIN
PIN #7758867865
D.B. 1883, PG. 1487

N/F
PIEDMONT TRIAD REGIONAL
WATER AUTHORITY
D.B. 1667, PG. 557

LEGEND

IRF	IRON ROD FOUND
℄	PROPERTY LINE

CONSERVATION EASEMENT AREA

CE AREA A	1.26± AC.
CE AREA B	2.71± AC.
CE AREA C	1.86± AC.
CE AREA D	5.62± AC.
TOTAL AREA	11.45± AC.

PLANTING PLAN

Common Name	Scientific Name	Stems
Green Ash	Fraxinus pennsylvanica	1,600
River Birch	Betula nigra	1,200
Northern Red oak	Quercus rubra	800
Swamp Chestnut Oak	Quercus michauxii	450
Water Oak	Quercus nigra	800
White Oak	Quercus alba	800
Sycamore	Platanus occidentalis	1,800
	Total stems planted	**7,450**

Project Components

Reach ID	Stationing/ Location	Existing Footage (LF)	Approach (PI, PII, etc.)	Restoration -or- Restoration Equivalent	Restoration Area (acres)	Mitigation Ratio
Reach UT1	N/A	2,450	N/A	Buffer Restoration	3.51	1:1
Reach UT2	N/A	1,156	N/A	Buffer Restoration	2.65	1:1
Reach UT3	N/A	1,105	N/A	Buffer Restoration	2.30	1:1
Reach UT4*	N/A	190 to 590	N/A	Buffer Restoration	0.28 to 1.14	1:1

REV. NO.	DESCRIPTION	DATE
	REVISED NOTE 5	05/21/12

REVISIONS

PROJECT MANAGER	GVC
DRAWN BY	JRM
APPROVED BY	GVC
FILE NAME	Green Valley ease
DRAWING SCALE	1"200'
PROJECT DATE	JAN 2012
PROJECT NUMBER	20110177000RA
PLOT DATE	

WK DICKSON
community infrastructure consultants

909 MARKET STREET
WILMINGTON, NC 28401
(910) 762-4200

Office Locations: North Carolina
South Carolina
Georgia
NC LICENSE NO. F-0374

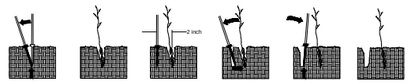
RELEASED FOR	DATE
APPROVALS	
BIDDING	
CONSTRUCTION	
RECORD DWG.	

AS-BUILT DRAWING
FOR THE
STATE OF NORTH CAROLINA
S.P.O. FILE # 76-BB
NCEEP RFP # 16-003567
NCEEP PROJECT # 95012
NCEEP PROJECT NAME "GREEN VALLEY FARM SITE".

EEP PROJECT NAME: GREEN VALLEY FARM SITE
AS-BUILT DRAWING
HERSCHELL NEEDHAM HOCKETT, JR. PROPERTY
PID #7758353599 AND PID #7758254510
LEVEL CROSS TOWNSHIP, RANDOLPH COUNTY
NORTH CAROLINA

5/7/2013 9:53 AM
I:\Projects\EBX\20120052009A - EEP Full Delivery Buffer Restoration Green Valley Farms and Hockett Data\CADD\Green Valley\DWG\Green Valley Farms Easement - FINAL\Green Valley As-Built.dwg

DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. INSERT PLANTING BAR AS SHOWN AND PULL HANDLE TOWARD PLANTER.
2. REMOVE PLANTING BAR AND PLACESEEDING AT CORRECT DEPTH.
3. INSERT PLANTING BAR 2 INCHES TOWARD PLANTER FROM SEEDING.
4. PULL HANDLE OF BAR TOWARD PLANTER, FIRMING SOIL AT BOTTOM.
5. PUSH HANDLE FORWARD FIRMING SOIL AT TOP.
6. LEAVE COMPACTION HOLE OPEN. WATER THOROUGHLY.

PLANTING NOTES:

PLANTING BAG
DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR OTHER CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

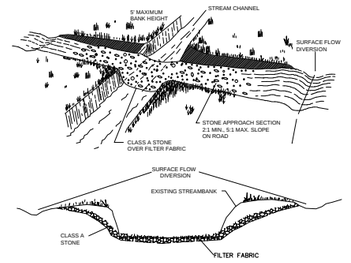
KBC PLANTING BAR
PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS SECTION, AND SHALL BE 12 INCHES LONG, 4 INCHES WIDE AND 1 INCH THICK AT CENTER.

ROOT PRUNING
ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 10 INCHES BELOW THE ROOT COLLAR.

NOTES:
BARE ROOTS SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER. RANDOM SPACING, AVERAGING 8 FT. ON CENTER. APPROXIMATELY 680 PLANTS PER ACRE.

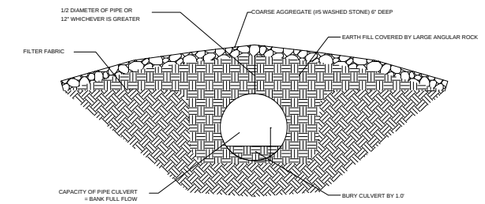
COMMON NAME	SCIENTIFIC NAME	PERCENT COMPOSITION
River Birch	Betula nigra	10
Eastern Redbud	Cercis canadensis	10
Green Ash	Fraxinus pennsylvanica	20
American Sycamore	Platanus occidentalis	20
Swamp Chestnut Oak	Quercus michauxii	15
Water Oak	Quercus nigra	10
Northern Red Oak	Quercus rubra	15

BARE ROOT PLANTING



NOTES:
1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
3. MINIMIZE CLEARING AND EXCAVATION OF STREAMBANKS. DO NOT EXCAVATE CHANNEL BOTTOM. COMPLETE ONE SIDE BEFORE STARTING ON THE OTHER SIDE.
4. INSTALL STREAM CROSSING PERPENDICULAR TO FLOW.
5. GRADE SLOPES TO A MINIMUM OF 2:1 SLOPE, MAXIMUM
6. MAINTAIN CROSSING SO THAT RUNOFF IN THE CONSTRUCTION ROAD DOES NOT ENTER EXISTING CHANNEL.
7. A STABILIZED PAD OF NATURAL CLASS A STONE, 6 INCHES THICK, LINED WITH FILTER FABRIC SHALL BE USED OVER THE BERM AND ACCESS SLOPES.
8. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.
9. WIDTH OF THE CROSSING SHALL BE SUFFICIENT (12' MIN.) TO ACCOMMODATE THE LARGEST VEHICLE CROSSING THE CHANNEL.
10. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED.

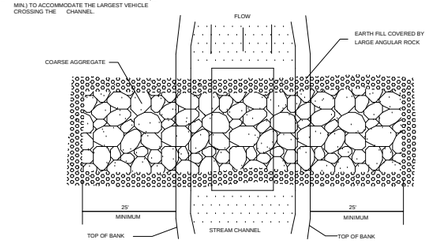
FORD STREAM CROSSING



ELEVATION

NOTES:
1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. INSTALL STREAM CROSSING PERPENDICULAR TO FLOW.
3. CONTRACTOR TO COORDINATE APPROPRIATE BEDDING MATERIAL WITH MANUFACTURER.
4. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.
5. WIDTH OF THE CROSSING SHALL BE SUFFICIENT (12' MIN.) TO ACCOMMODATE THE LARGEST VEHICLE CROSSING THE CHANNEL.

REACH	CULVERT SIZE/TYPE
UT-4 (UPSTREAM)	30" CMP
UT-4 (DOWNSTREAM)	36" CMP



PLAN

CULVERT CROSSING

NOT TO SCALE

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5/7/2013 9:54 AM

REV. NO.	DESCRIPTION	DATE
	REVISED NOTE 5	05/21/12

REVISIONS

PROJECT MANAGER	GVC
DRAWN BY	JRM
APPROVED BY	GVC
FILE NAME	Green Valley ease
DRAWING SCALE	1"200'
PROJECT DATE	JAN 2012
PROJECT NUMBER	20110177OORA
PLOT DATE	

WK DICKSON
community infrastructure consultants

909 MARKET STREET
WILMINGTON, NC 28401
(910) 762-4200

Office Locations: North Carolina
South Carolina
Georgia
NC LICENSE NO. F-0374

RELEASED FOR	DATE
APPROVALS	
BIDDING	
CONSTRUCTION	
RECORD DWG.	

AS-BUILT DRAWING
FOR THE
STATE OF NORTH CAROLINA
S.P.O. FILE # 76-BB
NCEEP RFP # 16-003567
NCEEP PROJECT # 95012
NCEEP PROJECT NAME "GREEN VALLEY FARM SITE".

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AS-BUILT DRAWING
HERSCHELL NEEDHAM HOCKETT, JR. PROPERTY
PID #7758353599 AND PID #7758254510
LEVEL CROSS TOWNSHIP, RANDOLPH COUNTY
NORTH CAROLINA

Appendix D
DWQ Correspondence

HOCKETT DAIRY AND GREEN VALLEY FARMS DWQ SITE VISIT SUMMARY

On September 1, 2011 NCDWQ met with NCEEP, EBX, and WK Dickson personnel to review the eligibility of the proposed Hockett Dairy and Green Valley Farms Buffer Mitigation sites in Randolph County, NC. The meeting attendees were:

- Sue Homewood, NCDWQ Surface Water Protection, Winston-Salem Regional Office
- Tim Baumgartner, NCEEP, Full Delivery Manager
- Martin Hovis, EBX
- Daniel Ingram, WK Dickson

The NCDWQ comments for each project site are summarized below. This memorandum also presents EBX's response to the NCDWQ comments.

HOCKETT DAIRY

UT1 –Ms. Homewood (NCDWQ) agreed that buffer restoration would be advantageous at this location due to the immediate proximity of Randleman Lake and the direct nutrient and sediment input from the cattle operations. However, Ms. Homewood felt this drainage lacked a defined channel and was not subject to the Randleman Buffer rules. Ms. Homewood stated that if the channel was contained in a gully such as the one on the back of the upstream dam, then the channel would qualify for buffer restoration credit. Ms. Homewood also stated that she could not define the top of bank location and would not be able to establish the buffer zones. For these reason Ms. Homewood felt the drainage feature was not suitable for mitigation. She did state that if a channel formed by the end of the five-year monitoring then the credits would be allowed. This results in a loss of 0.20 acres of buffer restoration and continued degradation of Randleman Lake.

EBX feels this determination is not appropriate for several reasons. The contributing watershed is 17.6 acres at the downstream end. Recent research by NCDWQ in this ecoregion (Carolina Slate Belt-A) has shown that stream channels form at a mean watershed size of 11.2 acres and intermittent channels are present in 75 percent of 14.47 acre watersheds (Mapping Headwater Streams: Intermittent and Perennial Headwater Stream Model Development and Spatial Application North Carolina Division of Water Quality Final Report for Federal Highway Administration Contract: Feasibility Study WBS: 36486.4.2, January 29, 2008). The upstream pond (Farm Pond 1) also provides hydrologic storage limiting channel forming flows. WK Dickson personnel observed seasonal stream flow in UT1 during the fall of 2010 and winter of 2011. Lastly, Keith Hockett, principle dairy farmer, stated that the UT1 channel was formerly gullied from cattle access and dam failures but was repaired at the request of NCDWQ. There is a defined drainage swale with FACW and OBL vegetation. EBX proposes the extent of the hydrophytic vegetation be considered the channel and buffer restoration be allowed for 50 feet extending outward from that point.

Farm Pond 1 – Ms. Homewood agreed that buffer restoration would be advantageous at this location due to the immediate proximity of Randleman Lake and the direct nutrient

and sediment input from the cattle operations. However, Ms. Homewood felt that Farm Pond 1 lacked a connection to a downstream water body due to UT1 not being subject to the Randleman Buffer Rules. As a result, Farm Pond 1 is not subject to the Randleman Buffer rules. For these reasons Ms. Homewood felt the pond was not suitable for mitigation. She did state that if UT1 was contained in a defined channel then the Pond 1 buffer restoration credits would be allowed. This results in a loss of 0.50 acres of buffer restoration and continued degradation of Randleman Lake. In addition, a supplemental planted area (not for credit) of 0.63 acres is located adjacent to the proposed buffer restoration and would not be included in the project if no buffer credit is allowed on Farm Pond 1. NCDWQ had previously recommended planting this denuded area during a farm inspection.

EBX feels this determination is not appropriate for the reasons discussed above. UT1 should be considered an intermittent stream and subject to the Randleman Buffer Rules and allowing buffer restoration on Farm Pond 1.

UT2 – Ms. Homewood agreed with the Technical Proposal that the proposed 1.52 acres of UT2 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

Farm Pond 2 – Ms. Homewood agreed with the Technical Proposal that the proposed 0.46 acres of Farm Pond 2 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT3 – Ms. Homewood agreed with the Technical Proposal that the proposed 1.44 acres of UT3 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

Farm Pond 3 – Ms. Homewood agreed with the Technical Proposal that the proposed 0.54 acres of Farm Pond 3 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT4 – Ms. Homewood agreed with the Technical Proposal that the proposed 4.35 acres of UT4 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT5 – Ms. Homewood agreed with the Technical Proposal that the proposed 1.00 acres of UT5 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT6 – Ms. Homewood agreed with the Technical Proposal that the proposed 1.78 acres of UT6 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

GREEN VALLEY FARMS

UT1 – Ms. Homewood agreed with the Technical Proposal that the proposed 3.55 acres of UT1 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT2 – Ms. Homewood agreed with the Technical Proposal that the proposed 2.65 acres of UT2 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT3 – Ms. Homewood agreed with the Technical Proposal that the proposed 2.30 acres of UT3 buffer restoration is allowable and appropriate under the Randleman Buffer Rules.

UT4 –Ms. Homewood Ms. Homewood felt the upper 400 linear feet (approximate) of this drainage feature was a linear wetland that lacked a defined channel and was not subject to the Randleman Buffer rules. Ms. Homewood also stated that she could not define the top of bank location and would not be able to establish the buffer zones. For these reason Ms. Homewood felt the upper UT4 drainage feature was not suitable for mitigation. She did state that if a channel formed by the end of the five-year monitoring then the credits would be allowed. This results in a loss of 0.92 acres of buffer restoration and continued degradation of Randleman Lake. Ms. Homewood agreed with the Technical Proposal that the lower 190 linear feet of UT4 buffer restoration is allowable and appropriate under the Randleman Buffer Rules, resulting in 0.28 acres of buffer restoration.

EBX feels this determination is not appropriate for several reasons. The contributing watershed is 19.2 acres. Recent research by NCDWQ in this ecoregion (Carolina Slate Belt-A) has shown that stream channels form at a mean watershed size of 11.2 acres and intermittent channels are present in 75 percent of 14.47 acre watersheds (Mapping Headwater Streams: Intermittent and Perennial Headwater Stream Model Development and Spatial Application North Carolina Division of Water Quality Final Report for Federal Highway Administration Contract: Feasibility Study WBS: 36486.4.2, January 29, 2008). Further, agricultural activities have resulted in heavy sediment loads entering the channel and filling/obscuring the channel. This is supported by the presence of a defined channel in the forested upstream reach. WK Dickson personnel observed seasonal stream flow in UT4 during the fall of 2010 and winter of 2011 and completed a NCDWQ Stream Identification Form that scored 26 points (intermittent). There is a defined drainageway swale with FACW and OBL vegetation. EBX proposes the extent of the hydrophytic vegetation be considered the channel and buffer restoration be allowed for 50 feet extending outward from that point.

Daniel Ingram

From: Martin Hovis [martin@ebxusa.com]
Sent: Tuesday, February 28, 2012 12:53 PM
To: Daniel Ingram
Subject: RE: Hockett Dairy and Green Valley Farms Buffer Site Cape Fear 03

From: Homewood, Sue [mailto:sue.homewood@ncdenr.gov]
Sent: Monday, February 27, 2012 12:37 PM
To: Martin Hovis
Subject: RE: Hockett Dairy and Green Valley Farms Buffer Site Cape Fear 03

Hi Martin,

I confirm that these statements are all accurate. If there are intermittent or perennial streams in these locations, as determined by the NCDWQ Stream Determination Manual that is in use at that time, then buffer credit would be allowed.

Sue Homewood
NC DENR Winston-Salem Regional Office
Division of Water Quality
585 Waughtown Street
Winston-Salem, NC 27107
Voice: (336) 771-4964
FAX: (336) 771-4630

From: Martin Hovis [mailto:martin@ebxusa.com]
Sent: Friday, February 24, 2012 1:44 PM
To: Homewood, Sue
Subject: Hockett Dairy and Green Valley Farms Buffer Site Cape Fear 03

Mrs. Homewood
I hope you are doing well.
We are in the process of developing our Mitigation Plans for the Hockett Dairy and Green Valley Farms Buffer sites we were awarded for RFP# 16-003567.
Would you please confirm the following statement to be true regarding the buffer acreage for both Sites?

On September 01, 2011 the NCEEP, NCDWQ and EBX visited the Green Valley Farms and Hockett Dairy Buffer sites. Upon viewing the sites NCDWQ, Sue Homewood, noted two sections of concern.
Hockett Dairy UT1 –Ms. Homewood (NCDWQ) agreed that buffer restoration would be advantageous at this location due to the immediate proximity of Randleman Lake and the direct nutrient and sediment input from the cattle operations. However, Ms. Homewood felt this drainage lacked a defined channel and was not subject to the Randleman Buffer rules. Ms. Homewood stated that if the channel was contained in a gully, such as the one on the back of the upstream dam, then the channel would qualify for buffer restoration credit. Ms. Homewood also stated that she could not define the top of bank location and would not be able to establish the buffer zones. For these reasons Ms. Homewood felt the drainage feature was not suitable for mitigation. She did state that if a channel formed by the end of the five-year monitoring then the credits would be allowed.
Farm Pond 1 – Ms. Homewood agreed that buffer restoration would be advantageous at this location due to the

immediate proximity of Randleman Lake and the direct nutrient and sediment input from the cattle operations. However, Ms. Homewood felt that Farm Pond 1 lacked a connection to a downstream water body due to UT1 not being subject to the Randleman Buffer Rules. As a result, Farm Pond 1 is not subject to the Randleman Buffer rules. For these reasons Ms. Homewood felt the pond was not suitable for mitigation. She did state that if UT1 was contained in a defined channel then the Pond 1 buffer restoration credits would be allowed

Green Valley UT4 –Ms. Homewood felt the upper 309 linear feet of this drainage feature was a linear wetland that lacked a defined channel and was not subject to the Randleman Buffer rules. Ms. Homewood also stated that she could not define the top of bank location and would not be able to establish the buffer zones. For these reason Ms. Homewood felt the upper UT4 drainage feature was not suitable for mitigation. She did state that if a channel formed by the end of the five-year monitoring then the credits would be allowed. Ms. Homewood agreed with the Technical Proposal that the lower 190 linear feet of UT4 buffer restoration is allowable and appropriate under the Randleman Buffer Rules, resulting in 0.28 acres of buffer restoration.

EBX plans to plant trees and place a conservation easement over the areas in question (Hockett Dairy UT1 and Farm Pond 1, and Green Valley Farm's UT4 upper 309 Linear Feet) in anticipation that at the end of the 5 year monitoring period there will be a defined channel. We feel the watershed size and defined drainage swale would develop a channel formation if the access of equipment and cattle was eliminated.

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